

Initial Environmental Examination

March 2018

NEP: Urban Water Supply and Sanitation (Sector)
Project

Bhojpur Bazaar Water Supply and Sanitation Sub-
Project

Government of Nepal
Ministry of Water Supply and Sanitation
Department of Water Supply and Sewerage
Third Small Town Water Supply and Sanitation Sector Project
EASTERN REGION PROJECT MANAGEMENT OFFICE
Itahari, Sunsari

**DETAILED DESIGN REPORT OF BHOJPUR BAZAAR
WATER SUPPLY AND SANITATION SUB-PROJECT
BHOJPUR, BHOJPUR**

Volume I	Main Report of Water Supply Component
Volume II	Appendices to Main Report
Volume III	Drawings
Volume IV	Socio - Economic Profile
Volume V	Initial Environmental Examination (IEE)

March, 2018

TAEC CONSULT P. Ltd.
JOINT VENTURE WITH
INTEGRATED CONSULTANTS NEPAL (P) LTD

ABBREVIATIONS

ADB	Asian Development Bank
AP	Affected Person
C-EMP	Contractor's environmental management plan
DI	Ductile Iron
DMA	District Metering Area
DSMC	Design, Supervision and Management Consultant
DRTAC	Design Review and Technical Audit Consultant
DWSS	Department of Water Supply and Sewerage
EARF	Environmental assessment and review framework
EIA	Environmental Impact Assessment
EMP	Environmental management plan
EMR	Environmental monitoring report
EPA	Environment Protection Act
EPR	Environment Protection Rules
EO	Environmental Officer
ES	Environmental Specialist
ESA	Environmental safeguard assistant
ESE	Environmental safeguard expert
GI	Galvanized Iron
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
HHs	Households
HDPE	High-Density Polyethylene
ICG	Implementation Core Group
IEE	Initial environmental examination
MoPE	Ministry of Population and Environment
MoWSS	Ministry of Water Supply and Sanitation
NDWQS	National Drinking Water Quality Standard
NPR	Nepalese Rupees
PMO	Project Management Office
RPMO	Regional Project Management Office
ROW	Right of way
REA	Rapid environmental assessment
STWSSSP	Small Towns' Water Supply and Sanitation Sector Project
SPS	Safeguard Policy Statement
SDG	Sustainable Development Goal
2 nd STWSSSP	Second Small Towns' Water Supply and Sanitation Sector Project
TSTWSSSP	Third Small Towns' Water Supply and Sanitation Sector Project
ToR	Terms of Reference
USD	United States Dollars
VDC	Village Development Committee
WTP	Water Treatment Plant
WHO	World Health Organization
WSSDO	Water Supply and Sanitation Divisional Office
WUSC	Water Users' and Sanitation Committee

WEIGHTS AND MEASURES

C	Celsius/centigrade
DbA	decibel audible
Ha	hectare/s
Km	kilometer/s
Kph	kilometer/s per hour
M	meter/s
Kph	kilometer/s per hour
M	meter/s
m ³	cubic meter/s
Amsl	Above mean sea level
mg/l	milligram/s per liter
Mm	millimeter/s

NOTE

In this report, "\$" refers to US dollars.

This initial environmental examination (draft) 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. Your attention is directed to the ["terms of use"](#) section on ADB's website.

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

Executive Summary.....	viii
I. INTRODUCTION.....	1
A. NAME AND ADDRESS OF THE INDIVIDUAL INSTITUTION PREPARING THE REPORT	1
B. BACKGROUND	1
C. PROJECT AREA DESCRIPTION	2
D. PURPOSE OF THE IEE	3
E. NEED FOR THE SUBPROJECT.....	4
F. RELEVANCY OF THE PROJECT.....	5
G. OVERVIEW OF THE SUBPROJECT	5
H. METHODOLOGY ADOPTED	6
II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK	8
A. NEPAL'S ENVIRONMENTAL POLICY AND LEGAL FRAMEWORK	8
B. ENVIRONMENTAL ASSESSMENT REQUIREMENTS	12
C. ENVIRONMENTAL ASSESSMENT REQUIREMENTS OF ADB	12
D. ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENTS OF NEPAL.....	15
III. ANALYSIS OF ALTERNATIVES	17
A. WITH- AND WITHOUT-SUBPROJECT ALTERNATIVES	17
B. ALTERNATIVES RELATIVE TO PLANNING AND DESIGN	17
1. <i>Alternative Sources</i>	17
2. <i>Alternative Design</i>	18
C. WATER QUALITY	18
IV. DESCRIPTION OF THE SUBPROJECT	20
A. SUB PROJECT SITE	20
B. WATER SOURCE AND PROTECTION	21
C. PROJECT COMPONENTS	22
1. <i>Intake</i>	23
2. <i>Transmission Main</i>	23
3. <i>Thrust Blocks, Saddle Blocks and Thrust Beam</i>	25
4. <i>River and Stream Crossing</i>	26
5. <i>Water Treatment Plant</i>	26
6. <i>Service Reservoir</i>	27
7. <i>Bulk Distribution Mains</i>	28
8. <i>Distribution Main</i>	28
9. <i>House Connection</i>	29
10. <i>Appurtenances</i>	30
11. <i>DMA Establishment</i>	30
D. SALIENT FEATURE OF THE PROJECT AREA	30
V. DESCRIPTION OF THE ENVIRONMENT.....	33
A. PHYSICAL ENVIRONMENT AND RESOURCES	33
1. <i>Landforms and Topography</i>	33
2. <i>Climate</i>	33
3. <i>Water Quality</i>	33
4. <i>Air Quality</i>	34
5. <i>Acoustic Environment</i>	34
B. ECOLOGY, ENVIRONMENT AND RESOURCES	35
1. <i>Natural Resource Management</i>	35
2. <i>Flora</i>	35
3. <i>Fauna</i>	36
4. <i>Aquatic Life</i>	38

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

5.	<i>Protected Areas</i>	38
C.	SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT	38
1.	<i>Settlement pattern</i>	38
2.	<i>Population and Household</i>	38
3.	<i>Ethnicity and caste</i>	40
4.	<i>Education and Health</i>	40
D.	EXISTING SANITATION SITUATION	42
1.	<i>Sanitation Facilities</i>	42
2.	<i>Drainage Facilities</i>	43
3.	<i>Wastewater Management Practices</i>	43
4.	<i>Solid Waste</i>	43
5.	<i>ODF Situation in Service Area</i>	44
6.	<i>Institutions involved in Water Supply and Sanitation Field</i>	44
7.	<i>Water Supply and Sanitation User's Association</i>	44
VI.	ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	46
A.	BENEFICIAL IMPACTS	46
1.	<i>Construction Phase</i>	46
2.	<i>Operation Phase</i>	47
B.	ADVERSE IMPACTS.....	49
1.	<i>Impacts and Mitigation Measures during Design Phase</i>	49
2.	<i>Impacts during Construction Phase</i>	50
3.	<i>Impacts, Issues, Concerns and Mitigation Measures during Operation</i>	55
C.	INDIRECT, INDUCED AND CUMULATIVE IMPACTS.....	57
1.	<i>During Construction</i>	57
a)	<i>Indirect and Induced Impacts</i>	57
b)	<i>Cumulative Impacts</i>	57
VII.	INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION	60
A.	SUMMARY OF THE CONSULTATIONS OUTCOMES.....	60
1.	<i>Common Issues Raised by Stakeholders</i>	60
2.	<i>Issues addressed by the Study Team</i>	60
VIII.	GRIEVANCE REDRESS MECHANISM	62
A.	PURPOSE OF THE GRIEVANCE REDRESS MECHANISM	62
B.	PROPOSED SET-UP	62
C.	ACCESS TO THE MECHANISM	63
D.	GRM STEPS AND TIMEFRAME	63
IX.	IX. ENVIRONMENTAL MANAGEMENT PLAN	67
A.	INSTITUTIONAL ARRANGEMENT	68
B.	DURING CONSTRUCTION AND OPERATION	69
1.	<i>Safeguard Implementation Arrangement</i>	69
2.	<i>Regional Project Management Offices (Eastern and Western RPMOs)</i>	70
C.	ENVIRONMENTAL MANAGEMENT PLAN (EMP)	73
D.	ENVIRONMENTAL MONITORING PROGRAM	81
E.	INSTITUTIONAL CAPACITY DEVELOPMENT PROGRAM	82
F.	STAFFING REQUIREMENT AND BUDGET.....	83
G.	IMPLEMENTATION SCHEDULE.....	87
X.	MONITORING AND REPORTING	89
XI.	CONCLUSION AND RECOMMENDATION	91
XII.	LITERATURE REVIEWED	92

LIST OF TABLES

Table 1: Other Relevant Environmental Act, Rules, Plan, Policies, and Guidelines of Nepal	9
Table 2: SPS 2009 Safeguard Requirements	13
Table 3: The GoN IEE Report Preparation, Review, Approval, and Implementation Process	15
Table 4: Relevant Environmental Quality Standards	16
Table 5: Result of water quality tests	18
Table 6: Existing Source Details	22
Table 7: Details of Service Reservoirs	28
Table 8: Total length of Pipes used in Distribution System	29
Table 9: Salient Features of the Project	30
Table 10: Result of water quality tests	34
Table 11: List of Plants in the Project Area	35
Table 12: Mammals in the Project Area	36
Table 13: List of Birds in the Project Area	37
Table 14: List of Reptiles and Amphibians Found in the Project Area	37
Table 15: List of Fishes Found in the Project Area	38
Table 16: Population of the Concerned Ward of Project Town	38
Table 17: Beneficiaries households	39
Table 18: Distribution of households and population by Ethnic composition	40
Table 19: Reported Water Borne and Communicable Diseases during last year	41
Table 20: Income Level of Households by Ward	42
Table 21: Toilet coverage (HHS)	43
Table 22: Solid Waste Management Practice	43
Table 23: Members of Bhojpur (Silichung) STWS Users and Sanitation Committee	45
Table 24: Summary of Impact Matrix of Beneficial Issues of BWSSP	48
Table 25: Impacts & Mitigation Measures during Design Phase	49
Table 26: Summary of Impact Matrix of Adverse Issues	58
Table 27: Environmental Management Plan Matrix	73

Table 28: Environmental Monitoring Program	81
Table 29 Training Program for Environmental Management	83
Table 30: Indicative Cost of EMP Implementation	85
Table 31:Environmental Management Implementation Schedule	87
Table 32: Proposed Topics for Capacity Building/Training	88

LIST OF FIGURES

Figure 1: Project Area Location Map.....	3
Figure 2: The Project Location Map	21
Figure 3: Schematic Diagram of the Proposed Water Supply System	25
Figure 4: Grievance Redress Mechanism (Formal Approach)	66
Figure 5: GRM First Level.....	67

LIST OF ANNEXES

Annex-1:	Approved Terms of References (ToR)
Annex 2 :	Sample Forms, Formats and Report Template
Annex 2A:	Rapid Environmental Assessment (REA) Checklist For Ilam Project Town and Preliminary Climate Risk Screening Checklist For Sample Project Towns
Annex 2B:	Water Quality Standards
Annex 2C:	Sample Grievance Redress Form
Annex 2D:	Spoil Management Plan
Annex 2E:	Sample Semi Annual Environmental Monitoring Report Template
Annex 2F:	Sample Environmental Site Inspection Report
Annex 3:	Map of the Project Area & Project Location
Annex 4:	Public Notice, Muchulka, Recommendation Letter & Minutes of Meeting
Annex 5:	Survey Questionnaire
Annex 6:	Chlorine Use Guidelines
Annex 7:	Water Quality Test Reports
Annex 8:	Checklists
Annex 9:	Photographs

EXECUTIVE SUMMARY

The Third Small Towns Water Supply and Sanitation Sector Project (TSTWSSSP) 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 over a period of five years (2015- 2020).

Bhojpur town subproject is one of the subprojects proposed under TSTWSSSP under a variation to the existing contract with DWSS/GON. The sub project town is served by two sub systems; major one that collects water from two surface sources viz., Gitang Khola & Badi Khola and minor one consisting of nine local sources. However, the system does not sufficiently meet the needs of the people, regarding both quantity and quality. Similarly, the sources of minor system are also said to be decreasing. The water sample has been collected from the proposed water source and has been analyzed accordingly. The results of the test have shown that chemical and microbial quality of water meets NDWQS standards. Access to sanitation facilities is satisfactory. The existing latrines in individual houses and schools are not maintained properly. However, the community has very limited knowledge on the use of sanitary latrines and personal hygiene, especially in the city periphery.

The majority of the people depend on agriculture as their main source of income, followed by service, remittance and wage labor. This IEE report is based on the Detailed Design report and approved ToR for IEE of this project from the Ministry of Water Supply and Sanitation, which is attached as Annex 1 of this report. The community has a heterogeneous ethnic diversity, with people from various ethnic groups living together.

Categorization: Bhojpur town subproject is classified as Environment Category B as per the SPS- 2009 as no significant impacts are envisioned. The Initial Environmental Examination (IEE) as per EPR-1997 of Schedule-1 has been prepared. The IEE assesses the environmental impacts, provides mitigation, and outline monitoring measures to ensure no significant impacts as a result of the project.

Subproject Scope: The project is formulated under TSTWSSSP to improve water supply and sanitation service delivery in Bhojpur municipality. Investments under this subproject include; i) Construction of a Piped Water Supply System (Intakes, Water Treatment Plant, Transmission Mains, Ground Reservoir Tank, Distribution Main, BPT, Guard House, Office cum Water Quality Laboratory, River Crossings and Household Connections), and ii) Construction of Public Toilets.

Implementation Arrangements: The Ministry of Water Supply and Sanitation is the executing agency, and the Department of Water Supply and Sewerage (DWSS) is the implementing agency. Project Management Office (PMO), established in DWSS building in Kathmandu and a Regional Project Management Office (RPMO) in Itahari, will implement the project activities. A team of technical, administrative, and financial officials, including safeguard specialists has been provided at the PMO to implement, manage and monitor project implementation activities. The RPMO has been staffed by qualified and experienced officers for the day-to-day activities of project implementation in the field and is under the direct administrative control of the PMO. Consultant teams are responsible for subproject planning, management, assuring the quality of design and construction; designing the infrastructure and supervising construction and safeguards preparation.

Description of the Environment: The project components are located in Ilam municipality. The project components will be located in WUSC sites, public road right-of-way (ROW) and community managed forests (that are not declared as protected areas). There are no protected areas, wetlands, mangroves, or estuaries in or near the project locations.

Environment Management: An environmental management plan (EMP) is included in this IEE, which includes i) mitigation measures for environmental impacts 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. The EMP will be included in civil work bidding and contract documents.

Some impacts and their significance have been reduced by amending the designs and locations. The concepts in the 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 any main drains to avoid contaminations; vi) locating tube wells at least 30 m upstream from sanitation facilities, vii) locating household and public latrines and septic tanks at least 30 meters downstream from the nearest drinking water source; viii) piloting controlled disposal of septage to reduce the likelihood of uncontrolled disposal; ix) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

During the construction phase, impacts mainly arise from the need to dispose of moderate quantities of waste soil; and from the disturbance of residents, businesses, and traffic. These are common impacts of construction in urban areas, and there are well-developed methods

for their mitigation. These are common temporary impacts of construction in urban work and minimizing inconvenience by best construction methods will be employed. Traffic management will be necessary during pipe laying on busy roads. It includes air quality, noise level monitoring, capacity building, workforce costs, administrative costs and other costs including public consultation and information disclosure. PMO, RPMO and DSMC are responsible for monitoring the EMP implementation at construction sites.

The total EMP implementation cost is NRs 2, 0,410,000 that includes air quality, noise level monitoring, capacity building, workforce, administrative and other costs, e.g. public consultation and information disclosure, GRM implementation and any unanticipated impact. (Table 32). The implementation costs of mitigation measures is covered separately under civil work contract. The contractor will be responsible for implementing the mitigation measures given in EMP. PMO, RPMO, and DSMC are responsible for monitoring the EMP implementation.

Environmental Impacts, Mitigation, and Monitoring

Nominal environmental impacts have been predicted and the anticipated negative impacts are localized in nature, short-term in duration and low in magnitude. The main environmental concern for water supply system is related to construction activities such as Protection Works at the proposed source to protect from flood & soil erosion, Protection works during construction of transmission & distribution lines such as the unsettling of street surfaces due to excavation and trenches which could lead to soil erosion and silt runoff etc. The mitigation measures are precautionary types such as proper backfilling of the excavated trenches and avoiding cutting of vegetation. The locations of major structures have been acquired in consultation with the user's committee, and no households or communities will be displaced or resettled. Therefore, there are very fewer possibilities of adverse impacts on the biological and socio-economic environment of the project area.

Monitoring is necessary to check the implementation of mitigation measures, and a detailed monitoring schedule has been designed specifying the regular and periodic monitoring activities during the project construction and operation phases. Before the operation of the project, PMO should develop a detailed work plan for implementing mitigation measures and monitoring plans based on the Environmental Management Plan which will be incorporated into the construction and operation contracts.

Consultation, Disclosure, and Grievance Redress: Public consultations were done in the preparation of the project and IEE. On-going consultations will occur throughout the

project implementation period. A grievance redress mechanism is described within the IEE to ensure that public grievances are addressed quickly.

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

Conclusions and Recommendations: Bhojpur town water supply and sanitation project will bring a series of benefits to the local people. However, there are some risks in the commencement of the project on time and sustainability of the project, which requires being identified and measures are taken to mitigate them. But the analysis shows that project benefits outweigh the risks, and these potential risks can be overcome through proper planning, coordination, and management. Therefore the proposed project is unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction, and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of IEE, there are no significant impacts, and the classification of the project as Category “B” is confirmed as per ADB and as Schedule -1 is confirmed as per Environment Protection Rules, 2054 (1997). No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) and Environment Protection Rules, 2054 (1997) of Nepal.

I. INTRODUCTION

A. Name and Address of the Individual Institution Preparing the Report

1. Name of the Proposal

The Name of the Proposal is Bhojpur Bazaar Small Town Water Supply and Sanitation Project

2. Name and Address of the Proponent

The Project proponent, the Third Small Town Water Supply and Sanitation Sector Project (TSTWSSSP) of the Department of Water Supply and Sewerage (DWSS), the Ministry of Water Supply and Sanitation (MoWSS), Government of Nepal, is responsible for the preparation of the IEE report.

Name of Proponent

Project Management Office
Third Small Towns Water Supply and Sanitation Sector Project
Department of Water Supply and Sewerage
Ministry of Water Supply and Sanitation
Government of Nepal

Address of the Proponent:

Panipokari, Kathmandu
Tel: 977 1 442388, 977 1 4412348
Fax: 977 1 4413280
E-mail: info@stwspp.gov.np
Website: www.sstwspp.gov.np

3. Consultant, Preparing the Report

TAEC Consult P. Ltd. *Joint Venture with Integrated Consultants Nepal (P) Ltd.* is responsible in preparing this IEE report.

B. Background

In January 2000, the Government of Nepal (GoN) endorsed the 15-year Development Plan for Small Towns' Water Supply and Sanitation to improve the health, economic and

environmental living conditions of the people in small towns in Nepal. The project embraces the community managed demand responsive approach, where the community is involved in all aspects of planning and implementation of the town projects. The Asian Development Bank (ADB) has been providing financial assistance to this sector project. The Department of Water Supply and Sanitation (DWSS) is the implementing agency, and the Ministry of Water Supply and Sanitation (MoWSS) is the executive agency.

The first phase of the Project, whose duration was 2001-2008, benefitted people in 29 small towns. Upon the completion of it, and after finding positive impacts of the Project, the Government of Nepal decided to implement the second phase, the Second Small Town's Water Supply and Sanitation Sector Project. Similarly, after the successful completion of the second phase "Third Small Town's Water Supply and Sanitation Sector Project (TSTWSSSP)" is under implementation. For the implementation, formulation, and operation and maintenance of the Project, TSTWSSSP aims to have full participation of the users of the respective towns. The users and GON will also share the cost.

The Project has many stakeholders that include WUSC, Project Management Office (PMO) of DWSS, Water Supply and Sanitation Division/ Subdivision Office, Regional Project Management Office (RPMO), Town Development Fund (TDF), Design and Supervision and Management Consultant (DSMC).

Both the Nepali law and ADB policy require that the planning and decision-making process needs to account for the environmental implications of individual developments, and that action is taken to reduce the adverse impacts to acceptable levels. The goal is achieved through the environmental assessment process, which has become an integral part of lending operations and Project development and implementation.

C. Project Area Description

The Project area of Bhojpur Bazaar Subproject lies in Bhojpur District, Koshi Zone in the Province 1 of Nepal. The proposed service area of the proposed project covers complete areas of three wards (wards 6 to 8) and partial areas of six wards (wards 3, 4, 5, 9, 10 and 11) of the Bhojpur municipality. Geographically, the project area lies in the hilly region lies between Latitude 27° 07' 58" N to 27° 16' 42" N and Longitude 87° 02' 40" E to 87° 04' 56" E.

The municipality is in hilly region with altitudes ranging between 560 m (Pikhuwa Khola) to 2560 m (Suntale Danda) above mean sea level (a msl) with average altitude of 1630

meters. The Municipality has subtropical to temperate climate and is heavily influenced by the monsoon (June-September) with an average annual rainfall of more than 1700 mm.

Bhojpur is home to many Newar businessmen as well as skilled Newar craftsmen, and is famous for its metalwork, particularly Khukuri Knives. The nearest airstrip, Taksar, is within the municipality, from where flights connect to Biratnagar and Kathmandu. The other nearest airport with regular flight is Biratnagar Airport, which is about 202 km. There is a road links to Bhojpur Bazaar with Hile which in the North-South Koshi Highway which joins Project area to Dhankuta, Dharan and Itahari. Distance from Bhojpur Bazaar to Hile, Dhankuta and Dharan is approximately 92 km, 118 km and 167 km, respectively.



Figure 1: Project Area Location Map

D. Purpose of the IEE

The IEE was conducted to ensure the environmental sustainability of the Subproject, to integrate environmental considerations into the Subproject preparation process, and to manage environment during Subproject implementation. ADB and GoN require projects to undergo environmental assessments. All projects funded by ADB must comply with the Safeguard Policy Statement (SPS) 2009 to ensure that projects are environmentally sound, designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards. The rapid environmental

assessment using ADB's REA Checklist has indicated that the Subproject is a Category B undertaking, requiring an IEE. On the GoN side, the statutory requirement that has to be adhered is the Environment Protection Act (1997), and Environment Protection Rules (1997) and as amended in 1999 and 2007). Based on EPR Schedule 1, the Subproject is within the threshold of activities under the water supply and sanitation sector that will require an IEE. This IEE fulfills the policy requirements of both ADB and GoN.

The IEE Report primarily:

- i. Provides information on the project and its environmental requirements;
- ii. Provides the necessary baseline conditions of the physical, ecological, cultural and socio-economic environments and/or resources in and surrounding the Project's area of influence;
- iii. Identifies and assesses potential environmental impacts arising from the implementation of the Subproject;
- iv. Recommends measures to avoid, mitigate, and compensate the adverse impacts;
- v. Presents information on stakeholder consultations and participation during project preparation
- vi. Recommends a mechanism to address grievances on the environmental performance of the Project
- vii. Provides an environmental management plan

Relevant reports/documents, consultations with communities are included in the report, and reference to relevant government policies, laws and regulations and mainly the Terms of References (ToR) approved by MoWSS.

E. Need for the Subproject

The Municipality is an attraction for internal migration from hill regions and hence the population growth is comparatively high. Because of its strategic location, the city will tend to grow in the future. However the existing water supply system has not been able to meet the growing demand for water from the consumers.

The present water supply is intermittent and is limited to only certain parts of the city area. The current systems serve only about 68.6% of the service area population. There is a demand from other parts of the Municipality for supply of regular and potable water to the consumers.

The water from the existing system is hardly treated. The people are mostly dependent on piped water supply directly from streams/springs, the quality of which is poor with bacteriological contamination.

At the same time due to intermittent supply and improper jointing method in this large pressure difference area, water distribution pipes sometime suck nearby drainage water.

Considering the water demand and condition of existing system, there is a need for a project to upgrade the existing water supply situation in the service area to meet growing demand for private connections and to make drinking water available to the people of service area throughout the year.

F. Relevancy of the Project

The proposed water supply and sanitation project is needed to be studied from the environmental point of view as per EPA 1997 AD and EPR 1997 AD, 2054 BS (Amendments 1999 AD and 2007 AD). The Proposed Water Supply and Sanitation Project is intended to serve drinking water in wards 6 & 7 (fully) and wards 8 & 9 (partially). The project is expected to benefit a base year population of about 2,711 populations (2019) & a design population of 3,836 (2039).

The proposed project shall be using surface water sources. The Project will not involve the construction of any tunnels; relocation of people or households, settlement plan above the gravity source and construction of river training works. As the proposed project falls within the definitions provided in the EPR 1997 (Amendments 1999 and 2007) Annex 1 (G) for drinking water projects; only IEE is required. The regulation stated in Annex 1 (H) shall only be applicable if the proposal does not fall under categories (A) through (H) of Annex 3.

G. Overview of the Subproject

The Sub Project will improve the water supply system of the project area that includes wards (6 to 8) and partial areas of six wards (wards 3, 4, 5, 9, 10 and 11) of the Bhojpur municipality.

The Project Management Office (PMO) of the Department of Water Supply and Sanitation (DWSS) is the proponent of the proposed Bhojpur Town Water Supply and Sanitation Project. The implementation period will be two years, including operation and maintenance.

H. Methodology Adopted

To meet the objectives of the IEE study a systematic and integrated methodology was followed by the legal requirements of GoN. The Ministry of Water Supply and Sanitation has already approved the Terms of Reference (ToR) for the IEE study of Bhojpur Town Water Supply and Sanitation Project. The IEE study has followed the procedures outlined in the approved ToR.

The IEE study was conducted as per provisions of the Environmental Protection Rules (1997) following the provision of Rules 5, 7, 10 & 11 in compliance with the schedule 1, 3 & 5.

The basic methodology as per EPR includes review of literature for the preparation of IEE, ToR, and approval from the concerned ministry, followed by a 15-days public notification & collection of suggestions from the project baseline information related to physical, biological socio-economic & the cultural environment (Rule 5 of the EPR) was conducted using various applicable survey tools. The study has followed the procedures outlined in the approved ToR and has covered the issues delineated therein. Key elements of the methodology include a collection of primary data based on field studies, consultation with the local people and officials.

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 project conducted at various times were the key documents collected and reviewed to determine the nature and scope of activities of the project that influences the environmental conditions of the proposal area. Similarly, published and unpublished reports about environmental standards, Acts, Regulations, etc. were collected and reviewed. Published and unpublished literature of the project area about biological, social, chemical, physical, and cultural environments in the form of maps, and reports, etc. were collected from various sources and reviewed to get information on the coverage of the studies and fulfill the data gaps.

Field studies were conducted in the project site areas in an extensive manner by a multidisciplinary team, which comprised of an Environmental Specialist, Water Supply & Sanitation Engineer, Sociologist, Geo-Hydrologist and Botanist/Forester. During the visits, baseline information on physical and cultural, chemical, biological, and social conditions of the project direct and indirect impact areas were collected using checklists. The sub-sections below present briefly the various approaches and methodological tools used during the field exploration.

The consultant has addressed the environmental aspects by furnishing information on the Physical, Biological, Socioeconomic and Cultural Environments.

1. **Physical Environment Assessment:** Existing environmental constraints and potential impacts in the project area were studied through field surveys, complemented by secondary information from reports and interviews with some of the government officials, schools and representatives of the local bodies.
2. **Biological, Environmental Assessment:** The information on the biological environment was gathered through a reconnaissance survey of the project site and surrounding area. Due attention was paid to vegetation, wildlife and aquatic life of the project area and its surroundings. The methods used for the collection of biological information are as follows:
 - A collection of ethnobotanical information on socio-economically important plant species through consultation with local informants
 - Ethno-zoological data have been obtained by conducting interviews and discussion with local informants
 - Information on local uses of aquatic biota, fish spawning sites, migration patterns, weedy aquatic plants, etc. was obtained through interviews/discussions with local informants.
3. **Socioeconomic and Cultural Environment Assessment:** Social assessment has attempted to determine the social implications regarding assumed positive and negative impacts. Primary data for the Initial Social Assessment, which is an integral part of the Initial Environment Examination (IEE), were obtained mainly through Focus Group Discussions with communities. Additional data were collected from documents on the districts and household survey questionnaires.

II. Policy, Legal and Administrative Framework

A. Nepal's Environmental Policy and Legal Framework

The Constitution of Nepal 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. Among these, the basic legislation that provides the framework within which environmental assessment is carried out in Nepal is the:

Environmental Protection Act (EPA), 1997, which requires a proponent to undertake IEE or environmental impact assessment (EIA) of the proposed project and have the IEE or EIA report approved by the concerned sector agency or Ministry of Population and Environment (MoPE), before implementation. The EPA: (i) sets out the review and approval process of IEE and EIA reports, that involve informing and consulting stakeholders; (ii) stipulates that no one is to create pollution that would cause significant adverse impacts on the environment or harm to public life and health, or to generate pollution beyond the prescribed standards; (iii) specifies for the Ministry in charge of Environment (currently the MoPE) to conduct inspection of approved projects to ensure that pollution prevention, control or mitigation is carried out according to the approved IEE or EIA report; (iv) provides for the protection of objects and places of national heritage and places with rare plants, wildlife and biological diversity; and (v) states that any person/party affected by pollution or adverse environmental impact caused by anybody may apply to the prescribed authority for compensation to be recovered from the polluter/pollution generator.

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

Other environmental Act, Rules, Plan, Policies, Guidelines that are relevant to the Subproject are presented in the Table 1.

Table 1: Other Relevant Environmental Act, Rules, Plan, Policies, and Guidelines of Nepal

Act/ Policy/Law/Guideline	Rule	Year	Relevant Provisions	Remarks
Water Resources Act		1992	A comprehensive law on the development, use, and conservation of water resources in Nepal, it aims to minimize damage to water bodies by requiring an EIA before granting a license to use water resources for any purpose. Th 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;	The District Office has granted use of water resource. Sites for main & other structures have been acquired accordingly. Pipelines and other small structures will be within RoW .
			Article 18 requires the compliance with quality standards in making use of water resources. Article 19 prohibits the pollution of water resources. Under the Act are two regulations for drinking water purposes: (i) Water Resources Regulation, 1993, setting out the implementation procedures of 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.	EMP prescribes the compliance with NDWQS and its Directives during operation.
Forest Act		1993	The Act prohibits the extraction of boulders, rocks, pebbles, sand or soil from national forests, defined as all forests, excluding private forests, whether marked or unmarked with forest boundary, to include waste or uncultivated lands, or unregistered lands surrounded by the forest or situated near adjacent forests as well as paths, streams, rivers, lakes, riverine lands within the forest.	No trees will be cut. EMP stipulates no illegal quarrying of natural aggregate materials.
Local Self-Governance Act		1999	The Act gives Local Government the functions, duties & powers to: (i) conserve & protect their local environment & natural resources; (ii) plan, implement &/or operate & maintain local WS projects; (iii) implement or arrange for implementation local sanitation/sewerage & drainage projects; (iv) protect cultural heritage & religious sites; &/or (v) monitor project activities within their respective jurisdictions.	Provides basis for Local Government to monitor the environmental performance of the subprojects. EMP provides the responsibilities of LGs in EMP implementation.
Labor Act		1992	The Act emphasizes on occupational health and safety of workers and stipulates provision of necessary safety gears and adopting necessary precautionary measures against potentially hazardous machine/equipment in the workplace. It also stipulates to arrange such as removal of waste accumulated during production process and prevention of dust, fume, vapor and other waste materials, which adversely affect the health of workers.	
Solid Management Act	Waste	2011	Article 4 provides that the management of hazardous, medical, chemical or industrial waste rest 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.

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Act/ Policy/Law/Guideline	Rule	Year	Relevant Provisions	Remarks
Child Labor Prohibition and Regulation Act		2001	The section 3 of the Act prohibits a child from engaging in work, sub-clause 1 of the clause 3 states "Nobody shall engage in work a child who has not completed fourteen years of age as a labor and subclause 2 states "Nobody shall engage a child in a risk full occupation or work set forth in the Schedule". The section 4 states "Child not to be engaged in work against his will by temptation or fear or pressure or by any other means."	
Local Rules	Self-Governance	2000	The rule states for Impact Assessment of the Project In assessing the impact of a project, the local government shall have to pay attention to the following factors:- (a) Social impact: Whether there is a rise in the awareness, change in the living style, thinking and culture and growth of the social and moral activities of the local people; (b) Economic Impact: Whether there is growth in the opportunity of employment or self-employment, in the business transaction, in purchasing power and the overall economic activities of the local people; (c) Services and Facilities: Quality of the services provided by the project, the reaction of the people who have or who have not enjoyed the services and the needs to increase the qualitative and quantitative growth of the services. (d) Environmental Impact: Whether, after launching the project, there occurs deluge, drought, floods, landslides, soil erosion and the like natural calamities	Provides a basis for Local Government to monitor the environmental performance of the subprojects. EMP provides the responsibilities of LGs in EMP implementation.
National Environmental Policy and Action Plan (NEPAP)		1993	Of its five objectives, most relevant to the Project are to (i) mitigate adverse environmental impacts; and (ii) safeguard national & cultural heritage & preserve biodiversity, within & outside protected areas.	The subproject will not impact on physical, cultural heritage & biodiversity. EMP provides measures to mitigate impacts.
National Water Supply and Sanitation Policy		1998	The Policy requires the: (i) monitoring of water quality supplied by completed WSS projects; and (ii) evaluation of their benefits in improving health (e.g., reducing waterborne diseases) and in relieving the sufferings of women and other disadvantaged groups in carrying out their responsibilities over water collection and maintenance of sanitation and hygiene.	Monitoring of the quality of supplied water is prescribed in the EMP following the NDWQS Directives.
National Urban Policy		2007	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.	ADB IEE is conducted to ensure environmental conservation and protection.
National Urban Water Supply and Sanitation Sector Policy		2008	The Policy requires the IEE or EIA of proposed WSS projects by the EPA/EPR to (i) incorporate consultations with key stakeholders, including endpoint users; & (ii) specify measures to mitigate environmental impacts before, during construction & operation, as well as corrective measures.	GoN TOR of IEE has been approved. This ADB IEE will be submitted to ADB for review and approval.
Updated	15-Yr	2009	The Plan defines the population threshold of "small towns" to be in the range of	EMP prescribes environmental effects and

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Act/ Policy/Law/Guideline	Rule	Year	Relevant Provisions	Remarks
Development Plan for Small Towns Water Supply and Sanitation Sector			5,000 to 40,000. Reference to Schedules 1 and 2 of the EPR, as amended in 2007, places water supply projects in small towns under Schedule 1 or within the threshold of water supply projects requiring only an IEE. The Plan emphasizes monitoring and evaluation as an important component of a project to determine the overall impact of a project.	performance monitoring.
Implementation Directives for the National Drinking Water Quality Standards		2005	It sets out the water sampling, testing, analysis, monitoring and surveillance procedures to certify that the quality of supplied drinking water conforms to the National Drinking Water Quality Standards.	Monitoring of the quality of supplied water is prescribed in the EMP following the NDWQS Directives.
National EIA Guidelines		1993	Chapter 3 of this guideline described an Initial Environmental Examination Report must be prepared for those projects which may cause significant impact on environment, whose impact may be known easily and for which mitigation measures may be revealed easily, as mentioned in Schedule-1	EMP prescribes environmental impact and mitigation measures and their performance monitoring.

Nepal is a party to the following international environmental agreements that have broad relevance to works and environmental assessment of works under the Project:

- i. World Heritage Convention, in 1978;
- ii. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), in 1987;
- iii. Convention on Biodiversity, in 1992;
- iv. Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol and subsequent London Amendment, in 1994;
- v. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, in 1996.

The relevance of the aforementioned environmental agreements to the Subproject are with their emphasis on human activities to (i) take measures to protect local, as well as global, natural resources and environment; (ii) prevent or reduce the causes of climate change; and (iii) anticipate and mitigate the adverse impacts of climate change. The country is also committed to the Millennium Development Goals, the seventh goal of which is to “ensure environmental sustainability” targeting the reverse of loss of forest and environmental resources, reduction of biodiversity loss, and increase in the proportion of the population with sustainable access to safe drinking water and basic sanitation.

The Bhojpur Bazaar Water Supply and Sanitation Sub Project does not and will not break or go against Nepal’s commitment to these international agreements. It supports the country’s effort to meet its committed target for SDG 6th.

B. Environmental Assessment Requirements

The Project is subjected to the environmental safeguard requirements of both the ADB and Government of Nepal.

C. Environmental Assessment Requirements of ADB

All projects funded by the ADB must comply with the Safeguard Policy Statement (SPS) 2009 to ensure that projects funded under ADB loan are environmentally sound, legally compliant, and safe. On the environment, the ADB Operations Manual, Bank Policy (OM Section F1/OP, 2010), underpins the SPS 2009. The policy promotes international good

practice as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health, and Safety Guidelines.¹

ADB's Environmental Safeguards policy principles are defined in SPS (2009), Safeguard Requirements as per Table 2 and the IEE is intended to meet these requirements.

