नेपाल सरकार
खानेपानी मन्त्रालय
सिंहदरबार, काठमाडौं

फोन नं.: ४२११६९३
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सिंहदरबार,
काठमाडौं, नेपाल ।

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सानासहरी खा. पा. आयोजना
आयोजना व्यवस्थापन कार्यालय
दर्ता नं.: ९४६
मिति: २०७६-९-१२

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

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

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

<u>आयोजनाहरु :</u>

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

(मधुसुधन खनाल)
ईन्जिनियर

बोधार्थ :
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आ.उ.नि. विकेश्वरी
कार्यालय
२०७६।९।१६

Government of Nepal

Ministry of Water Supply

Department of Water Supply and Sewerage Management
Urban Water Supply & Sanitation Sector Project
Project Management Office
Panipokhari, Maharajgunj, Kathmandu

Initial Environmental Examination (IEE)

of

Siddhanath-Baijnath Urban Water Supply and Sanitation Project
Bheemdatt Municipality, Mahendranagar
Sudurpaschim Province

SubmittedTo
Ministry of Water Supply
Singhadurbar, Kathmandu

Submitted By
Project Management Office
Urban Water Supply and Sanitation Sector Project
Department of Water Supply and Sewerage Management
Panipokhari, Kathmandu

Prepared By
BDA/PEA JV
Kamaladi, Kathmandu

Building Design Authority (P.) Ltd.
Architectural, Engineering & Planning Consultants
G.P.O. Box: 2882, Kamaladi, Kathmandu, Nepal
Tel: 4-227393 / 4-248200 / 4-247706 / 4-247939
Fax: 977-01-4227396, E-mail: bda@mos.com.np

JV

Plush Engineers & Architects
Engineering & Architectural Design, Project Planning & Evaluation, Socio Economic Survey etc.
P. O. Box : 2882, Kamaladi Kathmandu
Tel : 4247706, 4227393, 42477939, 4248200

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Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

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Government of Nepal
Ministry of Water Supply
Urban Water Supply and Sanitation Sector Project
Project Management Office

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ACRONYMS

ADB	Asian Development Bank
DCC	District Coordination Committee
DI	Ductile Iron
DSMC	Design, Supervision and Management Consultant
DTW	Design Tube Well
DRTAC	Design Review and Technical Audit Consultant
DWSSM	Department of Water Supply and Sewerage Management
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
IUCN	International Union for Conservation of Nature
MoFE	Ministry of Forests and Environment
MoWS	Ministry of Water Supply
NDWQS	National Drinking Water Quality Standard
NPR	Nepalese Rupees
PMO	Project Management Office
PMQAC	Project Management and Quality Assurance Consultant
RPMO	Regional Project Management Office
RoW	Right of way
REA	Rapid environmental assessment
S-EMP	Site Specific Environmental Management Plan
SPS	Safeguard Policy Statement
SDG	Sustainable Development Goal
ToR	Terms of Reference
USD	United States Dollar
UWSSP	Urban Water Supply and Sanitation (Sector) Project
WTP	Water Treatment Plant
WHO	World Health Organization
WSSDO	Water Supply and Sanitation Divisional Office
WUSC	Water Users' and Sanitation Committee

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कार्यकारी सारांश

पृष्ठभूमी

यस प्रस्तावित आयोजनाका प्रस्तावक शहरी खानेपानी तथा सरसफाई आयोजनाको आयोजना व्यवस्थापन कार्यालय हो । यो कार्यालय खानेपानी तथा ढल व्यवस्थापन विभाग अन्तर्गत पर्दछ । यो आयोजना साना शहर र नगरोन्मुख बस्तिहरुको खानेपानी तथा सरसफाई सेवा सुधारमा केन्द्रित रहेको छ । यो आयोजना समुदायको आवश्यकता अनुसारको माग र सोका लागि समुदायकै सक्रिय सहभागिता र व्यवस्थापनको सिद्धान्तमा आधारित छ । यो आयोजनाले नेपाल सरकारलाई दिगो बिकास लक्ष्य (बुँदा ६) अनुसार सन् २०३० भित्र सबैका लागि खानेपानी तथा सरसफाईको उपलब्धता र सोको दिगो व्यवस्थापन हाँसील गर्न सहयोग पुऱ्याउनेछ ।

यस आयोजनाबाट सुदूर पश्चिम प्रदेशको कञ्चनपुर जिल्लाको भिमदत्त नगरपालिकाको वडा नं. ६, ८ र १० का बासिन्दा लाभान्वित हुनेछन् । यो शहर उक्त क्षेत्रका तीब्र विकसित हुँदै गरेका स्थानहरुमा पर्दछ । आयोजना क्षेत्रका प्रमूख बस्तीहरुमा वडा नं. ६ को बैजनाथ, भूमीराज टोल, बनगाउँ, पूर्णीमा टोल, त्यसै गरी वडा नं. ८ को सिद्धनाथ, भानू, ज्योति टोल, र वडा नं. १० को आदर्श टोल, अमरज्योति टोल, बसन्त टोल, दिब्य ज्योति टोल, महालक्ष्मी टोल, विजया टोल लगायतका टोल बस्तीहरु पर्दछन् ।

प्रारम्भिक वातावरणीय परीक्षणको उद्देश्य

यस प्रारम्भिक वातावरणीय परीक्षणको मूल उद्देश्य भनेको यस आयोजनाका कार्यहरुबाट वातावरणमा पर्न सक्ने नकारात्मक असरहरुको पहिचान गरी ती असरहरुलाई न्यून गर्नु, निर्मूल गर्नु वा ऐनको स्वीकार्य सिमामा ल्याउन आवश्यक र उपयोगी उपाय तथा सुझावहरु योजनाबद्ध रुपमा दिनु हो ।

नेपाल सरकारका ऐन तथा कानून, र ए. डि. बि. को नीति

नेपाल राष्ट्रको प्रचलित कानून, नियम तथा एशियाली विकास बैंकको नीति अनुसार कुनै पनि विकासको योजना तथा निर्णय प्रक्रियामा वातावरणीय असरहरु बारे ध्यान पुऱ्याउनु पर्ने हुन्छ । नेपाल सरकारको कानूनी प्रक्रिया अनुसार यो प्रस्तावित परियोजनाले वातावरण संरक्षण ऐन, २०५३ र वातावरण संरक्षण नियमावली, २०५४ को पालना गर्नुपर्ने हुन्छ । प्रस्तावित प्रारम्भिक वातावरणीय परीक्षणले वातावरण संरक्षण नियमावली (२०५४) को अनुसूची १ अन्तर्गत दफा-ऐ को उपदफा ८ ("पाँच हजारदेखि पचास हजारसम्मको जनसंख्यालाई खानेपानी आपूर्ति गर्ने") को पालना गर्दछ ।

एशियाली विकास वैंकको सुरक्षण नीति कथन (जुन २००९) अनुसार यो परियोजना श्रेणी "बी" मा पर्दछ र एशियाली विकास वैंकको निर्देशिका अनुसार समेत यो प्रारम्भिक वातावरणीय परिक्षण गरिएको छ ।

Engineer

अध्ययन विधि

खानेपानी मन्त्रालयद्वारा मिति २०७५/०८/०३ मितिमा स्वीकृत कार्यसूची (टी.ओ.आर.) का आधारमा यो प्रतिवेदन तयार गरिएको छ । यस अध्ययनले वातावरण संरक्षण ऐन (२०५३) तथा वातावरणय संरक्षण नियमावली (२०५४), र साथ साथै एशियाली बिकास बैंकको सुरक्षण नीति कथन (जुन २००९) का प्रावधान, विधि तथा व्याख्याहरुको पालना गरेको छ । यस अध्ययनका सिलसिलामा प्रतिवेदन अध्ययन, फिल्ड अध्ययन, संकलित तथ्यहरुको विश्लेषण तथा सूचना संप्रेषण तथा सार्वजनिक सहभागिताका कियाकलापहरु गरिएका छन् । सार्वजनिक सूचना प्रकाशन, सुचना टाँसको मुचुल्का र सार्वजनिक छलफल गरीसरोकारवालाहरु का सुझावहरु प्रतिवेदनमा उल्लेख गरिएको छ । भौतिक वातावरणीय अवयवहरु, जैविक वातावरणका पक्षहरु तथा सामाजिक-आर्थिक अवस्थाहरुको सुक्ष्म रुपमा अध्ययन गरी स्थानीय सरोकारवालाहरु सित आयोजना कार्यान्वयन गर्दा हुन सक्ने सकारात्मक एवम् नकारात्मक प्रभावहरुका बारेमा छलफल गरिएको छ । यी अध्ययन विशेषत आयोजनाको प्रत्यक्ष रुपमा निर्माणका काम हुने ठाउँहरु - प्रत्यक्ष असर पर्ने क्षेत्र र त्यसको वरिपरि नजिकको क्षेत्रमा गरिएको छ ।

आयोजनाका मुख्य संरचनाहरु

प्रस्तावित सिद्धनाथ-बैजनाथ खानेपानी तथा सरसफाई आयोजना भूमिगत जलस्रोतमा आधारित प्रणाली हो । यसका दुईवटा कम्पोनेन्टहरु छन् : खानेपानी वितरण र सरसफाई । खानेपानी वितरण अन्तर्गत पानीको स्रोतका लागि डिप-ट्यूबवेल निर्माण, प्रसोधन प्रणाली, पानी भण्डारण ट्याङ्की निर्माण, गार्ड हाउस निर्माण, वितरण प्रणालीको निर्माण, पाईप विछ्याउने कार्य, र घरधारा जडान कार्यहरु हुनेछन् । दोस्रो पाटोमा सरसफाई कार्यक्रम छ, जस अन्तर्गत घरधुरी शौचालय निर्माणमा सहयोग र सार्वजनिक शौचालयको निर्माण पनि प्रस्ताव गरिएको छ । आयोजना संचालन र व्यवस्थापन प्रभावकारी बनाउन उपभोक्ता समितिको भवन निर्माण कार्य पनि गरिनेछ ।

वातावरणको वर्णन

यस आयोजनाको कार्यक्षेत्र कञ्चनपुर जिल्लाको सदरमुकाम भिमदत नगरपालिकामा रहेको छ । आयोजनाले कुनै पनि बन क्षेत्रको उपभोग गर्ने छैन । आयोजना क्षेत्र समुन्द्री सतहबाट २०३-२२५ मिटरको उचाईमा रहेको छ । यस आयोजनाका संरचनाहरु सार्वजनिक जग्गामा अवस्थित छन् । यसका संकलन र वितरण पाईपहरु बटोको RoW भित्र पर्दछन् । आयोजनाको निर्माण कार्य क्षेत्र भित्र कुनैपनि किसिमको सिमसार तथा संरक्षित क्षेत्रहरु छैनन् । आयोजना क्षेत्रमा बजार क्षेत्र पनि पर्दछ ।

आयोजना क्षेत्रको भू-उपयोग मुख्यत कृषि-उपभोग हो । आयोजना क्षेत्रमा नै बन नभए पनि यसका वरीपरी वन क्षेत्र रहेको छ । आयोजना क्षेत्रमा साल, खयर, सिसौ आदि प्रजातिका रुखहरु बढी व्याप्त रुपमा पाईन्छन् । महाकाली नदी यहाँको प्रमुख नदी हो भने तिलाचौल खोला, तिल्केनी खोला र बनगाउ खोला यस आयोजना क्षेत्र भित्र छन् । घाँसे मैदान र खोलानालाको आसपासमा पाइने वनस्पती पनि आयोजनामा देखिन्छ ।

सिद्धनाथ-बैजनाथ एक शहरोन्मूख बस्ती हो जहाँ आर्थिक कारोबार बढ्दो कममा छन् । आयोजना क्षेत्रका घरधुरीको औसत मासिक आय करिब रु २४,०७५ रहेको छ । बाहिरका बस्तीहरुबाट बसाई सरी आएका बासिन्दाहरु तथा भाडामा बस्ने मानिसहरुको बढ्दो जनसंख्याका कारण आयोजना क्षेत्रको जनसंख्या बृद्धि उल्लेखनीय रहेको देखिन्छ । बिद्यमान खानेपानी प्रणालीको क्षमता नपुग देखिन्छ र हाल १९.८% घरधुरीले कुवा वा खोलाबाट सीधै पानी प्रयोग गर्ने र ८०.२% घरधुरीले ट्युबवेलको पानी खाने

Engineer

गरेकाछन् । अधिकांश घरहरुमा चर्पीको व्यवस्था छ तर केहीमा अझै पक्की चर्पी बनाउन बाँकी रहेको छ । बजार क्षेत्रमा सार्वजनिक शौचालय संचालनमा छ तर बढ्दो शहरीकरणका कारण सरसफाई सम्बन्धी अतिरिक्त सुविधाको आवश्यकता देखिन्छ ।