Table 2: 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 Project 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 & short-term, can be mitigated without difficulty. There is no adverse impact during operation. 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. (Section VI). No transboundary & global impacts, including climate change.
Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also, consider the no project alternative.	Analysis of alternatives is presented in Section III.
Avoid, and where avoidance is not possible, minimize, mitigate, &/or offset adverse impacts and enhance positive impacts using 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.
Carry out meaningful consultation with affected people & facilitate their informed participation. Ensure women's participation. Involve stakeholders,	Key informant and random interviews have been conducted. A grievance redress mechanism for the resolution of valid Project-

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

SPS 2009 - Safeguard Requirements	Remarks
including affected people & concerned NGOs, early in the project preparation process & ensure that their views & concerns are made known to & understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to EA. Establish a GRM to receive & facilitate resolution of affected people's concerns & grievances on project's environmental performance.	related social and environmental issues/concerns is presented in Section VIII.
Disclose a draft EA (including the EMP) promptly, before project appraisal, in an accessible place & 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 before Project appraisal. The GoN has approved the IEE Report. Copies of both SPS-compliant IEE and GoN-approved IEE will be made available at the offices of the PMO, ICG and WUSC for public consultation.
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 in this IEE.
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 project does not encroach on areas of critical habitats. Forest Group have given their consent for the Project to use the land for said component. No tree will be cut. However, ground cover and low shrubs in the project footprint and some work easement will have to be removed from the transmission main. Although in due time, ground cover is expected to grow over the backfilled affected area naturally, EMP recommends seeding of the re-surfaced area to accelerated re-growth.
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,	This requirement is only minimally applicable to the Project in the aspect of waste generation, e.g., effluent from septic tanks and generated sludge and sludge disposal from water supply and sanitation structures. The Project will not involve hazardous materials subject to international bans/phase-outs.

SPS 2009 - Safeguard Requirements	Remarks
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.	
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.
Conserve physical, cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during the 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 Project will not affect any physical, cultural resource. The EMP recommends the measure/s mitigate the adverse impact on PCRs in case of the chance find.

D. Environmental Impact Assessment Requirements of Nepal

The Environmental Protection Rules (EPR) defines the process that should be followed in the preparation, review, and approval of environmental assessment reports. The process applicable to the Subproject is summarized in Table 3. The key environmental quality standards applied in the GoN IEE (as well as in the ADB IEE) are listed in Table 4 and their details featured as Annex A.

Table 3: The GoN IEE Report Preparation, Review, Approval, and Implementation Process

Steps in the Process	Remarks
Proponent refers to EPR Schedules 1 & 2 for the required environmental assessment (IEE or EIA) to carry out.	The project requires an IEE.
If proposed project requires an IEE, Proponent prepares an IEE schedule of work/ToR using the format prescribed in Schedule 3 of the EPR and submit this to the CSA for approval.	The project has secured an approved ToR.
Proponent carries out IEE according to the approved work schedule/ToR and prepares an IEE Report following the format prescribed in EPR Schedule 5 and incorporating stakeholders' feedback applying the consultation procedure specified in the EPR.	The project carried out IEE and prepared the IEE Report accordingly.
Proponent submits 15 copies of the IEE Report along with the project proposal and recommendation of the concerned VDC or Municipality to the CSA.	Project submitted documents accordingly for review and approval.
CSA conducts review and grants approval of IEE Report.	

Steps in the Process	Remarks
➤ If the review reveals project implementation to have no substantial adverse impact on the environment, CSA approves within 21 days from receipt of the report.	
➤ If the review reveals the necessity to carry out an EIA, Proponent conducts an EIA following the prescribed EIA process.	
Proponent implements approved IEE Report and any terms and conditions given with the approval.	Project has not started being implemented
CSA monitors and evaluates the impact of project implementation. When necessary, issue directives to the Proponent to institute environmental protection measures.	Project has not started being implemented
MWSS conducts the environmental audit after two years of project commissioning/operation.	Project has not started being implemented

CSA: Concerned Sector Agency; EPR: Environmental Protection Rules, 2054 (1997), with amendments in 1999 and 2007; MoPE: Ministry of Population and Environment VDC: Village Development Committee

Table 4: 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. Analysis of Alternatives

A. With- and Without-Subproject Alternatives

There is a road that links to Bhojpur Bazaar with Hile which in the North-South Koshi Highway joins Project area to Dhankuta, Dharan and Itahari. Despite of such type of road accessibility of the project area, the municipality is still facing significant development challenges: (i) The capacity of the existing intermittent water supply system is insufficient for its rapidly increasing population and urban development. (ii) The existing latrines in the houses are not maintained properly. and (iii) Public places are in need of maintained community toilets.

Without-project' or 'do-nothing' alternative: Doing nothing about these challenges would be allowing the municipality to further develop as “under-serviced”, the health of its residents and the general public at more risks, and its living environment, worsened. This would impede (i) further social and economic development of the municipality and (ii) Nepal's delivery of its commitment to SDG 6 to increase the proportion of the population with sustainable access to safe drinking water and basic sanitation.

With project' alternative: With the Project, 12,807 households (2018) will have convenient access to reliable and adequate safe and potable water supply and the local people will have easy access to sanitation at public places so that it helps to improve health and sanitation. As a result, good hygiene and sanitation practices will be promoted, and there will be reduced health and safety risks. Overall, the 'with project alternative' will bring about enhanced public health and living environment that will contribute to improved the quality of life in the project municipality. Improved water supply and sanitation will create an enabling environment for local economic development and improved social services that communities within the sphere of influence of project municipality will benefit from; thus, contributing to the overall local economic development of the District.

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

B. Alternatives Relative to Planning and Design

1. Alternative Sources

There are no alternative sources available in the nearby vicinity to meet the overall demand for this project.

2. Alternative Design

As the proposed system is unique and does not have any alternative source than surface to carry out comparative study, no alternative system analysis has been carried out.

C. Water Quality

During the survey, respondents were asked in term of existing water quality in the project area. The survey revealed that about 4% (86) of respondent feel as good quality where as large numbers 96% (2103) feel satisfactory or moderate in term of water quality.

Some of the major system carries out occasional disinfection (use of 3-5 kg bleaching powder once in a month during rainy season). Water Samples collected from different sources were tested for various physical, chemical and bacteriological parameters. The results of the tests are given below in table 5.

All parameters of water quality of sampled well are within the permitted value by NDWQS. It is recommended taking few samples from the source before construction phase to ensure about the water quality so as to make adequate provision for water treatment, if required.

Table 5: Result of water quality tests

S. N.	Parameters	Unit	Observed Value of Sample			NDWQS, Nepal
			Bhulke	Jor-Sanghu, Tindhare & Daduwa	Tin Bhangale	
1	pH at 26°C	-	6.6	6.5	6.3	6.5-8.5
2	Electrical Conductivity	µmhos/cm	58	48	52	1500
3	Turbidity	NTU	1.4	1.2	1.2	5(10)
4	Taste and Odor		N.O.	N.O.	N.O.	N.O.
5	Color	TCU	0.14	0.27	0.21	500
6	Total hardness as CaCO ₃	mg/l	32	32	34	5(15)
7	Total Dissolved Solid	mg/l	38	29	33	1000
8	Total Residual Chlorine	mg/l	<0.10	<0.10	<0.10	0.1-0.2
9	Chloride	mg/l	0.99	<0.50	0.99	250
10	Ammonia	mg/l	0.42	0.46	0.23	1.5
11	Nitrate	mg/l	0.40	0.44	0.58	50
12	Aluminum	mg/l	0.03	0.03	<0.02	0.2
13	Fluoride	mg/l	0.46	0.20	0.13	0.5-1.5
14	Sulfate	mg/l	6.4	2.4	2.1	250
15	Mercury	mg/l	<0.001	<0.001	<0.001	0.001
16	Calcium	mg/l	3.2	3.2	4.8	200

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

S. N.	Parameters	Unit	Observed Value of Sample			NDWQS, Nepal
			Bhulke	Jor-Sanghu, Tindhare & Daduwa	Tin Bhangale	
17	Iron	mg/l	<0.05	<0.05	0.12	0.30(3)
18	Manganese	mg/l	<0.05	<0.05	<0.05	0.2
19	Lead	mg/l	<0.01	<0.01	<0.01	0.01
20	Cadmium	mg/l	<0.003	<0.003	<0.003	0.003
21	Chromium	mg/l	<0.05	<0.05	<0.05	0.05
22	Copper	mg/l	<0.05	<0.05	<0.05	1
23	Zinc	mg/l	<0.02	<0.02	<0.02	3
24	Arsenic	mg/l	<0.01	<0.01	<0.01	0.05

IV. DESCRIPTION OF THE SUBPROJECT

A. Sub Project Site

The proposed sub-project has been conceptualized as a totally gravity surface water system. The overall concept has been developed with distribution system comprising of bulk water system (BDS) and household distribution system (DS). Altogether the Bhojpur Bazaar system comprises of ten sub-systems. The service area has been divided on the basis of elevation difference and proximity of distribution system. At the same time it will also reduce pipe cost considerably, provides flexibility to operate the system, avoid excessive large numbers of break pressure tanks and follows principles of DMA. Each service reservoir will have control mechanism with bulk meter so that it will support the principles of DMA.

The delineation of the service area of the proposed project has been done in consultation with WUSC, WSSDO and project site local stakeholders based on the needs and the willingness to implement the project as per policy and the requirements of TSTWSSSP. Also, the delineation of the project area is based on field observation of the technical team of the design consultant, which considers efficient management of the water supply system.

The population of the service area was 12,323 with 2,190 households in 2016 AD. The Project area is in Bhojpur Municipality (Latitude 27° 07' 58" N to 27° 16' 42" N and Longitude 87° 02' 40" E to 87° 04' 56" E) and is situated in Bhojpur district in Koshi Zone in the Province 1 of Nepal.

The municipality is in hilly region with altitudes ranging between 560 m (Pikhuwa Khola) to 2560 m (Suntale Danda) above mean sea level (a msl) with average altitude of 1630 meters. The Municipality has subtropical to temperate climate and is heavily influenced by the monsoon (June-September) with an average annual rainfall of more than 1700 mm.

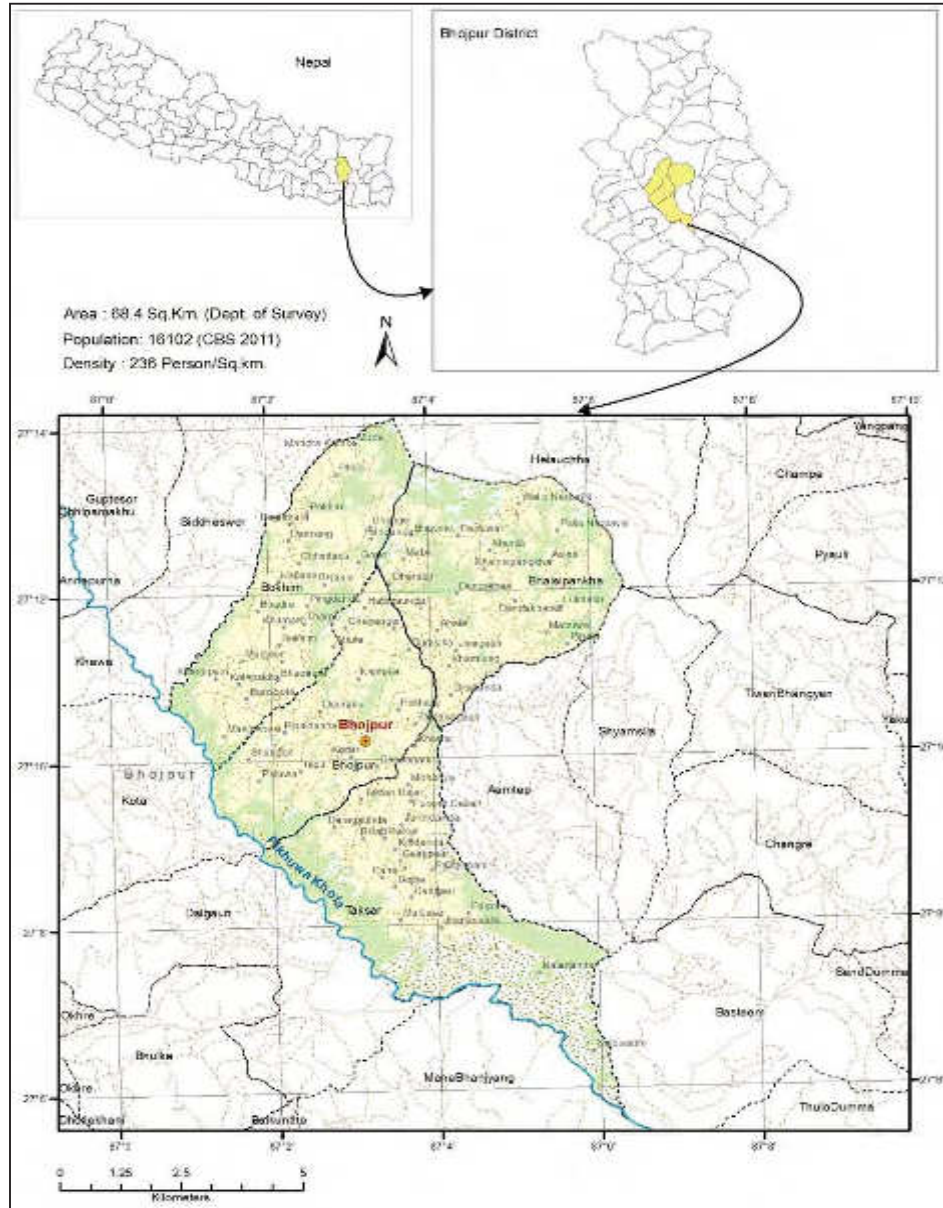


Figure 2: The Project Location Map

B. Water Source and Protection

The proposed system will draw water from different source in three locations. The existing sources such as Jor-sanghu, Tindhare and Daduwa are clustered in ward no 1 of the municipality near Khurila and hereinafter referred as Cluster- 1 Source. The existing source of Bhulke is located in ward no 3 of the municipality near Dhunge and hereinafter referred as Cluster- 2 Source. This Bhulke spring source is best source among the existing sources.

The existing intake and protection structures will be used for proposed system in possible extent after minor rehabilitation.

There are two proposed stream sources clustered in Teema VDC at Tin Bhangale and all are draining to Sangentuwa Khola, which ultimately drain out in Pikhuwa Khola. These sources are hereinafter referred as Cluster-3 Sources. These proposed sources are stream source and located in Tin-bhangale streams near village Sumlikha. Apart from these proposed stream sources there is another two sources near Tin Bhangale which have good yield but still Sillichung WUSC is in process to register these sources. Therefore it is recommended at least one source has to be added during detail design. This cluster is rich in spring source. Therefore, the entire stream in these area or basins are having high specific discharge compare to other river in the vicinity.

As most of the existing source are spring sources, hydrological analysis of these are not possible. Safe yield discharge of these spring source are adopted as per WUSC and local people reporting. The reported safe yields were further triangulated with measured discharges during dry season

The catchment area of proposed stream source, Tin Bhangale rivulets, at the proposed headwork sites has been calculated using the recent topographic map. The total calculated area is about 2.98 square kilometers. The PDSP Manual (Planning and Design Strengthening Project, design manual published by department of Irrigation) has been used to predict mean monthly flow and 80% reliable monthly flow. This rational method for the estimation or prediction of various discharges also referred as Medium Irrigation Project (MIP) Method.

Table 6: Existing Source Details

Name of the Source	Bhulke	Daduwa	Jor-sanghu	Tindhare
WN of the Municipality	WN 4 of BM	WN 1 of BM	WN 1 of BM	WN 1 BN, Khurila
Type (Spring/Stream)	Spring	Spring	Stream	Spring
Measured flow (lps)	6 lps	1 lps	4 lps	3 lps

C. Project Components

The Proposed Bhojpur Town project is extension of existing water supply project. The additional water will be added from other gravity sources. All the sources, old and new, are gravity sources. The system is a combination of rehabilitation of old system and

amalgamation of proposed water supply components required for upgrading the system. The proposed components comprises of new intakes from new source transmission lines, additional storage reservoirs, new households connection and allied structures.

The Bhojpur Bazaar water supply system will be surface water system as the area do not have other potential. It will use almost all structures of existing system to the extent possible. However, small storage reservoirs having less than 40 cum capacity and entire distributions mains are not incorporated in proposed system.

Altogether the system will be divided into Ten sub systems. Service or distribution reservoir of any sub-system shall be dedicated reservoir for that particular sub-system. This has been adopted to minimize large pressure differences in distribution networks and use maximum number of existing reservoirs. The configuration of the system has been shown in figure 3.

All of these project components with their characteristic features are described in the sections below.

1. Intake

Altogether six intakes are proposed. Out of these six intakes, four are existing intakes. The old sub-system comprises of four intakes. Out of these six intakes, three are spring intake and one is stream intake. As they are drawing water from these sources with a cumulative safe yield of 11 lps, the cumulative safe yield for these sources of Cluster-1 and Bhulke source has been adopted as 11 lps. The details of these intakes have been described in section 2.2 of this report. These sources are located in the range of 1958 to 2052 m amsl. The existing Bhulke spring source is very safe source in term of source protection, intrusion by animal and human being.

Two stream intake have been proposed at Tin-Bhangale stream located in Sumlikha village in Teema VDC of the Bhojpur district. Water from two streams will be collected at collection chamber. In totality cumulative discharge of 13 lps have been proposed from these sources (cluster-3 Sources). Slightly high discharge has been proposed for diversion than actual required assuming of about 5% leakage in transmission system. Relative Level (RL) of these intakes are around 2150 m msl.

2. Transmission Main

Three transmission systems have been proposed. Re-alignment of existing transmission from Bhulke source is necessary with re-arrangement of Bhulke transmission line. The

Bhulke transmission will join main proposed transmission (transmission from Cluster-2 sources) in new location.

As the pipe used in existing transmission line from Cluster-1 sources are of sub standard in terms of pressure rating, it is not recommended to incorporate in the proposed transmission system. A new transmission pipes has been proposed for water transmission from Cluster-1 sources (existing sources other than Bhulke). The total cumulative length of transmission mains for existing sources are about 17.5 km. The PE pipe of 75 to 160 outside diameter have been proposed.

The transmission length of the Tin-Bhangale to main WTP is about 18.8 km. This is the length of pipe between Tin Bhangale Intakes and proposed WTP-2. The transmission comprises combination of 150 ND DI and 180 OD PE pipes. Still the valley crossing and pipeline in steep terrain are the main reason to adopt DI pipe. However, large elevation differences in pipe static head valley has been decreased in some level after the presentation of feasibility study.

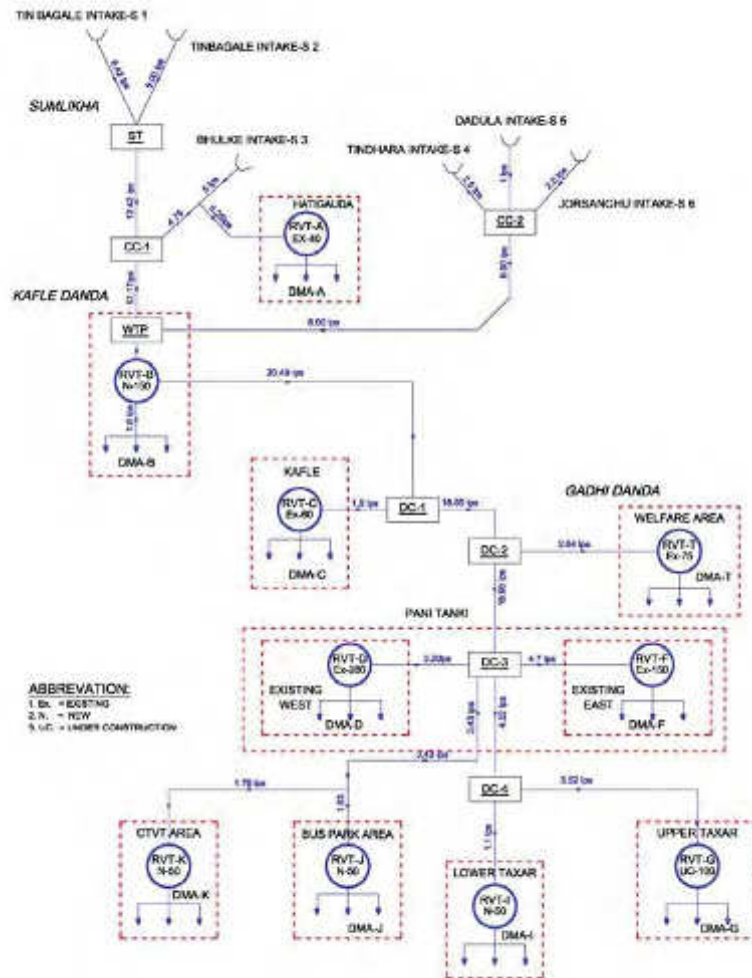


Figure 3: Schematic Diagram of the Proposed Water Supply System

3. Thrust Blocks, Saddle Blocks and Thrust Beam

Thrust blocks has been proposed for DI pipes (both transmission and distribution mains) from being moved by forces exerted within the pipe arising from the internal pressure of the pipeline or the flow of water hitting bends, tapers and closed or partially closed valves. Typical Thrust Blocks for horizontal bend, vertical bend have been design for pressure of 37.5 kg/sq cm and 24 kg/sq cm for transmission and distribution line, respectively.

Similarly, Thrust Beam and Saddle Blocks are proposed for DI Pipes laid up in sloppy areas and un-buried portions. All saddle blocks are proposed to be anchored with concrete at the

centre of each pipe to prevent movement. Provision of RCC Support for the stretches of buried and un-buried DI pipe line which are laid-up in sloppy area has been made to prevent pipe movement.

4. River and Stream Crossing

There are number of small river crossing in proposed transmission system. A simple crossing by providing SP-4 type concrete Saddle Blocks are recommended for small type of crossing for DI pipes. These types of crossing are used only when span of crossing is less than 5 m. There are about fifteen numbers of these type of crossings in the all transmission system. In case of crossing near existing bridge and culvert, provision has been made for pipe clamps.

5. Water Treatment Plant

The Bhojpur Bazaar water supply system will have two water treatment plants. As the SS-A or DMA-A is drawing water from the Bhulke spring source, a small WTP comprising only slow sand filter (SSF) has been proposed for SS-A. This area is at higher elevation than the proposed main WTP. As this area is presently served by the existing system, therefore separate WTP has been proposed for this SS-1. The capacity of the SSF is 0.25 lps.

The other sub-systems used to get water from central RVT located in the premises of main Water Treatment Plant. The main water treatment plant will consist of the following components: a) Inflow chamber; b) Sedimentation Tank for primary settling; c) Horizontal Flow Roughening Filter; d) Slow Sand Filter; and e) Chlorination unit.

The components of main WTP have been proposed at two locations. The sedimentation tank required for new stream sources for primary treatment has been proposed at Tin-Bhangale intake site. This has been adopted in order to control entering sediment even in transmission line. This will increase life of pipe and pipe lining of long transmission mains.

Plain sedimentation has been provided as a pre-treatment unit in main WTP. Where settling process of coarse and heavy suspended particles such as sand, silt, etc will settle through the force of gravity. The tank has been designed for retention period of more than 4 hours.

Setting basin is rectangular settling basin with a longitudinal flow. A Setting basin with two identical chamber of tentative size of 3 m x 10 m have been adopted for 13 lps with design load of 0.8 cum/sq. m /hour.

The other components of main WTP, Horizontal Flow Roughening Filter (HRF) and Slow Sand Filter (SSF) are proposed at Kafle Danda near to central storage reservoir.

Horizontal roughing filters (HRF) have been proposed in the main treatment plant. The filtration rate of 1.8 cum/sq.m/hr has been adopted for design. Inlet and outlet chambers, each 90 cm wide, have been provided in the unit. Each unit comprises of three chamber for fill filter material in gradation fashion (coarse to fine).

The roughing filter has been designed for a discharge capacity of 13.5 lps (additional 0.5 lps has been taken for design purpose) capacity since water from existing sources have been added in this location. About 0.5 lps discharge has been expected to increase during 80% of time in the year from existing sources. Eight numbers of units have been proposed in 2 identical set of HRF. A unit each of 5m wide x 8.8m in length (0.9+3m+2m+2m+0.9) of height 1.7 m has been provided for design discharge of 13.5 lps.

The filtration rate of 0.2 cum/sq.m/hr has been adopted for design of slow sand filter (SSF). SSF has been designed for 13.5 lps and will have a depth of 2.8 m including free board of 50 cm. Two identical unit comprising of three chambers in each unit have been proposed. The bed size of 6mx 12m has been proposed for each chamber. Detailed calculations about the numbers, size and shapes of various units have been annexed in Appendices Volume.

The bleaching powder has been proposed as disinfection agent for disinfection of water. The chlorinators of appropriate capacity have been proposed for chlorination of filtered water.

Each RVT sub-system has its own dosing system before distributing water to the system. The dosing system comprises of electronic dosing pump with FRP tank and stirring device. As the pump is automatic dosing pump of electronic type, close housing recommended. The dosing pump house with two compartments has been proposed. The one-compartment houses dosing pump and other compartment is recommended for chemical store.

6. Service Reservoir

The cumulative capacity of Ten service reservoir provided in the proposed Bhojpur Bazaar water supply sub-project is about 925 cum. The reservoir sizing for all sub-component has been carried out and shown calculations are shown in appendix. The minimum reservoir capacity (existing or proposed) is 40 cum. All existing service reservoir having 40 cum or more capacities have been incorporated in proposed system. Altogether five reservoirs

have been incorporated in to proposed system from the existing system. The details of reservoir are mentioned below:

Table 7: Details of Service Reservoirs

S. No.	Name	Size of RVT (cum)	Remarks
1	Existing RVT HATIGAUDA (A)	40	
2	New RVT at WTP AREA (B)	150	
3	Existing RVT at KAFLE DNANDA (C)	60	
4	Existing RVT at PANITANKI WEST (D)	200	
5	New RVT CTEVT AREA (K)	50	
6	New RVT BUSPARK AREA (J)	50	
7	Existing RVT at PANITANKI EAST (F)	150	
8	New RVT at UPPER TAXAR WN 10 (G)	50	
9	New RVT at LOWER TAXAR (I)	50	
10	Existing RVT at Welfare - Gadhi Danda (T)	75	

The cumulative capacity of all service reservoirs provided in this proposed project is about 875 m³. The reservoir sizing has also been carried out. A minimum of 50 cum capacity has been provided for proposed reservoirs.

7. Bulk Distribution Mains

All of the storage reservoir of the Sub-system will get required water from main water treatment plants except SS-A. The BDS comprises of PE Pipe from 50 OD to 140 OD. The cumulative length of BDS mains is about 9.6 km.

8. Distribution Main

The distribution system comprises of a pipe network, which are looped in certain cases and branched in other. The network has been analyzed using EPANet, a design analytical software tool. The entire system has been designed using Polyethylene (PE), Ductile Iron (DI) and Galvanized Iron (GI) pipes. The size of DI pipes is 150 mm and above. In order to have proper saddle arrangement at household connection in distribution pipe, minimum diameter of distribution pipe has been adopted as 50mm.

Table 8: Total length of Pipes used in Distribution System

A	PE PIPES of 6 Kg/Sq cm	Length (m)	B	PE PIPES of 10 Kg/Sq cm	Length (m)
	50 mm OD	0		50 mm OD	39,138
	63 mm OD	0		63 mm OD	9,017
	75 mm OD	2,549		75 mm OD	2,353
	90 mm OD	2,106		90 mm OD	594
	110 mm OD	166		110 mm OD	1,055
	125 mm OD	196		125 mm OD	0
	Sub Total	5,017		Sub Total	52,157
C	GI Pipes		D	DI	
	50 ND	19,453	150	123	
	80 ND	585			
	Sub Total	20,038		123	
Total =					77,335

Three types of pipes has been used in the distribution network; Ductile Iron (DI), Galvanized Iron Pipe (GI) and Polyethylene (PE) pipes. However, uses of GI pipes have been limited. The details of pipes of various diameters are given in table above. The total pipe length of the proposed distribution system works out to 78.627 km.

9. House Connection

Three types of house connection have been envisaged in the project. There are about 24 number of house connection from DI pipes, about 1,575 number of house connection from PE pipes and about 684 number of house connection from GI pipes. This will make total household connection of 2,283 in the project area. Most of the connection will be private.

The house connection shall comprise of about 12 m pipe PE or GI Pipe (as per requirement) and water meter. The house connection pipe shall be PE-80 or 100, 20 mm OD pipe of rating PN-16 for tapping from DI or PE pipes. In case of tapping from GI pipes, the house connection pipe shall be medium class GI of 15 ND. Tapping of household connection in PE pipe has been proposed from PE saddle with ferrule and in case of DI pipe, DI saddle shall be used with ferrule without touching DI pipe by ferrule. Tapping from GI pipes has been proposed from PE saddle with ferrule

Dry dial volumetric rotary piston type water revenue meter for all house connections are proposed. These household water meters are for 15 mm ND pipe.

10. Appurtenances

These shall primarily comprise of Line or Sectional Valves, Air (Release) Valves, Washout Valves, Flow Meters, Fire Hydrant and Valve Chambers. They are discussed below: These shall primarily comprise of valve chambers to house flow control valves etc. Altogether 30 to 40 valve chambers (chamber and surface valve box) are expected in the system. The RCC valve chamber has been expected less in numbers since the road is wider and some of the chamber will be in non-traffic area. In case of smaller diameter or in very congested urban area surface valve box has been proposed.

11. DMA Establishment

One increasingly common principle of managing a large water network is to sub-divide it into some areas, typically of between 500 and 3000 connections, each established area having a defined and permanent geographical and/or hydraulic boundary. Such an area is known as a District Management Area or, more commonly, a District Meter Area (DMA). Ideally, each DMA has a single source of supply to maximize the accuracy of data, with a strategically placed and suitably sized meter installed at the inlet that is capable of accurately measuring flow into the area. In this way, it is possible to regularly quantify the leakage level in each DMA so that the leakage location activity is always directed to the worst parts of the network.

An important factor in lowering and subsequently maintaining a low level of leakage in a water network is pressure control. The division of the network into DMAs facilitates the creation of a permanent pressure control system, thus enabling pressure reduction in DMAs which reduces the level of background leakage, the rate of flow of individual bursts and the rate of the annual burst frequency. To manage NRW in the proposed system, total system divided into 10 DMA according to the serving reservoir.

D. Salient Feature of the Project Area

The detail salient features of the project are shown in Table 9.

Table 9: Salient Features of the Project

S.N.	Items	Description
1	Name of Project	Bhojpur Bazaar Water Supply and Sanitation Project
2	Type	Gravity
3	Study Level	Detailed

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

S.N.	Items	Description
4	Location Area	
	Province	1
	Zone	Koshi
	District	Bhojpur
	VDC/Municipality	Bhojpur Municipality
	Ward	Complete area of Ward No. 6 to 8 and partial area of ward No. 3, 4, 5, 9, 10 and 11
5	Available Facilities	
	Road	Along Hulaki Road from Gaur to Kalaiya stretch via Garuda
	Supply Water System	Hile-Bhojpur road (92 km)
	Electricity	WUSCs
	Communication	Available
	Health Services	Available
	Banking Facilities	Available
6	Social Status	
	Present HHs Numbers (2016)	2,190
	Present Population (2016)	12,323
	Base Year Population (2018)	12,807
	Design Year Population (2038)	19,011
	Weighted Growth Rate % (WGR)	~2.00
	Projected HHs in Design Year (based on WGR)	~3,378
7	Water Demand (MLD)	
	Base Year (2018)	1.296
	Design Year (2038)	1.924
	Source Name	Apart Existing source, Tin-Bhanghale and its tributaries are proposed source
	Source Type	Perennial River at two stream
	Source Location	Timma VDC of Bhojpur
	Safe Yield (lps)	20 to 22 of proposed source at Tin Bhangale
7	Type of Structures	
	Proposed intakes	6 Nos with rehabilitation of 4 Nos Existing intakes
	Main Water treatment plant	At two location total capacity for 13.5 lps.
	Ground Reservoir - No /Existing (E)/New(N)/ UC (Under Construction) and Capacity in Cum	Total 10 numbers, (1E-40 cum + 1N-150 cum + 1E-60 cum + 1E-75 cum + 1E-200 cum + 1E-150 cum + 1UC-100 + 3N-150)
	Valve Chamber (Bricks/RCC)	32

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

S.N.	Items	Description
	Guard House (G1) / Small Guard House (G2) /Dosing House (DS)	3-G1 / 7- DS
	Household Connection	2,283
	Fire Hydrant	10
	Total Length of pipe in transmission and Bulk Distribution	Transmission line of about 36.3 km (cumulative 17.5 km for old sources and 18.8 km for new source) and BDS of 9.5 km.
	Total Length of pipe in Distribution	77,335 m
9	Total Cost of WS Component (Inclusive of all) NRs.	700,547,765.21
10	Cost Sharing Arrangement	
	GON Component (75 %)	490,383,435.65
	TDF Loan (25 %)	175,136,941.30
11	WUSC's Commitment for O&M as upfront (Cash)	35,027,388.26
12	Tariff	
	Up to 6 cum/monthly (NRs)	240
	7 to 10 cum/monthly (NRs)	60
	11 to 20 cum/monthly (NRs)	90
13	Economic Analysis	
	EIRR (Base case) %	29.05
14	Environment	
	ADB Category	B, Only IEE necessary
	IEE finding	No significant adverse impact.
15	Per Capita Cost for W/S	
	Per Capita Cost (for base year pop.)	54,700
	Per Capita Cost (for design year pop.)	36,850

V. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment and Resources

1. Landforms and Topography

The Project area lies in a hilly region. Geographically, it lies in the hilly region lies on lies between Latitude 27° 07' 58" N to 27° 16' 42" N and Longitude 87° 02' 40" E to 87° 04' 56" E with altitudes ranging between 560 m (Pikhuwa Khola) to 2560 m (Suntale Danda) above mean sea level (amsl) with average altitude of 1630 meters.

2. Climate

The climate in Bhojpur is warm and temperate. When compared with winter, the summers have much more rainfall. The Köppen-Geiger climate classification is Cwb. The average temperature in Bhojpur is 17.6 °C. The average annual rainfall is 1602 mm. The driest month is December, with 11 mm of rain. In July, the precipitation reaches its peak, with an average of 382 mm. June is the warmest month of the year. The temperature in June averages 21.8 °C. At 10.4 °C on average, January is the coldest month of the year. There is a difference of 371 mm of precipitation between the driest and wettest months. The variation in annual temperature is around 11.4 °C.

3. Water Quality

During the survey, respondents were asked in term of existing water quality in the project area. The survey revealed that about 4% (86) of respondent feel as good quality where as large numbers 96% (2103) feel satisfactory or moderate in term of water quality.

Some of the major system carries out occasional disinfection (use of 3-5 kg bleaching powder once in a month during rainy season). Water Samples collected from different sources were tested for various physical, chemical and bacteriological parameters. The results of the tests are given below in tabular form.

All parameters of water quality of sampled well are within the permitted value by NDWQS. It is recommended taking few samples from the source before construction phase to ensure about the water quality so as to make adequate provision for water treatment, if required.

Table 10: Result of water quality tests

S. N.	Parameters	Unit	Observed Value of Sample			NDWQS, Nepal
			Bhulke	Jor-Sanghu, Tindhare & Daduwa	Tin Bhangale	
1	pH at 26°C	-	6.6	6.5	6.3	6.5-8.5
2	Electrical Conductivity	µmhos/cm	58	48	52	1500
3	Turbidity	NTU	1.4	1.2	1.2	5(10)
4	Taste and Odor		N.O.	N.O.	N.O.	N.O.
5	Color	TCU	0.14	0.27	0.21	500
6	Total hardness as CaCO ₃	mg/l	32	32	34	5(15)
7	Total Dissolved Solid	mg/l	38	29	33	1000
8	Total Residual Chlorine	mg/l	<0.10	<0.10	<0.10	0.1-0.2
9	Chloride	mg/l	0.99	<0.50	0.99	250
10	Ammonia	mg/l	0.42	0.46	0.23	1.5
11	Nitrate	mg/l	0.40	0.44	0.58	50
12	Aluminum	mg/l	0.03	0.03	<0.02	0.2
13	Fluoride	mg/l	0.46	0.20	0.13	0.5-1.5
14	Sulfate	mg/l	6.4	2.4	2.1	250
15	Mercury	mg/l	<0.001	<0.001	<0.001	0.001
16	Calcium	mg/l	3.2	3.2	4.8	200
17	Iron	mg/l	<0.05	<0.05	0.12	0.30(3)
18	Manganese	mg/l	<0.05	<0.05	<0.05	0.2
19	Lead	mg/l	<0.01	<0.01	<0.01	0.01
20	Cadmium	mg/l	<0.003	<0.003	<0.003	0.003
21	Chromium	mg/l	<0.05	<0.05	<0.05	0.05
22	Copper	mg/l	<0.05	<0.05	<0.05	1
23	Zinc	mg/l	<0.02	<0.02	<0.02	3
24	Arsenic	mg/l	<0.01	<0.01	<0.01	0.05

4. Air Quality

There are few small industries in the project area. Air pollution is caused by fugitive dust from vehicle movements e.g. old and over smoky buses, tractor, heavy and overloaded trucks, old jeeps particularly over unpaved roads, construction activities, and wind action on unpaved exposed surfaces and industrial emissions from the wood mill, rice mill, and furniture. Gas emissions come from household cooking, open burning, and moving vehicles. Emissions from these sources are scattered regarding both locations and timing.

5. Acoustic Environment

The sources of noise in the Project area are from the construction activities, vehicle movements, and industrial activities. The anthropogenic noise is confined in few clustered settlements and market places only in the daytime.

B. Ecology, Environment and Resources

1. Natural Resource Management

Bhojpur Municipality is endowed with many natural resources like rivers, climate, forests etc. that has helped to enhance the economic development of Bhojpur municipality. There are several surface water sources in and around the project area. These rivers are also used for cultivation. The proposed project will consider natural resource management to ensure the sustainability of the project. The main sources of energy of the project are electricity, kerosene, wood, dry branches leaves.

2. Flora

The common species of plants within and around the proposed project area are shown in Table 11.

Table 11: List of Plants in the Project Area

S.No.	Scientific Name	Local Name	Family
1	<i>Vepris bilocularis</i>	Ainselu	Rosaceae
2	<i>Emblica officinalis</i>	Amala	Euphorbiaceae
3	<i>Pieris ovalifolia</i>	Angeri	Ericaceae
4	<i>Cedrealla toona</i>	Tuni	Meliaceae
5	<i>Lagerstroemia indica</i>	Ashare phul	Lythraceae
6	<i>Adhatoda vasica</i>	Asuro	Acanthaceae
7	<i>Melia azedarach</i>	Bakaino	Meliaceae
8	<i>Ficus bengalensis</i>	Bar	Moraceae
9	<i>Terminalia bellirica</i>	Barro	Combretaceae
10	<i>Aegle marmelos</i>	Bel	Rutaceae
11	<i>Rhus wallichii</i>	Bhalayo	Anacardiaceae
12	<i>Populus ciliate</i>	Bhote Pipal	Salicaceae
13	<i>Lagerstroemia Parviflora</i>	Bot Dhayaro	Lythraceae
14	<i>Schima wallichii</i>	Chilaune	Theaceae
15	<i>Bassia butyracea</i>	Chyuri	Sapotaceae
16	<i>Berberis aristata</i>	Chutro	Berberidaceae
17	<i>Debregeasia salicifolia</i>	Daar	Urticaceae
18	<i>Garuga pinnata</i>	Dabdabe	Burseraceae
19	<i>Mussaenda macrophylla</i>	Dhoben	Rubiaceae
20	<i>Colebrookea oppositifolia</i>	Dhursul	Labiatae
21	<i>Dioscorea bulbifera</i> L.	Githa	Dioscoreaceae
22	<i>Callicarpa macrophylla</i>	Guyanlo	Verbenaceae
23	<i>Lannea coromandelica</i> .	Hallunde	Anacardiaceae
24	<i>Terminalia chebula</i>	Harro	Combretaceae
25	<i>Syzygium cumini</i>	Jamun	Myrtaceae
26	<i>Phoebe lanceolata</i>	Jhankri syaula	Lauraceae
27	<i>Ficus lacor</i>	Kabro	Moraceae
28	<i>Anthocephalus chinensis</i>	Kadam	Rubiaceae
29	<i>Myrica esculenta</i>	Kafal	
30	<i>Adina cordifolia</i>	Karam	Rubiaceae
31	<i>Acacia catechu</i>	Khayar	
32	<i>Ficus semicordata</i>	Khanayo	Moraceae

S.No.	Scientific Name	Local Name	Family
33	<i>Sapium insigne</i>	Khirro	Euphorbiaceae
34	<i>Morus alba</i>	Kimbu	Moraceae
35	<i>Litsea monopelata</i>	Kutmiro	Lauraceae
36	<i>Duabanga grandiflora</i>	Lampate	Lythraceae
37	<i>Engelhardtia spicata</i>	Mauwa	Juglandaceae
38	<i>Erythrina stricta</i>	Phaledo	Leguminosae
39	<i>Ficus religiosa</i>	Pipal	Moraceae
40	<i>Pinus roxburghii</i>	Sallo	Coniferae
41	<i>Terminalia tomentosa</i>	Saj	
42	<i>Bombax ceiba</i>	Simal	Bombacaceae
43	<i>Vitex negundo</i>	Simali	Verbenaceae
44	<i>Mallotus philippensis</i>	Sindure	Euphorbiaceae
45	<i>Albizia chinensis</i>	Siris	Leguminosae
46	<i>Dalbergia sisoo</i>	Sisoo	
47	<i>Bauhinia vareigata</i>	Tanki	Leguminosae
48	<i>Alnus nepalensis</i>	Uttis	Betulaceae

F

Source: Field Survey, 2016

Non Timber Forest Products (NTFPs) are defined products derived from forest species other than timber and fuel wood. The main NTFP species found along the project area are Amala (*Phyllanthus emblica*), Asura (*Justicia adhatoda*), Bilaune (*Maesa chisia*), Kurilo (*Asparagus officinalis*), Dhasingare (*Gaultheria fragrantissima*).

3. Fauna

Some of the mammals reportedly present in the nearby forests are listed in Table 12.

Table 12: Mammals in the Project Area

S N	Common Names	Scientific Names
1	Buanso	<i>Canis lupus</i>
2	Common Leopard	<i>Panthera pardus</i>
3	Dumsi	<i>Histrix indica</i>
4	Fox	<i>Vulpes vulpes</i>
5	Golden Jackal	<i>Canis aureus</i>
6	Hill Mouse	<i>Mos hosmour</i>
7	Jungle Cat	<i>Felis Chaus</i>
8	Lokharke	<i>Funambulus sp.</i>
9	Long-winged Tomb Bat	<i>Taphozous longimanus</i>
10	Malsapro	<i>Martes flavigula</i>
11	Monkey	<i>Macaca mulatta</i>
12	Nepal Grey Langur	<i>Semnopithecus schistaceus</i>

Source: IEE Field Visit Survey, 2016

Some of the birds reported in the forest areas are listed in Table 13 given below:

Table 13: List of Birds in the Project Area

S.No.	Common Names	Scientific Names	Status of occurrence		
			Common	Sparse	Rare
1	Asain Koel	<i>Eudynamys scolopacea</i>		√	
2	Barn owl	<i>Tyto alba</i>		√	
3	Battai			√	
4	Bhangera	<i>Passer domesticus</i>	√		
5	Bhudi Phor	<i>Ciconia espiscopus</i>		√	
6	Bhyakur	<i>Pellorneum ruticepa</i>			
7	Blue-throated Barbet	<i>Megalaima australis</i>	√		
8	Chil	<i>Ictinaetus malayensis</i>		√	
9	Chyakhura	<i>Arborophila torqueola</i>		√	
10	Common Myna	<i>Acridotheres tritis</i>	√		
11	Dangre		√		
12	Dhukur	<i>Streptofelia sp</i>	√		
13	Huchil	<i>Bubo bubo</i>		√	
14	Indian Cuckoo	<i>Cuculus micropterus</i>	√		
15	Jureli	<i>Pycnotus cafen</i>		√	
16	Kag	<i>Crovis macrorhynchus</i>	√		
17	Kalij	<i>Lophura leucomelano</i>	√		
18	Koili	<i>Cuculus micropterus</i>	√		
19	Lampuchure	<i>Caprimulgus macrurus</i>		√	
20	Lato Koshero	<i>Bubo nepalensis</i>			√
21	Nyauli	<i>Megalaima spexies</i>		√	
22	Suga	<i>Psittacula cyanocephala</i>	√		

Source: IEE Field Visit Survey, 2016

The commonly found reptiles & amphibians observed in the project area are shown in Table 14 given below.

Table 14: List of Reptiles and Amphibians Found in the Project Area

Common Name	Scientific Name
Rat snake	<i>Ptyas mucosus</i>
Mountain pit viper	<i>Ovophis monticola</i>
Green Pit viper	<i>T. albolabris</i>
Garden lizard	<i>Calotes versicular</i>
Common lizard	<i>Hemidactylus brookii</i>
Common toad	<i>Bufo melanostictus</i>
Stream frog	<i>Rana cyanophylectis</i>

Source: IEE Field Visit, 2016

4. Aquatic Life

Similarly, common fishes found in the project area are given in Table 15.

Table 15: List of Fishes Found in the Project Area

SN	Scientific Name	Local Name	Migratory species	Economic Importance
1	<i>Barilius Vagra</i>	Faketa	R	Food
2	<i>Garra</i> sp	Buduna	R	Food
3	<i>Glyptothorax</i> sp	Kabre	R	Food
4	<i>Heteropneustes fossilis</i>	Singhi	R	Food
5	<i>Neolissocheilus hexagonolepis</i>	Katle	MM	Food
6	<i>Noemacheilus</i> sp	Gadela	R	Food
7	<i>Psilorhynchoides pseudecheneis</i>	Tite (Endemic)	R	Medicinal
8	<i>Schizothoracichthys</i> sp	Asala	R to MM	Food
9	<i>Channa gachua</i>	Hile	R	Food
10	<i>Tor tor</i>	Sahar	R to MM	Food

Source: IEE Field Visit, 2016

5. Protected Areas

No national parks and protected areas exist in the project area. The proposed project intervention will affect none of the forest areas.

C. Socio-economic and Cultural Environment

1. Settlement pattern

The town is located in hilly area with heterogeneous ethnic composition. Ward no. 7 of this Bhojpur municipality belongs to old main Bhojpur bazaar areas which is the only comparatively densely populated ward. However, the settlement pattern of the other wards is scattered.

2. Population and Household

As the area of present day municipality is complete ward area of four former VDCs, total populations of historic time has been estimated by summing population of these four VDC. The ward-wise populations of the project town according to census, 2001 and 2011 has been presented below:

Table 16: Population of the Concerned Ward of Project Town

Ward	W. Area (Ha)	Census 2001			Census 2011			Growth Rate
		HHs	Pop	P. Densities (PPHA)	HHs	Pop	P. Densities (PPHA)	
1	981.55	275	1,415	1.4	257	1,123	1.1	-2.28
2	842.64	299	1,604	1.9	278	1,301	1.5	-2.07

Ward	W. Area (Ha)	Census 2001			Census 2011			Growth Rate
		HHs	Pop	P. Densities (PPHA)	HHs	Pop	P. Densities (PPHA)	
3	252.56	345	1,688	6.7	350	1,534	6.1	-0.95
4	843.70	308	1,459	1.7	314	1,348	1.6	-0.79
5	189.25	362	1,527	8.1	489	1,771	9.4	1.49
6	221.29	217	1,002	4.5	311	1,160	5.2	1.47
7	244.57	506	1,859	7.6	862	2,805	11.5	4.2
8	686.17	343	1,493	2.2	408	1,710	2.5	1.37
9	693.01	302	1,442	2.1	271	1,112	1.6	-2.57
10	612.66	299	1,419	2.3	291	1,182	1.9	-1.81
11	761.55	279	1,403	1.8	262	1,056	1.4	-2.8
Total	3,110	3,535	16,311	5.3	4,093	16,102	5.2	-0.13

Source: CBS 2001 and 2011

The total population of Bhojpur Municipality as per census of 2011 is 16,102. The populations of this municipality during 2001 were 16,311. The analysis of census population shows that the overall annual growth rate of the municipality is declining with 0.13%. Most of the wards have declining population growth rate in last decade.

The declining population growth rate attributed to Maoist insurgency during early 2000 AD. The former Bhojpur VDC along with other neighboring VDCs were badly affected from the insurgency.

The average HHs size of the area has decreased from 4.61 in 2001 to 3.93 in 2011. Ward 5, 6, 7 and 8 of the municipality, area of former Bhojpur VDC, are only ward having growth rate in the municipality. Ward no 7 is old Bhojpur main bazaar area, is the only comparatively densely populated ward. The population density of this ward is slightly high. The overall population density of the project area increased from 3.77 (2001 AD) to 3.87 (2011 AD) person per hectare.

The consultants conducted a socio economic survey in 2016 of the proposed service area. It shows that the total population of the service area is 12,323. The following table shows the coverage of the population, including beneficiary households in the project area.

Table 17: Beneficiaries households

Ward	HHS	Population
3	29	148
4	142	698
5	284	1,458
6	232	1,515
7	456	3,239
8	332	1,864

Ward	HHS	Population
9	260	1,300
10	248	1,091
11	207	1,010
Total	2,190	12,323

Source: Socio-economic survey 2016

3. Ethnicity and caste

The composition of community by caste/ethnic is heterogeneous in nature. Therefore, diversity of culture, custom, tradition, norms and values exist 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 Janajati/ethnic (Newar, Rai, Magar, Tamang etc.) are the main ethnic group of the project area comprising of 63.7% (1395) of total household where as Brahmin/Chhetri, Dalit and other cast (Madeshi, Musalman etc.) comprising 26.5% (580), 8.4% (184) and 1.4 % (31) respectively. Details of information are presented in the table given below:

Table 18: Distribution of households and population by Ethnic composition

Caste/Ethnic Status	Ward									Total	%
	3	4	5	6	7	8	9	10	11		
Brahman/ Chhetri	0	23	112	105	87	78	43	86	46	580	26.5
Janajati	27	112	158	114	322	204	196	125	137	1395	63.7
Dalit	2	7	0	13	44	49	21	31	17	184	8.4
Others	0	0	14	0	3	1	0	6	7	31	1.4
Grand Total	29	142	284	232	456	332	260	248	207	2190	100.0

Source: Socio-economic survey 2016

4. Education and Health

i) Education

According to the institutional data obtained from the survey, 18 educational institutions including campus for higher education, higher secondary schools, secondary schools as well as primary schools in service area with 7588 people including students, staffs and teachers. Similarly, almost of educational institutions are depending on tap water provided by Silichung water supply. Likewise, all educational institutions have water-sealed latrines. The survey revealed that about 13.4 % (294) of household head are illiterate within the project area. Similarly, just literate ratio is 68% (1491) and more than SLC to above MA are 12%.

ii) Health

Medical facilities for diagnosis and treatments are available in the service area. Twelve numbers of hospitals, health posts and polyclinics with 67-bed capacity were recorded in service area.

iii) Water Borne and Communicable Diseases

The survey also collected cases of water born diseases such as diarrhea, dysentery, stomach ache and skin disease etc. within the service area. It was found that cases of mortality by water related diseases are nil. The information related to water borne and communicable disease was crossed checked by visiting hospital and health posts within the service area. According to the obtained information, about 4.27% (526) were suffered from diarrhea where as 3.17% (391) were suffered from dysentery. Similarly, about 2.73% (337) were suffered from other diseases such as skin, stomach pain, fever etc. The detail information is presented below:

Table 19: Reported Water Borne and Communicable Diseases during last year

	Children (<5 Yrs.)	Female	Male	Total	%
Diarrhea	244	156	126	526	4.27
Dysentery	185	111	95	391	3.17
Other	111	101	125	337	2.73
Total	540	368	346	1254	10.18

Source: Socio-economic Survey 2016 and Data from Hospitals and Health Posts

5. Economic Activities

The economy of the municipality is extensively 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, the highest number of population ie 46% engaged in Agriculture, whereas 23% populations depend on business, 10.8 percentage of population are engaged in service. Similarly, about 9.4% and 4.6% of household head are dependent upon remittance and labour respectively.

There are more than 42 hotels/lodges with 524 bed capacities and managed by 109 staff in the project area. The existing financial institutions are Tourism Development Bank, Citizen Bank, Bank of Kathmandu, Agricultural Development Bank, Banijya Bank, Prabhu Bank, Century Bank etc. Similarly, some cooperatives are also in operation in the area.

Likewise, about 73 governmental (including CDO office, LDO office, Education office etc), non governmental and financial institutions are existing in the area and providing services to the community.

6. Income Level and Poverty Conditions

The survey revealed that main sources of household income of the service area are agriculture, service, remittance and wage labour, respectively. Among the total households, 14.7 percent have monthly income of more than Rs. 7,501- 10,876, majority about 54 % of household have monthly income in the range of Rs. 10,876-20,000 whereas 13 % falls in the range Rs. 20,001-35,000. Likewise, 3% households are earning more than Rs. 35,000 per month. 14.7% households fall under poor category as they are only earning less than Rs 7,500 per month. The monthly income of HHs in the service area is given in the table below:

Table 20: Income Level of Households by Ward

Income Range	Ward									Total	%
	3	4	5	6	7	8	9	10	11		
<7500	4	25	52	19	15	66	7	61	72	321	14.7
7501-10875	8	30	40	40	43	74	28	41	28	332	15.2
10876-20000	8	74	146	124	310	162	172	133	55	1184	54.1
20001-35000	6	7	40	36	77	23	49	11	42	291	13.3
35001-50000	3	5	3	8	7	4	2	2	8	42	1.9
> 50001	0	1	3	5	4	3	2	0	2	20	0.9
Grand Total	29	142	284	232	456	332	260	248	207	2190	100.0

Source: Socio-economic Survey 2016

7. Willingness to Tap Connection

According to the study, 84 % of households are interested to having private tap connection in service area. However, about 16% of HHs has shown unwillingness toward the project.

D. Existing Sanitation Situation

1. Sanitation Facilities

The survey shows that about 70% (1507) household have ventilated pit latrine where as 25% (546) household have pit latrine, which seems to be temporary and needs to be replaced or opted for new construction. Only, 3.3% (73) of household are using cistern flush type of pit latrine. The table below shows the data information about latrine facility in the project area.

Table 21: Toilet coverage (HHS)

Type of Toilet	Ward									Total	%
	3	4	5	6	7	8	9	10	11		
No Toilet	0	2	17	3	6	13		11	11	63	2.9
Pit Latrine	0	8	20	78	154	75	20	78	113	546	24.9
Ventilated Pit Latrine	26	132	247	140	254	232	237	159	80	1507	68.8
Cistern Flush	3	0	0	10	42	12	3	0	3	73	3.3
Grand Total	29	142	284	232	456	332	260	248	207	2190	100

Source: Socio-economic survey, 2016

The existing latrines in individual houses and schools are not maintained properly. The community has very limited knowledge on the use of sanitary latrines and personal hygiene, especially in the core bazaar area.

2. Drainage Facilities

There is no proper drainage system for stormwater as well as for the domestic sewage in the project area. As the terrain is mostly steep, people are less concern about storm water drain.

3. Wastewater Management Practices

There is no sewerage system in the project area. Waste water from individuals is managed inside the house. The socio economic survey conducted in 2016 shows that 97.1% HHs have their own toilet. There is no wastewater treatment plant in the Municipality to treat domestic sewage/septage. However, the survey shows that 99% of the sampled HHs showed an interest in improving the septage management system and are interested to pay for it.

4. Solid Waste

The major sources of waste generation in Bhojpur Municipality are households, hotels, hospitals, vegetable and fruits market, meat stores, groceries, clothing/ fancy stores/tailors etc. There has been no study about types and volume of solid wastes. The disposal of solid waste is done as per the following table:

Table 22: Solid Waste Management Practice

Solid Waste management	Ward									Grand Total	%
	3	4	5	6	7	8	9	10	11		
Pit Near to House	4	6	26	12	12	4	31	7	15	117	95.1
Private Collector			2					1		3	2.4
Pit/Container managed by Municipality			3							3	2.4
Grand Total	4	6	31	12	12	4	31	8	15	123	100

Source: Socio-economic survey, 2016

5. ODF Situation in Service Area

Bhojpur Municipality has not been declared as Open Defecation Free (ODF) area. This proposed project is expected to bring awareness among the people regarding the sanitation improvement of the project area and this may encourage them to proceed for declaring their area ODF in the near future.

6. Institutions involved in Water Supply and Sanitation Field

The main institutions involved in water supply and sanitation sector in the project area are Silichung Water Supply and Sanitation Committee, Bhojpur and Division Office (WSSDO), Bhojpur. WSSDO, Bhojpur has been actively supporting the WUSC to operate the existing water supply system and carry out different WASH activities in the project area. It has been providing both financial and technical support for large scale maintenance and providing pipes, bleaching powder and human resource as and when needed basis.

7. Water Supply and Sanitation User's Association

The existing Bhojpur Bazaar Water Supply and Sanitation Committee consist of nine members representing from various clusters within the service area. The executive committee consists of 6 male and 3 female members and two female members have been working as position of vice chairman and treasurer in key executive post of WUSC. According to the caste/ethnicity status of WUSC body, Brahman/Chhetri and Janajati groups occupy 2 and 7 positions respectively.

The WUSC was registered in Water Resource Committee, Udaypur in 2072 B.S. as per the Water Resource Act-2049 and Water Resource Rule 2050 and involved in management and improvement of the water supply system in Bhojpur Bazaar. Similarly, renewal of WUSC and annual general meeting have been carrying out regularly. Name list and position of the existing WUSC are given in the table given below:

Table 23: Members of Bhojpur (Silichung) STWS Users and Sanitation Committee

S. N.	Name	Position
1	Mr. Navin Pradhan	Chairperson
2	Ms. Bishnu Kumari Rai	Vice Chairman
3	Mr. Shailendra Karki	Secretary
4	Mr. Bhirkha Bahadur Tamang	Assistant Secretary
5	Ms. Krishna Kumari Tamang	Treasurer
6	Mr. Jagat Bahadur Tamang	Member
7	Mr. Dambar Bahadur Shrestha	Member
8	Mr. Jeevan Pradhan	Member
9	Ms. Laxmi Kumari Khatri	Member

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Beneficial Impacts

Availability of clean and adequate drinking water and sanitary facility are basic human needs. The development of water and sanitation facilities will have numerous beneficial impacts to individuals and communities. The quality of life of the project area will be significantly improved by improving water and sanitation needs. Some of the major beneficial impacts of the project are described below along with suggestions for achieving optimal benefits.

1. Construction Phase

a) Employment Generation

The project will generate direct employment opportunities e.g. skilled and non-skilled work for the local people. Construction activities such as laying and joining of pipelines will create an opportunity for local people to get engaged. The earning will positively affect the local economy, thereby reducing the chances of seasonal migration of the local people. To obtain such benefits, priority will be given to employing local laborers.

The impact is thus direct in nature, local in extent, medium in magnitude and short term in duration.

b) Skill Enhancement

The construction of the project will not only provide direct employment opportunities but also ensure the transfer of skills and technical proficiency to the local workforce. The project activities i.e. constructing mechanical treatment plant, surface drains, a valve chamber and buildings will generate transferable skills. In the future, these skills will be useful for locals to generate income as well as implement when the need arises. To obtain or augment such benefits, proper work plan and code of conduct should be implemented during the construction.

The impact is thus indirect in nature, local in extent, medium in magnitude and long-term in duration.

c) Local trade and business opportunity

The proposed project creates business opportunity in the project area. Because construction work involves many workforces, few shops about food items and, agriculture and livestock

product will gain a momentum around the vicinity of the construction site. This demand and supply chain will boost local trade and business sector.

The impact is thus direct in nature, local in extent, medium in magnitude and long-term in duration.

2. Operation Phase

a) Improved health and hygiene

Deteriorating water quality and unsanitary conditions are often the causes of waterborne communicable diseases. The survey report showed that there is no such incidence of water borne diseases. However, the survey also revealed that people in the project area are mostly dependent on the existing piped water system that is hardly treated. Hence, there is high risk of bacteriological contamination in the existing water supply system and there is possibility of outbreak of water borne diseases at any time. This proposed project expects to avoid such risks. It is because after the implementation of the project, the hygiene of the local people will improve which will reduce the occurrence of waterborne diseases thereby improving the public health in the area. Regular maintenance of the project components needs to be carried out so that the project operates smoothly and the benefits are kept intact.

The impact is thus direct in nature, local in extent, high in magnitude and long-term in duration.

b) Increased economic opportunity

After the completion of the project, migration from rural areas to this project town may increase in search of better facilities and opportunities. This will increase the value of the land, thereby uplifting the economic status of the local people. These benefits can be maximized by ensuring regular maintenance of water supply and sanitation components and by promoting land development activities in the area.

The impact is thus indirect in nature, local in extent, medium in magnitude and long-term in duration.

c) Women empowerment

Women and girls are mainly responsible for household activities. Improved water supply and sanitation will contribute towards better health and hygiene of women, girls and the entire

household members. The beneficial impacts to women and girls can be augmented by conducting health and awareness programs to the local community.

The impact is thus indirect in nature, local in extent, low in magnitude and long-term in duration.

Overall, the proposed project will lead to improved public health and environment, significantly improving the quality of life of Bhojpur town residents.

To sustain the positive outcomes, effective operation and maintenance guided by an O&M manual that contains Water Safety Guide, among others, is essential. Continuing hands-on training of WUSC in EMP implementation particularly water quality monitoring is necessary.

Table 24: Summary of Impact Matrix of Beneficial Issues of BWSSP

Beneficial Impacts	Impact Rating				
	Nature	Magnitude	Extent	Duration	Rating
Construction Phase					
Employment Generation	D	M (20)	L (20)	ST (5)	Significant (45)
Skill Enhancement	IN	M (20)	L (20)	LT (20)	Significant (60)
Local Trade and Business	D	M (20)	L (20)	LT (20)	Significant (60)
Operation Phase					
Improved Health and Hygiene	D	H (60)	L (20)	LT (20)	Very Significant (100)
Increase Economic Opportunity	ID	M (20)	L (20)	LT (20)	Significant (60)
Women empowerment	ID	L (10)	L (20)	LT (20)	Significant (50)

Note: Scoring is done based on following;

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

Total Score: More than 75 : Very Significant

50-75 : Significant

Less than 50 : Insignificant

B. Adverse Impacts

1. Impacts and Mitigation Measures during Design Phase

The Impacts, Issues, Concerns & Mitigation Measures during the design phase is illustrated in Table 24.

Table 25: Impacts & Mitigation Measures during Design Phase

Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Responsibility
Detailed design			
Manual preparation	Health and safety of community and workers	Prepare training manuals in Nepali with sketches on community health and safety and potential occupational health and safety	PMO,RPMO & DSMC
Location of pipes and photographs of sites and utilities before construction,	False claims from people; water quality changes due to construction. Interference with other utilities	- Place water pipes away from utilities during design - Provide budget for restoration/replacement of damaged utilities - Avoid placing alignment near heritage buildings - Photograph all sites within heritage areas to enable before and after comparison (note: all roads are to be reinstated to original character especially in heritage areas) - Ensure compliance with any Department of Archaeology (DOA) rules during design including preparation of Archaeological Impact Assessment, or other agreed document by DOA if required.	PMO,RPMO & DSMC /Contractor
Sludge disposal	Inadequate disposal of sludge from reservoirs and treatment plant will cause nuisances to affected properties.	The design of sludge disposal sites will be made at designated sites approved by the municipalities.	PMO,RPMO & DSMC

2. Impacts during Construction Phase

a) Non-Compliance with Environmental Legislation

This issue will arise when there is a lack of awareness among Project staff and management of environmental safeguard requirements, compliance with the requirements, conditions specified in the IEE Report, approval status, and consent.

The impact is thus indirect in nature, local in extent, low in magnitude and short term in duration.

Measures to mitigate these concerns include (i) capacity strengthening of the PMO Environmental Officers and their counterpart at the subproject level; and (ii) ensuring that necessary permit and registration are obtained.

b) Erosion & land surface disturbance

Excavation and digging of trenches during construction has the potential to cause erosion and cave in thereby causing soil erosion, silt runoff and unsettling of street surfaces. Unorganized disposal of the excavated earth can disturb the street surface and decrease the aesthetic and economic value of the area. The activity will be a discomfort to the road users and inhabitants.

Quarrying activities operated to supply the aggregate demand of the subproject may disturb land that could cause further erosion and landslide.

The impact is thus direct in nature, local in extent, medium in magnitude and short term in duration.

Mitigation Measures

During construction, precautionary measures will be taken; proper backfilling of trenches will be done. Temporary access, diversions, and signboards for pedestrians will be provided. The exposed soil will be stabilized and vegetated to prevent further soil erosion.

The contractor must coordinate with DDC & local authority and the concerned Ministry regarding the restrictions in quarrying and the legitimacy of extraction operations of identified sources. The contractor must secure permits for quarrying aggregates and implement a restoration plan, which should be part of the EMP.

c) Impacts on Air Quality

Dust will be generated from inadequately managed or haphazard: (i) earthworks such as clearing, grubbing, excavations, and drilling; (ii) demolition works; (iii) stockpiling of natural aggregates, excavated materials and spoils; (iii) transport, loading and unloading of natural aggregates; (iv) movement of construction-associated vehicles; and (v) on-site rock crushing and concrete mixing; (vi) burning of firewood for cooking & heating in work and labor camps

The impact is thus indirect in nature, local to regional in extent, medium in magnitude and short term in duration.

Some mitigation measures include:

- i. Confining earthworks according to Excavation Segmentation Plan that should be part of the C-EMP;
- ii. Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, or as necessary;
- iii. If re-surfacing of disturbed roads cannot be done immediately, spreading of crushed gravel over backfilled surfaces;
- iv. During demolition, watering of exterior surfaces, unpaved ground in the immediate vicinity and demolition debris;
- v. Place signage at active work sites in populated areas;
- vi. Requiring trucks delivering aggregates and cement to have tarpaulin cover
- vii. Limiting speed of construction vehicles on access roads and work sites to a maximum of 30 km/h;
- viii. Prohibit burning firewood in work & labor camps (promote LP gas for cooking purposes and electric heater for heating purposes;
- ix. Use of vehicles complying with NVMES, 2069 enforcement, and green sticker standards
- x. Prohibit open burning of solid waste.

Odor and gas emissions: There will be a salient impact during the demolition of community toilets and septic tanks in public places.

To mitigate odor and gas emissions, before demolition: (i) clean and disinfect the community toilet.

d) Noise

Noise-emitting construction activities include earthworks, concrete mixing, demolition works, movement and operation of construction vehicles and equipment, and loading and unloading of coarse aggregates. The significance of noise impact will be higher in areas where noise-sensitive institutions such as health care and educational facilities are situated.

The impact is thus direct in nature, local in extent, medium in magnitude and short term in duration.

Some mitigation measures include: (i) using equipment that emits the least noise, well-maintained and with efficient mufflers; (ii) restricting noisy activities to daytime and overtime work to avoid using noisy equipment; (iii) limit engine idling to a maximum of one minute; (iv) spread out the schedule of material, spoil and waste transport; and (v) minimizing drop heights when loading and unloading coarse aggregates.

e) Impacts on Water Resources

Impacts on Surface Water Quality: Some sections of the distribution pipeline will cross water bodies, exposing them to risks of pollution caused by: (i) poorly managed construction sediments, and waste materials; and (ii) poor sanitation practices of construction workers. Polluted water bodies will be harmful to aquatic life and people that depend upon such contaminated sources.

The impact is thus direct in nature, local to regional in extent, medium in magnitude and short term in duration.

Some mitigation measures include: (i) excess spoils will be disposed as per Spoil Management Plan attached in Annex 2 (D); (ii) locating temporary storage areas on flat grounds and away from main surface drainage routes; (iii) shielding temporary storage areas with sandbags and (iv) providing adequate water supply and sanitation facilities at work sites.

For management & final disposal of solid waste following mitigation measures will be applied:

- i. Collection of recyclable solid wastes and supply to scrap vendors
- ii. Ensure all the camp wastes and construction wastes are placed in the designated waste collection pits away from the water path.
- iii. Establishment of separate bounded areas for the collection and storage of all the toxic material wastes, including batteries, oil filters, Mobil, burnt oils, etc. at the construction site
- iv. Collection of biodegradable wastes in separate vessel and transfer to municipal waste stream
- v. Application of various waste disposal systems for diverse wastes produced on site as per the consultation with environmentalists.

Impacts on River Morphology and Hydrology: Quarrying from riverbeds could cause the alteration of the river morphology and hydrology. The contractor will obtain quarry materials from the government approved area.

The impact is thus direct in nature, local in extent, high in magnitude and short term in duration.

To mitigate the negative impact the contractor needs to coordinate with MoWSS and local authorities for any quarry related activities. Alternative sources should be identified, before finalizing any quarry site approval. An Aggregates Management Plan must be part of the C-EMP. The contractors should be required to obtain aggregates only from sources with environmental clearance and licenses.

Impacts on the Quality of Groundwater Resource: There are no private and community groundwater wells that will be affected by the subproject.

Impacts on stored water in adjacent ground reservoir tanks (RVTs): The construction of new ground reservoir tanks will potentially expose the water stored in adjacent existing reservoir tanks. Aside from applicable measures to mitigate impacts on surface water quality (mentioned above), place the signage at existing RVTs. Provide sandbags in existing RVTs perimeters to mitigate sedimentation and contamination of stored water in adjacent RVTs.

f) Impacts on Flora and Fauna

Haphazard site clearing, parking, and movement of construction vehicles and equipment stockpiling, will result in disturbance to the land in the project area. However, the project area does not include any forest, so the impacts to flora and fauna will be minimal.

The impact is thus direct in nature, local in extent, low in magnitude and short term in duration.

During construction, few disturbances will occur. **Some of the mitigation measures include:** (i) installing clear signage and markers to direct traffic movement in sites; (ii) designating stockpiling areas; (iii) providing an alternative fuel to workers for cooking.

g) Impacts on Physical, Cultural Resources

The subproject will not encroach into, or be near physical, cultural resources.

h) Impacts on the Socioeconomic, Environment and Resources

The impacts will result from excavation works, stockpiling, the operation of construction vehicles and equipment, and accidental damage to utilities (e.g., power supply poles, open drains, and water taps or hoses). Nuisance and safety hazards are the indirect impacts.

The impact is thus indirect in nature, local in extent, medium in magnitude and short term in duration.

Some mitigation measures include: (i) Prepare a traffic management plan in collaboration with local authorities; (ii) Where traffic congestion will likely occur, place a traffic flagmen during the working hours; (iii) Provide compensation to affected people; (iv) Manage to stockpile; (v) Manage pumped water from excavations either to drains or drums for later use. (vi) Relocate the affected power supply poles, and embedded private water hoses before excavation, and (vii) Advise the concerned authority during accidental damage to utilities.

i) Community health and safety hazards

Communities will be moderately exposed to threats due to impacts on air and water quality, ambient noise level; mobility of people, goods, and services; accesses to properties, economic activities, and social services; service disruptions, etc. Construction workers may potentially bring communicable diseases in the community.

The impact is thus indirect in nature, local in extent, medium in magnitude and short term in duration.

Mitigation measures include: (i) Contractor's implementation of C-EMP; (ii) adequate space & lighting, temporary fence, shining barriers and signage at active work sites; (iii) Contractor's preparedness in emergency response; and (iv) adequate dissemination of GRM

and Contractor's observance and implementation of GRM v) At least 30% of the local people should be given an opportunity for work in the project activities.

j) Workers' Health and Safety Hazards

Workers will be exposed to the crosscutting threats of the impacts above during construction. Inadequate supply of safe and potable water and inadequate sanitation facilities; poor sanitation practices on site; poor housing conditions; the handling and operation of construction equipment; handling of hazardous substances; exposure to extreme weather and non-observance of health and safety measures, pose additional threats to the health and safety of construction workers. Construction workers may be potentially exposed to communicable and transmittable diseases in the community and the workforce.

The impact is thus indirect in nature, local in extent, medium in magnitude and short term in duration.

Mitigation measures include (i) Enforce the use of personal protective equipment (PPE) among construction workers(ii) provide safe access to and from work sites; (iii) provide safe & adequate water supply and sanitation facilities at camp and work sites ; (iv) provide health care and emergency care of workers (v) Construct gender friendly toilets

k) Impacts on the Sustainability of Works

During construction, seismic events may occur, causing damage to unsettled, unfinished, or uncured and completed structures and affecting their structural integrity.

The impact is thus direct in nature, local in extent, medium in magnitude and short term in duration.

Mitigation measures include: After every seismic event, the contractor must conduct engineering investigations of built structures and implement the necessary corrective actions immediately.

3. Impacts, Issues, Concerns and Mitigation Measures during Operation

a) Non-compliance with relevant environmental legislation

This issue will arise when there is a lack of awareness of Project staff and management of environmental safeguards requirements, compliance with the requirements and conditions specified in the IEE Report and approvals and permits for the use of water resources.

The impact is thus direct in nature, local in extent, medium in magnitude and long-term in duration.

Measures to mitigate this concern include (i) capacity strengthening of the WUSC and continuing capacity strengthening of Project staff; and (ii) ensuring compliance with EPA/EPR, NDWQS, applicable conditions in IEE approvals and registration for the use of water resources.

b) Occupational Health and Safety Hazards

Mishandling of chemicals and other hazardous substances may pose health and safety hazards to the workers.

The impact is thus indirect in nature, local in extent, medium in magnitude and long-term in duration.

Mitigation measures include (i) installation of clear, visible signage in premises on the observance of safety measures; and (ii) setting up of a mechanism for quick response to spills of chemical and hazardous substances.

c) Generation of waste water and sullage

The reliable and sufficient water supply will increase the generation of wastewater and sullage. If inadequately managed, this situation will lead to contamination of the water supplied through leaks or broken pipes in the distribution system.