वातावरणीय प्रभाव, वातावरणीय व्यवस्थापन तथा अनुगमन योजना

यस आयोजनाको कार्यान्वयनले कुनै खासै महत्वपूर्ण नकारात्मक वातावरणीय प्रभाव पर्ने देखिंदैन र संभावित नकारात्मक प्रभावहरु पनि स्थानीय र सजिलै सँग निराकरण गर्न सकिने प्रकारका रहेकाछन् । खानेपानी वितरण प्रणालीका मूख्य वातावरणीय मुद्दा निर्माणसंग सम्बन्धित क्रियाकलाप जस्तै पानी संकलन गर्न सम्पवेल निर्माण, प्रशोधन इकाइ निर्माण, भण्डारण ट्याङ्की निर्माण र पाइप लाइन बिछ्याउँदा जमीन तथा सडकको सतह खुकुलो हुदाँ हुने भूक्षय हुन सक्ने जस्ता प्रभावहरु रहेका छन् । आयोजनाका विभिन्न भौतिक संरचनाहरु निर्माण गर्न कूल १७९० वर्ग मिटर जमीन प्रयोग हुनेछ । वडा नं. ८ को थापाचौराहको मन्दिर नजिकको क्षेत्रमा केही (११ वटा) रुखहरु काट्नु पर्ने, एक वटा पाटी भत्काउनु पर्ने र विजुलीको पोल सार्नुपर्ने छ । यसका लागि वातावरणीय व्यवस्थापनका प्रावधानहरु अवलम्बन गर्नु पर्ने हुन्छ ।

आयोजनाको मुख्य संरचना स्थानको छनौट उपभोक्ता समितिको सल्लाह र सुझाव अनुरुप गरिएको छ र त्यसको लागि कुनै पनि संरचना र जनसमुदायलाई विस्थापित वा पुनर्स्थापना गर्नु नपर्ने देखिन्छ । पानी भण्डारण ट्याङ्की र पानी शुद्धिकरण प्रणाली निर्माण गर्नको लागि आवश्यक पर्ने जग्गामा उपभोक्ता समितिले नगरपालिकाबाट स्वीकृति र अधिकार प्राप्त गरिसकेको छ । छोटो समयको लागि हावा, पानी तथा ध्वनी प्रदुषण हुन सक्ने देखिन्छ । त्यसै गरी कामदारहरुको सुरक्षा पनि एउटा चासोको विषयको रुपमा हेरिएको छ । समग्र रुपमा हेर्दा प्रस्तावित आयोजनाबाट सो क्षेत्रका जैवीक, भौतिक, आर्थिक, सांस्कृतिक तथा सामाजिक वातावरणमा कुनै गहन प्रभावको सम्भावना निकै कम देखिन्छ ।

प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदनको एउटा मुख्य अंशको रुपमा वातावरणीय व्यवस्थापन योजना बनाईएको छ, जसमा निम्न कुराहरु समेटिएका छन् : (क) आयोजना कार्यान्वयन चरणमा पर्न सक्ने नकारात्मक वातावरणीय प्रभाव न्यूनीकरणका उपायहरु सुझाउने र सकारात्मक अवसरहरु अभिबृद्धिका उपायहरु दिने, (ख) जिम्मेवार निकायद्वारा वातावरणीय अनुगमन तथा न्यूनीकरणको प्रतिवेदन तयार गर्ने, (ग) सूचना सम्प्रेसण तथा सार्वजनिक छलफल गर्ने, र (घ) गुनासो सम्बोधन गर्ने संयन्त्र बनाउने ।

डिजाईनमा सूधार एवं संसोधन गरेर धेरै जसो वातावरणीय नकारात्मक असरहरुलाई न्यूनीकरण गरिएको छ । वातावरणीय प्रभाव न्यूनीकरणका उपायहरुका रुपमा प्रस्तावित उपायहरु मध्ये केहि महत्वपूर्ण कार्यहरु निम्नानुसार छन् : हरियाली प्रवर्धन कार्य; थापाचौराहमा रहेको पाटी भत्काउनु पर्ने कारण एक सामुदायिक भवनको निर्माण; निर्माण कार्यका क्रममा उत्पन्न हुने अतिरिक्त माटो वडा नं. ८ तिलाचौरको श्री त्रिभुवन उच्च मा.वि. को मैदान सम्याउन उपयोग गर्ने; तथा जैविक विविधता संरक्षणसम्बन्धी जनचेतना अभिबृद्धिका लागि चेतनामूलक कार्यक्रमहरु संचालन गर्ने ।

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वातावरणीय व्यवस्थापन योजनालाई निर्माण कार्यको ठेक्का सम्झौताको एउटा अंशको रुपमा राखिएको छ । नकारात्मक प्रभाव न्यूनीकरणको कार्यान्वयन राम्रो संग भएको वा नभएको जाँच गर्न अनुगमन गर्नु जरुरी छ । त्यसैले निर्माण र संचालन अवधिमा हुने क्रियाकलापहरुलाई समेटेर एउटा बिस्तृत अनुगमन कार्यक्रम तयार पारिएको छ । आयोजना शुरु गर्नु अगाडि आयोजना व्यवस्थापन कार्यालयद्वारा नकारात्मक प्रभाव न्यूनीकरणका उपायहरुको कार्यन्वयन गर्नका लागि कार्य योजना र वातावरणीय योजना अनुसारको अनुगमन योजना बनाइने छ । सो योजना निर्माण र संचालन कार्यको ठेक्का संगै संलग्न गरिनेछ । यस प्रस्तावित वातावरणीय व्यवस्थापन योजना कार्यान्वयनका लागि रु १५,००,००० विनियोजन गरिएको छ ।

यस आयोजनाबाट स्थानीय जनताहरुले प्रसस्त सकारात्मक फाईदा प्राप्त गर्नेछन्, जसमध्येका मुख्य फाईदाहरु निम्नानुसार छन्: (क) सुधारीएको खानेपानीको सूविधामा जनताको पहूंचमा वृद्धि हुने एवं सरसफाईको क्षेत्रमा सुधार, (ख) आयोजना क्षेत्रमा रोजगार बढ्नु र सीप अभिबृद्धि हुनु र (ग) चक्कीफाँटा शहरका बासिन्दाहरुको जीवनस्तरमा सुधार आउनु ।

स्थानीय सहभागिता, सूचना सम्प्रेशण र गुनासो सम्बोधन

प्रारम्भिक वातावरणीय परिक्षणको प्रतिवेदन लेखनका कममा समुदायसंग छलफल गरिएको छ । यस्ता छलफलहरु लाई पुरै आयोजना निर्माण चरणसम्म निरन्तरता दिइनेछ । मिति २०७५ पुष ३ गतेका दिन आर्थिक अभियान राष्ट्रिय दैनिकमा प्रारम्भिक वातावरणीय परिक्षणका लागि राय सुझाव पेश गर्ने सम्बन्धमा १५ दिने सार्वजनिक सूचना जारी गरियो । उक्त सूचना विभिन्न कार्यालय तथा स्थानहरुमा टाँस गरी सोको मुचुल्का गरियो । स्थानीय निकाय तथा सरोकारवालाहरुको उपस्थितिमा यस आयोजनाका बारेमा र प्रतिवेदनमा उल्लेख गरिएका वातावरणीय पक्षहरुका बारेमा जानकारी तथा छलफल पनि गरिएको छ । समुदायका कुनैपनि गुनासाहरुलाई तुरुन्तै सम्बोधन गर्ने हेतुले प्रारम्भिक वातावरणीय प्रतिवेदनमा गुनासो सम्वोधन प्रकिया विस्तृत रुपमा वर्णन गरिएको छ । आयोजनाको निर्माण कार्य शुरु हुनु अगाडी नै गुनासा व्यवस्थापन समितिको गठन गरिनेछ ।

निश्कर्ष

यस आयोजना बाट स्थानीय बासिन्दाहरुले चौविसै घण्टा आवश्यकता अनुसार सुरक्षित खानेपानी पाउनेछन् र सरसफाईको अवस्थामा सुधार हुनेछ जसले गर्दा आयोजना क्षेत्रका बासिन्दाहरुको जीवन स्तरमा सुधार आउनेछ । यस आयोजनाको प्रकृति, आयोजना क्षेत्रको वातावरण एवम् आर्थिक सामाजिक अवस्था र स्थलगत निरिक्षण एवम् सरोकारवाला संगको सरसल्लाहलाई मध्यनजर गर्दा यस परियोजनाबाट आयोजना क्षेत्रमा न्यून नकारात्मक वातावरणीय असर पर्ने देखिन्छ । संभावित प्रभावहरु धेरै जसो स्थानीय प्रकारका छन् र सुझाइएका प्रभाव न्यूनीकरणका उपयुक्त उपाय कार्यान्वयन गरिएमा र नियमित अनुगमन गरिएमा यी प्रभावहरुलाई सजिलै एवम् कम खर्चमा न्यूनीकरण गर्न सकिनेछ । यस आयोजना कार्यान्वयनका लागि प्रारम्भिक वातावरणीय परिक्षण मात्रै गरे पुग्छ र यसका अतिरिक्त वातावरणीय प्रभाव अध्ययन गर्नु नपर्ने देखिन्छ ।

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Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Project
Urban Water Supply and Sanitation Sector Project
Project Management Office

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

EXECUTIVE SUMMARY

Background

The Urban Water Supply and Sanitation (Sector) Project (UWSSSP) is the proponent of this project. The implementing agency is Department of Water Supply and Sewerage Management (DWSSM). The project is focused on the growing urban centers of the country. The project is designed based need-based community deman, and it also reflects the partnership approach based on active participation of the beneficiaries. The project will help the country to meet Sustainable Development Goal (SDG - 6th Goal) to ensure availability and sustainable management of water and sanitation for all by 2030.

The Siddhanath-Baijnath Urban Water Supply and Sanitation Project is located in Kanchanpur district of the Sudurpaschim Province of Nepal. The project town is within the Bheemdatt Municipality, the headquarters of Kanchanpur district. The project town is an emerging town of the belt. The service area of the proposed project covers ward numbers 6, 8 & 10 of Bheemdatt Municipality. The major settlements/toles of the service area are Baijnath, Bhumi Raj Tole, Bangaun, Purnima Tole of ward number 6, Siddhanath, Bhanu, Jyoti clusters of ward number 8, Adarsha Tole, Amarjyoti Tole, Badimalika Tole, Basanta Tole, Baijnath Tole, Danu Baba tole, Divya Jyoti Tole, Gadda Chauki Tole, Gajar, Gyanu Baba Tole, Gauri Shankar, Gorakhnath, Jay Jagannath, Jimuwa, Mahalaxmi Tole, Maheshori, Malikarjun Tole, Mankamana Tole, Nagarjune, Pashupati Tole, Pragati Tole, Purnagiri, Sangam Tole, Shanti Tole, Sarswati Tole, Shiva Tole, Siddhanath Tole, Siddeshori Tole, Sukasal, Tintara, Bijaya Tole of ward number 10.

Objectives of IEE

The prime objective of IEE is to identify the potential environmental impacts associated with the project, and to propose benefit augmentation measures as well as negative impact mitigation measures along with an environmental management plan so as to avoid such impacts or to limit any such impact/s within the levels acceptable as per environmental standards and thresholds of the GoN.

GoN's Legal Requirements, and Categorization

This Initial Environmental Examination (IEE) report has been prepared as per sub-clause 8 ("*Supply of drinking water to the population of 5,000 to 50,000*") of Clause H of Schedule-1 of Environment Protection Rule (1997), GoN. Procedures and reporting format has been followed as per the requirements of the EPR, 1997. Siddhanath-Baijnath Urban Water Supply and Sanitation Project is classified as Environment Category B as per the SPS- 2009.

Study Methodology

The present Initial Environmental Examination report has been prepared based on the Terms of Reference (ToR) approved by the Ministry of Water Supply, GoN, on 15th November 2018. The study has followed the provisions outlined in the Environment Protection Act, 1997 and Environment Protection Rules, 1997, and Safeguard Policy Statement, 2009 of the Asian Development Bank (ADB). The major activities undertaken during the preparation of IEE are Desk Study, Literature review, Field study, Data processing, Impact Prediction and Evaluation, and Public Consultation. Publication of public notice, collection of deed or inquiry of pasting of the notice in the locality, continuous public consultations, and conducting of a formal public

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consultation to collect opinions and suggestions from the locals was also conducted during the IEE study period. Study of the physical, biological and socio-economic environmental aspects was conducted in relation to the project activities and potential impacts of those activities. The study has focused in the core project area as well as its surrounding area.

Major Project Components

The proposed project is ground water source based system. It has two components; (i) water supply component, and (ii) sanitation component. Under water supply component, there are activities like deep-boring, establishment of treatment units, water storage tank construction, guard house, laying of transmission & distribution network pipelines, connection of household taps, and construction of a WUSC building. The sanitation component comprises of household sanitation promotion works and construction of a public toilet.

Description of the Environment

The location of the project is latitude 28°55'0" N and longitude 80°20'0" E lying in a part of alluvial deposit of Mahakali River and its tributaries. The project area has elevation range from 203 meters amsl to 225 amsl. The project components will be located in WUSC owned sites, public road right-of-way (ROW). There are no protected areas or wetlands, in or near close vicinity of the project area.

The landuse of project area is primarily agriculture based. Although the project components do not lie within forest area, there are forest areas close to the project area. Sal, khayer and sisso are among the predominant tree species in the project area. Mahakali river is the major river system whereas Tilachaur khola, Tilkeni khola and Bangau Khola are among the significant surface water bodies in the project area.