The impacts are thus indirect in nature, local in extent, medium in magnitude and long-term in duration.

Mitigation measures include: i) prompt action to repair broken pipes and leaks; ii) monitoring incidence of waterborne disease in the dry and wet seasons; iii) For management of waste water & sullage, methods like soakpit, diversion of waste water after treatment into natural drainages & infiltration trenches will be adopted considering the ground conditions, topography, quality and quantity of waste generated.

C. Indirect, Induced and Cumulative Impacts

1. During Construction

a) Indirect and Induced Impacts

The volume of the vehicle that will be operated from the simultaneous construction at project component sites may create traffic jams on narrow access roads and hinder the mobility of people, good, and services, particularly in the bazaar areas. A greater number of people may be exposed to safety hazards from the constricted road space. Coupled with disruption of economic activities and social services from extended interruption of power supply due to the relocation of power poles or likely accidental damages, production outputs will suffer a slowdown. Dust on rice plants and other crops nearby project area would have some effect on the crops' yields. Apart from the applicable mitigation measures, proper coordination with relevant ward authorities, social service institutions and businesses would further mitigate indirect and induced the impacts.

b) Cumulative Impacts

There are no known ongoing or proposed developments in the project town as well as the planned extension of the subproject yet. Hence, cumulative impacts will arise mainly from the construction of the main Subproject components and associated facilities. The subproject's "main area of influence covers component sites, i.e. footprints and areas within 200 m from their edges, considering the potential reach of noise, dust and socio-economic impacts; "Point works" refer to such main components as pumps, RVTs, treatment units/ancillaries, public markets; "Horizontal works" refer to the transmission main and distribution pipes; the "Construction period" (excluding O&M) for horizontal works is estimated to be 1 year, for collection chamber and water treatment plant and RVT and DTW unit/ancillaries is six months.

Assuming all components are started simultaneously, without mitigation, cumulative impacts will be "moderate" in magnitude during the peak construction (for the first four months of the construction). After this, the magnitude of cumulative impacts will lessen to "low" magnitude. The sensitiveness of the resources, natural and artificial, within the main areas of influence has been taken into account, together with the types of works involved and their intensities.

The potential moderate and high cumulative impacts would be dust, noise, road space limitation leading to slow mobility, access blocking, disruption of social services and

economic activities, community and workers' health and safety hazards, generation of solid wastes and spoils. To reduce the cumulative impacts down to acceptable levels:

- i. Civil works must be well planned, strategized and completed promptly;
- ii. The contractor should implement the C-EMP fully, and key institutions should act their roles in EMP implementation effectively;
- iii. There must be adequate consultations with stakeholders, including vehicle operators, and local authorities and coordination, particularly regarding expected cumulative impacts. Vehicle operations should temporarily adjust to the circumstances to relieve some road space limitations and for public safety and convenience;

The grievance redress mechanism should be disclosed (through public meetings, display at strategic places and media) to the communities affected by the cumulative impacts.

The summary of above-mentioned adverse impacts (construction & operation phase) of the project is shown in Table 25.

Table 26: Summary of Impact Matrix of Adverse Issues

Adverse Issues	Impact Rating				
	Nature	Magnitude	Extent	Duration	Rating
Construction Phase					
Non-Compliance with Relevant Environmental legislation	ID	L (10)	L (20)	ST (5)	In Significant (35)
Land Surface disturbance	D	M (20)	L (20)	ST (5)	In Significant (45)
Impacts on Air Quality	ID	H (60)	S (10)	ST (5)	Very Significant (75)
Noise	D	M (20)	L (20)	ST (5)	Insignificant (45)
Impacts on Water Resources	D	M (20)	S (10)	ST (5)	Insignificant (35)
Impacts on River Morphology and Hydrology	D	M (20)	L (20)	ST (5)	Insignificant (45)
Impacts on Flora and Fauna	D	L (10)	L (20)	ST (5)	Insignificant (35)
Impacts on Physical Cultural Resources	No any Impacts				
Impacts on the Socio-economic Environment and Resources	ID	M (20)	L (20)	ST (5)	Insignificant (45)
Community Health and Safety Hazards	ID	M (20)	L (20)	ST (5)	Insignificant (45)
Workers' Health and Safety Hazards	ID	M (20)	L (20)	ST (5)	Insignificant (45)
Impacts on the sustainability of works	D	M (20)	L (20)	ST (5)	Insignificant (45)
Operation Phase					
Non-Compliance with relevant environmental legislation	D	M (20)	L (20)	LT (20)	Significant (60)
Occupation Health and Safety Hazards	ID	M (20)	L (20)	LT (20)	Significant (60)
Generation of Waste-water and Sullage	ID	M (20)	L (20)	LT (20)	Significant (60)

Note: Scoring is done based on following;

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

Total Score: More than 75 : Very Significant

50-75 : Significant

Less than 50 : Insignificant

VII. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

Stakeholder consultation and participation was an essential process in project preparation. The process of engaging stakeholders and affected people involved key informant interviews, on-site discussions with WUSC, and random field interviews of stakeholders.

A. Summary of the Consultations Outcomes

The public meeting was organized in Bhojpur Municipality for the discussion of the environmental impacts due to the construction of this proposed project.

The local peoples' concerns regarding the construction of Subproject are summarized below:

1. Common Issues Raised by Stakeholders

The common issues raised by the local stakeholders during IEE Study are as follows:

- i. The contractor should bring construction related materials (sand, gravel & Boulder) from DDC approved crusher plant for the project.
- ii. The extraction of sand, gravel & boulder from unauthorized quarry/ riverbed must be prohibited.
- iii. The project should give priority to local people while hiring for construction related jobs.
- iv. The project must develop a solid waste management plan and a waste disposal plan.

2. Issues addressed by the Study Team

- i. The law and the site specific EMP of the project will compel the contractor to bring construction related materials (sand, gravel & Boulder) from DDC approved sources.
- ii. Whether the project conforms to the laws will be monitored by DDC, RPMO, etc. during the construction phase.
- iii. The safe disposal of solid waste management plan will be developed for the construction phase of the project
- iv. Local workers of the project town will be given priority for employment.

The project envisages that stakeholder consultations will continue during the project period and concerned stakeholders will be invited and encouraged to participate. The PMO and ICG will maintain rapport with WUSC and the VDC. PMO, ICG, Contractors, and WUSC will be open to the public to discuss concerning the progress of the subprojects, adverse

impacts, mitigation measures and environmental monitoring and grievances. The stakeholder consultations in future will be as follows.

- i. During construction, if changes in design, alignment, and location occur, the PMO and ICG will hold at least one public consultation to solicit perceived impacts, issues, concerns and recommendations from affected communities;
- ii. Before construction, the PMO and ICG will conduct an information, education and communication (IEC) campaign among the affected communities about 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. Billboards about the subproject, implementation schedule and contact details of the executing agency, PMO-ES, ICG-ESA and Contractors will be set up at strategic locations. The grievance redresses procedure and details will be posted at the offices of the ICG, WUSC, and VDC;
- 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. PMO and ICG will be responsible for designing and implementing such aspects on the ground.

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

VIII. GRIEVANCE REDRESS MECHANISM

A. Purpose of the Grievance Redress Mechanism

The Project-specific grievance redress mechanism (GRM) is meant for persons seeking a satisfactory resolution to their complaints on the social and environmental performance of the subprojects under the TSTWSSP. The mechanism, developed in consultation with key stakeholders, will ensure that: (i) the basic rights and interests of every person adversely affected by the social and environmental performance of a Subproject are protected; and (ii) their concerns are effectively and timely addressed.

B. Proposed Set-Up

The MoWSS, as the Project executing agency, will establish the GRM and its support system, including setting up the Grievance Redress Committee (GRC) at the subproject level. The GRC will comprise the: (i) Chief of the WSSDO; (ii) members of the WUSC; (iii) two representatives of affected persons, a male and a female; (iv) a member of IP community, preferably female; (v) a representative of a non-government organization or community-based organization actively involved in IP development/other backward communities in the area, if any; (vi) local government representatives, i.e., VDCs and DDC; (vii) DSMC social safeguard expert; and (viii) DSMC environmental safeguard expert (ESE). The environmental safeguard Assistant (ESA) of the ICG will oversee the implementation/observance of the mechanism for environmental complaints at the subproject level. He/she will be technically advised, supported and trained by DRTAC environmental specialist and the DSMC ESE. PMO's Environmental Officer will oversee the implementation/observance of the GRM in all subprojects. Representatives of affected persons (APs), civil society and eminent citizens will be invited as observers during GRC meetings. Contractors and WUSCs (as Operators) will be required to designate their respective counterpart GRM staff.

The GRM will accommodate both informally- and formally lodged, but Project-related, valid grievances. Informally lodged grievances are those received by the Contractors during construction or WUSCs during operation. Formally, lodged grievances are those received at the ICG office. The ICG, GRC, and PMO maintain records of all grievances, informally- and formally lodged, valid and invalid, and appealed. The ICG will immediately inform the PMO, as necessary, particularly when an AP makes an appeal in court. PMO will in turn immediately inform the ADB of the same. The observance/implementation of the GRM will be reported by the: (i) ICG ESA in the subproject's monthly progress reports, semi-annual

subproject environmental monitoring report (EMR) during construction and annual subproject EMR during operation; and (ii) PMO EO in the Project's monthly progress report, semi-annual Project EMR during construction and annual Project EMR during operation.

Sufficient support system, including well GRM-oriented staff of Contractors and WUSCs, communication/documentation/recording and reporting system, funds, and posters declaring contact details and displayed at strategic locations, among others, will be in place to sustain the effective implementation of the mechanism.

C. Access to the Mechanism

Any person who has environmental concerns/issues about the subprojects during detailed design, construction and operation phases will have access to the mechanism free of charge. The PMO EO and ICG ESA will ensure that:

The public, especially the residents and regular passers-by, in the main areas of influence of the subprojects, are aware of their rights to access, and will have access to, the GRM free of administrative and legal charges; and

The GRM is fully disclosed prior to Notice to Proceed for construction is given: (a) in public consultations and social/community preparations, (b) through posters displayed in the offices of the ICG, VDCs, DDC and at strategic places within the main areas of influence of subprojects (posters to include names and contact details of the EO of the PMO and ESA of the ICG).

D. GRM Steps and Timeframe

Informal Approach: Informally, APs can lodge complaints directly to the Contractor during construction or Operator (WUSC) during operation. Contractor/Operator will document and screen the complaint immediately. If screening reveals the complaint as Project-related and valid, the Contractor/Operator will act on the complaint within three days from receipt of the complaint. Otherwise, the Contractor/Operator will direct the AP with non-Project-related and invalid complaint to the ICG. The Contractor/Operator will secure a confirmation of completion of action from the AP. For at least a week after confirmation of completion, the ICG will monitor the effectiveness of the action/resolution taken. After which, ICG will secure a written confirmation of satisfaction from the AP. The Contractor/Operator shall report to the ICG all complaints received, eligible or ineligible, actions agreed on and taken and confirmation of completed action.

Formal Approach: If a complaint is eligible but is not acted on within three days from the receipt of the complaint, or if AP is not satisfied with the resolution undertaken by the Contractor/Operator, he/she can access the formal mechanism, as follows:

First Level: The access point will be the ICG. The steps are detailed below:

Step 1 - Lodging a Complaint (Day 1): AP lodges complaint with the ICG, verbally or in writing. ICG documents/registers lodged a complaint, makes sure these are duly referenced and provides AP with a copy of the referenced complaint.

Step 2 - Screening of Complaint (Day1): ESA screens the complaint if it is Project-related and valid and informs the AP immediately of the screening results. An AP with complaint screened as non-Project-related and invalid will be advised that he/she may raise a complaint to the second level of the GRM, and ICG will forward the complaint to the GRC.

Step 3 - Investigations, Discussion, and Agreement (Day 1): ICG, and the Contractor or Operator and AP, will investigate and discuss the complaint at the site. Agreement on actions and measures and time involved will be made with the AP. The agreement will be properly documented and filed; ICG, AP, Contractor/Operator will have copies.

Step 4 - Implementing the Agreed Action

- If the required action is minor, i.e. not requiring further investigation and would be quick and easy to implement, the Contractor/Operator will immediately implement the agreed action. (Day 2/Day 3)
- If required action is major, i.e. requiring further investigation and/or procurement of supplies/parts, the Contractor/Operator will: (i) immediately provide the most suitable interim measure to reduce the magnitude of the impact (Day 2/Day 3); and (ii) start work on the major action within 5 days from discussion (or not later than Day 8 since receipt of complaint).
- The ICG will advise AP that his/her complaint may be raised to the second level of the GRM, if he/she so prefers when: (i) minor action is not implemented within 2 days from discussion; (ii) interim measure prior to major action is not implemented within 2 days of discussion; or (iii) major action is not started within 5 days of discussion.

Step 5 - Confirmation of Completed Action: Contractor/Operator will secure a written confirmation of completed action from the AP and furnish the ICG a copy.

Step 6 - Confirmation of Satisfaction (1 week after confirmation of completed action): The ICG will monitor the effectiveness of the resolution for at least a week after receipt of confirmation of completed action from the Contractor/Operator. After which, ICG will secure a written confirmation of satisfaction from the AP.

Second Level: The AP will be notified by the ICG when a complaint is forwarded to the GRC. The GRC will call for a hearing, if necessary, where AP can present his or her concerns or issues. The GRC will suggest corrective action or measure at the field level and assign clear responsibilities for implementing its decision within 7 days of receipt of the complaint by GRC. If GRC decision is not acceptable to the AP, if the suggested corrective action/measure is not started within 7 days, the matter/AP will be referred to the third level.

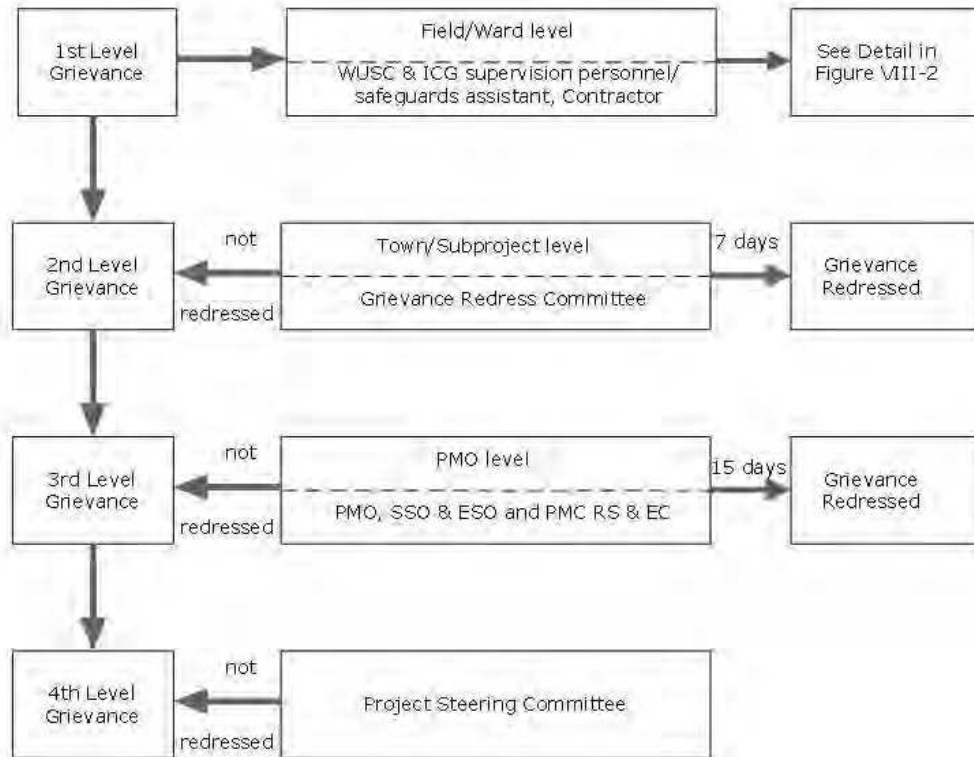
Third Level: The ICG will refer AP and its unresolved complaint or major issues to the PMO EO who will act within 15 days.

Fourth Level: For major issues that will go beyond the third level, these will be referred to the project steering committee (PSC), to be resolved within 30 days. Environmental complaints (other than those that will involve the legal system) are expected to be mainly resolved at the second level, and to a lesser extent on the third level.

Despite the GRM, an AP will have access to the country's legal system. Accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. If the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism (AM) 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 the country's language. The ADB Accountability Mechanism information will be included in the PID to be distributed to the affected communities, as part of the GRM.

Record keeping and disclosures: The PMO, GRC, ICG will keep records of all lodged and documented/referenced complaints, actions/resolutions taken, AP's written confirmations of completed action and satisfaction, complaints raised to higher levels and lessons learned. The number of grievances recorded and resolved and the outcomes will be displayed at the offices of WSSDO, ICG, Town LGU, PMO and WUSC and reported in the monthly progress reports, semi-annual EMR during construction and annual EMR during operation, submitted to ADB.

Periodic review and documentation of lessons learned: The PMO EO will do periodic review of the effectiveness of the GRM in each town and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address complaints.



- ES- Environmental Specialist
- ESO- Environmental Safeguards Officer
- ICG- Implementation Core Group
- PMC- Project Management Consultant
- PMO- Project Management Office
- RS- Resettlement Specialist
- SSO- Social Safeguard Officer
- WUSC- Water Users and Sanitation Committee

Figure 4: Grievance Redress Mechanism (Formal Approach)

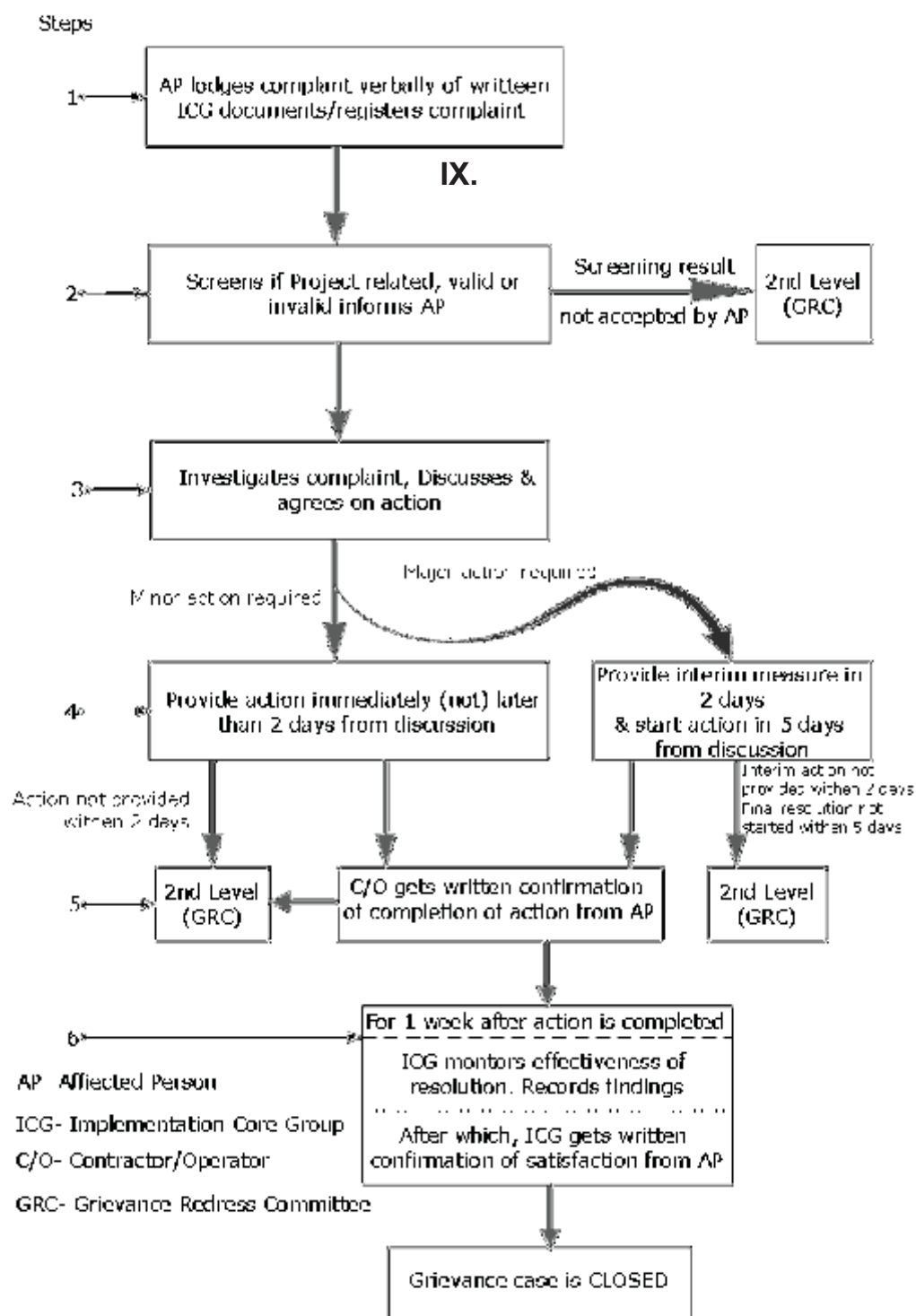


Figure 5: GRM First Level

IX. ENVIRONMENTAL MANAGEMENT PLAN

The purpose of the environmental management plan (EMP) is to ensure that the activities are undertaken in a responsible, non-harmful way with the objectives of (i) providing a proactive, feasible, and practical tool to measure and monitor environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the Environmental assignment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impacts of the project; and (iv) ensuring that safety recommendations are complied.

A copy of the EMP must be kept on work sites at all times. This EMP will be included in the bid documents and will be 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

Executing and implementing agencies: The Ministry of Water Supply and Sanitation (MoWSS) is the executing agency with the responsibility of subproject execution with the responsibility of subproject execution delegated to the Department of Water Supply and Sewerage (DWSS). Water User's and Sanitation Committees of participating towns are the implementing agencies.

The key responsibilities of the executing and implementing agencies are as follows:

Before construction:

- MoWSS will deputize a qualified staff to act as the Environmental Safeguard Officer of the Project management office (PMO).
- MoWSS will establish the grievance redress mechanism, including setting up the Grievance Redress Committee.
- The Water Supply and Environmental Division of the MoWSS is responsible for reviewing and approval of the IEE Report.
- DWSS will review the IEE Report prepared by the Design, Supervision, and Management Consultant Team's Environmental Safeguard Expert (DSMC-ESE) before forwarding this to MoWSS.
- DWSS prepares the ToRs for the Environmental Safeguard Specialist that will engage to support the PMO and for the Environmental Safeguard Specialists of the two Design, Supervision and Management Consultants prepare the subprojects.

B. During construction and operation

1. Safeguard Implementation Arrangement

Project Management Office (PMO): The safeguard officers (environmental safeguard officer and social safeguard officer) of the PMO will receive support from safeguards experts (environmental and social) of the Project Management Consultants (DRTAC) as specified below:

- Confirm IEEs/EMPs are updated based on detailed designs and that new IEEs/EMPs are prepared following the EARF and government rules;
- Confirm whether EMPs are included in bidding documents and civil works contracts;
- Provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by regional project management offices (Eastern RPMO and Western RPMO) and contractors;
- Establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the EMP;
- Facilitate and confirm overall compliance with all Government rules and regulations regarding the site and environmental clearances as well as any other environmental requirements;
- Supervise and guide the RPMOs to properly carry out the environmental monitoring and assessments as per the EARF;
- Review, monitor and evaluate the effectiveness with which the EMPs are implemented, and recommended necessary corrective actions to be taken as necessary;
- Consolidate monthly environmental monitoring reports from RPMOs and submit semi-annual monitoring reports to ADB;
- Ensure timely disclosure of final IEEs/EMPs in project locations and a form accessible to the public; and
- Address any grievances brought about through the Grievance Redress Mechanism promptly as per the IEEs.

2. Regional Project Management Offices (Eastern and Western RPMOs)

The DWSS/regional engineers and social development officers of the RPMOs will receive support from; (i) the PMO safeguards officers (environmental and social); and (ii) the safeguards specialists (environmental and social), the social mobilizers and environmental management plan (EMP) monitors of the design, supervision and management consultant (DSMC) teams as specified below:

- Prepare new IEEs/EMPs following the EARF and government rules;
- Include EMPs in bidding documents and civil works contracts;
- Comply with all government rules and regulations;
- Take necessary action for obtaining rights of way;
- Oversee implementation of EMPs including environmental monitoring by contractors;
- Take corrective actions when necessary to ensure no environmental impacts;
- Submit monthly environmental monitoring reports to PMO, and;
- Address any grievances brought about through the Grievance Redress Mechanism promptly as per the IEEs.

Civil Works Contracts and Contractors: EMPs are to be included in the bidding and contract documents and verified by the PMO and RPMOs. The contractor will be required to designate an environment supervisor to ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contracts. The government will ensure that bidding and contract documents include specific provisions requiring contractors to comply with all: (i) applicable labor laws and core labor standards on (a) prohibition of child labor as defined in the national legislation for construction and maintenance activities, (b) equal pay for equal work of equal value regardless of gender, ethnicity or caste (c) elimination of forced labor; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/AIDS to employees and local communities surrounding the project site.

Capacity Building: The DRTAC safeguards experts (environmental and social) will be responsible for training the; (i) PMO's safeguards officers (environmental and social); (ii) RPMOs' engineers and social development officers. Training modules will need to cover

safeguards awareness and management following both ADB and government requirements as specified below:

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

Water Users and Sanitation Committees (WUSCs): WUSCs are the eventual operators of the completed subprojects. The key tasks and responsibilities of the WUSCs are, but not limited to:

Before construction

- Facilitate public consultation and participation, information dissemination and social preparation.
- Provide available data to the DSMC-ESS during IEE
- Assist in securing the tree-cutting permit and/or registration of water source.
- Participate in training programs.

During construction

- Assist in the observance of the grievance redress mechanism.
- 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.
- Facilitate public consultations, as necessary.

During operation

- Implement Environmental Management Plan and Water Safety Plan.

- If applicable, actively work with the engaged licensed and accredited laboratory in water quality monitoring.
- Prepare the environmental monitoring report as per IEE.
- Ensure observance of the grievance redresses mechanism.

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.

C. Environmental Management Plan (EMP)

Table 27: Environmental Management Plan Matrix

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
1. Before Construction Activities					
Consents, permits, clearances, no objection certificate (NOC), etc.	Failure to obtain necessary consents, permits, NoCs, etc. can result to design revisions and work stoppage	- Obtain all of the necessary consents, permits, clearance, NOCs, etc. before the start of civil works. - Include in detailed design drawings and documents all conditions and provisions if necessary	PMO, RPMOS,& DSMC	Incorporated in final design and communicated to contractors	Before 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 construction contractors to prepare a contingency and spoil management plan	DSMC, RPMOS	List of affected utilities and operators; Bid document to include a requirement for a contingency plan for service interruptions, e.g. provision of water if disruption is more than 24 hours, spoil management plan	During detailed design phase Review of spoils management plan: Twice (once after first draft and once before final approval)
Drinking water supply	Extraction of unsatisfactory raw water quality Delivery of unsafe water to the distribution system Inadequate protection of intake well Health Hazards arising from inadequate design of facilities for receiving, storing and handling of Chlorine & other chemicals	- Provision of water treatment plant to meet satisfactory water quality - Perimeter fencing around deep tube well location. - Tube well should be at least 30m upstream from sanitation facilities. - "Housed" dosing unit with ventilation for chlorine - Train operators for handling chlorine	PMO, RPMOS & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Construction work camps, stockpile	Disruption to traffic flow and sensitive receptors	- Determine locations before award of construction contracts	DSMC, RPMO	List of selected sites for construction work camps,	During detailed design phase

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
areas, storage areas, and disposal areas				hot mix plants, stockpile areas, storage areas, and disposal areas. Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	
Waste generation	Generation of solid waste, wastewater from labor camp and other construction waste may cause pollution	- Follow the principle of "Reduce, Reuse, Recycle, and Recover" - Prohibition of unwanted littering and discharge of waste. - Solid waste is either managed in a pit or disposed in municipal collection system.	Contractor	Contractor's records. Visual inspection	Visual inspection by RPMO & DSMC-ESS on monthly basis
Sources of materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, resulting water logging, and water pollution	- Prepare list of approved quarry sites and sources of materials	DSMC, RPMOS	List of approved quarry sites and sources of materials; (ii) Bid document to include requirement for verification of quarry sites	During detailed design phase, as necessary with a discussion with detailed design engineers and PIUs suitability of sources and permit for additional quarry sites if necessary.
EMP Implementation Training	Impact to the environment, workers, and community	- Project manager and contractors should be trained on EMP implementation, spoils management, standard operating procedures (SOP), health & safety (H&S), Labor Act (1992)	PMO, RPMOs, and DSMC. Contractor's Environmental Supervisor	Record of completion (Safeguards Compliance Orientation) Contractor records for EMP implementation at worksites	During the detailed design phase before the mobilization of workers to site
2. During Construction Activities					
A. Physical Characteristics					
Topography landforms, geology, and soils and river morphology and hydrology	Sand, gravel or crushed stone will be required for this subproject. Extraction of natural aggregate materials may cause localized changes in topography and landforms (if on land) or river morphology and	- Utilize readily available sources with environmental clearance and license - Borrow areas and quarries comply with environmental requirements - Coordinate with local authorities for quarrying from rivers. Alternative sources should be identified.	Contractor	Records of sources of materials	Monthly by RPMOS

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	hydrology (if on the river).				
Water quality	Trenching and excavation, run-off from stockpiled materials and chemical contamination from fuels and lubricants may result to silt-laden runoff during rainfall, which may cause siltation and reduction in the quality of adjacent bodies of water.	- Spoils management plan. - Reuse excess spoils and materials - Disposal site in designated areas. - Earthworks during dry season - Stockyards at least 300m away from watercourses. - Fuel storage area away from water drainage - Take precautions to minimize the overuse of water - Prevent wastewater into water sources. - Ensure safe water diversion - No obstruction in flowing water.	Contractor	Areas for stockpile storage of fuels and lubricants and waste materials; Number of silt traps installed along trenches leading to water bodies; No visible degradation to nearby drainage, water bodies due to construction activities	Visual inspection by RPMOS and DSMC-ESS on weekly basis Frequency and sampling sites to be finalized during detailed design and final location of subprojects components
Air quality	Work at the dry season and transporting construction materials may increase dust, carbon, monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons in air environment	- Use of physical controls, sprays, covers, compaction, screening, enclosure, windbreaks, binders and road surfacing - Cover delivery trucks during transportation - Construction vehicle's speed limited to 30kph. - Use of vehicles complying with NVMES, 2069 - Prohibition of open burning of solid waste. - Minimize stockpile height	Construction Contractor	Location of stockpiles; Number of complaints from sensitive receptors; Heavy equipment and machinery with air pollution control devices; A certification that vehicles are compliant with air quality standards.	Visual inspection by RPMOS & DSMC-ESS on monthly basis Frequency and sampling sites to be finalized during the detailed design stage and final location of Subproject components
Acoustic environment	Temporary increase in noise level and vibrations by excavation equipment, and the transportation of materials, equipment and people. However, the proposed subproject pipeline will follow ROW alignment	- Prepare work schedule with community consultation and local administration - Overtime work restricted low noise generating equipment. - Minimize drop heights - No horns until necessary - Use modern vehicles and machinery with low noise emissions - Maintain low noise levels - Warning signs in noise hazard areas. Workers must wear hearing protection there. - Identify vibration risk to nearby structures. Take caution working in such areas.	Contractor	Number of complaints from sensitive receptors; Use of silencers in noise-producing equipment and sound barriers; Equivalent day and night time noise levels	Visual inspection by RPMOS & DSMC-ESS on monthly basis
Aesthetics		- Prepare a debris disposal plan.	Contractor	Number of complaints from	Visual inspection by

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	Interference with the enjoyment of the area and creation of unsightly or offensive conditions	- Minimize stockpile size - Clear wastes regularly - Avoid stockpiling of excess spoils. - Cover delivery trucks during transportation. - Clean roads. - Use screening enclosure shade cloth, temporary walls - Clean site regularly. - Follow the principle of "Reduce, Reuse, Recycle, and Recover"		sensitive receptors; Worksite clear of hazardous wastes Worksite clear of any wastes unutilized materials, and debris Transport route and worksite cleared of dirt	RPMOS & DSMC-ESS on monthly basis
B. Biological Characteristics					
Biodiversity	Activities in WUSC acquired area. There are no protected areas in or around subproject sites.	- Tree cutting will not be required for this project.	Contractor	PIU and PMO to report in writing the number of trees cut and planted if any (during detailed design stage) Some complaints from sensitive receptors on disturbance of vegetation, poaching fishing, etc.	Visual inspection by RPMOS & DSMC-ESS on monthly basis
C. Socioeconomic Characteristics					
Existing provisions for pedestrians and other forms of transport	The road closure is not anticipated. Hauling of construction materials and operation of equipment on-site can cause traffic problems. However, the proposed subproject's pipeline will follow ROW alignment.	- Prepare suitable transportation routes - Safe passage for vehicles and pedestrians - Schedule material deliveries on low traffic. - Erect and maintain barricades if required - Inform through display board about nature, duration of construction and contact for complaints - Complete the work quickly nearby institution, place of worship, business, hospitals, and schools. - Consult with business and institutions for work schedules. - Restore damaged properties and utilities	Construction Contractor	Traffic route during construction works, including number of permanent signs, barricades, and flagmen on worksite; Number of complaints from sensitive receptors; Some signage placed at the project location. Number of walkways, signage, and metal sheets placed at project location	Visual inspection by RPMOS & DSMC-ESS on monthly basis
Socioeconomic status	Staffing will be required during construction. This can result in an increase	- Engage the local workforce. - Secure construction materials from local market.	Construction Contractor	Employment records; Records of sources of materials	Visual inspection by RPMOS & DSMC-ESS on monthly basis

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	in local revenue.			Records of compliance to Nepal Labor Act(1992), district wages	
Other amenities for community welfare	Civil works may result in an impact to the sensitive receptors such as residents, businesses, and the communities. Excavation may also damage infrastructure located alongside the roads.	- Identify location and nature of existing infrastructure before excavation - Minimize repeated disturbance to locals by integrating other forms of infrastructures. - Inform local about nature, duration and possible impacts of the construction and integrate their concerns - Promptly relocate infrastructure materials - Take prior permission from local authority for water use - Restore damaged properties and utilities to pre-work conditions. -	Construction contractor	Utilities Contingency Plan Number of complaints from sensitive receptors	Visual inspection by RPMOS & DSMC-ESS on monthly basis
Community health and safety	Construction works will impede the access of residents and business in limited cases	- Restrict work force in designated areas. - Identify stockyard areas in consultation with local administration - Work on private land requires written permission of landowners and DSMC. - Prefer small mechanical excavator for trenching - Construct gender friendly toilets for workers - Prohibit alcohol and drugs on site - Prevent excessive noise; - Code of conduct for workers includes restricting workers in designated areas, no open defecation, no littering, no firewood collection, no fire except designated places, no trespassing, no residence at construction sites, and no obligation to potentially dangerous work - Maintain a complaint logbook in workers camp and take action promptly of complaints	Contractor	The number of permanent signs, barricades, and flagmen on worksites as per Traffic Management Plan (see Annex for sample); Number of complaints from sensitive receptors; Number of walkways, signs, and metal sheets placed at the project location Agreement between landowner and contractors in case of using private land as work camps storage areas etc.	Visual inspection by RPMOS & DSMC-ESS on weekly basis Frequency and sampling sites to be finalized during detailed design and final location of sub-project components
Workers Health & Safety	There is invariably a safety risk when construction works such	- Comply Labor Act (1992) of GoN - Train all site personnel on environmental health and safety	Contractor	Site –Specific H&S plan Equipped first-aid stations Medical insurance coverage	Visual inspection by RPMOS (monthly) and DSMC-ESS on a weekly basis.