The project area is a growing urban center and is featured by an increasing trend of economic activities. The average monthly income of the project area is NRs 24,075. There is also a remarkable population growth which is also due to increase in number of people migrating in the project area from nearby areas. The capacity of existing water supply system is inadequate. Around 80% of the households use water from tubewells. Though there is a public toilet in the market area, the service of public toilet is inadequate as per the growing urban features of the project area.

Environmental Impacts, Environment Management Plan and its Monitoring

For the consturciton and works of Deep Boring, Pressure Filter, Softener, Disinfection Unit, 450 Cum R.C.C OHT, Generator Operator House, Guard House, Office Building and Laboratory Room, approximately 1790.06 Sq.m land will be used at Sidhanath Tole, ward no: 8 of Bhimdatta Municipality. There is need of felling 11 trees in the project component site of Thapachauraha at ward number 8 of the municipality. There is also a need to demolish one public shed (pati) and relocation of electric pole in the same project component site.

Locations and sitting of the proposed infrastructure were considered to further reduce impacts. The WUSC has acquired land ownership for the required land areas. There is no need of resettlement of any household. There will be concern of air, water and noise pollution for a short period of time in the project specific sites. On the other hand, Occupation Health & Safety has been identified as a prominent concern of the project construction phase. The study shows that

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the environmental impacts associated with this project are not very significant. An Environmental Management Plan (EMP) is included as part of this IEE, which includes i) mitigation measures for environmental impacts during implementation, ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting, iii) public consultation and information disclosure, and iv) a grievance redress mechanism.

A number of impacts and their significance have already been reduced by amending the designs. Some of the major environmental mitigations proposed include compensatory replantation; construction of a community hall so as to compensate the dismantling of an existing commercial shed in the proposed project sit of Thapachauraha; utilization of spoil to level the ground of Shree Tribhuvan Higher Secondary School of Tilachaur, ward number 8; and specific awareness raising programs to raise the awareness of the locals and the workforce on wildlife conservation. A total cost of NRs 1,500,000 has been allocated for implementation of EMP works as per this IEE. The EMP will be included in civil work bidding and contract documents.

The beneficial impacts of the project are (i) improved access to safe water supply and sanitation facilities, (ii) increase in employment opportunities as skills enhancement in the project aera, and (iii) Improvement in the quality of life of the denizens of Chakkifanta project area.

Public Participation, Information Dissemination and Grievance Redress Mechanism

Public consultations were conducted in the preparation of the project and IEE. A 15-days' public notice was published on 18th December 2018 in a national daily *Arthik Abhiyan* to collect suggestions and opinions from the local stakeholders. A public consultation was carried out and information were provided in details regarding the project components, its activities and associated environmental impacts. Details of the draft IEE report were discussed and shared. On-going consultations will be carried throughout the project implementation period. A grievance redress mechanism is described to ensure any public grievances are addressed quickly. A Grievance Redress Committee will be established before starting of construction works of the project.

Conclusions

Siddhanath-Baijnath Urban Water Supply and Sanitation Project will bring a series of benefits to the local people. However, there are some risks in the commencement of the project on time and sustainability of the project which requires to be identified and measures 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. Based on the findings of IEE, there are no significant adverse impacts and the classification of the project as Category "B" is confirmed. No further special study or detailed Environmental Impact Assessment (EIA) needs to be undertaken.

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Urban Water Supply and Sanitation Sector Project
Project Management Office

1. NAME AND ADDRESS OF THE PROPONENT AND INSTITUTIONS PREPARING THE REPORT

The name of the proposal is '*Initial Environmental Examination (IEE) of* Siddhanath-Baijnath Urban Water Supply and Sanitation Project. It lies in Kanchanpur District of Sudurpaschim Province of Nepal.

1.1. Name and Address of the Proponent

The project falls under the Urban Water Supply and Sanitation (Sector) Project (UWSSP). Department of Water Supply and Sewerage Management (DWSSM) is the proponent of the project. The name and address of the proponent is given below;

Name of the Proponent
Project Management Office
Urban Water Supply and Sanitation Sector Project
Department of Water Supply and Sewerage Management
Ministry of Water Supply, Government of Nepal

Address of the Proponent:
Panipokhari, Kathmandu, Nepal
Phone: 977 1 4423848, 977 1 4412348
Fax: 977 1 4413280
email: info@uwssp.gov.np; website: www.uwssp.gov.np

1.2. Consultant Preparing the Report

BDA/PEA (JV) has worked on behalf of the proponent for conducting IEE studies and preparing IEE report using all the prevalent guidelines, acts, policies and regulations. The name and address of the consultant is given below;

Building Design Authority (P.) Ltd.
Architectural, Engineering & Planning Consultants
G.P.O. Box: 2882, Kamaladi, Kathmandu, Nepal
Tel : 4-227393 / 4-248200 / 4-247706 / 4-247939
Fax: 977-01-4223535, E-mail: bda@mos.com.np

JV

Plush Engineers & Architects
Engineering & Architectural Design, Project Planning & Evaluation, Socio Economic Survey etc.
P. O. Box : 2882, Kamaladi, Kathmandu
Tel : 4247706, 4227393, 42477939, 4248200

w w w . b d a . c o m . n p

The following team completed this IEE study;

Table 1: Study Team for IEE Study of the Project

SN	Name of Expert	Designation	Expertise field
1	Yogesh Shakya	IEE Team Leader	Environmental Management
2	Deependra Pokharel / Giri Bahadur Sunar	Social Safeguards Specialist	Socio-economist
3	Manoj Kumar Sharma	Engineer	Contract Management
4	Sheela Sharma / Rocky Mitra	Asst. Environmental Specialist	Environmental Science
5	Elena Pudasainee	Support Staff	

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2. SUMMARY OF THE PROPOSAL

2.1. Introduction

Along with the Third Small Towns Water Supply and Sanitation Sector Project, the Urban Water Supply and Sanitation (Sector) Project (UWSSP) will support the Government of Nepal (GoN) in providing water supply and sanitation facilities and services to around 22 additional small towns in Nepal. Asian Development Bank (ADB) has already supported the GoN through successful implementation of earlier two phases of projects in over 50 towns. Drawing experience from the past projects, the new phase project will fund physical investments in water and sanitation infrastructure in selected small towns in Nepal and non-physical investments in institutionalizing sector reforms, capacity building, project management and service delivery improvement.

UWSSP will be funded by a loan using a sector lending approach of ADB. The Executing Agency is the Ministry of Water Supply (MoWS) and the implementing agency is the Department of Water Supply and Sewerage Management (DWSSM).

The outcome will be inclusive and sustainable water supply and sanitation service delivery in selected small towns in Nepal. The project will have 3 outputs; (i) Improved water supply and sanitation infrastructure in selected small towns; (ii) Strengthened sector policy, institutional framework, service delivery and project implementation; and (iii) Improved project implementation and financing platform. The IEE is based on an assessment of these components, focused on output (i), within the project area.

2.2. Ojective of the Proposal

The objective of the proposal is to ensure adequate and safe drinking water to the targeted population of the project area. It is envisioned that the project implementation will also improve the condition of women and all beneficiaries in terms of water fetching, family hygiene and sanitation; and as a whole - the project will improve the quality of life.

2.3. Relevancy of the Proposal

There is no existing water supply scheme in the project area. People are using tube wells, kuwa and river for their daily water use. The household survey of the project area showed that about 80.2 percent of the people are using shallow tubewells while 19.8 percent are using kuwa and river for their daily water need. The present situation of drinking water is not safe and it doesn't meet the need of a growing urban center as well. The demand for institutions and local commercial activities will also increase in coming years. New residential settlements, educational institutions, commercial set-ups and other business interventions will increase in the project area in coming years as it is a part of already vibrant city of Bheemdatt. The Siddhanath-Baijnath Urban Water Supply and Sanitation Project is a good opportunity for the community to fulfill their water supply and sanitation needs.

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2.4. Rationale of IEE study

The proposed water supply and sanitation project is need to be studied from the environmental point of view as per Section 3 of Environment Protection Act 1997, and Clause H of Schedule 1 of the Environment Protection Rules, 1997 (with amendments). The proposed water supply and sanitation project is intended to serve drinking water to complete area of ward numbers 6, 8 abd 10 of Bheemdatt Municipality of Kanchanpur district. The proposed project shall be ground water sources to benefit a design population of about 21,809 (Design Year 2039).

Relevancy of environmental assessment of water supply projects is defined basically based on the population of the beneficiaries as it determines the scale of the project and its activities. Hence IEE is relevant in terms the population of the people to be served by the project as indicated in criteria 8 of Table 2 below;

Table 2: Criteria for Requirement of IEE for Drinking Water Supply Projects as per EPR (1997) - Schedule 1, Clause H, and its comparison with situation of the Project

Clause Number	Particulars	Status for proposed Project
Criteria/ Sub-clause 8	Supply of drinking water to population ranging between 5,000 and 50,000	Within Limits (21,464 permanent and 345 rented; in total 21,809 population for design year)

The design year population of the project is 21,809. As the design population of the proposed project is above threshold of 5,000 an environmental assessment is required. However, since it falls within the range of 5,000 to 50,000 - it falls under the threshold need for IEE as per definitions provided in the EPR 1997 (and its amendments).

2.5. Objectives of IEE

IEE is a tool for incorporating environmental concerns at the project level and is carried out as a part of the detailed study. The objectives are:

- To establish baseline environmental status of the project area
- To identify, predict and evaluate the potential beneficial and adverse impacts of the project on the physical, biological and socio-economical resources in the project area
- To suggest enhancement measures to augment the benefits of the project and to propose suitable mitigation measures to avoid, minimize and compensate the adverse impacts of the project.
- To prepare appropriate Environmental Management Plan (EMP).
- To inform public about the proposed project and its impact on their livelihood.
- To prepare an IEE as per the EPR, 1997.

2.6. Scope of the Study

The scope of the study is to study and prepare the IEE report as per the format indicated by EPR (1997). The task during the preparation of this report included description of the project with reference to the physical, biological and social environment, and identification of potential impacts, mitigation measures, monitoring plan and other related topics. However, the study does not limit itself only here, but has strived to completeness and objectiveness.

The study focused in the zone of influence of the project area. Its impacts zones were studied with respect to the activities related to the project. Physical, biological and socio-economic aspects of the environment and the associated concerns were studied. The current studies were conducted as per the ToR of Siddhanath-Baijnath Urban Water Supply and Sanitation Project which has been approved by MoWS. The impacts of providing infrastructure in the areas were assessed. Under the environmental impacts, adverse as well as beneficial ones, and its mitigation measures as well as augmentation measures relating to all the project activities during design, construction and operation phases were considered. The Environmental Management Plan with a Monitoring Plan was prepared. The report has been conducted fulfilling the requirements of ADB's Safeguard Policy Statement 2009 and GoN's Environment Protection Rules (1997 and amendments).

Discussions with the locals, consultations with the key persons, coordination with related stakeholders, surveys and specific studies are the range of activities of this IEE study.

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3. DESCRIPTION OF THE PROPOSAL

3.1. Type of Proposal

Siddhanath-Baijanath Urban Water Supply and Sanitation Project is a basic infrastructure development project with motive of gender strengthening in the long run. The project has been conceptualized as ground water based water supply system integrated with sanitation improvement in the project area. The focus of outputs is on water and sanitation status improvement in household level under a community owned water supply system management approach.

3.2. Salient Feature of the Proposal

The salient features of the project are given in table below;

Table 3: Salient Features of Siddhanath-Baijanath Urban Project

SN	Items	Description
1	**Name of the Project**	Siddhanath-Baijnath Water Supply and Sanitation Project, Kanchanpur Urban Water Supply and Sanitation Sector Project
2	**Type**	Ground water (Pumping) scheme
3	**Study Level**	Detailed Engineering Design Report
4	**Location Area**	
	Province	Sudurpaschim Province
	District	Kanchanpur
	Municipality	Bheemdatt Municipality
	Wards	Parts of Ward Numbers 6, 8 and 10
5	**Available Facilities**	
	Road	East-West Highway
	Nearest Airport	Dhangadhi Airport at Attariya
	Existing Water Supply System	None
	Electricity	Available
	Communication	Available
	Health Services	Available
	Banking Facilities	Available
	Attariya- Bheemdatt distance	42 km
6	**Source Characteristics**	
	Source Name	Deep Tube Well
	Source Type	Groundwater
	Source Location	Thapachauraha in Ward # 8, Bheemdatt Municipality
	Proposed Tapping yield (lps)	DTW:2 x 20,12 = 40.24 lps (Pumping)
7	**Project Components**	
	Storage Tank	RCC Overhead Tank 450 Cum : 1 # (Proposed)
	Valve Chamber (Nos.)	Type I (1500x900x1000) : 3 # Type 2 (900 x900x1000) : 86 # Pipe Valves (125mm dia) : 10 #
	Household Connection (Nos.)	1730 for base year; 24 hours supply
	Total Length of pipe (Km)	Transmission : 4.865 Km Distribution : 52.904 Km

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SN	Items	Description
	Treatment Unit	Pressure filter, Softener and Disinfection
	Fire Hydrants	21 numbers
8	**Social Status**	
	Survey Year Population (2017)	9,178 (permanent) 132 (floating) [Total 9,310]
	Base Year Population (2019)	9,903 (permanent) 144 (floating) [Total 10,047]
	Design Year Population (2039)	21,464 (permanent) 345 (floating) [Total 21,809]
	Adopted Annual Growth Rate %	3.95 (Average)
	Household Numbers (2017, 2039)	1,603 HHs in 2017 and 3,745 HHs in 2039
	Average Family Sizes	5.73
9	**Total Water Demand**	
	Base year 2019 (m^3/day)	**Total 1,069.51**
	Design year 2039 (m^3/day)	**Total 2,606.66**
10	**Total Cost of the Project (NRs.)**	**280.8834 million** with 15% contingencies & 13%VAT
	Water Supply Sector	NRs. 274.5817 million
	Sanitation Sector	NRs. 6.3017 million
11	**Cost Sharing Arrangement for water supply component (NRs)**	**274.5817 million**
	1) GoN Grant @ 70%	NRs. 192.2072 million
	2) WUSC Contribution	
	a) Upfront cash contribution @ 5%	NRs.13.7291 million
	b) Loan through TDF @ 25%	NRs.68.6454 million
12	**Cost Sharing Arrangement for Sanitation Component (NRs)**	**6.3017 million**
	1) GoN Grant @ 85%	NRs.5.3564 million
	2) Local Body (WUSC, Municipality & others) 15%	NRs. 0.9453 million
13	**Per capita Investment (for water supply sector)**	**Base Year** : NRs. 27,329.71 (considering permanent and floating population both) **Design Year** : NRs. 12,590.29 (considering permanent and floating population both)
14	**Project Status**	Detailed Engineering Design (2018) Construction Period of 18 months

3.3. Location of Proposal

Siddhanath-Baijnath project area is a growing town in Kanchanpur district. The location of the project area is latitude 28°55'0" N and longitude 80°20'0" E. It is bordered by Kailali district in East, Dadeldhura district in North and India in South and West. It lies within the Bheemdatt municipality which is a hub of activity for industries running between India and Nepal. It is also a gateway to Shuklaphanta National Park. East-West highway passes through the project area. Siddhanath-Baijnath project area is located about 42 km away from Attariya.