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	as excavation and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can arise from working at height and excavation works.	- Exclude public from worksites - Provide personal protective equipment to workers and ensure their effective usage - Document procedures to be followed for site activities; and - Maintain accident reports and records. - Make first aid kits readily available - Maintain hygienic accommodation in work camps. - Ensure uncontaminated water for drinking, cooking and washing, - Assure clean eating areas - Make sure sanitation facilities are readily available - Provide medical insurance coverage for workers; - Provide orientation for guest visitors - Ensure that visitors do not enter hazard areas unescorted; - Require workers to wear high visibility clothes - Ensure moving equipment is outfitted with audible backup alarms; - Chemical and material storage areas need to be marked clearly - Hearing protection equipment enforced in noisy environment		for workers Number of accidents Records of supply of uncontaminated water Condition of eating areas of workers Record of H&S orientation training Availability of personal protective equipment at construction site % of moving equipment outfitted with audible back-up alarms Signage for storage and disposal areas Condition of sanitation facilities for workers	Frequency and sampling sites to be finalized during detailed design and final location of sub-project components
D. Historical, Cultural, and Archaeological Characteristics					
Physical and cultural heritage	There are no archaeological, paleontological, or architectural sites of significance listed by local, national authority and UNESCO.	- Stop work immediately to allow further investigation if any findings are suspected.	Contractor	Records of chance finds	Visual inspection by RPMOS and DSMC-ESS on Monthly basis.
E. Others					
Submission of EMP implementation Report	Unsatisfactory compliance to EMP	- Appointment of EMP supervisor - Timely monitoring reports with field photographs	Contractor	Availability and competency of appointed supervisor Monthly report	Monthly monitoring report to be submitted by RPMOS to PMO

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
					PMO to submit semi-annual monitoring report to ADB
Post Construction Activities	Damage due to debris, spoils, excess construction materials	- Remove spoils wreckage, rubbish, or temporary structures no longer required; - All excavated roads shall be reinstated to original condition. - All disrupted utilities should be restored - All affected structures rehabilitated /compensated - The construction camp needs to clear of spills e.g. oil, paint, etc. and other pollutants after dismantling - All hardened surfaces shall be ripped; all imported materials shall be removed and all temporary services shall be cancelled - Request PMO/PIU in writing that worksites and camps are vacated and restored to pre-project conditions	Contractor	RPMOS/PMO report in writing that (i) worksite is restored to original conditions; (ii) camp has been vacated and restored to pre-project conditions; (iii) all construction related structures not relevant to O&M are removed, and (iv) worksite cleanup is satisfactory.	Before turnover of completed works to WUSC
Environmental legislation compliance	Lack of awareness in project managers and WUSC about legislations and IEE requirements	- Strengthen capacity of WUSC and project staffs - Ensure compliance with NDWQS	PMO, RPMOs, DSMC, and WUSC	Monitoring reports and checking operations against O&M manuals and permits/clearances	After commissioning of systems and semi-annually
Drinking water supply system	Delivery of unsafe Water	- Prepare operations and maintenance plan - Proper handling and storage of calcium Hypochlorite - Ensure qualified persons to handle disinfection, safe storage of chemicals - Ensure capacity of WUSC to implement quick response to hazardous chemical spills - Implement SPS-complaint EMP and a water safety plan - Monitor water quality	PMO, RPMOs, DSMC, and WUSC	Water Quality reports WTP records in the log book	During O&M of the system Quarterly monitoring
	Excessive algal growth in reservoirs.	- Close water tanks all the time - Clean reservoirs as per the O&M schedule.	WUSC	Water quality results	During O&M of the system. Daily maintenance of chlorine residual, cleaning.
Mishandling of chlorine	Excessive exposure to chlorine, hypochlorous acid, and hypochlorite ion	- Ensure proper storage and handling practices for chemicals - Ensure the knowledgeable and skilled person is	WUSC	Water quality test	

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	results in irritation of the esophagus, a burning sensation in the mouth and throat, and spontaneous vomiting.	- in charge of chlorine handling - Ensure use of PPE while using chemicals; - Use of chlorine as per WHO guideline			
Sanitation facilities (toilets and septage disposal site)	Contamination of land or waterways due to overflow of septic tanks and the uncontrolled dumping of septage	- The subproject incorporates a pilot for the controlling disposal of septage. This is to reduce the likelihood of uncontrolled septage disposal to land and local waterways (nallas). Further septic tanks will be designed to ensure maximum retention is achieved and will be emptied at the required frequency (min every 3 years). Households will be educated on the above to further reduce the likelihood of septic tank overflows and uncontrolled dumping of septage.	WUSC, DSMC, RPMOs, and PMO for education campaign	Sanitary inspection reports. Water quality reports from test pits near tubewell sites	During O&M of the system.

D. Environmental Monitoring Program

Environmental monitoring will be done during construction on three levels:

- (i) Monitoring the 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.

In addition to regular monitoring on-site (at the subproject level) by the ICG and DSMC-ESS on the EMP implementation of the mitigation measures, monitoring of key environmental parameters is proposed. Table 29 presents the indicative environmental monitoring plan for the subproject, which includes environmental parameters, with a description of the sampling stations, the frequency of monitoring, applicable standards, and responsible agencies. This will be updated during detailed design to ensure EMP and monitoring program is commensurate to the impacts of the subproject.

Table 28: Environmental Monitoring Program

SN	Field	Stage	Parameters	Location	Frequency	Standards	Responsibility
1.	Air quality	Before construction to establish baseline Construction phase	PM10 SO2 NOx	Worksite locations Along water transmission main 1-km interval from PTWs Construction campsite locations	24-hour monitoring once in a season (except monsoons) during the construction	National Ambient Air Quality Standards, 2003	Contractor
2.	Noise and vibration levels	Before construction to establish baseline Construction phase	Equivalent day and night time noise levels	PTWs location Along water transmission main 1-km interval from PTWs Construction campsite locations	Once in a season (except monsoons) during construction	National Noise Standard Guidelines, 2012	Contractor
3.	Water quality	Before construction to establish baseline Construction phase	TDS, TSS, pH, hardness, BOD, fecal coliform, total nitrogen, total phosphorus, heavy metals, temperature, DO, hydrocarbons, mineral oils, phenols, cyanide, temperature	Adjacent to construction sites (to be identified by the PMC or DSMC))	Twice a year (pre-monsoon and post-monsoon) during construction	National Drinking Water Quality Standards, 2006	Contractor
4.	Survival rate of landscaping, tree plantation	O&M phase	Survival rate	In the areas where re-plantation/ landscaping proposed is	Twice a year for 2 years	None	WUSC

E. Institutional Capacity Development Program

Considering the limited capability of the Project's key players in environmental management, technical assistance from environmental specialists and capacity development during loan implementation will be needed. Capacity development will consist of hands-on training in implementing the responsibilities in EMP (as well as in EARF) implementation, complemented with a short-term series of lectures or seminars.

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, it does not guarantee that WUSC would be able to handle them for effective monitoring. DWSS has five regional laboratories; however, some are not functioning well due to lack of human resources. For effective monitoring, it is recommended that a licensed and accredited laboratory be engaged in water quality monitoring during the first 2-3 years of operation during when WUSC will enhance its capacity by actively participating. After the engagement period and initial phase of "learning by doing", there should be continuing periodic training to sustain WUSC's capacity. The cost of monitoring during operation takes account of a licensed laboratory for water quality monitoring and training WUSC. A Water Safety Plan is included in subproject design and will oblige the operator to carry out water quality monitoring accordingly. The amount of NPR 500,000 will be provided annually to implement the Plan. There will be sufficient fund to include training by the licensed and accredited lab while monitoring water quality.

The DRTAC-ESS will be responsible for environmental awareness training and management by both ADB and government requirements. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. Typical modules would be as follows: (i) sensitization; (ii) introduction to the environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers before deployment to work sites. The proposed training project along with the frequency of sessions is presented in Table 29.

Table 29 Training Program for Environmental Management

Items	Pre-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 staff for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and GON	To share the experiences and best practices aimed at learning lessons and improving implementation of EMP
Contents	Module 1: Orientation ADB Safeguards Policy Statement Government of Nepal Environmental Laws and Regulations Module 2: Environmental Assessment Process ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements Review of environmental assessment report to comply with ADB requirements Incorporation of EMP into the project design and contracts	Roles and responsibilities of officials/contractors/consultants towards protection of the environment Environmental issues during construction Implementation of EMP Monitoring of EMP implementation Reporting requirements	Experiences on EMP implementation – issues and challenges Best practices followed
Duration	1 day	1 day	1 day on a regular period to be determined by PMO, ICGs, and (provide if PMC/DRTAC or DSMC)
Participants	Executing and implementing agencies, PMO, and PMO staff (technical and environmental) involved in the project implementation	PMO ICGs Contractors	PMO ICGs Contractors

F. Staffing Requirement and Budget

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.

Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by PMO-ESS assisted by the PMO environmental safeguard officer. Therefore, no separate budget is required for the PMO-ESS.

The cost of mitigation measures and surveys during construction will be incorporated into the contractor's costs, which will be binding on him for implementation. The contractors will conduct the surveys.

The operation phase for mitigation measures are good operating practices to mitigate the environmental impacts of this phase & the responsibility remains to WUSC. WUSC will conduct all monitoring during operation and maintenance. If a licensed laboratory is engaged for the first 2-3 years of operation for training purposes, the cost can be accommodated under the Water Safety Plan.

The cost of awareness program & WSP during contract is NPR 600,000.00 under provisional sum.

The indicative cost of EMP implementation is shown in Tables 30.

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

Table 30: Indicative Cost of EMP Implementation

SN	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
A.	Monitoring Measures						
1.	Air quality monitoring	- Pre-construction - Construction	Per location	3	450000.00	300,000.00	Civil works contract
2.	Noise levels monitoring	- Pre-construction - Construction	Per location	2	30000.00	60,000.00	Civil works contract
B	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 for EMP implementation and environmental monitoring requirements related to mitigation measures; and taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during implementation; and (iii) lessons learned information sharing	Module 1 – immediately upon engagement of the (provide if DRTAC or DSMC) environmental specialists Module 2 – before award of civil works contracts (twice a year for 4 years) Module 3 – before start of Phase 2 and upon completion of the project	lump sum	1 8	Module 1 – 300000.00 Module 2 – 100000.00 Module 3 – 200000.00	300,000.00 800,000.00 200,000.00	DRTAC
C.	Human Resources Costs						
1	PMO Environment Safeguards Officer	Construction phase	1	20	65000.00	1300000.00	Budget covered through DRTAC
2	ICG Environment Safeguard Assistants	Construction phase	2	20	25000.00	1,000,000.00	Budget covered through DSMC
3	PMO Environmental Safeguard Specialist	Responsible for environmental safeguards of the project at PMO level	person months (spread over entire project implementation period)	24	350000.00	8,400,000.0	Remuneration and budget for travel covered in the DRTAC contract
4	DSMC Environmental Safeguard Specialist	Responsible for environmental safeguards of the project at ICG level	person months (spread over entire project implementation period)	20	300000.00	6,000,000.0	Remuneration and budget for travel covered by the DSMC contract
D.	Administrative Costs						
1.	Legislation, permits, and agreements	Permit for excavation, tree-	Lump sum		XXX	XXX	These consents

Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

SN	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
		cutting permits, etc.					are to be obtained by the contractor at his expense.
		Environmental assessment and environmental clearances as per EPA 1996 and EPR, IEE presentation at review committee related expenses	Lump sum	1	50,000	50,000	50,000
E.	Other Costs						
1.	Public consultations and information disclosure	Information disclosure and consultations during preconstruction and construction phase, including public awareness campaign through media	As per requirement	Lump sum		300,000	Covered under DSM Contract
2.	GRM implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination)		Lump sum		200,000	PMO cost
3.	Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction		Lump sum	Contractor's liability	As per insurance requirement	Civil works – contract contractor's insurance defect liability period
TOTAL						2,0,410,000	

However, the provisional amount of NPR 1,500,000.00 has been provided to execute all necessary environmental mitigation measures.

G. Implementation Schedule

Environmental management will be implemented from the detailed design phase through to procurement, construction, and operation. Table 31 presents the indicative timeframe of key EMP activities about the subproject implementation schedule. Similarly, Table 34 presents training for capacity building programs for the project.

Table 31: Environmental Management Implementation Schedule

Activity		Indicative Time Frame
SUBPROJECT IMPLEMENTATION		
	Detailed Design & Bidding Documents	
	Procurement	
	Construction	
	Defects Liability Period	
	Operation and Maintenance	
ENVIRONMENTAL MANAGEMENT		
	Overall	
1.	Design Review and Technical Audit Consultant of Environmental Specialist	Starting (4 yrs of intermittent inputs)
2.	PMO's submission of Environmental Monitoring Report (EMR)	
	Monthly EMR for Subproject's Monthly Progress Report	8 th day after effective month
	Semi-Annual EMR during construction for submission to ADB	8 th day after effective 6-months
	Annual EMR for submission to ADB	8 th day after effective year
Before Construction Mobilization		
1.	Finalization of EMP, (if applicable) revision of IEE	
2.	ADB review & approval of revised IEE & EMP.	
3.	Obtaining Government's approval of IEE Report	
4.	Community preparation (including disclosure of Final IEE & its EMP)	
5.	Establishment of baseline data (as set out in the EMP)	(shall have been done before award of contract)
6.	Preparation of C-EMP by selected Contractor, review of C-EMP	before start of works on site
	against SPS-compliant EMP.	or establishment of construction-related facilities.
Construction		
	Mobilization to Demobilization	
1.	Implementation of mitigation measures and conduct of environmental effects monitoring following the C-EMP.	
2.	Submission of Environmental Monitoring Report (EMR)	
	Monthly, by Contractor	5 th day of the month following the effective month
	Quarterly, by Contractor or by Licensed Laboratory	3 rd day of the month following the effective quarter
Operation (potentially could start even before DLP is over)		
1.	Implementation of mitigation measures & monitoring activities as specified in the EMP	Starting Q/Q Y

Activity			Indicative Time Frame
2.	Submission of EMR		Starting Q/Q Y
	Monthly, by Operator		5 th day of the month following the effective month
	Quarterly, by Operator or (if applicable) by Licensed Laboratory		3 rd day of the month following the effective quarter

Table 32: Proposed Topics for Capacity Building/Training

Topic			Target Participants	Timing
1.	By Environmental Specialists			
	1.1	Legal Framework	DWSS, PMO,	Early stage
		▪ Relevant national laws, regulations & standards on EA & management	WSSDO, ICG,	of Output 2
		▪ ADB SPS 2009	RMSO, WUSC (15-18)	
		▪ EA & review procedure under the Project		
	1.2	Environmental Assessment		
		▪ Rapid environmental assessment		
		▪ Initial environmental examination		
	1.3	Some Aspects of EA Process & Environmental Management		
		▪ Meaningful consultation & info disclosure		
		▪ Grievance redress mechanism		
		▪ Environmentally responsible procurement		
		▪ Occupational & community health and safety		
	1.4	EMP Implementation, part 1	DWSS, PMO,	Early stage
		▪ Institution arrangements & responsibilities	WSSDO, ICG,	of Output 2
		▪ Environmental quality monitoring	RMSO, WUSC,	
		▪ Emergency response	(15-18)	
	1.5	EMP Implementation, part 2		
		▪ Performance monitoring & indicators		
		▪ Environmental monitoring report		
2.	By External Experts			
	2.1	Other topics, such as:	MWSS, DWSS,	During
	A	Good engineering and construction practices as mitigation measures	PMO, ICG,	Project's
	B	Climate change adaptation (applicable to eligible activities/works under the Project)	WSSDO, RMSO, DSMC (30)	Capacity Devt. Program
		B.1 Climate change impacts on infrastructure		
		B.2 Climate-proofing of infrastructure		
	C	Strategic environmental assessment of WSS sector policy, development plans, and programs		
	D	Other topics that may be suggested by MWSS, DWSS, PMO, ICG & WSSDO		

X. MONITORING AND REPORTING

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

RPMO will submit a monthly monitoring and implementation reports to PMO, who will take follow-up actions, if necessary. The PMO will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in Annex F. Subproject 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 the annual basis. Monitoring reports will be posted in a location accessible to the public.

For subprojects 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 the PMO-ESS

ADB will review project performance against the MoWSS'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.

XI. CONCLUSION AND RECOMMENDATION

The proposed subproject is not an environmentally critical undertaking. The IEE indicates that:

The proposed subproject, and its components, is not located within or adjacent to environmentally sensitive areas.

The extent of adverse impacts is expected to be local, confined within the subprojects' main areas of influence, quarry or burrowing sites, waste disposal sites, and the routes to and from these sites. With mitigation measures in place and ensuring that the bulk of earthworks are completed before the onset of the rainy season, the potential adverse impacts during construction would be site-specific.

The few adverse impacts of moderate magnitude during construction will be temporary and short-term (i.e., most likely to occur only during peak construction). These will not be sufficient to threaten or weaken the surrounding resources. Mitigation measures, integral to socially and environmentally responsible construction practices, are commonly used at construction sites and are well known to Contractors. Hence, mitigation measures would not be difficult to implement.

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.

The proposed subproject will bring about: (i) the benefits of access to a 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.

Based on the above findings, the classification of the Bhojpur Town Water Supply and Sanitation Project Category B is confirmed, and no further special study or detailed EIA needs to be undertaken.

XII. LITERATURE REVIEWED

ADB, 2003. Environmental Assessment Guidelines.

ADB, 2010. Handbook of Style and Usage.

Constitution of Nepal (2015). Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu

District Development profile of Nepal 2010/11 with VDC Profile. A Socio-Economic Development

District Health Office, Bhojpur 2062/63

Environment Protection Act, (1997). Ministry of Science, Technology and Environment Kathmandu

Environment Protection Rules, (1997), Ministry of Science, Technology, 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

Final Feasibility Study of Bhojpur Water Supply and Sanitation Project, 2014

Detailed Engineering Design Report of Bhojpur Water Supply Sub-Project, 2017

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. Environmental Protection Act, 1997 and Environment Protection Rules, 1999.(Amendment, 1999). Ministry of Law, Justice and Parliament Affairs, Nepal

VDCs profile and baseline information of Bhojpur, 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

Updety, 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: Approved Terms of Reference

TAEC Consult P. Ltd.

Joint Venture with

Integrated Consultants Nepal Pvt. Ltd.

Eastern Region Design, Supervision and Management Consultant
Third Small Towns Water Supply & Sanitation Sector Project
Itahari, Sunsari

Phone/Fax: 025-588306

Email: erdsmc3@gmail.com

Ref.: WS-72-315/K6-2/H

Date: November 23, 2016

To,

The Regional Project Manager,
Eastern Regional Project Management Office
Itahari, Sunsari

Ref: ERDSMC
Contract No. TSTWSSSP/CS-02/070-71

Sub: ^{Re}_A Submission of ToR for IEE of Bhojpur STWSSP

Dear Sir,

We are pleased to submit one copy of the ToR for Initial Environment Examination (IEE) as part of the Feasibility Study Report of Bhojpur STWSSP for your review and comments as per the work program proposed in consultant's Technical Proposal to meet requirement of Terms of Reference (ToR).

Thank you and regards

Yours faithfully,

Anand Mohan Lal Das
Anand Mohan Lal Das
Team Leader

Cc:

1. Project Director, PMO, Maharaigunj, Kathmandu: One copy is attached herewith.
2. TAEC & ICON Consultants Pvt. (Ltd) J/V, Sankhamul, Kathmandu
3. WUSC, Bhojpur

To: Laxmi Panta
Er. Laxmi Panta
I have gone through
the report & recommend to
send TOR to Ministry for
approval.
28 Nov. 2016
Coordinator, DTAC

Kathmandu Office:

PO Box: 2519, Sankhamul, Kathmandu
Phone: 01-4781446 / 4782340; Fax: 01-4781447
Email: taec@mos.com.np

Government of Nepal
Ministry of Water Supply and Sanitation
Department of Water Supply and Sewerage
Third Small Town Water Supply and Sanitation Sector Project
PROJECT MANAGEMENT OFFICE
Panipokhari, Kathmandu

TERMS OF REFERENCE (ToR)
for
INITIAL ENVIRONMENTAL EXAMINATION
of
**BHOJPUR BAZAAR TOWN WATER SUPPLY AND SANITATION
PROJECT**
BHOJPUR, BHOJPUR DISTRICT

Submitted by:	Submitted to:
TAEC CONSULT P. Ltd. JOINT VENTURE WITH INTEGRATED CONSULTANTS NEPAL (P) LTD.	Government of Nepal Ministry of Water Supply and Sanitation Department of Water Supply and Sewerage Third Small Town Water Supply and Sanitation Sector Project PROJECT MANAGEMENT OFFICE Panipokhari, Kathmandu

NOVEMBER, 2016



ADB	Asian Development Bank
CBS	Central Bureau of Statistics
DC	Direct Current
DDC	District Development Committee
DI	Ductile Iron
DL	Distribution Line
DMA	District Meter Area
DSMC	Design Supervision and Management Consultant
DTW	Deep Tube Well
DWSS	Department of Water Supply & Sewerage
EA	Executing Agency
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Act
EPR	Environmental Protection Rules
ES	Environmental Safeguards
FGD	Focus Group Discussion
GI	Galvanized Iron
GoN	Government of Nepal
GRC	Grievance Redress Committee
HDPE	High Density Polyethylene Pipe
HP	Horse Power
IA	Implementing Agency
IEE	Initial Environmental Examination
IO	International Organization
kV	Kilo Volt
kVA	Kilo Volt Ampere
MoWSS	Ministry of Water Supply and Sanitation
NDWQS	National Drinking Water Quality Standard
NGO	Non-Governmental Organization
NPR	Nepalese Rupee
O&M	Operation & Maintenance
OSA	Output Based Aid
OHT	Over Head Tank
PAM	Project Administration Manual
PMC	Project Management Consultant
PMO	Project Management Office
RCC	Reinforced Cement Concrete
RPMO	Regional Project Management Office
RVT	Reservoir Tank
SS	Stainless Steel



Handwritten signature

ToR for Initial Environmental Examination of Bhogpur Bazar Water Supply and Sanitation Project

SSTWSSSP	Second Small Towns' Water Supply and Sanitation Sector Project
STW	Shallow Tube Well
STWSSSP	Small Towns' Water Supply & Sanitation Sector Project
TDF	Town Development Fund
TL	Transmission Line
ToR	Terms of Reference
TSTWSSSP	Third Small Towns' Water Supply & Sanitation Sector Project
VDC	Village Development Committee
WASH	Water, Sanitation and Hygiene
WSSDD	Water Supply and Sanitation Division
WTP	Water Treatment Plant
WUA	Water Users' Association
WU/SC	Water Users' & Sanitation Committee



Handwritten signature

Table of Contents

1	NAME AND ADDRESS OF THE PROPONENT	1
2	BACKGROUND AND DESCRIPTION OF THE PROJECT	2
2.1	Project Background	2
2.2	Objective of TOR and IEE study	2
2.3	Description of the Project	3
2.3.1	Location and Accessibility of the Project Area	3
2.3.2	Proposed service area	3
2.3.3	Population and Demographic Characteristics	4
2.3.4	Existing Water Supply Situation	5
2.3.5	Ethnicity and caste	9
2.3.6	Settlement pattern	9
2.3.7	Education and Health	9
2.3.8	Water-borne and Communicable Diseases	9
2.3.9	Economic Activities	10
2.3.10	Poverty Conditions	10
2.3.11	Existing Sanitation Facilities	11
2.3.12	Project Rationale	12
2.3.13	Need of the Sanitation Component	13
2.3.14	Hydrology and Climate	13
2.3.15	Flora and Fauna	14
2.3.15	Protected Areas	17
2.3.16	Community Forest	17
2.4	Infrastructure Facilities	17
2.4.1	Transportation, Electricity and Communication	17
2.4.2	Educational Institutions	17
2.4.3	Other Institutions	17
2.5	Quality of Life Values	17
2.6	Cultural and religious sites	17
2.7	Resettlement, Relocation and Compensation Issues	18
2.8	Salient Features	18
2.9	Proposed water supply system	19
2.10	Relevancy of the Project	22
3	PROCEDURES TO BE ADOPTED FOR THE STUDY	24



3.1	Environmental Assessment	24
3.2	Socio-Economic Assessment	25
3.2	Report Preparation	25
4	POLICIES, LAWS, RULES, DIRECTIVES AND GUIDELINES	26
5	REQUIRED TIME, ESTIMATED BUDGET AND SPECIALISTS REQUIRED FOR PREPARING THE REPORT	29
5.1	Time Schedule	29
5.2	Estimated Budget	29
5.3	Human Resource Required	29
6	ANTICIPATED IMPACTS OF THE PROPOSED PROJECT ON ENVIRONMENT	31
6.1	Physical Impacts	31
6.2	Biological Issues	32
6.3	Socioeconomic, Cultural and Chemical Issue	32
7	ALTERNATIVE ANALYSIS	34
7.1	Alternative System Analysis	34
8	MATTERS TO BE IMPLEMENTED WHILE IMPLEMENTING THE PROJECT	35
8.1	Environmental Management Plan	35
8.2	Environmental Monitoring Plan	35
8.3	Information Disclosure, Public Consultation and Participation	35
8.4	Grievance Redress Mechanism	36
9	REPORT	37
10	OTHER NECESSARY MATTERS	38
11	LITERATURE REVIEWED	39

Dhaka



List of Tables

Table 2-1: Population of the Concerned Ward of Project Town	5
Table 2-2: Beneficiaries households	5
Table 2-3: Existing Source Details	6
Table 2-4: Existing Storage Reservoir Details	6
Table 2-5: Name list of WUSC and Details	7
Table 2-6: Result of water quality tests	8
Table 2-7: Reported Water Borne and Communicable Diseases during last year	10
Table 2-8: Distribution of mean monthly household income	10
Table 2-9: Toilet coverage (HHs)	11
Table 2-10: Willingness to pay connection charge (in NPR)	12
Table 2-11: Willingness to pay monthly water Charges (NPR)	13
Table 2-12: List of Plants in the Project Area	14
Table 2-13: Mammals in the Project Area	15
Table 2-14: List of Birds in the Project Area	15
Table 2-15: List of Reptiles and Amphibians Found in the Project Area	16
Table 2-16: List of Fishes Found in the Project Area	16
Table 2-17: Salient features of the project	18
Table 2-18: Criteria for requirement of IEE and/or EIA for Drinking water supply Projects	22
Table 5-1: Proposed Work Schedule	29

List of Figures

Figure 2-1: Project Location	3
Figure 2-2: Proposed service area	4

List of Annexes

Annex I: Project Location Map
Annex II: Schematic & Layout Plan for the Proposed Project
Annex III: ADB's REA Checklist, Environmental Checklists & Socioeconomic Questionnaires for IEE Study

Shale



Chapter 1

1. NAME AND ADDRESS OF THE PROPONENT

This Terms of Reference (TOR) has been prepared with reference to the Feasibility Study Report to carry out the Initial Environmental Examination (IEE) of Bhojpur Bazaar Town Water Supply and Sanitation Project in Bhojpur District. TOR for this IEE study of this project is needed as a reference to EPR 1997 (amendment 2007). The project proponent, Small Towns Water Supply and Sanitation Sector Project (STWSSSP) of the Government of Nepal, Department of Water Supply and Sewerage (DWSS), Ministry of Water Supply and Sanitation (MoWSS), is responsible for the preparation of the IEE report.

Name of Proponent:

Project Management Office

Third Small Towns' Water Supply and Sanitation Sector Project

Department of Water Supply and Sewerage

Ministry of Water Supply and Sanitation

Government of Nepal

Address of the Proponent:

Panipokhari, Kathmandu

Tel: 977 1 442368, 977 1 4412348

Fax: 977 1 4413280

E-mail: info@stwsssp.gov.np

Website: www.stwsssp.gov.np



A handwritten signature in black ink, appearing to read "Shah".

Chapter 2

2. BACKGROUND AND DESCRIPTION OF THE PROJECT

2.1 Project Background

In January 2000 the government endorsed the 15-year Development Plan for Small Towns' Water Supply and Sanitation in order to improve the health, economic and environmental living conditions of the people in small towns in Nepal. The project embraces the community managed demand responsive approach, where the community is involved in all aspects of planning and implementation of the town projects. The Asian Development Bank (ADB) has been providing financial assistance to this sector project. The Department of Water Supply and Sewerage (DWSS) is the implementing agency whereas the Ministry of Water Supply and Sanitation (MoWSS) is the executive agency.

The first phase of the Project, whose duration was 2001-2008, has already been completed and the people of 29 small towns have been benefitted by the Project. Upon the completion of the first phase and after finding positive impacts of the Project, the Government of Nepal decided to implement the second phase, with the name, Second Small Town's Water Supply and Sanitation Sector Project. Simultaneously after the successful completion of the second phase DWSS has brought some changes on this project and named as Third Small Town Water Supply and Sanitation Sector Project (TSTWSSSP). For the implementation, formulation, and operation and maintenance of the Project, TSTWSSSP aims to have full participation of the users of the respective towns. The cost will also be shared by the users and GON.

The Project has many stakeholders such as WUSC, Project Management Office (PMO) of DWSS, Water Supply and Sanitation Division/ Sub-division Office, Regional Project Management Office (RPMO), Town Development Fund (TDF), Design and Supervision and Management Consultant (DSMC) are responsible for social mobilization, health and hygiene programs and preparation of social profiles.

Both the Nepali law and ADB policy require that the environmental implications of individual developments are taken into account in the planning and decision making process and that action is taken to reduce the adverse 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.

2.2 Objective of TOR and IEE study

The main objectives of the TOR is to guide the subsequent IEE study, to produce a comprehensive and coherent IEE Report as per the Environmental Protection Act, 1997 and Environmental Protection Rules, 1997 (with amendments). The specific objectives of the proposed IEE study include to:

- Identify the major issues that may arise as a result of proposed works on bio-physical, socioeconomic and cultural environment of the project area,
- Recommend practical and site specific environmental mitigation and enhancement measures prepare and implement environmental monitoring plan for the project,
- Provide information on the general environmental setting of the Bhojpur Bazaar Town area as baseline data. Make sure that IEE is sufficient for the proposed water supply project.

2.3 Description of the Project

2.3.1 Location and Accessibility of the Project Area

The Project is located in Bhojpur Municipality, which is situated in Bhojpur district in Koshi Zone of the Eastern Development Region of Nepal. The Municipality lies between 27° 07' 58" N to 27° 16' 42" N latitude to 87° 02' 40" E to 87° 04' 56" E longitude. The Municipality is in hilly region with an altitude ranging between 560 m (Pikhuwa Khola) to 2560 m (Suntale Danda) above mean sea level with an average altitude of 1630 meters.

The North-South Koshi Highway joins project area to Dhankuta, Dharan and Itahari. The distance from Bhojpur bazaar to Hile, Dhankuta and Dharan is approximately 92 km, 118 km and 167 km respectively. The nearest airstrip, Taksar connects project area to Biratnagar and Kathmandu with regular flight.



Figure 2-1: Project Location

The project area is in hilly region. The Municipality has subtropical to temperate climate and is heavily influenced by the monsoon (June-September) with an average annual rainfall of about 1700 mm.

2.3.2 Proposed service area

The proposed service area includes complete area of ward no. 6 to 8 & partial area of ward no. 3, 4, 5, 9, 10 & 11.

Shale



Figure 2-2: Proposed service area

2.3.3 Population and Demographic Characteristics



The total population of the Bhojpur Municipality as per 2011 census was about 16,102 in 4093 households. The average HHs size of the area has decreased from 4.62 in 2001 to 3.94 in 2011. The ward-wise population of the project area of the town according to census, 2001 and 2011 has been presented below:

Shah



Table 2-1: Population of the Concerned Ward of Project Town

Ward	W. Area (Ha)	Census 2001			Census 2011			Growth Rate
		HHS	Pop	P. Densities (PPHA)	HHS	Pop	P. Densities (PPHA)	
1	981.55	275	1,415	1.4	257	1,123	1.1	-2.28
2	642.64	299	1,604	1.9	278	1,301	1.5	-2.07
3	252.58	345	1,688	6.7	350	1,534	6.1	-0.95
4	643.70	308	1,450	1.7	314	1,346	1.9	-0.70
5	189.25	362	1,527	8.1	489	1,771	9.4	1.49
6	221.29	217	1,002	4.5	311	1,160	5.2	1.47
7	244.57	505	1,659	7.6	662	2,805	11.5	4.2
8	686.17	343	1,453	2.2	408	1,710	2.8	1.37
9	693.01	302	1,442	2.1	271	1,112	1.6	-2.57
10	612.68	299	1,419	2.3	291	1,182	1.9	-1.81
11	781.55	279	1,403	1.8	292	1,056	1.4	-2.5
Total	3,110	3,535	16,311	5.3	4,093	16,102	5.0	-0.13

Source: CBS 2001 and 2011

The above Table 2-1 shows that the average HHS size of the area has decreased from 4.62 in 2001 to 3.94 in 2011. Ward no. 5, 6, 7 and 8 of Municipality, area of former Bhojpur VDC are only comparatively densely populated area.

The consultants conducted a socio-economic survey in 2016 of the proposed service area. It shows that the total population of the service area is 12,323. The following Table 2.2 shows the coverage of population including beneficiaries' households in the project area.

Table 2-2: Beneficiaries households

Ward	HHS	Population
3	29	148
4	142	656
5	284	1,458
6	233	1,515
7	456	3,239
8	332	1,864
9	280	1,300
10	248	1,091
11	207	1,010
Total	2,190	12,323

Source: Socio-economic survey 2016

2.3.4 Existing Water Supply Situation

Existing Water Supply

Sillichung Water Supply system in Bhojpur Bazaar is the only existing pipe water system in the project area. The system served partly areas of ward no. 7, 8, 9 and 10 of the Municipality.

Source description and Intake

There are four water sources supplying existing Sillichung water supply system. All these sources are registered in District Water resources committee. There is no dispute in water sources, two sources Bhulke and Jor Sango are in public land and other sources Daduwa and Tindhare are in private land which are owned by Sillichung WUSC.



The sources were well protected by stone Masonry wall and barbed wire fencing and covered with vegetated forest.

The source Daduwa, Jor-sanghu and Tindhare are clustered in east side of the Municipality in Khurila area. The source Bhulke is located in western area of the Municipality. The details of existing sources are illustrated in the table below.

Table 2-3: Existing Source Details

Name of the Source	Bhulke	Daduwa	Jor-sanghu	Tindhare
WN of the Municipality	WN 4 of BM	WN 1 of BM	WN 1 of BM	WN 1 BM, Khurila
Type (Spring/Stream)	Spring	Spring	Stream	Spring
Measured flow (lps)	6 lps	1 lps	4 lps	3 lps

Transmission Line, Distribution lines and Storage Capacity

The cumulative length of transmission line is about 32 Km. Entire length of transmission line comprises of HDPE pipe. There is less chances of landslide in transmission pipeline route unless other development activities like road and other construction works are commenced. Similarly, the distribution pipe line of about 45 Km comprises of HDPE pipe networks are serving water to town. The pipe was not properly laid and distribution system was not properly maintained.

The cumulative storage capacity of the existing system is 555 cum. The storage capacity is very high as Compared to drawing discharge. The storage capacity is more than 50% of the daily supply.

Table 2-4: Existing Storage Reservoir Details

Ward No.	Location	Capacity (CUM)	Condition
WN 5	Hattgaunda	40	Good
WN 5	Hattgaunda	10	
WN 5	Hattgaunda	10	
WN 5	School Danda	10	
WN 5	Kalle	80	Good
WN 5	Widhara	75	Good
WN 5	Pandanki	200	Good
WN 5	Pandanki	150	Very Good
	Total	555	

As it has been mentioned already, small storage reservoirs having less than 40 cum capacity and entire distributions mains are not incorporated in proposed system.

There are several piped water supply system within the project area. There are about 17 major system operated by 17 different WUSC. The detail of each system with regard of name of source, number of taps and storage tanks is shown in Table 2-5.

Thakur



Table 2-6: Result of water quality tests

S. N.	Parameters	Unit	Observed Value of Sample			NDWQS, Nepal
			Bhulke	Joti, Sanghu, Tindhare & Daduwa	Tin Bhongale	
1	pH at 25°C	-	6.6	6.5	6.3	6.5-8.5
2	Electrical Conductivity	µmhos/cm	58	48	52	1500
3	Turbidity	NTU	1.4	1.2	1.2	5(10)
4	Taste and Odor		N.O	N.O	N.O	N.O
5	Color	TCL	0.14	0.27	0.21	500
6	Total hardness as CaCO ₃	mg/l	32	32	34	5(15)
7	Total Dissolved Solids	mg/l	38	29	35	1000
8	Total Residual Chlorine	mg/l	<0.10	<0.10	<0.10	0.1-0.2
9	Chloride	mg/l	0.99	<0.50	0.99	250
10	Ammonia	mg/l	0.42	0.48	0.23	1.5
11	Nitrate	mg/l	0.40	0.44	0.56	50
12	Aluminum	mg/l	0.03	0.03	<0.02	0.2
13	Fluoride	mg/l	0.46	0.20	0.13	0.5-1.5
14	Sulfate	mg/l	6.4	2.4	2.1	250
15	Mercury	mg/l	<0.001	<0.001	<0.001	0.001
16	Calcium	mg/l	3.2	3.2	4.8	200
17	Iron	mg/l	<0.05	<0.05	0.12	0.30(3)
18	Manganese	mg/l	<0.05	<0.05	<0.05	0.2
19	Lead	mg/l	<0.01	<0.01	<0.01	0.01
20	Cadmium	mg/l	<0.003	<0.003	<0.003	0.003
21	Chromium	mg/l	<0.05	<0.05	<0.05	0.05
22	Copper	mg/l	<0.05	<0.05	<0.05	1
23	Zinc	mg/l	<0.02	<0.02	<0.02	3
24	Arsenic	mg/l	<0.01	<0.01	<0.01	0.05

Source: Feasibility Report of Bhojpur Bazaar Water Supply and Sanitation Project, 2016

All parameters of water quality of sampled well are within the permitted value by NDWQS. It is recommended taking few samples from the source before or during construction phase also to ensure about the water quality so as to make adequate provision for water treatment, if required.