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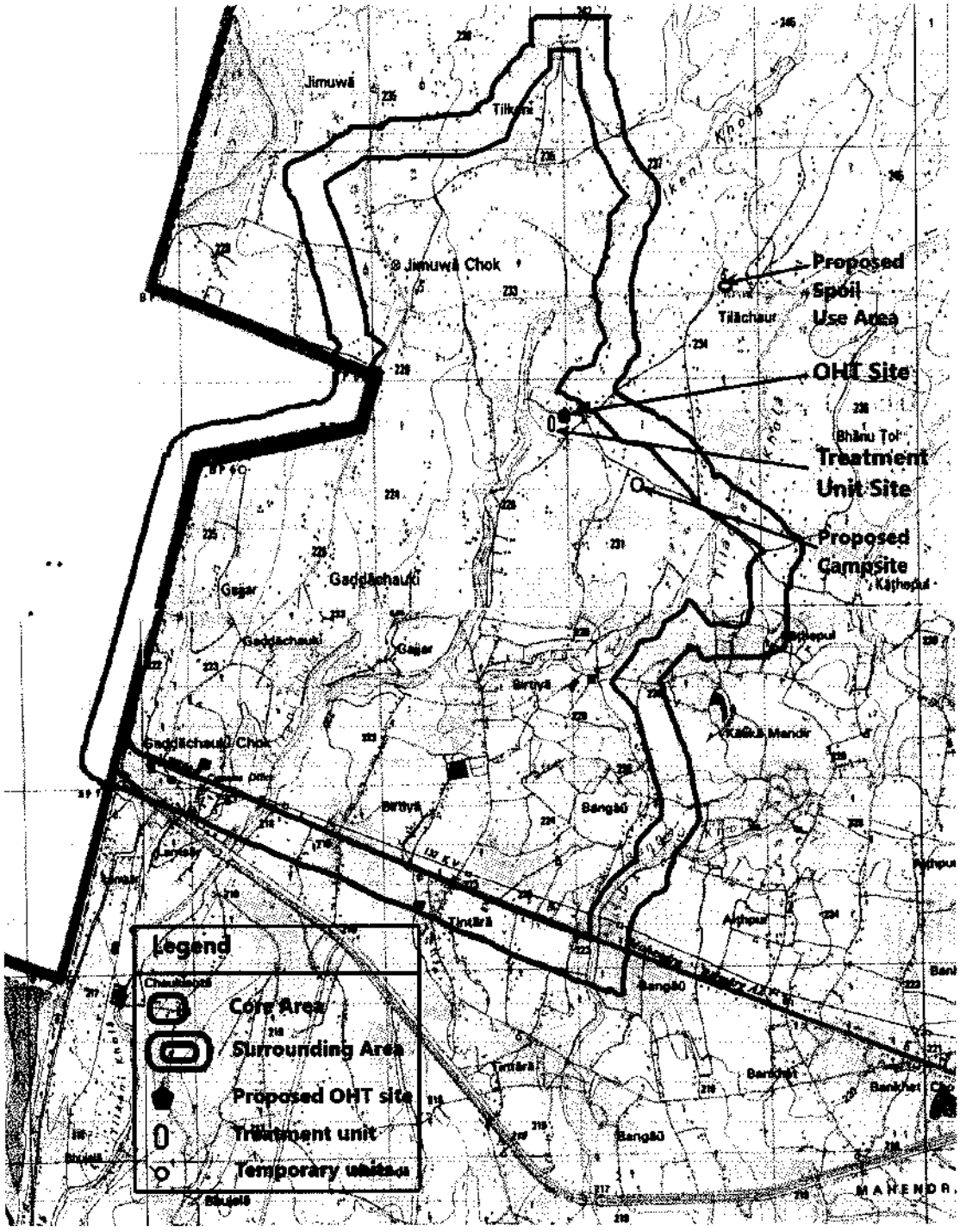

Figure 2: Project Components and Project Area Delineation

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3.8. Methods Adopted During Study

The present Initial Environmental Examination report has been prepared based on the Terms of Reference (ToR) approved by the Ministry of Water Supply, GoN, on 15th November 2018. The study has followed the provisions outlined in the Environment Protection Act, 1997 and Environment Protection Rules, 1997, and Safeguard Policy Statement, 2009 of the Asian Development Bank (ADB). The major activities undertaken during the preparation of IEE are outlined below;

3.8.1. Desk Study

Existing secondary data relevant to the proposed project was collected from various published and unpublished sources from different governmental and non-governmental organizations. Municipality profile of Bheemdatt Municipality, Detailed Engineering Design Report, toposheet of project area, EPA 1997 and EPR 1997, Environmental Assessment Review Framework for Urban Water Supply and Sanitation (Sector) Project 2018 - ADB were specifically reviewed. Policies, legislations and guidelines relevant to the project were also referred. Specifically, water supply, sanitation, urban aspects and biodiversity aspects were considered.

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

3.8.2. Literature review

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 pertaining to environmental standards, acts, and regulations were collected and reviewed. Published and unpublished literatures of the project area pertaining to 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.

3.8.3. Field Work

Field studies were conducted in project site areas in an extensive manner by a multidisciplinary team, which comprised of an environmentalist, biologist, socio-economist, and civil engineer. During the visits, baseline information on physical and cultural, chemical, biological, and social conditions of the project direct and indirect impact areas were collected by using checklists (Annex 7). Field works of IEE study were carried out during first quarter of 2019. The sub-sections below present briefly the various approaches and methodological tools used during the field exploration.

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Physical Assessment

A field survey was carried out by delineating the project impact area to collect the baseline information on physical environment. Topographic and geomorphic features were observed and documented. Physical features such as topography, climate & meteorology, air quality, erosion and land stability & landuse pattern were observed and recorded. In-situ measurements and samplings were carried out for field assessment of physical environment. Topographic and geomorphic features were observed and documented. Similarly, data on rainfall and other meteorological conditions were collected. Consultations with the local communities were were carried out through-out.

Biological Assessment

Study of the vegetation was carried out during walkthrough survey in the project area. Type of vegetation and forest were identified based on the species composition. Biodiversity of the core impact area and surrounding area were studied. Ethno-botanical information was obtained. The protected vegetation (rare, endangered, indigenous etc.) of the influence area as per IUCN Red Book, CITES Appendices, and GoN list species were studied based on consultation with the local people in the indirect impact areas of the project.

Wildlife bio-diversity in the indirect impact areas was studied in the field interacting with local people to identify linkages between wildlife habitats and proposed activities of this project. The indicator wildlife and threatened or endangered species (as per IUCN Red Book, CITES Appendices, and GoN list) in the area were listed through consultation with the local communities.

Socio-economic and Cultural Environment: Household survey with questionnaires was conducted by interviewing to obtain information on socio-economic and cultural environment like demography, ethnicity, education, health, and sanitation, drinking water condition of the project area, irrigation facility, local traditions, religion, land holding pattern, income and expenditure and to acquire their perception towards proposed project, etc. The survey conducted during the detailed design period covered 100% of the total HHs.

Stakeholder consultations were held at at Siddhanath-Baijnath project area in order to interact with local people and stakeholders so as to collect information on local socio-economy, potential impacts, and to obtain suggestions from all relevant stakeholders. Direct observation (walk-through survey) was done to collect information on the cultural sites, and public institutions such as temples, and festival sites, historical and archaeological sites, school, and health post within the project area. Consultation with local elites and focus group discussions were conducted to assess the current situation of these facilities.

3.8.4. Data processing

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

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3.8.5. Impat Identification, Impact Prediction and Evaluation

The impacts were identified using simple checklist method. A project specific checklist was developed and was used during field observation, walkthrough surverys, and during key respondent interviews. The impacts were predicted based on probabilistic approach, and based also on expert judgements. The impacts are evaluated based on their impact levels, coverage of area and duration of the impacts. The evaluation will be supportive to emphasize the need to address the concerns. Magnitude, geographical extent and duration of impacts are defined below;

Magnitude: This can be low-L (minor), medium-M (moderate), and high-H (major), depending on the scale or severity of change.
Geographical extent: If the action is confined to the project area, it is referred as site specific (Ss), if it occurs outside area but close to project area, the extent of impact is local (Lc), if it occurs far away from the project, it is referred as regional (R).
Duration: It can be short term (St - i.e. less than 3 years), medium term (Mt - i.e. 3-20 years), and long term (Lt - i.e. more than 20 years).

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

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

3.8.6. Consultation and Information Dissemination

Public consultation and information dissemination process was carried out to inform the local people and concerned agencies about the project and to obtain their concerns, issues and suggestions. The methods adopted for conducting public consultations included holding meetings with local authorities, institutions and NGOs. Key informant consultations and meetings were also held with the stakeholders within the project area. The land availability for project components, and location of these components were also discussed in the semi-formal, formal and informal meetings. A 15 days' public notice was published on 18th December 2018 in a national daily newspaper *Aarthik Abhiyan* seeking written opinions from municipality office, DCC, schools, health posts and related local organizations and concerned people. A copy of the Public Notice was also posted in the notice board of Municipality office, ward offices, and other public places in the project area and the deed of inquiry was collected. The public consulation was carried out on 23rd January 2019 in a local cooperative firm's meeting hall nea Thapachauraha. The major concerns raised during the public consultations were greenery promotion, prioritization for local employment, waste/spoil disposal, and need of sanitation support through the project. (Annex 5). A recommendation letter from the municipality office has also been received. The final IEE report, after incorporating the comments from the concerned department and ADB, will be made available in their respective websites and will be made available to anyone interested upon request.

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3.9. Environmental Baseline Information

3.9.1. Physical Environment

3.9.1.1. Topography, Geology And Soils

Siddhanath-Baijnath project area is a growing town in Kanchanpur district. The location of the project area is latitude 28°55'0" N and longitude 80°20'0" E. It is bordered by Kailali district in East, Dadeldhura district in North and India in South and West. It lies within the Bheemdatt municipality which is a hub of activity for industries running between India and Nepal. It is also a gateway to Shuklaphanta Wildlife Reserve. East-West highway passes through the project area. Siddhanath-Baijnath project area is located about 42 km away from Attariya. Service area has elevation difference in order of 22 m.

Geologically it is situated in the foothills of Mid-Hills of far western Nepal. The underline formation of the area is of cobbles, gravels and sand with pockets of clay. Acidic soil is usually found in the forest area. The main four orders of soil are entisols, inceptisols, mollisols, and alfisols. The areas around the borehole compounds are stable without any apparent occurrence of land instabilities. The area is rich in ground water potential, shallow as well as deep aquifers are being extracted for drinking, irrigation and industrial purposes.

3.9.1.2. Land Use

The majority of land in the municipality is covered by cultivated land (51.49%) followed by forest area (33.39%), built up (2.21%), bush/grassland (1.35%), barren land (0.71%), and debris (0.46%). The information on land use pattern of the project area will be collected during detailed study period of this IEE. In the core area of the project, the land use is around 75% cultivated land, and built-up area of around 10%, around 2.5% surface water bodies and rest is bush/barren land.

3.9.1.3. Climate

The project area lies in a part of alluvial deposit of Mahakali River and its tributaries. The altitude of the project area is varying from 203 m- 225 m above mean sea level. The project area is a flat-land with frequent waterways flowing across mostly from North-East to South wards. It has humid type of climate. The maximum temperature varies from 37°C-40°C in summer and 4°C to 18°C in the winter. The relative humidity is in the range of 84-87 %. The average rainfall is 1900 mm. Almost 80% of rainfall occurs during monsoon (June to September).

3.9.1.4. Air Quality

There are no major industries in the project area. There are 2 brick factories and 10 cottage industries. Air pollution is caused by emissions from these along with the fugitive dust from vehicle movements particularly over unpaved roads, and by local small scale constructions activities. Emissions from these sources are scattered/spread apart both in terms of locations and timing, and may couple with the low scale emissions from any new construction activities. Based on direct observation, it was noted that the air quality is under normal limits without dust.

3.9.1.5. Acoustic Environment

The sources of noise in the project area are the local small scale construction activities and vehicle movements. The anthropogenic noise is confined in few clustered settlements and in market places and only in the daytime. From direct field observation, noise level in Siddhanath-Baijnath project area is within normal limits.

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3.9.1.6. Surface water bodies and Water Quality

Tilkeni khola, Tilachaur khola, Bangau khola and Jimuwa khola are the surface water bodies of the project area. The surface water sources do not have significant source of threat. However, disposal of waste onto water bodies is seen as a concern at some places. No major case of ground water contamination was noticed. Based on direct field observation of surface water bodies, it was observed that water quality has no objectional colour or odour, and is at almost normal condition.

3.9.1.7. Solid Waste Management

There is no proper system of solid waste collection and final disposal. General pit composting is observed in the core area and surrounding area. Recyclables are collected and sold to local scrap dealers. There is lack of proper education and knowledge regarding management of solid waste and waste water. Since the area is not industrial area, the waste water generated is mostly from residential areas which is being disposed into septic tanks and soak pits.

3.9.1.8. Sanitation Services

Most of the households have their own toilets in or outside the house. In the core area, most of the buildings have been constructed with attached water sealed toilet or flush toilet with septic tanks. The newly constructed houses, offices and camps need to be monitored so as to ensure that there is no open defecation. Most of the households do not have access to proper drainage and sewerage facility. There is no municipal drainage system in the project area.

3.9.2. Biological Environment

3.9.2.1. Flora in Project Area

The project area is a mix of agricultural land, settlements and areas with thin tree cover. The area has rich surface flow of water bodies. There are only scattered tree covers and grasslands within the project area. Natural Sal (*Shorea robusta*) forest is predominant in the project aera. Khayar (*Senegalia catechu*), Sisso (*Dalbergia sisso*), Betel nut (*Areca catechu*), Kadam (*Anthrocephalus chinensis*), Bar (*Ficus benghalensis*), Peepal (*Ficus religiosa*), Liptis (*Eucalyptus*), Bamboo (*Bambusa vulgaris*) and Amriso (*Thysanolaena*) are the common species found in the project area. Amp/Mango (*Magnifera Indica*), Banana trees (*Musa Velutina*), Guava (*Psidium guajava*) are among the common fruit species found in the project area.

3.9.2.2. Fauna of in Project Area

Many species of mammals and birds are observed in the project area. Both large and small mammals are present. Spotted dear (*Axis axis*), Muntjac deer (*Muntiacus*), Fox (*Canisaurens*), Wild Boar (*Sus scrofa*), Langoor Monkeys (Trachypithecus *francoisi*), Squirrel (*Sciuridae*), Hispid hare (*Caprolagus hispidus*), Rabbit (*Lepus nigricollis*), etc are found in and around the project area. Birds such as Crow (*Corvus splendens*), Peacock (*Hubaropsis bengalensis*), Hutityau (*Tringa hypoleucos*), Sparrow (*Passer domesticcus*), Pigeon (*Columba livia*), and Parrot (*Cacatuasp.*), Eagle (*Haliaeetus leucocephalus*) are among the bird species found in the area.

There are no protected areas within project area. The core project area doesn't lie within demarcated chure area. The project area is situated around 2 km north from the closest boundary of Buffer Zone of Shuklaphanta National Park.

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3.9.3. Socioeconomic and Cultural Environment

3.9.3.1. Demography:

Service area of the project has been established to cover wards 6, 8 and 10 of Bheemdatt Municipality. While carrying out the household survey, the local community people, leaders and key informants provided great assistance to identify the exact service area to be considered in the proposed project. Household survey within service area accounted the total households as 1,603 and permanent population as 9,178. The ward numbers and the cluster settlements including the survey year households and the population is presented in table below;

Table 4: Service Area, HH and population

Municipality	Ward No.	Cluster / Settlements	HHs	Population		
				Permanent	Rental (Floating)	Total
Bheemdatt Municipality	6	Baijnath, Bhumi Raj Tole, Banagau, Purnima Tole	111	710	32	742
	8	Sidhanath, Bhanu, Jyoti	142	880	5	885
	10	Adarsha Tole, Amarjyoti Tole, Badimalika Tole, Basanta Tole, Baijnath Tole, Danu Baba tole, Divya Jyoti Tole, Gadda Chauki Tole, Gajar, Gyanu Baba Tole, Gauri Shankar, Gorakhnath , Jay Jagarnath, Jimuwa, Mahalaxmi Tole, Maheshori, Malikarjun Tole, Mankamana Tole, Nagarjune, Pashupati Tole, Pragati Tole, Purnagiri, Sangam Tole, Shanti Tole, Sarswati Tole, Shiva Tole, Sidhanath Tole, Sidheshori Tole, Sukasal, Tintara, Bijaya Tole	1350	7588	95	7683
Total			**1603**	**9178**	**132**	**9310**

Source: Socio-economic Survey, 2017

The project area has average household size of 5.7 and male to female ratio is 1.02 in average. Migration to this town from nearby hill areas and hinterlands has been observed. It was recorded that around 15 families migrated in the service area during the year 2074/75 (Field study, 2019).

3.9.3.2. Caste and Ethnicity

The proposed project service area comprises different caste / ethnic groups. Each caste and ethnicity is characterized by its own customs, traditions, culture and nature of occupation with which they are associated. Dalit comprising 23.8 percent of total families are prevailing ethnic group in the service area. Brahmin/Chhetri is the major group with 75.7% as shown in table below;

Table 5: Caste / Ethnicity

Ethnicity	Ward Number			Total	Percentage
	6	8	10		
Brahmin/Chhettri	72	130	1011	1213	75.7
Janjati		1	6	7	0.4
Dalit	39	11	332	382	23.8
Other			1	1	0.1
Total	**111**	**142**	**1350**	**1603**	**100.0**

Source: Socio-economic Survey, December 2017

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The service area has no significant cases of untouchability and no significant social discrimination. The WUSC has ensured on the full access of water supply system to people of all castes and social status.

3.9.3.3. Occupation

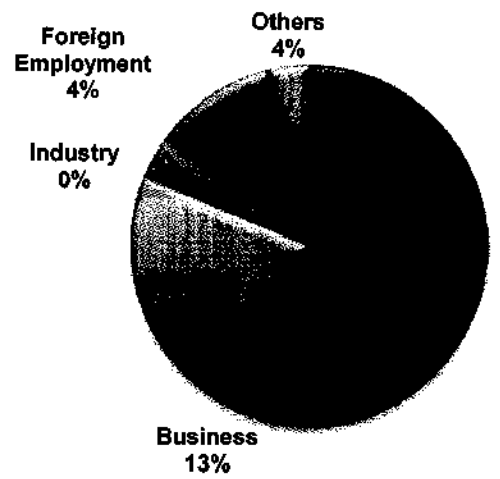
Although, the economy of the area is gradually shifting from rural agricultural economy to trade/ business and service based, majority of the households are still dependent on agriculture. As the socio-economic data shows, around 43 percent of the households have agriculture as main occupation. Service is another main occupation (25%) followed by business (13%). The ward-wise households by occupation are presented in table below;

Table 6: Main Occupation of Household

SN	Occupation	Ward Number			Total	Percent
		6	8	10		
1	Agriculture	63	108	524	695	43.4
2	Business	5	13	195	213	13.3
3	Services	1	15	377	393	24.5
4	Industry		2		2	0.1
5	Foreign Employment	3		55	58	3.6
6	Wages	4	3	175	182	11.4
7	Others	35	1	24	60	3.7
	Total	**111**	**142**	**1350**	**1603**	**100.0**

Source: Socio-economic Survey, December 2017

Figure 3: Main Occupation of Households



3.9.3.4. Household Monthly Income Level

Economic condition of the families in service area is satisfactory in terms of their monthly income level. The distribution of households by income range is shown in Table V-4, which indicates that 59.5 percent of them have income range NRs. 20001-50000 per month. Likewise, 27.1 percent of households fall under the income range NRs. 8001-20000 categories. As the data shows 7.4

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percent of households have highest income level (more than NRs.50,000 per month), whereas 2.0 percent of the households have lowest income level i.e. less than NRs. 5,000 per month

Table 7: Monthly Average Income Range

SN	Income Range (NRs.)	Ward No.			Total	%
		6	8	10		
1	<5000	12	2	4	32	2.0
2	5000-8000	5	10	15	27	1.7
3	8001-20000	42	63	372	434	27.1
4	20001-50000	45	64	870	954	59.5
5	>50000	7	3	89	119	7.4
Total		**862**	**111**	**142**	**1350**	**1603**

Source: Socio-economic Survey, December 2017

Finding of socio-economic census survey depicts that the household average monthly income is NRs. 24,057. There will be fixed monthly water tariff based on optimal use of water by the beneficiaries. There are some cases of very poor families as well. The WUSC will have the full priority to include the backward communities in its service, and will have the authority to establish provisions to facilitate for financial ease of the payments of monthly water use tariff by such families.

3.9.3.5. Existing Water Supply Condition

The findings of socio-economic census survey of the service area is given in table below, which signifies that more than 80.2 percent households in the service area have tubewells and 19.8 percent of them are getting water from other sources such as kuwa, and river. There is no systematic water supply distribution facility in this area.

Table 8: Existing Sources of Water

SN	Water Source	Ward No			Total	Percent
		6	8	10		
1	Public Tap	0	0	0	0	0
2	Private Tap	0	0	0	0	0
3	Shallow tubewell/hand pump	80	107	1100	1287	80.2
4	Others (Kuwa/Mul/River)	31	35	250	316	19.8
Total		**111**	**142**	**1350**	**1603**	**100.0**

Source: Socio-economic Survey, December 2017

3.9.3.6. Existing Sanitation Condition and access to household latrine

Most of the households in the market area have permanent type of private latrine and others have temporary type of private latrine. In total 97.8 percent (1567 out of 1603) of the households have household toilet. Among the households with access to household latrine, 90.3 percent of

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them have water-sealed type latrine, 7.0 percent have ventilated pit latrine and 2.7 percent have pit latrine. The following table shows ward-wise the access to household latrines;

Table 9: Access to Household Latrine and Latrine Types

SN	Toilet Type	Ward No.			Total	
		6 (Total 111 HHs)	8 (Total 142 HHs)	10 (Total 1350 HHs)	No.	%
1	Pit Latrine	30	2	11	43	2.7
2	Ventilated Pit	64	3	42	109	7.0
3	Water Seal	17	135	1263	1415	90.3
Total		**111**	**140**	**1316**	**1567**	**100.0**

Source: Socio-economic Survey, December 2017

3.9.3.7. Existing Health Situation

The service area has a good availability of health services. There is Health Post in ward 10 with 2 bed facilities and a Health Desk in ward 10. The data of water-borne disease from Jimuwa Health Post show that there are significant cases of typhoid and dysentery in the project area.

Table 10: Data of Water Borne Diseases from Jimuwa Health Post

SN	Types of diseases	FY 2073/74	FY 2074/75 (6 months)
1	Typhoid	302	179
2	Dysentery	240	78
3	Jaundice	11	9
4	Tape-worms	50	15
	Total	**603**	**281**

Source: Field Survey, February 2018

Total 4741 numbers of water born/related diseases infected persons were found and treated by Zonal Hospital last year. Out of the total incidents, 1000 incidents were diarrheas, 900 and 557 were suffered from typhoid and dysentery likewise, and 1646 water related skin diseases were also reported in the project area.

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

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3.10.2. Nepal's Environmental Legal Frameworks

Environment Protection Act (EPA), 2053 B.S., 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 Forests and Environment (MoFE), respectively, prior to implementation. The EPA: (i) sets out the review and approval process of IEE and EIA reports, that involve informing and consulting stakeholders; (ii) stipulates that no one is to create pollution that would cause significant adverse impacts on the environment or harm to public life and health, or to generate pollution beyond the prescribed standards; (iii) specifies for the Ministry in charge of environment (currently the MoFE) to conduct inspection of approved projects to ensure that pollution prevention, control or mitigation is carried out according to the approved IEE or EIA report; (iv) provides for the protection of objects and places of national heritage and places with rare plants, wildlife and biological diversity; and (v) states that any person/party affected by pollution or adverse environmental impact caused by anybody may apply to the prescribed authority for compensation to be recovered from the polluter/pollution generator.