2.3.4.4 Operation costs and current Tariff

The WUSCs have been operating the former individual systems, for which water supply technicians, supporting administrative/accountant and office staffs are deployed for managing water distribution, maintenance and meter reading etc.

Shah



2.3.4.5 Problems of Existing System

The problems of existing water supply systems and service in Bhojpur Municipality are as follows:

- The water source is not sufficient to meet present water demand of the service area. The water shortage is more acute during the dry season;
- There is only an intermittent supply of water. The present system capacity is not sufficient to meet water demand of the population;
- The WUSC is not able to meet demand for private connections from the consumers in the service area;
- The existing system supplied water as without treatment therefore the existing system has not been able to deliver water quality conforming to NDWQS standards;
- The WUSC has not been able to extend distribution system to new areas where the demand of water exist and most of existing systems need improvements in terms of its design and construction.

2.3.5 Ethnicity and caste

The survey revealed that Janajatis/ethnics (Newar, Rai, Magar & Tamang etc.) are the major caste group of the project area comprising about 63.7% of the total households. Similarly, Brahmins/Chhetris, Dalits and other caste (Madeshis, Musalmans etc.) are comprising 26.5 %, 8.4 % and 1.4 % of the total households respectively.

2.3.6 Settlement pattern

The town is located in hilly area with heterogeneous ethnic composition. Most of the government and non-governmental offices are located in ward no 7 which has most dense population of the service area. However, the settlement pattern of the other wards is scattered.

2.3.7 Education and Health

Education

The institutional data shows that eighteen educational institutions including campus for higher education, higher secondary schools, secondary schools as well as primary schools was recorded in the service area with 7588 people including students, staffs and teachers.

The socio-economic survey of 2016 AD shows that the overall literacy rate is 80 %.

Health

Medical facilities for diagnosis and treatments are available in the service area. There are 15 medical institutions including 12 hospitals, 2 health posts and polyclinics with 67 beds.

2.3.8 Water-borne and Communicable Diseases

Cases of water-borne diseases such as diarrhea, dysentery, stomach-ache and skin disease etc. are found very few in numbers. Similarly, cases of mortality due to water related diseases are nil. The information related to water borne and communicable disease was crossed checked by visiting hospitals and health posts within the service area. According to the survey, about 4.27% (526) suffered diseases from diarrhea where as 3.17% (391) suffered from dysentery. Similarly, about 2.73% (337) were suffered from other water-borne diseases (such as skin, stomach pain, fever) etc. (Table 2-7.)



Table 2-7: Reported Water Borne and Communicable Diseases during last year

Diseases	Children (<5 Yrs.)	Female	Male	Total	%
Diarrhea	244	155	126	326	4.27
Dysentery	185	111	95	361	3.17
Other	111	101	126	337	2.73
Total	540	366	346	1254	10.18

Source: Socio-economic Survey 2016 and Data from Hospitals and Health Posts

2.3.9 Economic Activities

The economy of the Municipality is extensively agrarian although most of the households in the project area depend on more than one occupation. During the course of the household surveys of project area, detailed information has been collected on the major occupation and economic activities of all household heads. As a result of the survey shows about 46% are engaged in agriculture, about 23% depend on business, 10.8% are service holders about 9.4% are engaged in foreign employment, 4.6% are labor.

There are more than 42 hotels/lodges with 524 beds and are managed by 109 staff in the project area. At the moment, there are 4 industries and businesses in Bhopur. The type of industries operating in the Municipality are rice mills, cotton, grill and carpet etc.

There are eight public and private banks providing banking services to the people of the Municipality. Similarly some cooperatives are also in operation in the service area.

There are 14 educational institutions and 23 government/NGO offices. The major government offices are district based offices and the Municipality office.

2.3.10 Poverty Conditions

The survey revealed that the main sources of household income of the service area are agriculture, service remittance and wage labour, respectively. Among the total households 14.7% have monthly income of less than Rs. 7500 which is considered as a poor household. About 15.2% of the households have monthly income ranging from Rs. 7501 to Rs. 10875. Similarly, 54.1% of the households have income ranging from Rs. 10876 to Rs. 20,000, 13.3% of households have income ranging from Rs. 20001 to Rs. 35,000, 1.9% of the households have income ranging from 35001 to 50000 and about 0.9% of the households have income of above Rs. 50,000 a month. Similarly, the survey shows that about 14.7% of the total populations live below the poverty level (Table 2-8).

Table 2-8: Distribution of mean monthly household income

Income Range	Ward										Total of Ward	Total %
	3	4	5	6	7	8	9	10	11			
<7500	4	25	52	19	15	66	7	81	72	321	54.7	
7501-10875	8	30	40	40	43	74	28	41	28	332	15.2	
10876-20000	8	14	146	124	310	162	172	133	56	1184	54.1	
20001-35000	6	7	40	36	77	23	49	11	42	291	13.3	
35001-50000	3	5	5	8	7	4	2	2	6	42	1.9	
>50001	0	1	3	5	4	3	2	0	2	20	0.9	
Grand Total	29	142	284	232	456	332	280	248	207	2490	100.0	

Source: Socio-economic survey 2016

2.3.11 Existing Sanitation Facilities

Sanitary Facilities

The overall sanitary condition of the Municipality is found to be reasonably satisfactory. In the core area, almost all HHs have private toilets whereas in isolated/semi-urban areas some people still practice open defecation. The socio-economic survey (2016) reported that 2.9% HHs still practice open defecation in the project area and the majority of HHs i.e. 93.7 % have either pit latrines or ventilated pit latrines. Only 3.3 % are using cistern flush type of pit latrine. (Table 2-9).

Table 2-9: Toilet coverage (HHs)

Type of Toilet	3	4	5	6	7	8	9	10	11	Total	%
No Toilet	0	2	17	3	6	13		11	11	63	2.9
Pit Latrine	0	6	20	73	154	75	20	73	113	546	24.3
Ventilated Pit Latrine	26	132	247	140	264	232	237	159	60	1507	68.8
Cistern Flush	3	0	0	10	42	12	3	0	3	73	3.3
Grand Total	29	142	264	132	459	352	200	248	207	2100	100

Source: Socio-economic survey, 2016.

The existing latrines in the houses as well as in schools are not maintained properly. The community has very limited knowledge on the use of sanitary latrines and personal hygiene especially in the city periphery.

Drainage Facilities

There is no proper drainage system for storm water as well as for the domestic sewage in Bhojpur Municipality. The core area of the city along the highway has about 1 km of open surface drains on each side in ward 1 and other few stretches of surface drains to avoid local pondage. As the terrain is mostly steep, people are less concerned about storm water drainage.

Wastewater Management Practices

There is no sewerage system in the project area. Wastewater from individuals is managed inside the house. The socio-economic survey conducted in 2016 shows that 97.1% HHs have their own toilets. Some of them have constructed septic tanks and some have direct connections with surface drains. There is no wastewater treatment plant in the Municipality to treat domestic sewage/septage. The Municipality is planning to organize separate units for septage and solid waste management. The survey shows that 99% of the sampled HHs showed an interest in improving the septage management system and are interested to pay for it.

Solid Waste

The major sources of waste generation in Bhojpur Municipality are households, hotels, hospitals, vegetable and fruits market, meat stores, groceries, clothing store/ fancy stores/tailoring shops, etc. There has been no study on types and volume of solid wastes.

Existing Institutions Involved in Water Supply and Sanitation

The main institutions involved in water supply and sanitation in the project area are Bhojpur Municipality, Water Supply and Sanitation Division Office (WSSDO), Bhojpur Water Users and Sanitation Committee, other WUSC Committees and some NGOs. WSSDO, Bhojpur has been actively supporting most of the WUSCs to operate the existing water supply system and carry out different WASH activities in the project area. They have been providing both financial and technical support for large scale maintenance and

Bhaloo



providing pipes, bleaching powder and human resources as and when needed. DWSS through WSSDO, Bhojpur constructed and then rehabilitated the water supply systems. The WUSCs have been managing the existing systems.

2.3.12 Project Rationale

Demand for the Project

The Municipality is an attraction for internal migration from the hill regions and hence the population growth is comparatively high. Because of its strategic location, the city will tend to grow in the future. However the existing water supply system has not been able to meet the growing demand.

The present water supply is intermittent and is limited to only certain parts of the city area. The current systems serve only about 68.6% of the service area population. There is a demand from other parts of the Municipality for supply of regular and potable water to the consumers.

The water from the existing system is hardly treated. The people are mostly dependent on piped water supply directly from streams/springs, the quality of which is poor with bacteriological contamination.

Considering the water demand and condition of the existing system, there is a need for a project to upgrade the existing water supply situation in the service area to meet the growing demand for private connections and to make drinking water available to the people of the service area throughout the year.

Willingness and Affordability to Pay

According to the concept of Third Small Town Water Supply and Sanitation Sector Project, the local community has to contribute 5% of total cost as up-front contribution (Waived off for earth quake victims of Bhojpur) and has to take 25% as a loan from the TDF. It is also required to pay monthly water bills to the system operator. The local people are familiar with this modality from the experience of other nearby small town projects already implemented. The socio economic survey, 2016 shows that people are willing to contribute cash as up front collection.

Connection charge

The sample survey shows that most people in the project area (56.1%) are willing to pay up to NPR 6001 to 9000 for a water supply connection. About 17.1% of the households in the project area are willing to pay more than NPR 1,500 and up to NPR 3,000 for a new connection. (Table 2-10).

Table 2-10: Willingness to pay connection charge (in NPR)

Willingness for Cash Contribution	Service Area										Grand Total	%
	3	4	5	6	7	8	9	10	11			
Rs.>15000	0	2	0	2	0	0	3	0	2	9	7.3	
Rs. 9001-15000	0	2	0	0	0	0	0	0	1	3	2.4	
Rs. 6001-9000	2	2	6	4	12	4	25	5	9	69	56.1	
Rs. 3001-6000	2	0	0	2	0	0	0	1	1	6	4.9	
Rs. 1501-3000	0	0	10	0	0	0	0	1	1	12	9.8	
Rs.< 1500	0	0	12	4	0	0	3	1	1	21	17.1	
Not Responding	0	0	3	0	0	0	0	0	0	3	2.4	
Grand Total	4	6	31	12	12	4	31	8	15	123	100.0	

Source: Socio-economic survey 2016

Monthly Tariff

The survey revealed that the community has shown a positive response towards willingness to pay monthly water tariffs. As per the findings, more than 17.1% households prefer to pay monthly water tariff ranging from Rs. 251 to 300 whereas about 56.1% of households prefer to pay tariff ranging from Rs. 401-450. Similarly, 7.4% of households are willing to pay Rs. 451-500 per month. Likewise, about 7.3% of household are willing to pay more than Rs. 501 (Table 2-11).

Table 2-11: Willingness to pay monthly water Charges (NPR)

Willing Range-NRs	Service Area										Grand Total	%
	3	4	5	6	7	8	9	10	11			
Not Interested			3								3	2.4
>500		2		2			3		2		9	7.3
451-500		2							1		3	2.4
401-450	2	2	5	4	12	4	25	5	9		69	56.1
351-400	2			2				1	1		6	4.9
301-350			10					1	1		12	9.8
251-300			12	4			3	1	1		21	17.1
201-250												0.0
151-200												0.0
Total	4	5	31	12	12	4	31	8	15		123	100.0

Source: Socio-economic survey, 2015

Poverty Alleviation Aspects

The socio-economic survey shows that 11% of the total HHs in the project area is below poverty line. Ward wise distribution of BPL has been given in social profile.

2.3.13 Need of the Sanitation Component

Bhojpur Bazaar Municipality was not declared as Open Defecation Free (ODF) area. About 3% of the HHs does not have toilets and percentage of pit latrine is 24.9 which demand up gradation or renovation. Institutional toilets & public toilets will be dealt in totality of sanitation components. These sub-components of sanitation help for betterment of sanitation facilities in this area. These facilities also inculcate behavior of toilet use among students and general public.

Proper and effective management of storm water drainage has become the most important problem of the Bhojpur Bazaar Town. As the urbanization increases, frequency of localize pondage during the monsoon in several areas of the town increases. These problems need to be addressed in a holistic manner with correct remedial measures. It is envisaged to formulate and prepare Master Plan for the Municipality area in close consultation and collaboration of the newly formed Municipal Office.

Since significant work and procedure has been felt necessary in development of septage treatment concept, the septage bed would be dealt separately and additional separate contract package would be developed for implementation. It requires extensive work to manage septage collection, conveyance, treatment, and disposal. Hence, separate study could be conducted. Similarly, Solid waste management Master Plan will be prepared and submitted as waste management master plan in totality. All sanitation activities could be done in second phase only.

2.3.14 Hydrology and Climate

The district has a subtropical to temperate climate and is heavily influenced by the monsoon (June-September) with an average annual rainfall of 1700 mm. The average maximum & minimum temperature of the district is 29° and 8° Celsius respectively.

2.3.15 Flora and Fauna

The common species of plants within and around the proposed project area are shown in Table 2-12.

Table 2-12: List of Plants in the Project Area

S.No.	Scientific Name	Local Name	Family
1	<i>Vernis indicum</i>	Amsela	Rosaceae
2	<i>Emblica officinalis</i>	Anala	Euphorbiaceae
3	<i>Pteris caudata</i>	Angel	Ericaceae
4	<i>Cedrela toona</i>	Tun	Meliaceae
5	<i>Lagerströmia indica</i>	Ashare phul	Lythraceae
6	<i>Adiantum viviparum</i>	Asuro	Asaraceae
7	<i>Melia azadirach</i>	Bakara	Meliaceae
8	<i>Ficus bengalensis</i>	Bur	Moraceae
9	<i>Terminalia bellirica</i>	Burro	Combretaceae
10	<i>Aegle marmelos</i>	Bel	Rutaceae
11	<i>Rhus v. alba</i>	Bhalavo	Anacardiaceae
12	<i>Populus ciliata</i>	Bhote Pipal	Salicaceae
13	<i>Lagerströmia Parviflora</i>	Bot Dhasare	Lythraceae
14	<i>Shorea wallichii</i>	Chilane	Theaceae
15	<i>Bacca berytacea</i>	Chyari	Sapotaceae
16	<i>Berberis aristata</i>	Charo	Berberidaceae
17	<i>Debregeasia salicifolia</i>	Dair	Urticaceae
18	<i>Cassia pinnata</i>	Dalsabe	Burseraceae
19	<i>Mussaenda macrophylla</i>	Dharbeni	Rubiaceae
20	<i>Colchicaria oppositifolia</i>	Dhursal	Labiatae
21	<i>Dioscorea bulbifera</i> L.	Girha	Dioscoreaceae
22	<i>Callicarpa macrophylla</i>	Guyalo	Verbenaceae
23	<i>Lantana camara</i>	Haluinde	Anacardiaceae
24	<i>Terminalia chebula</i>	Harto	Combretaceae
25	<i>Syzygium cumini</i>	Jamun	Myrtaceae
26	<i>Phoebe lanceolata</i>	Jhankri syala	Lauraceae
27	<i>Ficus lacor</i>	Kabro	Moraceae
28	<i>Ashlepiodaphne chitensis</i>	Kadam	Rubiaceae
29	<i>Morica excelsa</i>	Kafai	
30	<i>Adina cordifolia</i>	Karam	Rubiaceae
31	<i>Acacia catechu</i>	Khagar	
32	<i>Ficus semicordata</i>	Kharayo	Moraceae
33	<i>Sapium tosigne</i>	Khurro	Euphorbiaceae
34	<i>Morus alba</i>	Kimbu	Moraceae
35	<i>Litsea morpeltata</i>	Kuturo	Lauraceae
36	<i>Dioscorea grandiflora</i>	Lampare	Lythraceae
37	<i>Engelhardia spicata</i>	Mauwa	Loganiaceae
38	<i>Erythrina stricta</i>	Phaledo	Leguminosae
39	<i>Ficus religiosa</i>	Pipal	Moraceae
40	<i>Pinus roxburghii</i>	Sallo	Coniferae
41	<i>Terminalia tomentosa</i>	Saj	
42	<i>Bombax ceiba</i>	Simali	Bombacaceae
43	<i>Ulex negundo</i>	Simali	Verbenaceae
44	<i>Mallotia philippensis</i>	Sindare	Euphorbiaceae
45	<i>Albizia chinensis</i>	Siris	Leguminosae

Dhaka



46	<i>Dalbergia sissoo</i>	Sissoo	
47	<i>Bombina variegata</i>	Yanki	Leguminosae
48	<i>Alnus nepalensis</i>	Utro	Betulaceae
49			

Source: IEE Field Visit SurSource: Field Survey, 2016

Non Timber Forest Products (NTFPs) are defined products derived from forest species other than timber and fuel wood. The main NTFP species found along the project area are: Amaia (*Phyllanthus emblica*), Asura (*Justicia adhatoda*), Blaune (*Maesa chola*), Kurila (*Asparagus officinalis*), Dhasingere (*Gaultheria fragrantissima*).

Some of the mammals reported to be present in the nearby forests are listed in Table 2-13.

Table 2-13: Mammals in the Project Area

S. N	Common Names	Scientific Names
1	Buanse	<i>Canis lupus</i>
2	Common Leopard	<i>Panthera pardus</i>
3	Damsi	<i>Hystrix indica</i>
4	Fox	<i>Vulpes vulpes</i>
5	Golden Jackal	<i>Canis aureus</i>
6	Hill Mouse	<i>Mus leucurus</i>
7	Jungle Cat	<i>Felis Chaus</i>
8	Lokharke	<i>Funambulus sp.</i>
9	Long-winged Tomb Bat	<i>Myotis longimanus</i>
10	Malsapro	<i>Martes flavigula</i>
11	Monkey	<i>Macaca mulatta</i>
12	Nepal Grey Langur	<i>Somaphyscus schistaceus</i>

Source: IEE Field Visit Survey, 2016

Some of the birds reported in the forest areas are listed in Table 2-14.

Table 2-14: List of Birds in the Project Area

S.No.	Common Names	Scientific Names	Status of occurrence		
			Common	Sparse	Rare
1	Asian Koel	<i>Eudynamis scolopacea</i>	x		
2	Barn owl	<i>Tyto alba</i>		x	
3	Battai			x	
4	Bhangera	<i>Passer domesticus</i>	x		
5	Bhudi Phor	<i>Ciconia cypselurus</i>		x	
6	Bhaskar	<i>Pellionomys rubiceps</i>			
7	Blue-throated Barbet	<i>Megalaima asiatica</i>	x		
8	Chil	<i>Actinotus malayensis</i>			

S.No.	Common Names	Scientific Names	Status of occurrence		
			Common	Sparse	Rare
9	Chyakhura	<i>Ardeopygia longicauda</i>		✓	
10	Common Myna	<i>Acridotheres tristis</i>	✓		
11	Dangre		✓		
12	Dhukur	<i>Streptopelia sp</i>	✓		
13	Hachii	<i>Bubo bubo</i>		✓	
14	Indian Cuckoo	<i>Cuculus macropterus</i>	✓		
15	Jureli	<i>Pycnonotus caten</i>		✓	
16	Kag	<i>Crotophaga sulcirostris</i>	✓		
17	Kalli	<i>Lophura leucocomata</i>	✓		
18	Koili	<i>Cuculus micropterus</i>	✓		
19	Lampachure	<i>Caprimulgus macrurus</i>		✓	
20	Lado Koshoro	<i>Bubo nepalensis</i>			✓
21	Nyali	<i>Megascops syriacus</i>		✓	
22	Suga	<i>Psittacula cyanoptera</i>	✓		

Source: IEE Field Visit Survey, 2016

The commonly found reptiles and amphibians observed in the project area are presented in Table 2-15:

Table 2-15: List of Reptiles and Amphibians Found in the Project Area

Common Name	Scientific Name
Rat snake	<i>Ptyas mucosa</i>
Mountain pit viper	<i>Ovophis monticola</i>
Green Pit viper	<i>T. albolabris</i>
Garden lizard	<i>Calotes versicolor</i>
Common lizard	<i>Hemidactylus brooki</i>
Common toad	<i>Bufo melanostictus</i>
Stream frog	<i>Rana cymophylectis</i>

Source: IEE Field Visit Survey, 2016

Similarly, common fishes found in the project area are given in Table 2-16.

Table 2-16: List of Fishes Found in the Project Area

SN	Scientific Name	Local Name	Migratory species	Economic Importance
1	<i>Barilius Vagrus</i>	Lakela	R	Food
2	<i>Gambusia sp</i>	Budma	R	Food
3	<i>Glyptothorax sp</i>	Kabre	R	Food
4	<i>Heteroglyphis fuscus</i>	Singha	R	Food
5	<i>Nesiocheilus latus</i>	Kalye	MM	Food
6	<i>Nesiocheilus sp</i>	Gadela	R	Food
7	<i>Psilichthys piceus</i>	Tite (Endemic)	R	Medicinal

8	<i>Schizothoracichthys sp</i>	Asala	R to MM	Food
9	<i>Channa gachua</i>	Hile	R	Food
10	<i>Tor tor</i>	Sehar	R to MM	Food

Source: IET Field Visit Survey, 2016

2.3.15 Protected Areas

No national parks and protected areas for forest/ wildlife exist in the project area. No forest will get affected from the proposed project intervention.

2.3.16 Community Forest

The community forests within and nearby of the proposed project are Aahale Community Forest, Piyaale Kalipatal Community Forest, Aapthhare Hatti Kharka Community Forest, Omala Patal Community Forest, Yeklea Panni Community Forest, Kaggate Dhunge Community Forest, Panthale Community Forest, & Bhaktimle Community forest.

2.4 Infrastructure Facilities

2.4.1 Transportation, Electricity and Communication

The North-South Koshi Highway joins project area to Dhankuta, Dharan and Itahari. The distance from Bhojpur bazaar to Hile, Dhankuta and Dharan is approximately 92 km, 118 km and 167 km respectively. The nearest airstrip, Taksar connects project area to Biratnagar and Kathmandu with regular flight.

The area is well connected to the national electricity grid. The project area is connected to national and international telecommunication networks. Major national daily newspapers print regional editions and are available to readers.

2.4.2 Educational Institutions

There are various public and private institutions such as schools and colleges, community based organization, NGOs, banks and financial institutions, within the service area.

2.4.3 Other institutions

There are several government and non-government offices including private institutions in the project area.

2.5 Quality of Life Values

The Project is not expected to adversely affect any cultural or recreational resources but will increase the existing quality of life due to the improvement in personal, household and community hygiene practices and community health.

2.6 Cultural and religious sites

Siddhakali Temple, Kaffea Gufma & Taxar Boudhia Bihar are some famous cultural & religious sites of the project area. But due to the construction of the project these sites won't get affected.

2.7 Resettlement, Relocation and Compensation Issues

The Project does not have any issues related with resettlement, relocation and compensation.

2.8 Salient Features

Table 2-17: Salient features of the project

S.N.	Items	Description
1	Name of Project	Bhojpur Bazaar Water Supply and Sanitation Project
2	Type	Gravity
3	Study Level	Feasibility
4	Location Area	
	Region	Eastern Development Region
	Zone	Koshi
	District	Bhojpur
	VDC/Municipality	Bhojpur Municipality
	Ward	Complete area of Ward No. 6 to 8 and partial area of ward No. 3, 4, 5, 9, 10 and 11.
5	Available Facilities	
	Road	Along Pulaki Road from Gaun to Kalaiya stretch via Garusa
	Supply Water System	Hide-Bhojpur Road (22 km)
	Electricity	WUSCs
	Communication	Available
	Health Services	Available
	Banking facilities	Available
6	Social Status	
	Present HHs Numbers (2016)	2,190
	Present Population (2016)	12,323
	Base Year Population (2018)	12,849
	Design Year Population (2037)	19,721
	Weighted Growth Rate % (WGR)	2.16
	Projected HHs in Design Year (Based on WGR)	~3,504
7	Water Demand (MLD)	
	Base Year (2018)	1.625
	Design Year (2037)	2.495
	Source Name	Apart Existing source, Tin Bhangale and its tributaries are proposed source.
	Source Type	Perennial River at two stream
	Source Location	Timma VDC of Bhojpur
	Safe Yield (lps)	20 to 22 of proposed source at Tin Bhangale
7	Type of Structures	
	Proposed intakes	6 Nos with rehabilitation of 4 Nos Existing intakes
	Water treatment plant	At two location total capacity for 31.34 lps
	Ground Reservoir No (Existing (E)/New (N) and Capacity in Cum	Total 7 numbers, (1E-40 cum + 1N-700 cum + 1E-60 cum + 1E-200 cum + 1E-150 cum + 1N-150)
	Valve Chamber (Bricks/RCC)	25/15

Table for Initial Environmental Examination of Bhajpur Bazaar Water Supply and Sanitation Project

S.N	Items	Description
	Guard House (G1) / Small Guard House (G2) / Dosing House (DS)	3-G1 / 7-D5
	Household Connection	2,283
	Fire Hydrant	10
	Total Length of pipe in transmission and Bulk Distribution	Transmission line of about 25.8 km (7 km for old sources and 18.8 km for new source) and BDS of 6 km.
	Total Length of pipe in Distribution	68,386 m
9	Total Cost of WS Component (inclusive of all I NRs)	838,563,541.36
10	Cost Sharing Arrangement	
	GON Component (75 %)	587,504,478.55
	UDF Loan (25 %)	209,490,885.34
11	WUSC's Commitment for O&M as upfront (Cash)	41,976,177.47
12	Tariff	
	Up to 6 cum/monthly (NRs)	240
	7 to 10 cum/monthly (NRs)	60
	11 to 20 cum/monthly (NRs)	90
13	Economic Analysis	
	ERR (Base case) %	26.0%
14	Environment	
	AIS Category	B, Only IEE necessary
	IEE finding	No significant adverse impact.
15	Per Capita Cost for W/S component	
	Per Capita Cost (for base year pop.)	68,530
	Per Capita Cost (for design year pop.)	42,572

Source: Feasibility Report of Bhajpur Bazaar Water Supply and Sanitation Project, 2016

2.9 Proposed water supply system

Service Area

The IEE study area covers the environment that will potentially be affected by the intake, transmission mains, thrust blocks, saddle blocks & thrust beam, water treatment plants, service reservoir, bulk distribution mains, distribution mains, and appurtenances such as office building, laboratory unit, guard house and generator house etc.

All the project components are located in the Direct Impact Zone (DI2) considering the environmental as well as socio-economic impacts. The delineated service area includes complete areas of ward no 6 to 8 and partial areas of wards 3, 4, 5, 9, 10 & 11 of Bhojpur Municipality.

The study area is also referred to as "area of influence", and areas within 200 m from the area of influence is the Indirect Impact Zone (IIZ) where environmental and socio-economic impacts will be less.

Concept Design of Sub-project

The Bhojpur Bazaar sub-project has been conceptualized as a gravity surface water system. The overall concept has been developed with a distribution system comprising of a bulk water system (BDS) and household distribution system (DS). The whole service area will be divided in number of service area with dedicated storage reservoirs. The service area is very scattered and stretch 7 to 10 km with very high elevation differences within the service area (in the range of 1500 m). The concept of BDS has been conceptualized in order to reduce inequality of pressure in HHs connections within the service area. Each service reservoir will have a control mechanism with a bulk meter so that it will support the principles of DMA. The entire distribution network is to be supplied from six reservoirs.

Sub-project Components

The major sub-components of the subproject with their characteristic features are described in the sections below.

Intake

There are altogether six intakes. Four intakes are existing intakes and two intakes will be newly proposed intakes. Of the four existing intakes, three are spring intakes and one is stream intake.

Two streams intake have been proposed at Tin-Bhangale stream located in Sumlikha village in Teema VDC of the Bhojpur district. Water from two streams will be collected at collection chamber. In totality cumulative discharge of 21 lps have been proposed from these sources. Slightly high discharge has been proposed for diversion than actual required assuming of about 15% leakage in transmission system. Relative Level (RL) of these intakes are around 2150 m msl.

Transmission Main

The cumulative length of transmission line is about 32 km. There are three different transmission system. The total length of the transmission main of the Old System is about 7.0 km.

The transmission length of the Tin-bhangale to main WTP is about 17 km. This is the length of pipe between Tin Bhangale intakes and proposed WTP-2. The transmission comprises combination of 150 and 200 ND DI pipe and 150 and 200 OD PE pipes.

Thrust Blocks, Saddle Blocks and Thrust Beam

Thrust blocks have been proposed for DI pipes (both transmission and distribution mains). Typical Thrust Blocks for horizontal bends, vertical bends, these have been designed for pressures of 30 kg/sq cm and 20 kg/sq cm for the transmission and distribution line, respectively.

Similarly, thrust beams and saddle blocks are proposed for DI Pipes laid in slopping areas and un-buried portions. All saddle block are proposed to be anchored with concrete at the centre of each pipe. Provision of RCC support for the stretches of buried and un-buried DI pipe lines which are laid in slopping areas has been made to prevent pipe movement.

River and Stream Crossing

There are a number of small river crossings in proposed transmission systems. A simple crossing by providing SP4 type concrete saddle blocks is recommended for small type of crossings for DI pipes. These types of crossings are used only when the span of crossing is less than 5 m. There are about fifteen numbers of this type of crossings in

all transmission system. In case of crossing near the existing bridges and culverts, provision has been made for pipe clamps.

Water Treatment Plant

The Bhopur Bazaar water supply system will have two water treatment plants. Each water treatment plant will consist of the following components: a) Inflow chamber; b) Sedimentation tank for primary settling; c) Horizontal flow roughening filter; d) Slow sand filter; and e) Chlorination unit.

Service Reservoir

The cumulative capacity of the seven service reservoirs provided is about 1375 cum.

Bulk Distribution Mains

As the service area is very scattered and stretches 7 to 10 km with high elevation differences within the service area (in the range of 1500 m), the concept of Bulk Distribution has been proposed. This has been done in order to reduce inequality of pressure in HHs connection within the service area.

All of the storage reservoirs of the Sub-system will get required water from corresponding water treatment plants. The BDS comprises of GI, PE and DI pipes from 75 ND to 160 OD diameter.

Distribution Main

The Distribution system comprises of a pipe network, looped in certain cases and branched in others. The network has been analyzed using EPANet, a design analytical software tool. The entire system has been designed using polyethylene (PE), ductile iron (DI) and galvanized iron (GI) pipes. The size of DI pipes is 150 mm and above. For proper saddle arrangements at household connections a minimum of 50 mm diameter distribution pipe has been adopted. Use of GI pipes has been limited. The total pipe length of the proposed distribution system is 68.353 km.

House Connection

Three type of house connections have been envisaged in the project. There are about 46 number of house connections from DI pipes, about 1598 number of house connection from PE pipes and about 639 number of house connections from GI pipes. Most of the connections will be private.

The house connection shall comprise of about 12 m pipe PE or GI Pipe (as per requirement) and a water meter. The house connection pipe shall be PE-80 or 100, 20 mm OD diameter pipe of rating PN-16 for tapping from DI or PE pipes. In case of tapping from GI pipes, the house connection pipe shall be medium class GI of 15 ND. Tapping of household connection in PE pipe has been proposed from PE saddle with ferrule and in case of DI pipe, DI saddle shall be used with a ferrule. Tapping from GI pipes has been proposed from PE saddle with a ferrule.

Dry dial volumetric rotary piston type water revenue meter for all house connections are proposed. These household water meters have 15 mm ND.

Appurtenances

These shall primarily comprise of valve chambers to house flow control valves, control valves for controlling flow etc. Altogether 50 to 60 valve chambers are expected in the system. A RCC valve chamber has been proposed on the carriage way and a brick type is proposed in other places where vehicular traffic is not expected.

DMA Establishment

One increasingly common principle of managing a large water network is to sub-divide it into a number of areas, typically between 500 and 3000 connections, each established area having a defined and permanent geographical and/or hydraulic boundary. Such an area is known as a District Management Area or more commonly, a District Meter Area (DMA). Ideally each DMA has a single source of supply to maximize accuracy of data, with a

[Handwritten signature]



strategically placed and suitably sized meter installed at the inlet that is capable of accurately measuring flow into the area.

An important factor in lowering and subsequently maintaining a low level of leakage in a water network is pressure control. The division of the network into DMAs facilitates the creation of a permanent pressure control system, thus enabling pressure reduction in DMAs which reduces the level of background leakage, the rate of flow of individual bursts and the rate of the annual burst frequency. In order to manage NRW in the proposed system, the total system is divided into 7 DMAs.

2.10 Relevancy of the Project

As per the TOR issued to DMCC, it is stated that the Project needs to be studied from the environmental point of view as per EPA 1997 and EPR 1997 (Amendments 1999 and 2007). The proposed water supply and sanitation project is intended to serve the water demand of service area that includes complete areas of ward no 6 to 8 and partial areas of wards 3, 4, 5, 9, 10 & 11 of Bhojpur Municipality of Bhojpur District. It is expected that on implementation of the project the users of the area will be able to avail adequate amount of safe drinking water.

The project needs to go through the IEE process as stipulated in EPR 1997 (Amendments 1999 and 2007). The proposed project shall be using surface water sources. The Project does not involve construction of any tunnels; relocation of people or households & there is no need to settle any households. The project is expected to benefit a design population of about 19,721 (2038).

As the proposed project falls within the definitions provided in the EPR 1997 (Amendments 1999 and 2007) Annex 1 (G) for drinking water projects; only an IEE shall be necessary. The regulation stated in Annex 1 (H) shall only be applicable, if the proposal does not fall under categories (A) through (H) of Annex 3. Table 2-18 compares the status of the project point by point against the conditions defined by Environment Protection Act 1997 and Environment Protection Regulation 1997 (and its amendments 2007) for which a drinking water would require IEE or EIA.

Table 2-18: Criteria for requirement of IEE and/or EIA for Drinking water supply Projects

Condition described in the Act and Regulations	IEE Required as per the Regulation Annex 1 g	EIA Required as per the Regulation Annex 3 h	Conditions in the project
River Control (training)	Up to 1 kilometer	Over 1 kilometer	NA
Channeling Water from one Watershed to Another	Applicable	Applicable	NA
Rain Water Collection and Use, of spewing Wetland	Up to 200 hectares	More than 200 hectares	NA
Supply of Water in Dry Season from Surface Water Source with a safe yield of	Up to 1 cusec and utilizing up to 50 % of the available quantity	More than 1 cusec and utilizing the total available quantity	NA
Ground Water Recharge	Up to 50 % of total aquifer	More than 50 % of aquifer	NA
Water Treatment	Up to 25 liter per sec		Within 25 liter per sec
Construction of Tunnel for Channeling Drinking Water	Tunnel constructed		Not constructed
Water Resource Development which Displaces People	25 to 100 people	Over 100 people	Not done

ToR for Initial Environmental Examination of Bhagpur Bazaar Water Supply and Sanitation Project

Condition described in the Act and Regulations	IEE Required as per the Regulation Annex 1g	EIA Required as per the Regulation Annex 3h	Conditions in the project
Permanent Residents			
Settlement of People Upstream of Water Source	Settlement of up to 500 people	Settlement of above 500 people	Not done
Supply of water to a population of	5,000 to 50,000	Over 50,000	This is an extension of the existing system. Newer service areas have been added and new sources are to be tapped.
Connection of New Source to Supply Water to existing water supply system for a population of	10,000 - 100,000	More than 100,000	The current population is 21,909 in 2016 and the project is designed for a final population of 34,610 in 2038.
Operation of a drinking water supply system with inclusion of sewage disposal system with sewage treatment system	Installed	Installed	Sewage treatment plant not yet installed.
Extraction of ground water from sources which are located at point and non-point sources of biological and chemical pollution and/or their influenced areas.	Not done	Applicable	No non-point and point sources of pollution in the vicinity of the water source
Operation of water supply project included in a multipurpose project utilizing a source of 25 litres per sec. water. (Construction of Multiple Purpose Reservoir Required)	Not operated	Operated	This is not a multipurpose project and is solely for water supply

Shail



CHAPTER 3

3. PROCEDURES TO BE ADOPTED FOR THE STUDY

The IEE approach, methodology and procedure adopted to prepare a comprehensive IEE report will generally follow the provisions of the EPA & EPR and related national and sectoral guidelines. The IEE study will focus on impact identification, prediction and finally evaluating the extent and weightage of the impact. The consultant will follow the following methodology for preparation of the report:

Complete the Rapid Assessment Checklist for each subproject. It should cover water supply, sewerage, solid waste components.

Prepare a comprehensive data base on the corridor of influence on the biophysical and socioeconomic environment.

Collect secondary data from published and unpublished reports, maps, aerial photographs, newspaper articles, etc. from different Government and non-government organizations.

Prepare questionnaires/checklists/matrices for collection of primary data for both the bio-physical and socio-economic assessments.

Provide a description of relevant parts of the town project, using maps with appropriate scale and photographs and aerial photographs, where necessary, including the following information: location, alignment, alternatives, design, standards, pre-construction, construction and post-construction activities, work schedule, staffing and support facilities and services.

Information on mitigation; costs associated with construction activities (during design, construction, and operation and maintenance activities) should also be included.

3.1 Environmental Assessment

The Consultant shall study the existing environmental constraints and potential impacts in the Project area through field surveys, complemented by secondary information from reports and interviews with a number of government officials, representatives of NGOs and international organizations (IOs) supported projects and researchers.