Environment Protection Rules (EPR) 1997 (and its amendments), define the implementing rules and regulations of the IEE/EIA process, elaborating the provisions in the EPA. The preparation, review and approval of IEE and EIA reports are dealt with in Rules 3 to 7 and 10 to 14. Schedule 1 and Schedule 2 list down the projects of activities that are required IEE and EIA, respectively, as amended in 2007. Other environmental acts, rules, plan, policies, guidelines that are relevant to the project are presented in Table 11;

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Table 11: Other Relevant Environmental Acts, Rules, Regulations, Guidelines & Manual of Nepal

Act/ Rule Policy/Law/Guideline	Year	Relevant Provisions	Remarks
Environment Protection Act	2076 BS	The act emphasis on new aspects like provisions of Preliminary Environmental Study, IEE and EIA under the jurisdiction of local authority, provincial government, and central government. Need of Strategic Environmental Assessment for policies/plans/programs, and considerations of climate change for projects are among the newly enforced aspects of this act.	
Labour Act Labour Rules	2017 2018	The Act emphasizes OHS Policy; Safety & Health Committee; OHS arrangements including child care center; workplace safety; environment of work place; and specific Labour Audit Additional rest period for certain female employees, Specific provisions relating to the safety of the works having health hazards are also there in the Act	
Water Resources Act	2049 B.S. (1992 A.D.)	A comprehensive law on the development, use and conservation of water resources in Nepal, it aims to minimize damage to water bodies by requiring the conduct of EIA & preparation of EIA Report before granting license to use water resources for any purpose.	
		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;	
		Article 18 requires the compliance to quality standards in making use of water resources. Article 19 prohibits the pollution of water resources. Under the Act are two regulations for drinking water purposes: (i) Water Resources Regulation, 1993, setting out the implementation procedures for the Act; and (ii) the Drinking Water Regulation, 1998, which specifies compliance with the drinking water quality standards and control of water pollution (or sanitation) as it affects drinking water.	
Forest Act	2076 B.S.	It stipulates that the GoN can develop a land use plan of a forest in order to maintain the balance of environment and development. It also provisions that the government can develope a specific forest conservation plan for a particular section of a national forest. It also states that the forest area can be used with approval for national priority projects.	

Act/ Rule Policy/Law/Guideline	Year	Relevant Provisions	Remarks
National Environmental Policy and Action Plan (NEPAP)	2049 B.S. (1993 A.D.)	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.	Project will not have significant impacts on physical cultural heritage & biodiversity. EMP provides measures to mitigate some of the possible impacts.
National EIA Guidelines	2050 B.S. (1993 A.D.)	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.
Local Government Operations Act	2017	The Local Government Operation Act, 2017 empowers the local authority for the conservation of local natural resources and implementation of environmental conservation activities along with prime responsibility of conducting development projects which includes water supply, sanitation and awareness activities. Provides basis for Local Government to monitor the environmental performance of the projects. EMP provides the responsibilities of LGs in EMP implementation.	
Child Labor Prohibition and Regulation Act	2056 B.S. (2001 A.D.)	The section 3 of the act prohibits a child from engaging in work, sub clause 1 of the clause 3 states "Nobody shall engage in work a child who has not completed fourteen years of age as a labor and sub clause 2 states "Nobody shall engage a child in a risk full occupation orwork set forth in the Schedule". The section 4 states "Child not to be engaged in work against his will by temptation or fear or pressure or by any other means"	
Implementation Directives for the National Drinking Water Quality Standards	2063 B.S. (2005 A.D.)	It sets out the water sampling, testing, analysis, monitoring and surveillance procedures to certify that the quality of supplied drinking water conforms to the National drinking Water Quality Standards.	Monitoring of the quality of supplied water is prescribed in eth EMP following the NDWQS Directives.
Updated 15-Yr Development Plan for Small Towns Water Supply and Sanitation Sector	2067 B.S. (2009 A.D.)	The Plan defines the population threshold of "small towns" to be in the range of 5,000 to 40,000. Reference to Schedules 1 and 2 of the EPR, as amended in 2007, places water supply projects in small towns under Schedule 1 or within the threshold of water supply projects requiring only an IEE. The Plan	EMP prescribes environmental effects and performance monitoring.

Act/ Rule Policy/Law/Guideline	Year	Relevant Provisions	Remarks
		emphasizes monitoring and evaluation as an important component of a project to determine the overall impact of a project.	
Solid Waste Management Act	2068 B.S. (2011 A.D.)	Article 4 provides that the management of hazardous, medical, chemical or industrial waste rests upon the generators of such wastes. Management should be as prescribed in the Act. Article 5 provides that individuals and entities have the duty to reduce the amount of solid waste generated while carrying out work or business.	EMP prescribes environment friendly management of solid and hazardous wastes.
Consumer Protection Act	2075 BS	Article 3 of the act states that every consumer shall have the rights to quality goods and services. Article 7 talks about compensation to the customer if any kind of damage is caused due to the manufacture of goods and service. Article 12 provisions that the service provider should provide services without any discrimination.	
Guidelines for removel of trees from government land	2071	This procedure simplifies the procedure of getting approval from the local authority/government for tree removal	

3.10.3. International Conventions

Nepal is party to the following international environmental agreements that have broad relevance to works and environmental assessment of works under the Project: (i) Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), in (2045 B.S.) 1987 A.D.; (ii) Convention on Biodiversity, in 2050 B.S. (1992 A.D.); and (iii) Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and Their Disposal, in (2053 B.S.) 1996 A.D. The relevance of the aforementioned environmental agreements to the Project are on their emphasis for human activities (such as development projects) to: (i) take on/institute measures to protect the local, as well as global, natural resources and/or environment; (ii) prevent and/or reduce the causes of climate change; and (ii) 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 population with sustainable access to safe drinking water and basic sanitation.

The Siddhanath-Baijnath Urban Water Supply and Sanitation 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.

3.10.4. RELEVANT STANDARDS

Table 12: 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 (2062) of Nepal shall be applied since these resources are used for drinking.

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3.11. Environment Assessment Requirement of ADB

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

3.11.1. Environmental Assessment Requirements of the 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, are designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards. With respect to the environment, the SPS 2009 is underpinned by the ADB Operations Manual, Bank Policy (OM Section F1/OP, 2010). 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 13 and the IEE is intended to meet these requirements.

Table 13: 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. 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 Chapter 5

[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

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SPS 2009 - Safeguard Requirements	Remarks
Avoid, and where avoidance is not possible, minimize, mitigate, &/or offset adverse impacts and enhance positive impacts by means of environmental planning & management. Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.	An EMP has been prepared to address this requirement. Chapter 7
Carry out meaningful consultation with affected people &facilitate their informed participation. Ensure women's participation. Involve stakeholders, including affected people & concerned NGOs, early in the project preparation process & ensure that their views & concerns are made known to & understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to EA. Establish a GRM to receive & facilitate resolution of affected people's concerns & grievances on project's environmental performance.	Key informant and random interviews have been conducted. A grievance redress mechanism for the resolution of valid Project-related social and environmental issues/concerns is presented in Chapter 7
Disclose a draft EA (including the EMP) in a timely manner, before project appraisal, in an accessible place & in a form & language(s) understandable to affected people & other stakeholders. Disclose the final EA, & its updates if any, to affected people & other stakeholders.	The draft IEE will be disclosed on ADB's website prior to Project appraisal. 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,	The project does not encroach into areas of critical habitats.

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SPS 2009 - Safeguard Requirements	Remarks
(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.	
SPS 2009 - Safeguard Requirements 1	**Remarks**
Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	This requirement is 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.
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 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 to mitigate adverse impact on PCRs in case of chance find.

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3.12. Existing Condition

Existing Water Supply and Sanitation Situation

There is no existing water supply scheme in the Siddhanath-Baijnath project area, Kanchanpur. People are using tube wells, kuwa and river for their daily water use. In general the overall sanitation condition of the project area was observed satisfactory. In the project area, most of the households in the market area have permanent type of private latrine and others have temporary toilets.

The current practice of human excreta management and disposal is on-site sanitation consisting of individual household or institutional septic tanks often without a proper effluent disposal system. The septic sludge is often discharged, though illegally, into surface water. The existing practice is unhygienic and unaesthetic for the population. The sewerage system has not been developed in the service area so far.

Type, Category and Need of the Project

Under ADB classification, the Project is of Category B, which needs an initial environmental examination (IEE). Under GoN policy, the scope/scale of the project is within the threshold of projects requiring an IEE as listed in Schedule 1 of the EPR. The proposed "Siddhanath-Baijnath Urban Water Supply and Sanitation Project" is a ground water based water supply system project covering wards 6, 8 and 10 of Bheemdatt Municipality. The project comprises of two major components; *water supply* and *sanitation*. The water supply part comprises of pumping from deep tubewells and its gravity based distribution system from an OHT. Small scale sanitation intervention with focus on household toilets is also a component of this project. The present situation of drinking water is not safe and it doesn't meet the need of a growing urban center as well. The demand for institutions and local commercial activities will also increase in coming years. New residential settlements, educational institutions, commercial set-ups and other business interventions will increase in the project area in coming years as it is a part of already vibrant city of Bheemdatt. The Siddhanath-Baijnath Urban Water Supply and Sanitation Project is a good opportunity for the community to fulfill their water supply and sanitation need.

3.13. Size and Magnitude of Operation

The water supply system has been designed for a base year population of 10,047 for the year 2019. The system has been designed to extract ground water source from deep tubewell for a total design year population of 21,809 for the year 2039. One new overhead reservoir has been proposed considering the locality and topography of the project area. A total of 4.865 km of transmission mains and 52.904 km of distribution lines will serve household connection to 1730 households in the base year.

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3.14. Proposed Schedule of Implementation

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

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

- Preparation of Detailed Engineering Design
- Preparation of Working Drawings
- Preparation of Quantity and Cost Estimates
- Carrying out of Economic and Financial Analysis and level of Water Tariff
- Preparation of Socio Technical Profile
- Environmental Study of the Project Area
- Preparation of Tender Documents
- Awarding of Contract
- Construction
- Operation and Maintenance

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

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design period. However, initially during construction phase, only 1730 house connections are provided to satisfy the need for the base year population.

(vi) Appurtenances

These will primarily comprise of valve chambers in flow control valves for controlling flow in the pipeline. Altogether 89 valve chambers and 10 pipe valve boxes are expected in the system. Other appurtenances as air valves, scour valves, fire hydrants will be provided at suitable locations. Some road crossing has been initially provided. This will also facilitate for less road cuttings during the operational phase.

(vii) Guard House

There is no guard house in the project area. One guard house is proposed in the Siddhanath-Baijnath project area. The guard house is to be located at the reservoir site.

(viii) Office Building

There is no office building in the project area. Thus new one is proposed to accommodate the required facilities including a laboratory room, counters, manager's room and meeting hall. The building will be of two stories. The ground floor coverage will be around 1830 square feet.

(ix) Generator/Operator Room

One permanent generator operator houses to accommodate the generators shall be constructed. In case of failure of power supply the generator shall be used to supply power to the pumps to deliver water. A permanent area to accommodate the pump / plant operator will be provided in this generator house.

(x) O & M Equipment and Tools

An assessment was done for the needed items. The UWSSP has also some guide lines on it. The list of tools required for the operation and maintenance has been listed in BoQ document. Besides these, the following equipment have been also considered in the project so that project works during construction period and for operational activities are effectively carried out;

a) Leakage detecting equipment - 1 set
b) Submersible sludge pump - 1 no.
c) Electro-fusion machine for joining HDPE pipes including portable Generator - 1 set
d) Water quality testing laboratory equipment - 1 set
e) Other Tools and Plants like: electric pipe cutters, pipe wrenches etc.

(xi) Project Components and Land Availability

All the structural components of the project will be built on the land acquired by the WUSC. These sites are selected on the basis of technical feasibility and it is kept in mind that minimum vegetation cover is disturbed. All the structurs like treatment unit, one reservoir, generator house, guard house and WUSC building are proposed in a single site. Around 1790 square meters of land is required for the project components. The distribution lines will be through the RoW.

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3.16. Construction and Operation Activities of the Project

The construction phase will include following activities;

- Deep boring, and excavation and surface clearing activities,
- Earthworks for construction of treatment plant, reservoirs, pipeline extension, and foundation works. The trenches for pipelines will be 90 cm deep. The total spoil generated will be around 550m^3.
- Machinery works like cutting of iron-rods, mixing of concrete; operation of generators as per need,
- Mechanical works like vehicle operations, maintenance of vehicles and equipments,
- Manual works assisted by equipment use; like masonry works, casting, pipeline laying, plumbing,
- Temporary facilities like campsite establishment, and stockpiling of construction materials/fuel will be needed for the project. There will be only one campsite and stockpile site proposed,
- Storage and disposal of extra spoil and solid waste will be carried out, and
- Transportation activities for construction materials.

The operation phase will include following activities;

- Operation of electrical pumps, and operation of diesel generator sets during electric power shortage will be required ,
- Disinfection of water using Bleaching powder
- Water Quality Laboratory operation
- Backwash of treatment plant
- Other O&M works

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4. IMPACTS OF THE IMPLEMENTATION OF THE PROPOSAL ON THE ENVIRONMENT

The potential impacts of the proposed Siddhanath-Baijnath Urban Water Supply and Sanitation Project are *Physical*, *Biological*, and *Socio-economic & Cultural* in nature. These impacts may occur at various phases of the project such as design, preconstruction, construction and operation and maintenance phases. The magnitude of these project related impacts can be small, moderate, or high depending upon its severity, and can be temporary or long term, reversible or irreversible, local or wide. The impacts need not necessary be limited to negative ones but can be positive as well. The objective of this environment assesment is to attempt to augment positive impacts and to minimize negative impacts through sustainable mitigation measures.

4.1. Beneficial Impacts and Augmentation Measures

4.1.1. Construction Phase

i. Employment Generation and Increase In Income

An important direct beneficial impact of a construction project is the generation of employment opportunity to the local communities and its nearby places. The socio-economic study shows that around 11.4% of the household have daily wage-based works as main occupation of the household. The locals who are interested can get opportunities in semi-skilled, unskilled as well as skilled works. This opportunity remains open to all, but the priority will be given to the locals. The income amount will directly enhance various economic activities and enterprise development with multiplier effect in the project area. In order to augment the impact, the local people particularly poor, dalits, ethnic minority and women will be given priority for employment.

ii. Skill Enhancement

The local people will be given on-the-job trainings. The onset of project construction phase is likely to enhance their skills in plumbing, fittings and other construction works. Working skills acquired from this project will be useful for the locals to secure employment opportunities in similar projects in coming days. If required, the locals will be given trainings on plumbing, bathroom fittings, and other construction activities so that the interested and potential ones can adopt it as a profession. Since Siddhanath-Baijnath project area is itself a growing town, and also the fact that it is a part of Mahendranagar and is close to Dhangadhi as well, the skilled ones will easily get better employment opportunities in the nearby places. In order to augment the impact, the locals will be given on-the-job trainings.

iii. Enterprise Development and Business Promotion

During the construction period, different types of commercial activities will come into operation in order to cater the demand and requirement of workers. As money flow begins, they will regularly demand different food items, beverages and other daily needs. To meet these demands, small shops and restaurants around the vicinity of the construction sites are likely to open. Various farm based enterprises including wide range of agricultural and livestock products will also gain momentum as a result of increased demand by labors. At present almost 13.3% of the households are involved in business. This shows that the locals will be more motivated and promoted to expanding their business and in opening new potential business as hardware shops, etc which will be in increasing demand once the town gets better water and sanitation facilities.

4.1.2. Operation and Maintenance Phase

i. Improvement in health and saving of time

After the water supply and sanitation project is complete, the people living within the project area will benefit from the supply of sufficient quantity of water, good quality water and improved sanitary conditions. There will be significant saving in health care expenses as water borne diseases are expected to reduce significantly after the service of the project begins. Women and girls will be directly benefited as they have to spend less time in fetching water and thus have more time for study, other household and income generating activities. The time savings of households are the time spent in obtaining water from other sources prior to the project. Time taken in collecting households' daily water requirements was assessed during the socioeconomic surveys. Table 20 shows economic value of time saved from water fetching in the project area;

Table 20: Economic value of times saved from water fetching

Assumptions		Economic Value: Benefit/year (Rs)
Time Savings per Household per year (Working Days)	Shadow price of labor per day (Rs)	
52	350	18275

Source: Socio-economic Survey, 2017

The study shows that there will be annual saving of time equivalent to NRs 18,275 per household after the beneficiaries of the project start receiving the servie from the project.

The impact will be augmented through regular maintenance of the water supply system by the user committee. Water Safety Plan (WSP) will be developed under an active WSP monitoring team. Development of a WSP can be an effective means to ensure functionality of the system and hence leading to its safe water supply and sustainability.

ii. Increased Markets and Higher Market Value

The availability of adequate supply of drinking water in the project area will accelerate the rate of development of Siddhanath-Baijnath project area as a growing market centre. Gaddachauki market and Aithpur market are expected to expand soon. At present, there are locals who are earning by selling agricultural products like food crops and fruits. Oilseeds, pulses, vegetables are sold to neighbouring major townships like Mahendranagar, Dhangadhi, and Attariya. Commercial farming of off-seasonal vegetables is also seen in the project area. Lokta is one of the NTFPs produced in the project area. After attraction of settlements and investments in the town, these products will have increased market value, better market-chain and increased opportunities of sales.

iii. Appreciation of Land Value

One of the benefits of the project is that land price will increase due to the availability of reliable safe drinking water and sanitation system. Siddhanath-Baijnath project area has a plain land, and it also has fertile land with irrigation facilities. Upon completion of the present project, migration from nearby places is expected. In order to promote land development in the area, the

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local people will be made aware that high value lands are acceptable to the banks and microfinance institutions to provide loans for them to start their own economic/social ventures.

iv. Women Empowerment

Women will largely benefit from this project, as they are the ones who spend a great deal of time in fetching water. With the operation of the water supply scheme, time will be saved. As contaminated water can lead to diseases the women of the family also have to spend a good deal of their time to care for the sick family members. With the improvement of water supply, there will be marked reduction in the occurrence of infectious disease in the area. This will provide more time to spend on other economic and social activities leading to empowerment. In order to augment the impact, the water supply system will be regularly maintained so that it operates smoothly and health and awareness programmes will be given to the local people.

v. Quality of Life Values

The project will provide good quality water and improved sanitation facilities. It is likely to bring improvement in personal, household and community hygiene practices. This will result in good family health and community health. These improvements in lives of the locals will bring about overall improvement in quality of life of the locals in the long-run.

4.2. Adverse Impacts

4.2.1. Pre-construction Phase

The pre-construction works involves field survey and investigation, development of design & detailed drawings, carrying out cost estimate etc. This also includes discussion with WUSC and revision of design as necessary. As there will be no construction activities involved; there will be no construction related adverse impacts. Design consideration has been made to avoid damages to existing facilities as far as possible. The Rapid Environmental Assessment (REA) Checklist for water supply and sanitation was used to identify potential impacts/issues/concerns of the project as per design. REA identified the issues and concerns that were considered during design phase are listed in Table 21;

Table 21: REA Identified Impacts and Mitigation Measures Taken During Project Preparation Phase

REA identified Impacts/Issues/Concerns	Measures taken during FS/DED to mitigate impacts/issues/concerns
Unsatisfactory raw water quality	During the detailed engineering design stage, water sample from existing tubewells was tested. This information has guided design of water treatment.
Delivery of unsafe water to the distribution System	Design proposes basic treatment using pressure filter, softening and disinfection. This IEE proposes "hands on" training by a licensed & accredited laboratory for the first few years of operation under the Water Safety Plan included in the project design & continuing training there-after.
Health hazards arising from inadequate design of facilities for receiving, storing and handling of Cl & other chemicals	Design has included a "housed" dosing unit.
Delivery of water to distribution system which is corrosive due to inadequate attention of feeding of corrective chemicals	Design has proposed DI, and HDPE pipes. The PE pipes of class 6kgf is chosen to avoid any leakage issues

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Contamination of drinking water source and other environmental receptors from household and public toilets	The design of toilets includes septic tanks that are designed as per national standards and codes to allow for maximum retention of septage. This includes ensuring septic tanks are sealed and water tight. Toilets will be established at least 30m down-stream of the drinking water source.

4.2.2. Construction Phase

4.2.2.1. Physical Environment

i. Erosion and land surface disturbance

Excavation and digging works during construction may lead to soil erosion, silt runoff, and unsettling of land and street surfaces. Haphazard disposal of the excavated earth can disturb the road surface. The activity as such will be a nuisance and discomfort to the road users and inhabitants. Accordingly water stagnation in the construction area especially during the rainy season may occur. The construction sites are public lands and are unused lands.

Public land will be used for construction of project components such as deep boring, treatment unit, OHT, office building and guard house at Sidhanath tole beside the open space of Thapachaur. Around 1,790 sq.meters of land will be used for the project structures thus bringing permanent land use change in the project area. Pipe-laying works are are proposed through existing public road RoWs as far as possible. Hence, disturbance is minimal. However, some disturbances and damages to public or private properties can take place at Thapachauraha, Banagau, Bhanu tole, Mahalaxmi tole and Sangam tole.

ii. Underground Water Quality and State of Water table

Due to the continue extraction of ground water, there will be fluctuation in ground water level. As the water is proposed to be extracted from the depth of about 100 m to 120 m, below the impervious strata, there shall be insignificant effect to the existing shallow tube wells which are generally at the level of 10 to 15m. Hydro-geological formation within the area Bheemdatt shows that ground water can be safely extractred within the depth of 150m (*Groundwater Development Board, GoN, 2029*). Generally ground water can be found from the depth of 100 m.

iii. Damage to Existing Facilities

Most of the concerns have already been addressed during design phase. During construction period, while excavating the earth, side-drains and compound walls may get damaged in few places particularly in the major settlement and market areas of Thapachauraha, Banagau, Bhanu tole, Mahalaxmi tole and Sangam tole. Existing road may be degraded due to plying of project's vehicles on a regular basis. There will be road crossings of pipelines at three stretches. An open shed (pati) which lies within the project construction site will need to be dismanteled.

iv. Air and Noise Pollution

The construction activities like laying of transmission and distribution pipes, construction of storage reservoirs, transport and installation of pumps, construction of deep tube-well will produce some extent of air pollution and noise for a certain period of time. There will be some activities such as transportation, loading/unloading of construction materials, stockpiling of construction materials, disposal of spoil, and earthworks. These will cause effect into air quality due to dust generation and vehicular emissions. Use of power horns and movement of heavy

vehicles can cause serious disturbance to the community, educational institutes, hospitals/health posts and residences.

v. Impact on water bodies

There will be some impacts on water bodies located within the project area during the construction phase. Tilkeni khola, Tilachaur khola, Bangau khola and Jimuwa khola are the surface water bodies that are likely to be polluted. Possible activities, which may influence the water quality, are listed below;

- Haphazard disposal of solid waste in the vicinity of water bodies
- Haphazard quarrying of construction materials from river beds
- Sediment and excavated materials may be transported to water bodies during rain
- Pipeline will need river crossing at 2 points.
- Leakage and disposal of oil and grease from construction equipment

The excavation works will cause turbidity in water up to a certain extent. However the quantity is limited with respect to the discharge of water in Mahakali River, and the impact will be there for short period of time.

vi. Waste Disposal

Waste like excess grease, lubricants, paints, etc may pollute soil and water resources. Solid wastes from construction campsites are also likely to be a visible source of pollution. However, waste segregation, containment and safe disposal are expected to be conducted as per standard practices.

4.2.2.2. Biological Environment

The major project structures will be built on un-used and vacant land surfaces. These will be constructed on land owned by WUSC. However, transmission and distribution lines may pass through agricultural land and private lands. Only scattered plants/trees of local species and fruit trees are observed in these sites, and thus only minor impacts are anticipated during the construction period. Most of the pipelines pass along the roadside (RoW) and only a few numbers of plants and patches of bushes have to be cleared up within the transmission pipe line stretches.

The potential environmental impacts of the project on local flora and fauna during construction and post construction phases will be low. Some of the impacts that may likely to occur are described below;

i. Loss of vegetation cover

The loss of vegetation cover and species diversity due to earthwork primarily in the construction sites of deep tubewells, reservoir, treatment units and office building sites. During the construction, there will be loss of around 11 trees of non-timber, timber type and local fruits (3 trees of Sissau - *Dalbergia sissoo*, 1 tree of Teak - *Tectona* grandis, 1 tree of Guava - *Psidium guajava*, 2 trees of Mango - *Mangifera indica* and some other small trees). However, the impacts will be minimized as far as possible.

Some of the topsoil and vegetation may also be lost during pipe laying works. No distribution line passes through the forest area. The project components require a very small area of land

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for implementation and environmental impacts on the vegetation and natural eco-system will not be significant.

ii. Impact on Fauna

The project service area is within the built up area. Population dynamics of resident and migratory birds and reptiles at the project site may be affected during the construction period due to various construction activities. But these effects will be of temporary in nature. The condition will be normal after construction is over.

Any kind of bird hunting or poaching by workforce will be strictly prohibited. Awareness programs will be conducted in the campsites and in the project communities regarding conservation of the wildlives. There is no protected area within the project area. The Buffer Zone of Shuklaphanta National Park is around 2 km from the project area.

iii. Impact on aquatic life

Some of the construction activities and protection works are proposed at the bank of the river. These construction activities will physically disturb the water quality for a certain period of time and may cause adverse impact on aquatic life. But these effects will be temporary in nature.

4.2.2.3: Socio-economic Environment

i. Disturbance to community activities

Construction activities, particularly construction works on roads will cause disturbances to the community activities, festivals and social events. The free movement of vehicular traffic and pedestrians will be affected. Noise produced due to the operation of machines may disturb the neighbourhood in construction areas. The impacts to human settlement including villages, cattle sheds and farmlands will be very low.

ii. Social Dispute and Dissatisfaction

There is a possibility of influx of outside workforce. There are chances of disharmony of the influx population with the local community. Social dispute may arise if there are any irresponsible behaviour of the workers such as gambling and excess drinking. Disposal of waste, improper sanitation practices, etc by the workforce may also bring dissatisfaction in the local communities. On the other hand, the local who are willing to get employment in the project may not get employment benefits from the project causing dissatisfaction and conflicts.

iii. Occupational health and safety (OHS)

Health and safety of workers particularly of those involved in concreting, trench cutting, formwork and rebar fixing in the overhead tank is of prime concern. Injuries, falling sick and chances of communicable diseases are also possible cases for the workforce. These risks may arise at different work fronts.

iv. Community health and safety

Since some of the construction works take place near the settlements, and the pipelaying works will be through the settlements, there are chances that the local people may face small accidental cases. This is critical primarily for chilredn and old-aged people. Chances of communicable diseases are also a concern. Stock-piles sites, spoil disposal sites and

movement of vehicles for construction activities are some of the aspects of construction works which may pose threat to health and safety of the community.

v. Resettlement, relocation and compensation issue

The major structures are to be constructed on public land or on land belonging to WUSC. Similarly, the distribution system network falls within the public property line/RoW. Therefore resettlement or relocation is not required. However some cases of loss of crops during pipelaying, damage to compound wall may arise. These will be avoided as far as possible. Within the project construction site, there is a small open shed built for the purpose of selling of local agricultural products.