The Consultant shall collect primary and secondary data, evaluate them and describe the relevant environmental characteristics of the area along the pipeline routes and its corridor of influence, including the following information:

Physical Environment: topography, soils, climate, and meteorology, geology, surface and ground water hydrology, noise, air and water quality.

Biological Environment: flora, fauna, rare and endangered species, religious trees and sensitive habitats (including parks and reserves).

Chemical Environment: Use of various chemicals including fuel, lubricants, oil, acids, cement etc.

The Consultant will develop all necessary documents for field visits and collect data with the help of the survey team.

Shank



3.2 Socio-Economic Assessment

Social assessment of the project tries to determine the social implication (issues) in terms of assumed positive and negative impacts related to location, design, construction, and operation. Preparation and actual implementation of the construction activities will create some nuisance and inconvenience for the communities in the area.

Primary data shall be obtained through Focus Group Discussions (FGDs) with communities, along the pipeline routes under consideration. Additional data shall be collected from various Committees (Municipalities/VDCs, DDCs, NGOs, Community groups, etc.) through which the respective pipe alignments pass.

The Consultant shall collect primary and secondary data, evaluate them, and describe the relevant environmental characteristics along the pipe routes and its corridor of influence, along with the following information:

Population, land use, planned development activities, community structure, government services, demography, employment, distribution of income and sources of livelihood, goods and services produced, water supply, public health, education, extension services, cultural sites and heritage, tribal people, customs, aspirations and attitudes, expected water users and those benefitting from it, different needs and demands of VDCs, and the present quality of life (QoL), etc.

3.2 Report Preparation

An IEE report as per the revised format combining formats of both GoN and ADB shall be prepared in accordance with contents given in Chapter 9 of this TOR. The draft report shall be presented to MoWSS and after receiving the comments and suggestion from MoWSS, a final report will be prepared after incorporating the comments on the draft report.

Shaley



CHAPTER 4

4. POLICIES, LAWS, RULES, DIRECTIVES AND GUIDELINES

The consultant shall describe the pertinent regulations, standards that govern environmental quality, health and safety, protection of sensitive areas and endangered species etc. at international, regional, district, VDC and Ward levels. Nepal is a signatory to many international conventions, including those concerning habitat, biodiversity, cultural heritage protection. These issues shall be considered during IEE and their avoidance/mitigation measures shall be identified. The IEE should also be conducted in compliance with the following Laws, Acts, Rules & Regulation, Standard, Manuals, and Strategies & International Conventions:

Law

- Constitution of Nepal 2072 B.S. (2015 A.D.)
- Interim Constitution of Nepal 2063 B.S. (2007 A.D.)

Acts

- Land Acquisition Act 2034 B.S. (1977 A.D.)
- Solid Waste Management and Resource Mobilization Acts 2044 (1987)
- Water Resources Act 2049 B.S. (1992 A.D.)
- Water Tax Act 2023 (1966)
- Soil and Water Conservation Act, (1995)
- Nepal Water Supply Corporation Act, (1989)
- Water Supply Management Board Act, (2006)
- Labor Act 2048 B.S. (1992 A.D.)
- Forest Act 2049 (1993 A.D.)
- Forest Regulations 2050 (1995 A.D.)
- Environmental Protection Act 2053 B.S. (1997 A.D.)
- Local Self Governance Act 2055 B.S. (1999 A.D.)
- Drinking Water Regulations 2055 B.S. (1998 A.D.)
- Child Labor Prohibition and Regulation Act 2056 B.S. (2001 A.D.)
- Town Development Act 2045 B.S. (1988 A.D.)

Rules & Regulations

- Solid Waste (Management & Resource Mobilization), Rules, 2047 B.S. (1990 A.D.)
- Water Resources Regulations 2049 B.S. (1993 A.D.)
- Forest Regulation 2052 B.S. (1995 A.D.)
- Environmental Protection Rules 2054 B.S. (1997 A.D.) with Amendment
- Drinking Water Regulations 2055 B.S. (1998 A.D.)
- Child Labor Prohibition & Regulation Act 2056 B.S. (2001 A.D.)
- Urban Water Supply & Sanitation Policy 2056 B.S. (2009 A.D.)



Plans and Policies

- Rural Water Supply & Sanitation National Policy, Strategy & Action Plan 2060 B.S. (2004 A.D.)
- Three Year Interim Plan 2063 B.S. (2007 A.D.)
- ADB's "Safeguard Policy Statement (SPS)" 2066 B.S. (2009 A.D.)

Standards, Manuals, Strategies & Guidelines

- National IEE Guideline 2049 B.S. (1993 A.D.)
- National Drinking Water Quality Standards 2062 B.S. (2005 A.D.)
- Water Resources Strategy, 2059 (2002)



Handwritten signature

Chapter 5

5. REQUIRED TIME, ESTIMATED BUDGET AND SPECIALISTS REQUIRED FOR PREPARING THE REPORT

This includes the time schedule, estimated budget and appropriate human resources (experts) for conducting the IEE study.

5.1 Time Schedule

Considering the time limitations, the study has to be completed within about 9 weeks. The work schedule is presented in the Table 5-1.

Table 5-1: Proposed Work Schedule

Activity / Work	Weeks								
	1	2	3	4	5	6	7	8	9
Desk Study	■								
Preparation and Approval of TOR	■	■							
Public Notification			■	■					
Field Work				■	■	■			
Data Compilation/Evaluation						■	■	■	
Preparation of Draft IEE Report								■	■
Submission of Final IEE Report									■

5.2 Estimated Budget

The total estimated cost for the Initial Environmental Examination (IEE) work of Bhojpur Bazaar Small Town Water Supply and Sanitation sub project is approximately NRs. 500,000.00.

5.3 Human Resource Required

As the IEE requires different personnel for specific tasks, the following inter-disciplinary human resources will be required. A team leader will be required to co-ordinate the different tasks of the personnel involved. The Team will consist of:

1. Environmental Specialist
2. Water Supply and Sanitation Engineer
3. Sociologist
4. Geo-hydrologist
5. Botanist/Forester



Three to four enumerators will also be required to help the team. The IEE team will also benefit from the inputs provided by the design team.

Shail



Chapter 6

6. ANTICIPATED IMPACTS OF THE PROPOSED PROJECT ON ENVIRONMENT

The impacts shall be identified for different phases of project activities i.e. project design, pre-construction, construction and post construction, Operation & Maintenance phase on the existing physical, biological and socio-economic resources. A distinction will have to be made between potentially significant positive and adverse impacts, direct and indirect impacts. The impacts shall be characterized as (i) low, high & medium in terms of magnitude, (ii) long term, short term & medium term in terms of duration and (iii) site specific, local & regional/national in terms of extent. As a part of the study, enhancement of the positive impacts shall also be carried out. The potential physical, biological and socio-economic impacts should be considered as follows:

6.1 Physical Impacts

Design Stage

- i. Soil erosion and slope stability due to incorporation of sloped areas in project design
- ii. Cracking of structure (leading to facility failure & hazard to public) due to construction of reservoirs in high earthquake zone
- iii. Inadequate disposal of sludge from reservoirs and treatment plant
- iv. Construction of intake in high earthquake zone
- v. Location of pipes and existing utilities particularly in heritage areas

Pre-Construction Stage

- i. Inadequate protection of reservoir area/source
- ii. Deterioration in the water quality in the storage reservoirs
- iii. Delivery of unsafe/ raw water to distribution system

Construction Stage

- i. Changes in land use pattern along the alignment due to construction of different component structures.
- ii. Land instabilities, soil erosion, silt runoff, landslides and setting of street surfaces due to excavation works, and other construction related activities during the construction phase of the project.
- iii. Changes in land form and in drainage pattern due to spoil dumping, excavating and aggregate mining etc.
- iv. Possible loss of agriculture land, cereal crops and settlements due to laying of pipes, reservoirs and construction activities and thus need of compensation at market price.
- v. Disposal of solid waste, waste materials and construction spoils in the productive land.
- vi. Issue related to the groundwater extraction and associated off shore erosion, silt runoff and sedimentation.

Post Construction and Operation Stage

- i. Changes in land use patterns and the economic impacts on the affected people
- ii. Natural hazards associated with the reservoir due to reservoir induced seismic effects.



6.2 Biological Issues

Design Stage

Forest clearance due to construction of different project structures in the forest area

Pre-Construction Stage

- i) Forest clearance if so
- ii) Tree cutting and forest clearance process

Construction Stage

- i) Encroachment of vegetation as well as wildlife habitats and bio-diversity of the protected species.
- ii) Loss of vegetation and terrestrial habitat due to project component and facility placements.
- iii) Loss of local vegetation and wildlife habitats due to illegal exploitation of the resources like felling, hunting and poaching activities of the construction workforce.
- iv) Impacts on groundwater resource/water resources
- v) Extinction/impacts of rare and endangered species of floral species

Post Construction and Operation Stage

- i) Permanent disturbances and losses to the local wildlife habitat and natural vegetation.
- ii) Impacts on Groundwater due to extraction of the water for project.
- iii) Protection and ecological balance of water resource

6.3 Socioeconomic, Cultural and Chemical Issue

Design Stage

Health & Safety of community & workers

Pre-Construction Stage

- i) Water use conflicts due to source dispute
- ii) Land acquisition, resettlement and compensation
- iii) Impairment of historical/ cultural monuments/ areas

Construction Stage

- i) Effects of land and property acquisition on the social and economic status of the people.
- ii) Impacts on the social structures, social amenities and community resources due to exposition to outside workforce.
- iii) Impacts on sanitation and health of the community due to increase in disease vector and transmission of disease from outside workforce.
- iv) Loss of cultural values and norms due to exposition to outside workforce.
- v) Impacts due to encroachment to religious and cultural sites having historical significance by the project structures and associated facilities.
- vi) Changes in migration pattern, influx of the workers and impact on vulnerable groups of the community.
- vii) Possibility of employment (income) generation activities amongst the community people of the project area.



Sheela

Post-Construction and Operation Stage

- i) Impacts due to withdrawal of economic activities after the completion of the construction.
- ii) Changes in aesthetic values of landscape due to project structures and facilities associated impacts.
- iii) Impacts of permanent loss of production from the project occupied areas.
- iv) Changes in Religious values of area due to project.
- v) Changes in religious aspects of the people in and around source array.

Besides the water supply and sanitation project will have numerous beneficial issues. The proposed project shall enhance the access to safe drinking water facility and improved sanitation and help transfer the rural settings to the semi urban market centers. The project will also increase the comfort of human life in the project area.

The above aspects of impacts will be considered during the environmental examination period. The study will reveals the impacts associated with the various aspects.



Dhak

Chapter 7

7. ALTERNATIVE ANALYSIS

Alternative analysis of the project shall be considered as an integral part of the IEE study, which involves alternative ways of achieving the objectives of a proposed project. The aim of alternative analysis will be to arrive at a development option, which shall be conducted during the study to minimize the possible negative environmental impacts. Alternative measures to the proposed project to meet the same project objectives will be described under the following aspects:

- No action option
- Alternative design
- Alternative location
- Alternative schedule and process

Alternatives in terms of potential environmental impacts, capital and operating costs and institutional training and monitoring requirements should be described. Costs and benefits of each alternative should be quantified (wherever possible) and incorporating the estimated costs of any associated mitigation measures. The no project option is always open.

The mitigation measures for adverse potential impacts due to location, design, construction and post-construction will have to be proposed during the preparation of the IEE report for all the perceived impacts to minimize the environmental impacts of project implementation after the prediction of extent, magnitude and duration of the impacts. Mitigation measures will have to be incorporated from the planning stage onwards. In general the following area shall be covered while preparing mitigation measures:

- a. Project design/pre-construction phase
- b. Project construction phase
- c. Project operation and maintenance phase

Concerned agencies like STWSSSP, DWSS, WUSC and local agencies, local administration, police office shall be consulted during the implementation of mitigation measures. The proponent is required to prepare the Environmental Management Plan (EMP) and these measures should be outlined in the EMP in order to implement the proposed measures during project implementation.



7.1 Alternative System Analysis

System alternatives need to be developed to assess the most cost effective, reliable and efficient system that can serve the design population. The system design for the sub-project can be done under two different scenarios. Optimization of a proposed water supply system can be done in terms of system layout, alternative technology, alternative materials or even alternative design parameters.

Shree

Chapter 8

8. MATTERS TO BE IMPLEMENTED WHILE IMPLEMENTING THE PROJECT

8.1 Environmental Management Plan

The project proponent has to develop an Environmental Management Plan (EMP) to systematically manage all the perceived environmental impacts of the project. It shall be therefore based on the mitigation measures for the project induced impacts. An Environmental Management Plan (EMPI) has a dual purpose. It is designed to monitor the contractor's work during project implementation, it helps to check contractual compliance with specified mitigation measures. It also helps in making periodic checks on the actual environmental impacts of the Project over the years following completion of the works, and compares these with those impacts anticipated at the time of Project appraisal. The EMP therefore provides the necessary feedback required for correcting potentially serious Project deficiencies, and for planning of other projects. The EMP shall include the responsibilities of different stakeholders based on preliminary plans and schedules. This program shall include measures required during the project design, construction and operational phases and shall include recommendations on allocation of components of the EMP to the various parties involved. Feasible and cost-effective measures to prevent/mitigate/reduce significant negative impacts should be recommended in an Environmental Management Plan. The impacts and costs associated with implementing the measures will have to be detailed. The EMP will include proposed work programs, budget estimates, schedules, staffing and training requirements and other support services to implement the mitigating measures.

8.2 Environmental Monitoring Plan

The project will develop an Environmental Monitoring Program for the pre-construction, construction and post construction activities of the project. The program will evaluate: (i) the extent and severity of the adverse environmental impacts as compared to what was predicted, (ii) how effective the mitigating measures were and compliance with the regulations and (iii) the overall effectiveness of the EMP. The environmental monitoring of the project includes field supervision and reporting of project activities prior to and during the project construction and operation in order to ensure that the works are being carried out in accordance with the approved design and that the environmental mitigation measures are fully implemented in accordance with the EMP. A monitoring system will be developed involving (i) front line monitoring (ii) monitoring by the government line agencies or independent monitors.

8.3 Information Disclosure, Public Consultation and Participation

Public consultation is the process of exchanging information with those persons and organisations with a legitimate interest in a project and/or who are likely to be affected by the project (stakeholders). It is a two-way process that informs and involves the community in developing a project, and informs the proponent about issues and concerns, which can then be addressed in project design. Information disclosure involves stakeholders in monitoring the development and implementation of a project and fosters openness in decision-making by presenting documents and other project materials for public scrutiny. The consultation and disclosure involves consultation with stakeholders at an early stage of project preparation, and throughout project implementation. As a minimum, stakeholders will be consulted regarding the scope of the environmental study before work has commenced in earnest, and should then

be informed about the likely impacts of the project and proposed mitigation once the draft IEE report is under preparation. The report should record the views of stakeholders and indicate how these have been taken into account in project development. Information is disclosed through public consultation and more formally by making documents and other materials available and at a location in which they can be easily accessed by stakeholders. This normally involves making draft reports available (in the local language) at public locations in the community and providing a mechanism for the receipt of comments and making documents available more widely.

Public consultation and involvement should be given highest priority in the implementation of mitigation measures. Public consultation should take place and on the basis of decision of the consultation meeting, implementation of mitigation measures should be prioritized and should be carried out with the involvement of the local people.

Monitoring is one of the components of EMP. The results of monitoring should also be disclosed in the form of demonstration, charts, figures, graphs, and samples, etc., to the local people, school students and other interested stakeholders. In the process of compliance monitoring of the project construction, local people and construction workers should be consulted.

8.4 Grievance Redress Mechanism

A project-specific grievance redress mechanism (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. GRM will aim to provide a time-bound and transparent mechanism to resolve such concerns.

A Grievance Redress Committee (GRC) will be formed at the town/VDC/Municipality level, comprising the Chairperson of V/M/D WASH CC as the chairperson of GRC and Secretary of concerned WUA or local bodies as the GRC secretary. The GRC members will comprise of (1) RPMO social development/environmental (as relevant) officer, (2) representative of affected persons, (3) DSMC's safeguards specialist (social/environment as relevant), (4) a representative of reputable CBO/SHG/organization working in the project area², and (5) 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 DSMC 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 APs, civil society and eminent citizens can be invited as observers in GRC meetings. A three tier GRC will be operative as per PAM, TSTWSSSP.

The Social Development Officer at the Regional Project Management Office (RPMO) will be the focal person for facilitating the grievance redress at the local level.

Shree



² If the complaints are related with IF/DoIs/other vulnerable groups, specific NGO/CBO that actively involved in development of these communities should be involved.

Chapter 9

9. REPORT

The IEE report shall be prepared as per this ToR. The IEE report, whenever applicable, shall contain maps, graphs, photographs, tables and matrix. The format of report will be in accordance with the format provided by PMO, SSTWSSSP. However, the IEE report should include the following:

Executive Summary (in English and Nepali)

Table of Contents

List of Tables

List of Figures/Photographs

Appendices

List of Abbreviations

Acknowledgements

Introduction

Description of the Project

Description of the Environment

Anticipated environment impacts and mitigation measures

Analysis of alternatives with and without project situations

Information disclosure, consultation and participation

Grievance and redress mechanism

Environmental Management Plan

Environmental Monitoring Plan

Conclusions and Recommendations

References

Annexes



Sheet

Chapter 10

10. OTHER NECESSARY MATTERS

Other necessary matters to be included in the IEE report will be relevant information, reference lists, annexes, maps, photographs, tables and charts, and questionnaires to be used at the time of carrying out the baseline survey. The report will clearly recommend whether an Environmental Impact Assessment (EIA) is required or whether an Initial Environmental Examination (IEE) is sufficient for the proposed project.



Shah

11. LITERATURE REVIEWED

- ADB, 2003, *Environmental Assessment Guidelines*.
- Constitution of Nepal* (2015), Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu
- District Development profile of Nepal 2010/11 with VDC Profile, A Socio-Economic Development*
- District Health Office, Bhojpur, 2062/63*
- Environment Protection Act, (1997)*, Ministry of Science, Technology and Environment, Kathmandu
- Environment Protection Rules, (1997)*, Ministry of Science, Technology 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
- Feasibility Study of Bhojpur Bazaar Water Supply and Sanitation Project*, 2015
- Ministry of Population and Environment, 1999, *Environmental Protection Act, 1997 and Environment Protection Rules, 1999 (Amendment, 1999)*, Ministry of Law, Justice and Parliament Affairs, Nepal
- Municipality profile and baseline information of Bhojpur Municipality*, and *National Population and Housing 2011*, CBS, 2012
- 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
- Updey, 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

Shrestha



ANNEXES



ANNEX I
Project Location Map





TAEC Consult P. Ltd.

100

Figure 1

Department of Psychology, University of Illinois at Chicago, Chicago, IL 60607

[illegible]

1000

© 2000 Blackwell Science Ltd, *Journal of Internal Medicine* 247: 103–110

Nonlinear models

10. The following are the results of a survey of 100 students in a high school. The students were asked to indicate their favorite sport and their favorite color. The results are as follows:

© 2000 Blackwell Science Ltd, *Journal of Internal Medicine* 247: 399–406

© 1999 Blackwell Science Ltd, *Journal of Internal Medicine* 245: 399–405

Project Location Map

INTECHNOLOGY AND THE SERVICE SECTOR

ANNEX II

Schematic Layout Plan for the Proposed Project

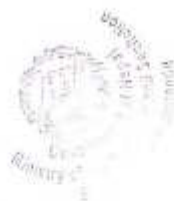




Shen

ANNEX III

ADB's REA Checklist, Environmental Checklists & Socioeconomic Questionnaires for IEE Study



ADB's Rapid Environmental Assessment (REA) Checklist for Bhojpur Bazaar Sub Projects and preliminary Climate Risk Screening Checklist for Sample Sub project Towns

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: Third Small Towns Water Supply and Sanitation Sector**

Subproject: **Bhojpur Bazaar Water Supply and Sanitation Subproject**

Screening Questions	Yes	No	Remarks
A. PROJECT SITING			
IS THE PROJECT AREA			
• DENSELY POPULATED?			
• HEAVY WITH DEVELOPMENT ACTIVITIES?			
• ADJACENT TO OR WITHIN ANY ENVIRONMENTALLY SENSITIVE AREAS?			
• CULTURAL HERITAGE SITE			
• PROTECTED AREA			
• WETLAND			
• MANGROVE			
• ESTUARINE			

Handwritten signature

Screening Questions	Yes	No	Remarks
• BUFFER ZONE OF PROTECTED AREA			
• SPECIAL AREA FOR PROTECTING BIODIVERSITY			
• BAY			
B. POTENTIAL ENVIRONMENTAL IMPACTS Will the Project cause ...			
• pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?			
• impairment of historical/cultural monuments/areas and loss/damage to these sites?			
• hazard of land subsidence caused by excessive ground water pumping?			
• social conflicts arising from displacement of communities?			
• conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?			
• unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?			
• delivery of unsafe water to distribution system?			
• inadequate protection of intake works or wells, leading to pollution of water supply?			
• over pumping of ground water, leading to salinization and ground subsidence?			
• excessive algal growth in storage reservoir?			
• increase in production of sewage beyond capabilities of community facilities?			
• inadequate disposal of sludge from water treatment plants?			
• 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?			
• health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.			
• 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?			



Signature

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. 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.)		
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-meteorological parameters) affect the selection of project inputs over the life of project outputs (i.e. construction materials)?		
Performance of Project Outputs	Would climate/weather conditions and related extreme events likely to affect the performance throughout their design life time?		



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

Signature

Checklist for Physical Environment

A. Topography/Physiography

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

B. Climate and Meteorology

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

C. Air Quality

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

D. Erosion and land Stability

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

E. Land Use

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



[illegible]

CHECKLIST OF WILDLIFE ANIMALS

Date:

[illegible]

Date: _____

[illegible]

Note: _____



Household Survey

१. परिचय

१.१. पसखावा बिने व्यक्ति का नाम देना ना:

(क) जिला: (ख) गा.वि.स.
(ग) टोल नम्बर: (घ) बड नं.

१.२. पौराणिक विवरण

(क) घरमालकी नाम: (ख) धर्म: (ग) उमेर: (घ) लिंग: ☐ पुरुष ☐ महिला
(ङ) वैवाहिक स्थिति: (च) काम: (छ) व्यवसाय घरमालकी
(ज) समुदाय नाम: (झ) शिक्षा:

३. कुल परिवार संख्या:

उमेर समूह	पुरुष	पेशा	महिला	पेशा	जम्मा
०-२ वर्ष					
३-१० वर्ष					
११-२२ वर्ष					
२३-४२ वर्ष					
४३-६० वर्ष					
६० वर्ष भन्दा माथि					
जम्मा					

१.३. विद्यालय जाने उमेरका बाल बालिका (६-१२ वर्ष)

जम्मा	विद्यालय गएका		विद्यालय नगएका	
	पुरुष	महिला	पुरुष	महिला

२. साक्षरता: (लगाईको परिवारमा)

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

३. कृषि (मु-उपयोग)

३.१. लगाई वा परिवार सदस्यको नाममा गा.वि.स. र वडा भित्र जग्गा छ र

छ ☐ छैन ☐

३.२. यदि छ भने कति छ: (योजनामा सम्मिलित)

क.स.	स्वामित्व	खेत	बारी	घरवारी	बन	कौफियत
१.	जाफती					
२.	सगुलगाई					

ToR for Initial Environmental Examination of Bhojpur Bazaar Water Supply and Sanitation Project

क्र.स.	स्वामित्व	खेत	बारी	खरबारी	वन	कैफियत
३	कमाई अणक					
४	कमाउन (शाकी)					
५	जग्गा					

३.३ गा.वि.स. बा वडा बाहिर कुन ठाउँमा जग्गा छ ?

क्र.स.	ठाउँको नाम	खेत	बारी	खरबारी	वन	कैफियत

३.४ तपाईंको जग्गा आयोजना भित्र पर्छ वा ? यदि भित्रमा पर्दछ भने तलको जफतफलभरण वा जफतफलभरण आयोजनाको जफतफल

- घर
- ☐ लुम्बाई किटमा
- ☐ चौडाई किटमा
- ☐ छाना
- ☐ बल्लो
- ☐ कोष
- खेत
- ☐ पाले बारी
- ☐ जग्गा
- ☐ अन्य
- ☐ अन्यारी मूला (बल्लोबल्लोमा) भन्ने

क आयोजना अर्वा भित्र तपाईंको कतिवटा घर र गोठ छन् ।

घर गोठ



क्र.स.	क्रिसिम	क्षेत्रफल
घर १		
घर २		
घर ३		

१. कच्ची-खरबे छाएको । २. पक्की (बुझा, हुँदाको पक्की र खुल्लो भित्रको छानो) ।

	संख्या	क्षेत्रफल
गोठ		
अन्य खुलाउने		

३.५ तपाईंको आयोजना क्षेत्र भित्र पर्ने जमिनमा कुन कुन फसल लगाउनु हुन्छ ?

क्र.स.	खाद्यान्न वाली	वाली लगाएको क्षेत्रफल	उत्पादन परिणाम
१. खाद्यान्न वाली			
	धान		
	माह		
	मकै		
	कोरी		

ग्राम गडागुडी	
अन्य	
२. नगदे वाली	
ग्राम	
नारी	
सरकारी	
अन्य	

३. दुम्स जग्गामा लगाएको फलफूल र अन्य खाद्य विस्तारको विवरण दिनुहोस्

क्र.सं.	खीटविस्तार	विस्तार संख्या		जग्गा
		फल लागेको	फल नलागेको	
१	फलफूल			
२	कागती			
३	सुन्दरी			
४	आम			
५	मैना			
६	अमर			
७	मिर्छा			
८	खट्वा			
९	पुस			
१०	आम			
११	नामाली			
१२	आमखट्टा			
१३	अन्य			
१४	हाल घास			
१५	पाखुरी			
१६	कागती			
१७	खट्वा			
१८	खतापी			
१९	मुसुरी			
२०	मिर्छा			
२१	अन्य			
२२	इन्धनको लागि प्रयोग गर्ने खाद्य विस्तार			
२३	काटमा प्रयोग हुने खाद्यविस्तार			
२४	बास तिर्नाले			

३.६ के तपाईंको जग्गामा भएको गत वर्षको उत्पादनले तपाईंको परिवारलाई खान पर्याप्त भयो र

भयो ☐

भान ☐

३.७ खाँदै अग्र्याप्त भयो भने कोत सज्जताको लागि कुनै र माहिला

क. तीन माहिला

ख. छ माहिला

ग. नौ माहिला

घ. बाइ माहिला

३.८ आफ्नो उत्पादन खाद्यान्न अग्र्याप्त भएको भन्दा आफ्नो परिवारलाई कसरी खुवाउनु हुन्छ ?



क	बृहन् नगर	ख	नौकरीवाट भएकी आम्दानीवाट
ग	आवासीयको आम्दानीवाट	घ	भारी बोकेर भएकी आम्दानीवाट
ङ	शैक्षिक सहजुनवाट भएकी	च	अन्य

३.९ पशुपालन सम्बन्धी :

नपाटको घरमा कति कस्तो पशु पशुपालन पाल्ने भएको छ ?

क्र.सं.	पशुपक्षी	संख्या
१	गाई	
२	गाँस	
३	भैँसी	
४	वाछी	
५	वाँछि	
६	पाट	
७	फट्टि	
८	रानी	
९	छाँडा	
१०	बाख्रा	
११	बोको	
१२	खसी	
१३	पाठा पाठी	
१४	सुगर बगर	
१५	हंस	
१६	कुखुरा	
१७	अन्य कुराउने	

४. घर परिवारको वार्षिक औषत आम्दानी :

श्रोत	वार्षिक आम्दानी (रु.)	श्रोत	वार्षिक आम्दानी (रु.)
कृषिबाट		अन्य श्रोतबाट	
खाद्यान्न		नौकरी सेवा	
तगबिचारी		ज्याला सहजदारी र भारीवा	
फलफूल		निवृत्तिपछि	
जम्मा (१)		ब्यापार	
पशुपालनबाट		घरेलु उद्योग	
द्रव्य उत्पादन		पेशागत सेवा	
अण्डा कुखुरा होम बिक्री		माछा बिक्री	
वाछी बाँछि रानी बिक्री		अन्य	
भैँसी रानी बिक्री		जम्मा (२)	
बोको खसी भेडा बाख्रा			
बिक्री			
सुगर बगर बिक्री			
कुखुरा हंस बिक्री			
जम्मा (२)			
जम्मा (आप १+२)			

५. घर परिवारको वार्षिक औषत खर्च :

विवरण	जम्मा रकम (रु.)	विवरण	जम्मा रकम (रु.)
चर्मस		चिप्टा	
दान		दाउरा	
मकै		फल्गो	
लरकारी		मडिनाल	
दण्ड-दोरी		मोप्याइ	
माछा-मासु		विश्रा	
नयाँ-उज्ज		काण्डा	
मस-मसल		काहल	
मन		अन्य	
चिनी			
		जम्मा रुच	

६. पानीको आपूर्ति

क. नपाईले कुन खेतको पानी उपचार गर्नु हुन्छ कि हुँदैन र
गर्नु = सोझै =

ख. यदि खेतको पानी उपयोग गर्नु हुन्छ भने कुन उपचारको लागि उपयोग गर्नुहुन्छ र
निपाई = मुहाने-कण्डा हुने =
विजुले = अन्य =

७. स्वास्थ्य सम्बन्धि:

क. नपाईको परिवारमा कुनै सदस्य जितेन कसै बिगमो भएका बिग र
बिग = बिगमन् =

ख. यदि बिग भए निम्न विवरण दिनुहोस् र

क्र.सं	नाता	पुरुष	महिला	उमेर	रोग
१					
२					
३					
४					

नगरको प्रकार- विमानस्थान, डाँड, हाइमोडल, रोज, सभरिया, टीपी, कण्डोस, छाना सम्बन्धी, निर्माणको, इम, गहनचार, एलुम र यौन-रोग, अन्य

क. बिगमो पढी सचेतबल कति जान्नुहुन्छ र

ख. कति जिको नबना कति जान्नुहुन्छ र कसले पुग्नेछ रानहोस ।

क्र.सं	जाने ठाउँ	रहेको स्थान	दूरी (कि.मी.)
१	अस्थान		
२	हेल्थपाम्		

३	हलद मन्दिर		
४	आयुर्वेदिक औषधालय		
५	निजी क्लिनिक/औषधी पसल		
६	घामी भावकी		
७	अन्य		

म. महिलाको अवस्था

क. अन्नको वितरण

क्र.सं.	कामको विवरण	हिस्ता प्रतिशतमा	
		पुरुष	महिला
१	खनखोल		
२	मल राखी		
३	काममा तयारी		
४	रोज		
५	रोडभोल		
७	सिक्काइ		
८	काटने		
९	बोक्ने र चल्काउने		
१०	अन्य पसोपस बुट्टाइ सिक्काइ		
११	आम बाड्ने		
१२	गोठानी		
१३	मैलापान		
१४	सुत्तना पसोपस		
१५	पानी पसो		
१६	बचवाथनकी र बुट्टाबुट्टी डेरबिचार		

ख. सम्पत्तिमा अधिकार

क्र.सं.	कामको विवरण	हिस्ता प्रतिशतमा	
		पुरुष	महिला
१	घर		
२	जग्गा		
३	पस		
४	पसोपस		
५	बुट्टाग जग्गा		
७	अन्य		

ग. निजग प्रोक्कामा अधिकार

क्र.सं.	कामको विवरण	हिस्ता प्रतिशतमा	
		पुरुष	महिला
१	बानी रोज्ने		

Annex 2: Sample Forms, Formats and Report Template

**Annex 2A:Rapid Environmental Assessment (REA)
Checklist for Ilam Sub projects and Preliminary Climate
Risk Screening Checklist for Sample Sub Project Towns**

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: Third Small Towns Water Supply and Sanitation Sector Project

Subproject:

Bhojpur Town Water Supply and Sanitation Subproject

Screening Questions	Yes	No	Remarks
A. Project Siting : Is the project area			
Densely populated?	√		Bhojpur Municipality has moderate population density.
Heavy with development activities?	√		The distribution pipeline will partially go through the old Bhojpur main bazaar area. Development activities are of low moderate intensity.
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...			
Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and		√	

Screening Questions	Yes	No	Remarks
Soil erosion runoff?			
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	
Hazard of land subsidence caused by excessive ground water pumping?		√	
Social conflicts arising from displacement of communities ?		√	
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		√	
Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?	√		The existing water treatment plant is hardly functioning. Hence, untreated water is being supplied. EMP recommends water quality monitoring as prescribed in the
Delivery of unsafe water to distribution system?	√		Design proposes office building that also comprises water quality laboratory to deliver safe water. EMP recommends continuing training of WUSC in water quality monitoring, as prescribed in the <u>NDWQS Directives</u> .
Inadequate protection of intake works or wells, leading to pollution of water supply?	√		Design has considered the safest site for intake regarding environmental pollution and proposes enough measures to mitigate contamination.
Over pumping of ground water, leading to salinization and ground subsidence?		√	
Excessive algal growth in storage reservoir?		√	EMP provides mitigation measures.
Increase in production of sewage beyond the capabilities of community facilities?		√	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.	√		EMP provides measures to mitigate impacts on power supply poles in the bazaar that are immediately adjacent to, or onto, road carriageways.

Screening Questions	Yes	No	Remarks
Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.	√		EMP provides measures to mitigate health and safety impacts from improper handling, potential accidents &/or human error in dosing.
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?		√	EMP provides measures to mitigate health and safety impacts from improper handling, potential accidents &/or human error in dosing.
Dislocation or involuntary resettlement of people?		√	
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	
Noise and dust from construction activities?	√		EMP provides mitigation measures.
Increased road traffic due to interference of construction activities?		√	EMP provides mitigation measures.
Continuing soil erosion/silt runoff from construction operations?		√	
Delivery of unsafe water due to poor O&M treatment processes (especially mud 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 the 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		√	
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 an 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.

Screening Questions	Yes	No	Remarks
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?	√		EMP provides mitigation measures.
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	√		EMP provides mitigation measures.

Preliminary Climate Risk Screening Checklist for Sample Sub Project Towns

Screening Questions	Score	Remarks
Location and design of project	0	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides
	0	Investments in the sample sub project will not likely be affected by climate change and extreme weather events due to the siting of project. For example all pipes will be constructed below ground no investments will be sited in flood plains etc.
	0	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.)
Materials and maintenance	0	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)
Performance of Project Outputs	0	Would climate/weather conditions and related extreme events likely to affect the performance throughout their design life time?
		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

Annex 2B: Water Quality Standards

B.3 National Drinking Water Quality Standards, 2006

Group	National Drinking Water Quality Standards, 2006			WHO Guidelines for Drinking-water Quality, 4th Edition, 2011*
	Parameter	Unit	Max. Concentration Limits	
Physical	Turbidity	NTU	5 (10) **	-
	pH		6.5 - 8.5	none
	Color	TCU	5 (15)	none
	Taste & Odor		Would not be objectionable	-
	TDS	mg/l	1000	-
	Electrical Conductivity	µc/cm	1500	*
	Iron	mg/l	0.3 (3)	-
	Manganese	mg/l	0.2	-
	Arsenic	mg/l	0.05	0.01
	Cadmium	mg/l	0.003	0.003
	Chromium	mg/l	0.05	0.05
	Cyanide	mg/l	0.07	none
	Fluoride	mg/l	0.5 - 1.5 ^	1.5
	Lead	mg/l	0.01	0.01
Chemical	Ammonia	mg/l	1.5	none established
	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 national 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 2C: Sample Grievance Redress Form

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 enable 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 2D: Spoil Management Plan

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:

- A** To minimize spoil generation where possible
- B** Maximize beneficial reuse of spoil from construction works in accordance with spoil management hierarchy
- C** Manage onsite spoil handling to minimize environmental impacts on resident and other receivers
- D** Minimize any further site contamination of land, water, soil
- E** 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 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, mud 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, there should not 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 DSC 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

- F** Photos
 - G** Summary of consultations
 - H** Copies of environmental clearances and permits
 - I** Sample of environmental site inspection Report
 - J** Others
-

Annex 2E: 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.

- a. Introduction
- b. Overall project description and objectives
- c. Description of sub-projects
- d. Environmental category of the sub-projects
- e. Details of site personnel and/or consultants responsible for environmental monitoring
- f. Overall project and sub-project progress and status

N o.	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

- a. Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- b. 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:
 - c. What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
 - d. If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;
 - e. 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;

- f. Are their designated areas for concrete works, and refueling;
- g. Are their spill kits on site and if there are site procedure for handling emergencies;
- h. Is there any chemical stored on site and what is the storage condition?
- i. Is there any dewatering activities if yes, where is the water being discharged;
- j. How are the stockpiles being managed;
- k. How is solid and liquid waste being handled on site;
- l. Review of the complaint management system;
- m. 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 ($\mu\text{g}/\text{m}^3$)	SO2 ($\mu\text{g}/\text{m}^3$)	NO2 ($\mu\text{g}/\text{m}^3$)

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity ($\mu\text{S}/\text{cm}$)	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

**Annex 2F: Sample Environmental Site Inspection
Report**

Annexes

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

Waste Minimization		
Reuse and Recycling		
Dust and Litter Control		
Hazardous Substances		
Site Restored to Original Condition	Yes	No

Annexes

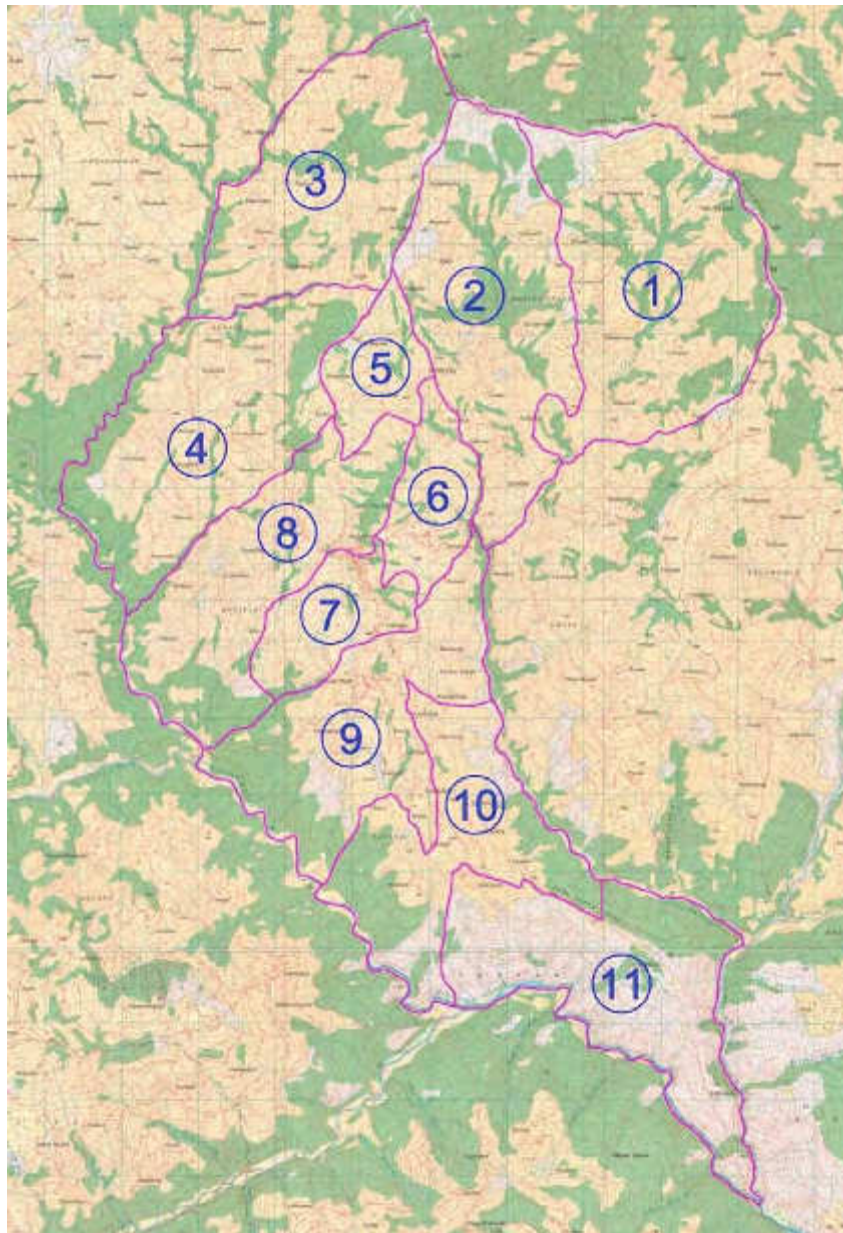
Signature

Sign off

Name Name
Position Position

Annex 3: Map of the Project Area & Project Location

Project Location Map



Project Area

**Annex 4: Public Notice, Muchulka, Recommendation
Letter, Minutes of Meetings**

आज्ञा मिति २०७४ जेष्ठ १० गते पुष्कर सिंह बुढा स्वामेजनी तथा व्यस्यपाई प्रह्व उपभोक्ता आगोति, भोजपुरको अध्यक्ष श्री प्रविण कुमार सुवाल अध्यक्षको अध्यक्षतामा तैमो खना शहरी स्वामेजनी आगोतका आगोत भोजपुर गार स्वामेजनी आगोत अनछो अभ्यास्यता अध्यक्ष प्रविण कुमार प्रस्तुतीकरण कार्यक्रमको अध्यक्षतामा शहरी शहरी दलको अध्यक्षतामा प्रविण कुमार लडा निवेदन र्थक संस्थाको अध्यक्षतामा प्रविण कुमार माथी ब्यक्त गरेका ।

उपस्थित :-

१. अध्यक्ष - श्री प्रविण कुमार सुवाल *प्रविण कुमार*
२. प्रमुख अतिथि - श्री श्यामेश विजय आगोती रितापारेका *श्यामेश विजय*
३. डि. अतिथि - श्री १०१. ५५५ (मि. प्रह्व) *प्रविण कुमार*
४. रिता आगोती आगोती *प्रविण कुमार*
५. र्थक *प्रविण कुमार*
६. विष्णु अतिथि *प्रविण कुमार*
७. हरि प्रसाद शर्मा *Hariprasad Sharma*
८. चन्द्रेश्वर शर्मा *Chandreshwar Sharma*
९. लाला प्रसाद शर्मा *Lal Prasad Sharma*
१०. सुवाल उपभोक्ता *Suwal Upabokta*
११. र्थक *Thak*
१२. मदन कुमार डंगेल *Madan Kumar Dangal*
१३. र्थक *Thak*
१४. र्थक *Thak*
१५. र्थक *Thak*
१६. र्थक *Thak*
१७. र्थक *Thak*
१८. र्थक *Thak*
१९. र्थक *Thak*
२०. र्थक *Thak*
२१. र्थक *Thak*
२२. र्थक *Thak*
२३. र्थक *Thak*
२४. र्थक *Thak*
२५. र्थक *Thak*

- 26- दुर्गा. व. काठमाडौं-२२३६-०४
- २८- परशुराम निवासी नारायणमान मगर
३९. गोपाल वरु रानी वडा नं. २ राप्ते
- ३० राजकुमार श्रेष्ठ वडा नं. ६ राप्ते
- ३१ श्री वसुधर श्रेष्ठ " १२ राप्ते
- ३२ जगत राप्ते वडा नं. २ राप्ते
- ३३ रत्न वसुधर श्रेष्ठ नैपाल राप्ते
- ३४ सुबोधराज राप्ते राप्ते
- ३५ सुबोधराज राप्ते राप्ते
- ३६ मोहन श्रेष्ठ, ५६३५/५६३५६ P. Subodh
३७. जगत राप्ते (३५३५/५६३५६)
३८. श्री लोका ५६३५ ३८ (५६३५)
३९. नारायण राप्ते ५६३५ राप्ते
४०. वसुधरा श्रेष्ठ लि. श. राप्ते
४१. श्रीमान राप्ते, उपराज राप्ते राप्ते
४२. श्रीमान राप्ते - राप्ते
- (४४) श्रीमान राप्ते (ICON) राप्ते
४५. श्रीमान राप्ते राप्ते
४६. श्रीमान राप्ते राप्ते
४७. श्रीमान राप्ते नेपाल सरकार महामन्त्र राप्ते
४८. श्रीमान राप्ते को. नं. ५६३५ राप्ते
४९. श्रीमान राप्ते को. नं. ५६३५ राप्ते
५०. श्रीमान राप्ते को. नं. ५६३५ राप्ते
५१. श्रीमान राप्ते को. नं. ५६३५ राप्ते

प्रस्ताव १. १ - कोषपुर रंगर आयोजनाको व्यापारिक सम्बन्धमा।
प्रतिवेदन प्रस्तुतितरुन सम्बन्धमा।

प्रस्ताव १. २ - प्राविधिक फा. सुवर्णमणि सुरक्षण फा. राप्ते
वातावरणमा पत्र अगुवारी सम्बन्धमा।

प्रस्ताव १. ३ - संस्कृत प्रमाणिक नगरी अगुवा सुवर्णमणि अगुवा
समा अगुवा सुवर्ण २५० सुवर्ण राप्ते प्रतिवेदन सम्बन्धमा।

प्रस्ताव १. ४ - पापी राप्ते सम्बन्धमा।

निम्नलिखित प्रश्नों के उत्तर दीजिए -
 १. भारत में राष्ट्रीय धर्म क्या है?
 २. भारत में राष्ट्रीय भाषा क्या है?
 ३. भारत में राष्ट्रीय फूल क्या है?

प्रयोग १.६ - प्रत्यक्ष १.६ माथी कुलकाको भोजपुरको
माथोको उपस्थिति गर्ने आकाशको रङ्गको प्रमाणको लागि
अर्को उपस्थिति गराउने तथा आकाशको कुल रङ्गको
२.६ हुने आउने उक्त प्रमाणित अर्को प्रमाण उपस्थिति गराउने
प्रतिबद्धता व्यापक गर्ने प्रयोग गर्ने प्रमाणित पारित गरीयो।

निर्णय 1. - 8 प्रस्ताव 1, 8 भागों इकट्ठा करी भोजपुर जल
खानेकारी लायोभुआके परामर्श पानी सारपाके प्रत्यक्ष 2
ग्रा. निष्काश कोषके आर्थिक निरीक्षण समेतके आधार
प्रस्ताव जारि पानी प्रत्यक्ष लागू करें प्रतिफल व्यक्त करें
निर्णय सर्वसम्मतिसे पारित गरियो।

Handwritten signatures and initials on a piece of paper, including names like "R. Suban" and "R. Suban" (repeated).

Minutes of Meeting

English Translation of Minute of Meeting

The draft detail study report presentation programme was conducted under the chairperson Mr. Pravin Kumar suwal, Chairman Silichung Small Town Water Supply and Sanitation User Committee, Bhojpur dated May 24, 2017. The programme was organised in the meeting hall of the District coordination committee. District level active political parties, concerning different stakeholder institutions working in the Bhojpur were presented in the programme and during the presentation, some discussion and decision were made:

Participants:

Chairman WUSC:	Pravin Kumar Suwal
Chief Guest:	Sita Pariyar Local Development Officer
Mr. Nabin Kumar Pradhan	Past President
Mr. Shiva Adhiakri	Social Safeguard Specialist
Mr. Sirjan Aryal	Design Engineer TAEC-ICON
Ms. Bishunu Kumari Rai	Ra. Pra. Pa.
Mr. Hari Prasad Sharma	Coordinator DRTAC
Mr. Chandeshwar Pd Shah	ERPM, Manager
Mr. Narayan Prasad Acharya	Deputy Project Manager
Mr. Suwas Raj Panta	Head of Technical Branch TDF
Mr. Ram Pukar Safi	Chief Engineer Sub Division
Mr. Madan Kumar Dangol	DRTAC Engineer
Mr. Hrishu Dhan Rai	
Mr. Ishwar Pokharal	Engineer TAEC-ICON
Mr. Sunil Devkota	Engineer
Mr. Dhurba Lal Shrestha	Senior Member District Business Development
Committee	
Ms. Krishna Maya Tamang	
Ms. Kalpana Tamang	
Mr. Nabin Bhuda Thoki	Ward Coordinator
Mr. Khadak Bahadur Rai	
Mr. Daya Prasad Ghimire	
Mr. Gaya Prasad Ghimire	UML Town Coordinator
Mr. Durga Bahadur Baniya	Engineer ICON
Mr. Prasuram Tiwari	Civil Society Member
Mr. Durga Bdr. Baniya	Engineer
Mr. Parasuram Tiwari	Civil Society
Mr. Gopal Bdr. Khatri	Coordinator
Mr. Raj Kumar Shrestha	

Mr. BhimBdr. Shrestha	Coordinator
Mr. Jagat Bdr. Tamang	Member
Mr. KhadkaBdr. Karki	Nepali Congress Party Representative
Mr. Sagar Narayan Moktan	
Mr. Surya Bdr. Bhandari	
Mr. RoshanSubedi	GESI Specialist/ERDSMC
Mr. Krishna Sagar Tamang	Office Manager
Mr. SailendraKarki	Secretary
Mr. Narayan Karki	Member
Mr.Laxmi Kumari Khatri	
Mr.Sahiman Rai	
Mr.Sarita Rai	Journalist
Mr.Jamuna Rai	
Mr.Tirtha Raj Bhatta	
Mr.KirtiKumari Kami	
Mr.Nirmata Basnet	
Mr.Sandes Bantawa	Nepal Reporter Organization
Mr.Chering Sharpa	
Mr.KajiBdr. Karki	
Mr.Binam Shrestha	
Mr.Saraswati Shrestha	

Proposed Agenda

1. About the feasibility Report Presentation
2. About the information dissemination on Technical, Social safeguard and Environment aspect.
3. Providing land for construction of essential structures, collection of 5% up front cash and ccommitment on those matters.
4. About the water tariff.

Decision

1. Discussion over the agenda number one, the feasibility report presentation program was held in the district by the design team, district-based political parties, concerned stakeholder and various organizations situated in the district participated, During the presentation program some discussion was made finalized the various alternative water source and limit the service area to further the program.
 2. Discussion over agenda number 2, concerning resource person was disseminated the information on Technical, Social safeguard, Social, and Environment aspect of the project during the presentation meeting.
 3. Discussion over agenda number 3, providing required land to the project for construction of various structures and collection of 5% upfront cash within the particular time.
 4. Discussion over agenda number 4, the tariff rate is accepted, which is come from study by the consultant and economic analysis of TDF.
-

Annex 5: Survey Questionnaire

!= kl/ro

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

-s_ lhNnfM

-v_ uf=lj=M

-u_ 6f]n /:yfgM

-3_ jf8{ g+=M

!=@ kfl/jfl/s ljj/Of

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

=====

===

-v_ hftLM

-u_ pd]/M

-3_ lnĖM □ k'?if dlxf □

-a_ j}jflxs l:yltM

-r_ wd{M

-5_ Joj;fo -3/d'nLsf]_M

-h_ a;]sf] jif{M

-em_ lziff M

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

pd]/ ;d'x	k'?if	k]zf	dlxf	k]zf	hDdf
)-% aif{					
^!-) aif{					
!!-!% aif{					
!^-\$% aif{					
\$%-^) aif{					
^) eGbf dfly					
hDdf					

!=# ljBfno hfg] pd]/sf afn aflnsf -^!-) aif{

hDdf	ljBfno uPsf		ljBfno guPsf	
	k'?if	dlxf	k'?if	dlxf

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

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

#= s[lif -e'-pkof]u_

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

5 ☐ 5}g ☐

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

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

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

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

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

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

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

3/ uf]7

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

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

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

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

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

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

s +;+=	af]6lj?jf	lj?jf ;+Vof		hDdf
		kmn nfPsf]	kmn gnfPsf]	
!	kmnkm"n			
@	sfutL			
#	;'Gtnf			
%	cfFk			
^	d]jf			
&	cDaf			
*	lnRrL			
(	s6x/			
!)	s]/f			
!!	cf?			
!@	gf:kftL			
!#	cf?v8f			
!\$	cGo			
!%	8fn] 3fF;			
!^	kfv'/L			

s +=	af]6lj?jf	lj?jf ;+Vof		hDdf
		kmn nfPsf]	kmn gnfPsf]	
!&	sfe f]			
!*	j8x/			
!(	vgfof]			
@)	6fsL			
@!	lub/L			
@@	cGo			
@#	OGwgsf] nflu k of]u ug]{ af]6 lj?jf			
@\$	sf7df k of]u x'g] af]6lj?jf			
@%	jfF; lgufnf]			

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

eof]

ePg

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

-s_ ltg dlxgf

-v_ 5 dlxgf

-u_ gf} dlxgf

-3_ afx| dlxgf

#=* cf^gf] pTkflbt vfBfGg ck|of{Kt ePsf] a]nf cf^gf] kl/jf/nfO{ s;/L v'jfp'g' x'G5 <

s= COf u/] /

v= gf]s/Laf6 ePsf] cfDbfgLaf6

u= Jofkf/Lsf] cfDbfgLaf6

3= ef/L af]s]/ ePsf] cfDbfgLaf6

8= b}lgs dhh'/af6 ePsf]

r= cGo

=====

#=(kz'kfng ;DaGwL M

tkfO{sf] 3/df slt ÷s:tf kz' klfLx? kfNg' ePsf] 5 ?

s =+=	kz'k+lfL	;+Vof
!	ufO{	
@	uf]?	
#	e};L	
\$	af5f	
%	afl5	
^	kf8f	
&	kfl8	
*	/fFuf]	

s ;+=	kz'k+lfl	;+Vof
(	3f]8f	
!)	afv f	
!!	af]sf	
!@	v;L	
!#	kf7f÷kf7L	
!\$	;'Fu'/÷a+u'/	
!%	xfF;	
!^	s'v'/f	
!*	cGo -v'nfp]g]_	

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

>f]t	Jfflif{s cfDbfgL - ?=_	>f]t	jflif{s cfDbfgL - ?=_
s[lifaf6		cGo >f]tx?	
vfBfGg		gf]s/L, ;]jf	
gub]jfnL		Hofnf dnb'/L / e/Lof	
kmnkm'n		lgj[lte/Of	
hDdf -!_		Jofkf/	
kz'kfngaf6		3/]n' pBf]u	
b'Uw pTkfbg		k]zfut ;]jf	
c08f s'v'/f xfF; lasL		df5f lasL	
af5f÷af5L÷uf]? ÷lals		cGo	
e} ; ÷/fFuf] lals		hDdf -#_	
af]sf÷v;L÷e]8f÷afv f lals			
;'u+/÷a+u'/ lals			
s'v'/f÷xfF; ljls			
hDdf -@_			
hDdf cfo -!+@+#_M			

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

lj]Of	hDdf /sd -?=_	lj]Of	hDdf /sd -?=_
Rf.dn		lrof	
bfm		bfp/f	
ds}		lah'nL	
t/sf/L		dl\$]t]n	

ljj/Of	hDdf /sd -?=_	ljj/Of	hDdf /sd -?=_
b'3÷bxL		cf}iflw	
df5f÷df;'		lzlff	
t]n÷Wo"		sk8f	
d/-d;nf		rf8kj{	
g'g		cGo	
lrgL			
hDdf vr{			

^=kfgLsf] cfk"lt{

-s_ tkfO{n] o; vf]nfsf] kfgL pkof]u ug'{ x'G5 ls x'b}g ?
u5'{ ☐ ulb{g ☐

-v_ olb vf]nfsf] kfgL k|of]u ug'{ x'G5 eg] s'g k|of]hgsf] nflu k|of]u ug'{x'G5 ?
l;+rfO{ ☐ g'xfpg], sk8f w'g] ☐
lkpg] ☐ cGo ☐

&=:jf:Yo ;DalGwM

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

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

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

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

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

=====

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

s +=;+	hfg] 7fpF	/x]sf] :yfg	b"/L -ls=dL=_
!	c:ktfn		
@	x]Nykf]:6		
#	x]Ny ;]G6/		
\$	cfo'a]{lbs cf}ifwfno		
%	lglh lSnlgs/cf}ifwL k;n		
^	wfdL emfs L		
&	cGo		

***=dlxnfsf] cj:yfM**

-s_ >dsf] jlu{s/Of

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

-v_ ;DklQdf clwsf/

s +=;+	sfdsf] ljj/Of	lx;;f k ltztdf	
		k'?if	dlxnf
!	3/		

s +=;+	sfdsf] ljj/Of	lx;;f k ltztdf	
		k'?if	dlxnf
@	hUuf		
#	kz'		
%	u/uxgf		
^	pBf]u wGb f		
&	cGo		

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

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

(= d'cfAhf ;DaGwLM

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

gub □ hUufsf] ;\$f hUuf □ cGo □

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

hUuf lsGg] □ 3/ jgfp g] □ COf Itg]{ □
Aofkf/ ug]{ □ cGo □

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

Annex 6: Water Quality Test Reports

NS Lab Accreditation No.: 09-2068/59

Regd. No. 53875/064/065

**AASTHA SCIENTIFIC RESEARCH SERVICE PVT. LTD.**P.O. Box No. 4316, Dillibazar, Kathmandu, Nepal
Tel: +977-1-4433748, E-mail: aasthalab2068@gmail.com

(Center for complete scientific solution)

Test Report/CertificateReport No. : 88/2073
Entry No. : AASTHA-43-2073
Sample : Surface Water
Client : ICON-TAEC JV
Location : Tin Bhangate, BhojpurDate received : 29-01-2073
Date completed : 07-02-2073
Sampled By : Client

S. N.	Parameters	Method	Observed Values	National Drinking Water Quality Standard
1.	pH at 26°C	4500-H APHA-AWWA-WEF 2012, 22 nd Edition	6.3	6.5 - 8.5
2.	Electrical Conductivity, (µmhos/cm)	2510 B, APHA-AWWA-WEF 2012, 22 nd Edition	52	1500
3.	Turbidity, (NTU)	2130 B, APHA-AWWA-WEF 2012, 22 nd Edition	1.2	5 (10)
4.	Taste and Odor	-	N. O.	Not Objectionable
5.	Color, (TCU)	2120 C, APHA-AWWA-WEF 2012, 22 nd Edition	0.21	500
6.	Total Hardness as CaCO ₃ , (mg/l)	2340 C, APHA-AWWA-WEF 2012, 22 nd Edition	34	5(15)
7.	Total Dissolved Solid, (mg/l)	2540 C, APHA-AWWA-WEF 2012, 22 nd Edition	33	1000
8.	Total Residual Chlorine, (mg/l)	4500-Cl B, APHA-AWWA-WEF 2012, 22 nd Edition	<0.10	0.1-0.2
9.	Chloride, (mg/l)	4500-Cl B, APHA-AWWA-WEF 2012, 22 nd Edition	0.99	250
10.	Ammonia, (mg/l)	4500-NH3 D, APHA-AWWA-WEF 2012, 22 nd Edition	0.23	1.5
11.	Nitrate, (mg/l)	4500-NO ₃ -B, APHA-AWWA-WEF 2012, 22 nd Edition	0.58	50.0
12.	Aluminum, (mg/l)	3500-Al B, APHA-AWWA-WEF 2012, 22 nd Edition	<0.02	0.20
13.	Fluoride, (mg/l)	4500-F D, APHA-AWWA-WEF 2012, 22 nd Edition	0.13	0.5-1.5
14.	Sulfate, (mg/l)	4500-SO ₄ ²⁻ C, APHA-AWWA-WEF 2012, 22 nd Edition	2.1	250
15.	Mercury*, (mg/l)	3500-Hg-C, APHA-AWWA-WEF, WPCF, 17th Edition	<0.001	0.001
16.	Calcium, (mg/l)	3500-Ca B, APHA-AWWA-WEF 2012, 22 nd Edition	4.8	200
17.	Iron*, (mg/l)	3111 B, APHA-AWWA-WEF 2012, 22 nd Edition	0.12	0.30(3)
18.	Manganese*, (mg/l)		<0.05	0.20
19.	Lead*, (mg/l)		<0.01	0.01
20.	Cadmium*, (mg/l)		<0.003	0.003
21.	Chromium*, (mg/l)		<0.05	0.05
22.	Copper*, (mg/l)		<0.05	1.0
23.	Zinc*, (mg/l)		<0.02	3.0
24.	Arsenic, (mg/l)		<0.01	0.05

Remarks: Observed level of pH is slightly lower than the NDWQS required limit.

Analyzed By

Checked By

Authorized By

- Note:**
1. The issued report refers only to the tested sample and applicable parameters. Endorsement of products is neither inferred nor implied.
 2. This report is neither to be reproduced wholly or partially nor can be used as an evidence in the court of law.
 3. Liability of our institute is limited to the invoiced determinands and amount only.
 4. Even in the case of stable samples such as limestone, minerals, soil etc. they will not be stored more than six months.
 5. Parameters in * are not accredited by NBSM

NS Lab Accreditation No.: 09-2058/69

Regd. No. 53875/054/065



ASTHA SCIENTIFIC RESEARCH SERVICE PVT. LTD.

P.O. Box No. 4316, Dillibazar, Kathmandu, Nepal
Tel: +977-1-4433748, E-mail: aasthalab2055@gmail.com

(Center for complete scientific solution)



Test Report/Certificate

Report No. : 86/2073

Entry No. : AASTHA-43-2073

Sample : Surface Water

Client : ICON - TAEC JV

Location : Jor Sanghu, Tindhare, Daduwa, Bhojpur

Date received : 29-01-2073

Date completed : 07-02-2073

Sampled By : Client

S. N.	Parameters	Method	Observed Values	National Drinking Water Quality Standard
1.	pH at 26°C	4500-H ⁺ APHA-AWWA-WLF 2012, 22 nd Edition	6.5	6.5 - 8.5
2.	Electrical Conductivity, (µmhos/cm)	2510 B, APHA-AWWA-WEF 2012, 22 nd Edition	48	1500
3.	Turbidity, (NTU)	2130 B, APHA-AWWA-WEF 2012, 22 nd Edition	1.2	5 (10)
4.	Taste and Odor			
5.	Color, (TCU)	2120 C, APHA-AWWA-WEF 2012, 22 nd Edition	N.O	Not objectionable
6.	Total Hardness as CaCO ₃ , (mg/l)	2340 C, APHA-AWWA-WEF 2012, 22 nd Edition	0.27	500
7.	Total Dissolved Solid, (mg/l)	2540 C, APHA-AWWA-WEF 2012, 22 nd Edition	32	5(15)
8.	Total Residual Chlorine, (mg/l)	4500-Cl ₂ B, APHA-AWWA-WEF 2012, 22 nd Edition	29	1000
9.	Chloride, (mg/l)	4500-Cl ⁻ B, APHA-AWWA-WEF 2012, 22 nd Edition	<0.10	0.1-0.2
10.	Ammonia, (mg/l)	4500-NH ₃ D, APHA-AWWA-WPCF, 17 th Edition	<0.50	250
11.	Nitrate, (mg/l)	4500-NO ₃ -B, APHA-AWWA-WEF 2012, 22 nd Edition	0.46	1.5
12.	Aluminum, (mg/l)	3500-Al B, APHA-AWWA-WEF 2012, 22 nd Edition	0.44	50.0
13.	Fluoride, (mg/l)	4500-F ⁻ D, APHA-AWWA-WEF 2012, 22 nd Edition	0.03	0.20
14.	Sulfate, (mg/l)	4500-SO ₄ ²⁻ C, APHA-AWWA-WEF 2012, 22 nd Edition	0.20	0.5-1.5
15.	Mercury*, (mg/l)	3500-Hg-C, APHA-AWWA-WEF, WPCF, 17 th Edition	2.4	250
16.	Calcium, (mg/l)	3500-Ca II, APHA-AWWA-WEF 2012, 22 nd Edition	<0.001	0.001
17.	Iron*, (mg/l)		3.2	200
18.	Manganese*, (mg/l)		<0.05	0.30(3)
19.	Lead*, (mg/l)		<0.05	0.20
20.	Cadmium*, (mg/l)		<0.01	0.01
21.	Chromium*, (mg/l)	3111 B, APHA-AWWA-WEF 2012, 22 nd Edition	<0.003	0.003
22.	Copper*, (mg/l)		<0.05	0.05
23.	Zinc*, (mg/l)		<0.05	1.0
24.	Arsenic, (mg/l)	3500-As B, APHA-AWWA-WEF 2012, 22 nd Edition	<0.02	3.0
			<0.01	0.05

Remarks: Water quality meets NDWQS required limit.

[Signature]
Analyzed By

[Signature]
Checked By

[Signature]
Authorized By

- Note : 1. The issued report refers only to the tested sample and applicable parameters. Endorsement of products is neither inferred nor implied.
2. This report is neither to be reproduced wholly or partially nor can be used as an evidence in the court of law.
3. Liability of our institute is limited to the invoiced detrimands and amount only.
4. Even in the case of stable samples such as limestone, minerals, soil etc. they will not be stored more than six months.
5. Parameters in * are not accredited by NBSM.

Annex 7: Photographs



1. Bhulke Source



2. Existing RVT at Pani Tanki Area



3. Existing RVT at Pani Tanki Area



4. Meter Installation Point for 24 Hour Water Supply to Main Offices



5. Meeting with WUSC in Bhojpur



6. Women Participation in WUSC meeting

Annex 8
SOUTH ASIA REGIONAL DEPARTMENT
SAFEGUARDS INFORMATION LOG FOR SAUW PROJECTS

	Section	Status		Comments/Remarks (include date accomplished or obtained, if applicable)
1.	Environmental assessment report (EIA/IEE/envi due diligence) has been prepared?	Yes	No	
		X		
2.	EIA/IEE/envi due diligence based on project components and detailed engineering design?	Yes	No	
		X		
3.	Statutory Requirements		Forest Clearance	Table 1 page 9 mentions that the District Office has granted the use of water resource. Further actions: Attach in the first semi-annual environmental monitoring report (SEMR) to ADB the following: (i) Permit from the District Office on the use of water resource; and (ii) all other permits and/or NOCs issued by local government for the implementation of the subproject.
			No Objection Certificate	
			Site Location Clearance	
		???	Environmental Compliance Certificate	
		???	Permit to Construct (or equivalent)	
		???	Permit to Operate (or equivalent)	
		???	Others	
5.	Policy, legal, and administrative framework	Adequate	Not Adequate	
		X		
		EIA/IEE/envi due diligence included discussion on:		

Project:	Nepal: Urban Water Supply and Sanitation Project (UWSSP): Bhojpur Bazaar Small Town Water Supply and Sanitation Subproject		
Loan No.:	3711	Package No.: W02	
Components:	Construction of a Piped Water Supply System as follows:		
	Rehabilitation and construction of intakes	(i) 4 existing intakes to be rehabilitated (ii) 2 new intakes to be constructed	
	Rehabilitation and construction of water treatment plants (WTPs)	(i) 1 WTP to be rehabilitated (0.25 lps) (ii) 1 WTP to be constructed (13.5 lps)	
	Construction of transmission mains	Length = 36.3 km with pipe diameter ranging from 75 mm to 180mm	
	Rehabilitation and construction of service reservoirs	10 service reservoirs with total capacity of 875 cu. m.	
	Construction of Bulk Distribution System	Length = 9.6 km with pipe diameter ranging from 50 mm to 140mm.	
	Construction of distribution network	Length = 77.335 km with pipe diameter ranging from 50 mm to 150 mm.	
	Other small allied components	BPT, guard house, office cum water quality laboratory, river crossings and household connection appurtenances.	
Contract Type:	NCB		
Date of IEE:	March 2018		
Draft IEE		Updated/Revised IEE	Others
			This is final IEE. The IEE is based on final detailed design per bidding documents prepared.

	Section	Status			Comments/Remarks (include date accomplished or obtained, if applicable)	
		X	National regulation/law on EIA			
		X	Environmental agency			
		X	Relevant international environmental agreements			
		???	Environmental standards (IFC's EHS Guidelines)		ADB SPS requirements on environmental standards are not discussed. Insufficient information that contractor's measures and practices are in line with internationally-accepted practices (as required by ADB SPS). Further action: Confirm in the first SEMR that contractor's site-specific EMP satisfactorily meet ADB SPS requirements.	
6.	Anticipated environmental impacts and mitigation measures	EIA/IEE/envi due diligence satisfactorily discussed impacts and risks on:		Mitigation measures provided?		
				Yes	No	
			Biodiversity conservation		n/a	Endangered species and habitats not present in subproject area.
			Pollution	???		Section VI discusses impacts and

			prevention and abatement			mitigation measures applicable to the subproject. However, reference to the EHS guidelines on pollution control and prevention has not been included. Further action: Confirm in the first SEMR that EHS guidelines on pollution control and prevention are being followed under the subproject.
			Health and safety	X		Section VI discusses impacts and mitigation measures of all health and safety issues that may arise in the implementation of the subproject.
			Physical cultural resources (PCR)	X		The IEE explicitly mentions that no PCRs in the subproject area.
			Cumulative impacts	X		No mitigation measures required.
			Transboundary impacts		n/a	Not applicable
7.	Impacts from Associated Facilities	Addressed	Not Addressed	Not applicable		Considered as associated facilities are the existing water supply systems of Bodjpur Municipality. However, all these existing facilities will be rehabilitated and part of the various components of the subproject.
		X				
8.	Analysis of Alternatives	Yes	No			Section III provides discussion on alternatives. However, this is not required for Cat B and no need to include in IEE.
		X				
9.	EMP budget included	Yes	No			Excluding human resources costs, the EMP provides indicative budget
		X				

	Section	Status		Comments/Remarks (include date accomplished or obtained, if applicable)
				of NPR 2.160,000 for EMP implementation. Further action: Prior to award of contract, ensure that this amount is included in the contract.
10.	EMP implementation integrated in PAM, and in bid and contract documents	Yes	No	Included in PAM during loan processing. Included in Section 8 of bid documents. 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	Yes	No	A preliminary consultation was done

	Participation	X		on 24 May 2017 and no other consultations have been made after that. - Minutes of this consultation is in Annex 4. - The minutes includes list of attendees and their gender. However, only 3 out of the 49 participants are women. - Translation of the minutes in the English language is provided. Further action: Continue to conduct meaningful consultations as defined by ADB SPS throughout the duration of the subproject implementation. Ensure to include more participants from the communities to be consulted and encourage the participation of women.
12.	Grievance Redress Mechanism	Yes	No	GRM mechanism included in IEE.
		X		Further action: Confirm in the first SEMR that GRM is notified and GRC members have the capacity to address project-related grievances/complaints. Confirm in the first SEMR that contractors are given instructions and orientation on GRM. Attach in the first SEMR copy of GRM notification.
		Description of GRM		Included in IEE (main text)
		Identification of GRC members		Done.
13.	Disclosure		Endorsement to disclose on ADB website	Pending. This will be requested when the IEE has been cleared by ADB.
			Disclosed on project website	Pending. This will be requested when the IEE has been cleared by ADB.
			Relevant information available to stakeholders and affected people in language and form they understand	Pending. This will be requested when the IEE has been cleared by ADB.
14.		Yes	No	

	Section	Status		Comments/Remarks (include date accomplished or obtained, if applicable)
	Mobilized PMO Environment Officer	???		Further action: Include in the first SEMR the status of appointment PMO Envi Officer.
15.	Mobilized RPMO Environment Specialist	Yes	No	Further action: Include in the first SEMR the status of appointment RPMO Envi Specialist.
		???		
16.	Mobilized DSMC Environment Specialist	Yes	No	Further action: Include in the first SEMR the status of DSMC
		???		

				Environment Specialist. If he/she is not available, provide reasons and include corrective actions with timeframe to appoint DSMC Environment Specialist.
17.	Confirm bid and contract documents and/or EMP include requirement for the contractor to appoint EHS supervisor and/or nodal person for environmental safeguards	Yes X	No	This role and responsibility of the contractor is discussed in Section IX.
18.	If contract awarded already, confirm contractor's appointment of EHS supervisor and/or nodal person for environmental safeguards	Yes X	No	This role and responsibility of the contractor is discussed in Section IX.
19.	Awareness training on compliance to safeguard requirements	Yes X	No	Section IX discusses the institutional capacity development program, schedule, and topics for the subproject, which DRTAC-ESS will supervise for the entire UWSSP.
20.	Monitoring and Reporting	Yes ???	No	Section X discusses the roles and responsibilities of PMO and RPMO in reporting the implementation of EMP. However, the role of contractors on reporting is not included. Further action: Include in the first SEMR discussion on the role of contractors in the reporting to RPMO, including the frequency of reporting.
21.	Others/Remarks	Summary of Suggested Next Steps: <u>Include in the first semi-annual environmental monitoring report (SEMR) to ADB the following:</u> 1. Confirmation that contractor's site-specific EMP satisfactorily meet ADB SPS requirements. 2. The document from the District Office approving the use of water resource; 3. All other permits and/or NOCs issued by local government for the implementation of the subproject; 4. Confirmation that the GRM is notified and GRC members have the capacity to address project-related grievances/complaints. 5. Confirmation that contractors are given instructions and orientation on GRM. 6. Copy of GRM notification. 7. Confirmation on the status of appointment PMO Envi Officer, RPMO Envi Specialist, and DSMC Envi Specialist.		
	Section	Status		Comments/Remarks (include date accomplished or obtained, if applicable)

		8. Discussion on the role of contractors in the reporting to RPMO, including the frequency of reporting. 9. English translation of Survey Questionnaire. <u>Prior to award of contract:</u> 1. Ensure that the contract includes provisions on the responsibilities of contractor in the implementation of the EMP; 2. SEMP has been submitted by contractor and approved by RPMO; 3. Ensure that the amount for EMP/SEMP implementation is included in the contract. <u>Other actions:</u> 1. Continue to conduct meaningful consultations as defined by ADB SPS throughout the duration of the subproject implementation. Ensure to include more participants from the communities to be consulted and encourage the participation of women.
--	--	--

Prepared by: Miguel B. Diangan, Jr., ADB Consultant, Contract No. S22361

Noted and Checked By: Zarah Pilapil, ADB SAUW Safeguards Officer
Ninette Pajarillaga, ADB SAUW Environment Specialist

Documents/References: 1. Draft IEE for Bhojpur Water Supply Subproject sent by UWSSP
2. EARF of UWSSP