4.2.3. Operation & Maintenance Phase

i. Risks from exposure to chemicals

Direct exposure to Bleaching Powder is toxic and the workers will have to deal with it during the operation of the system. Ingestions, inhalations, application to body parts, especially to the eyes, nose, and mouth are of extreme hazard to the workers handling chlorine and bleaching powder.

ii. Impact on water bodies and aquatic life

The effluent produced from the periodic backwashing of the filter plant, if discharged directly to the river course may cause harm to the water bodies and aquatic life especially during the dry season when the flow will be less.

iii. Risk of supply of contaminated water

Contamination of source or in reservoir, leakage and contamination through pipelines and contamination at point-of-use during operation phase may adversely affect the health of the consumers. Lack of regular maintenance could be a concern.

iv. Impact of use of diesel generators

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

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4.3. Indirect, Induced and Cumulative Impacts

4.3.1. During Construction

4.3.1.1. Indirect and Induced Impacts:

The vehicular movements that will be generated from the simultaneous construction of different components in different sites will create choke points at the narrow access roads and slow down mobility of people, goods and services, particularly in the market area. Coupled with disruption of economic activities and social services the local socio-economy may be negatively affected.

4.3.1.2. Cumulative Impacts:

There are no known ongoing or proposed large scale developments in Siddhanath-Baijanath urban as yet. A brick kiln is present in the project area. Hence, cumulative impacts may arise in case of air pollution, and labour interactions.

Assuming all components are started simultaneously or almost simultaneously, without mitigation, cumulative impacts will be "significant" in magnitude during the peak construction period (about first four months of construction period). After this period, magnitude of cumulative impacts will lessen to "moderate" magnitude. The significant 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.

4.3.2. During Operation

4.3.2.1. Indirect and Induced Impacts:

The indirect and induced impact of a reliable and sufficient water supply would be increased generation of wastewater and sewage. If inadequately managed, this situation would lead to contamination of supplied water through leaks or broken pipes in the distribution system.

With reliable and sufficient access to safe and potable water, the indirect positive impacts will be improved public hygiene and sanitation, leading to overall improvement in public health and quality of life. Enhancement measures include ensuring the quality of supplied water meets NDWQS through implementation of quality monitoring as prescribed in the EMP. Induced impacts of improved water supply system include rural–urban migration, more land conversion from rural to urban uses.

4.3.2.2. Cumulative Impacts:

The cumulative impact would be the increment in urban growth that will be driven by the availability of a reliable water supply system. The land use pattern will gradually be modifying towards urban settlements pattern which might reduce the available agricultural land.

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4.4. Evaluation of the Impacts

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

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

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

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

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

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

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

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Table 22: Evaluation of the Environmental Impacts

Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
Beneficial Impacts					
Construction stage					
Employment Opportunity and Increase of Income	Direct	M (20)	Lc (20)	St (5)	Significant (45)
Skill Enhancement	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
Enterprise Development and Business Promotion	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
Operation Stage					
Improvement in health and saving of time	Direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Increased markets and Higher Market values	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Appreciation of land value	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Women Empowerment	Direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Quality of Life Values	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Adverse Impacts					
Construction stage					
Physical Environment					
Erosion and land surface disturbance	Direct	M (20)	Ss (10)	Lt (20)	Significant (50)
Underground water quality and state of water table	Direct	M (20)	Ss (10)	Lt (20)	Significant (50)
Damage to existing facilities	Direct	L (10)	Ss (10)	St (5)	Insignificant (25)
Air Pollution and Noise nuisance	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)
Impacts on water bodies	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Waste disposal	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
Biological Environment					
Loss of vegetation	Direct	M (20)	Ss (10)	Mt (10)	Insignificant (40)
Impacts on fauna	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Impacts on aquatic lives	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Socio-economic Environment					

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Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
Disturbance to community activities	Direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Social dispute and dissatisfaction	Indirect	M (20)	Ss (10)	St (5)	Insignificant (35)
Occupational health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Community health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Resettlement, relocation and compensation issues	Direct	M (20)	Lc (20)	St (5)	Significant (45)
Operation & Maintenance Stage					
Risk of exposure to chemicals	Direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Impact on water bodies and aquatic life	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Risk of supply of contaminated water	Direct	H (60)	Lc (20)	St (5)	Significant (85)
Impacts of operation of diesel generators	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)

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5. ALTERNATIVES OF THE PROPOSAL

5.1. With- and Without-Project Alternatives

The project area is a major junction and booming market place. The town is facing increased problems to water supply. The overall sanitary condition of the project area is reasonably satisfactory, but still improvements are required.

Doing nothing about these challenges would be allowing the project municipality to further develop as "under-serviced" area, put the health of its residents and the general public at more risks, and worsen its living environment. This would impede: (i) further social and economic development project municipality and (ii) Nepal's delivery of its commitment to SDG 6th to increase the proportion of population with sustainable access to safe drinking water and basic sanitation. Hence, do-nothing or without-project alternative is not chosen.

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 to the delivery of Nepal's commitment to SDG 6th.

5.2. With project's location alternative

The project area is a very needy area in terms of safe water needs. Strategically, the investment in water and sanitation in this belt will improve the overall socio-economic aspects of the Province as it serves as a market junction to the surrounding rural municipalities and it also lies close to the Dhangadhi and Attariya. The project components are selected at technically safe site where there is no social dispute as well. Minimization of loss of vegetation cover is also considered. Avoiding tree clearance and damage to cultivated land has also been considered in site selection.

Since the settlements in Siddhanath-Baijnath project area are scattered, 3 separate District Management Areas (DMAs) are established. This is based on the principle of managing a large water network into a number of areas, typically of between 500 and 3000 connections, each established area having a defined and permanent geographical and/or hydraulic boundary. With other possibilities as well, the proposed sub-systems will be a easy-to-operate and cost effective option for the scattered location of the settlements.

5.3. Alternative Related to technology, materials and implementation procedure

The proposed system is a small scale project. Since the yield of the proposed deep tubewells is reliable, it is expected that the water supply will be smooth. Another probable source of water is Mahakali River which is located about 5 km west of the project area which defines boarder of Nepal and India at many places. Although the hardness of water in the surface source is likely

to be low with no calcium deposition problem in pipes, the cost of tapping the water will be considerably high due to high pipe and energy cost.

The major component of a ground water based water supply system consists typically of boreholes with pumps, treatment unit, and reservoir and distribution system. It was assessed that the proposed water supply system with adequate treatment will have very small negative impact on the environment. However, there will be substantial improvement in personal hygiene thereby increasing the quality of life and community health. All water supply components will be constructed on the land owned by WUSC.

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

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

6. MITIGATION MEASURES FOR THE ANTICIPATED IMPACTS

Precautionary measures and the mitigations with respect to the project development activities have been considered, and are already metioned in section 4.2.1 and Table 21. This chapter focuses on the mitigation measures for the anticipated impacts during project's Construction Phase, and project's O&M Phase.

6.1. Construction Phase

6.1.1. Physical Environment

i. Erosion and land surface disturbance

During execution of construction works, precautionary measures will be taken. Backfilling of excavated trenches will be carried out timely and the excavated soil will be stacked at safe and authorized site/s. On-site refill and reuse will be prioritized. Major construction activities will be avoided during the rainy periods. Thapachauraha is a place where there is significant local mobility. Similarly, Tilachaur area is a area where there is a local school. Hence, more focus will be required and given to avoid stockpiling and water logging issues in these sites.

Since formation of topsoil is very long natural process, efforts will be made to safeguard the topsoil. The topsoil of about 20 cm thick will be placed at a separate place and the remaining excavation will be done. After placing the pipes in trenches and backfilling with other soil and compaction, the topsoil will be replaced to its original position and compacted. Also, stockpiling will be carried out at designated site and and short term stacking of construction materials at construction sites will be covered and marked or barred using temporary facilities.

ii. Underground Water Quality and ground water overextraction

The tubewells sites have been selected at optimal locations and they will be installed accordingly. Since the subsurface soil filters biological contaminants from slowly percolating groundwater, the risk of undergournd water contamination is very low. The concern of overextraction of the groundwater will be mitigated using following measures;

- ✓ WUSC managing water source shall ensure that there will be no overpumping
- ✓ Educate and create awareness to the community on the value of water and water resources for enhanced conservation
- ✓ Ensure optimum maintenance of the water supply system components including pipelines, valves and consumer taps

iii. Damage to the Existing Facilities

A repair team will be on standby for the repair of water supply pipe line for immediate repairs. To avoid any such damage, prior coordination will be established with other local authorities. Layout drawing will be at the site to avoid any kind of possible damage. All the electric poles, around 4 of them, will be relocated meeting the standard requirements. A proper inventory of any damages to existing facilities will be kept. Any grievance regarding such damage will be dealt with priority and will be addressed timely.

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iv. Air Pollution and Noise nuisance

Use of power horns and movement of heavy vehicles can cause disturbances to the community, educational institutes, hospitals/health posts and residences. Mitigating measures to reduce air and noise pollution are:

- Providing information to the public about the work schedule,
- Allowing the use of vehicles only complying with NVMES 2069 or vehicles having green stickers meeting Vehicle Emission Standards 2057 during the project construction period,
- Limiting the speed of vehicles, and prohibiting the use of power horns,
- Equipment and vehicles will be regular maintained,
- Prohibiting the operation of plants and construction vehicles between 7 PM to 6 AM in residential areas,
- Avoiding work at culturally sensitive times (during religious festivals in the area),
- Increasing the work force in sensitive areas so as to finish the work quickly,
- Burning of solid wastes, particularly in worker's camp/construction sites, will be prohibited &
- Use of firewood as fuel will be prohibited in the work-camps.

v. Impact on water bodies

To mitigate this potential impact, the worker's camp will be located away from the vicinity of water bodies. There will be restriction on washing and fishing by workers in local surface water bodies like Tilachaur khola and Bangao khola. Waste water will be collected in a soak pit, and will be used for watering gardens and orchards. Absorbent pads/mats will be placed at the stockpiles, workshops and campsites to control seepage during accidental spillage. Fuel and lubricants will be stored in containers over well concealed surfaces which are at safe distance from any water bodies. Regular monitoring of the worker's camp will be scheduled. In addition to this, the excavated soil will be stacked. Backfilling of trenches will be done timely, and before the rainy season. A separate area will be allocated for the stacking of construction materials. An open space at Tilachaur is proposed as a campsite and stockpile area. Blocks will be used to provision for river crossings of the pipes.

vi. Waste Management and Disposal

Waste generated from the workers' camps will be properly disposed off. Organic waste like food waste and others will be used for composting. Pit composting and bin composting will be promoted. Residue inorganic waste will be collected in a bin and properly disposed off only in designated final disposal site of the municipality. 3R Principles will be regulated. Regular monitoring of the workers camps will be carried out. Temporary sanitary toilets for the workers will be installed before starting the work. Waste like excess grease, lubricants will be collected in plastic containers and will be sold to scrap dealers. Dried slurry generated after backwashing of treatment units, and other construction waste will be disposed in designated final disposal site of the municipality. It is proposed that the spoil will be used to level the ground of Shree Tribhuvan Higher Secondary School of Tilachaur, ward number 8. After decommissioning, the reusables

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will be reused or sold, and only the residue will be landfilled at the designated disposal site of the municipality.

6.1.2. Biological Environment

i. Loss of vegetation cover

To protect the topsoil and vegetation, the topsoil will be kept separately and replaced in its original position after laying the pipes. Greenery promotion will be carried out in the user committee building premise and around treatment unit. There will be compensatory plantation at the ration of 1:10 per tree cut will be carried out. Revegetation will be carried out in open spaces in wards 8 and 10.

ii. Impact on Fauna

Any kind of bird hunting or poaching by workforce will be strictly prohibited. Awareness programs will be conducted in the campsites and in the project communities regarding conservation of the wildlives.

The Buffer Zone of Shuklaphanta National Park is around 2 km from the project area. The workforce will be given following instructions;

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

Code of conduct will be provided to all the technicians and workers regarding the activities that may disturb any migratory or local species of amphibians, birds and other fauna. Shuklaphanta National Park office and its team will be coordination on regular basis to be aware if there is any ecological condition which needs to be notified to the locals and workforce during construction period so that any possible disturbance can be avoided.

iii. Impact on aquatic life

To minimize the impacts on aquatic life, washing of vehicles and clothes directly on rivers will be discouraged. Disposal of waste and spoil on to water bodies will be strictly regulated. Fishing by workforce in the local rivers will be strictly restricted.

6.1.3. Socio-economic Environment

i. Disturbance to community activities

In order to minimize the disturbance to the community activities, a detailed Traffic Management Plan will be developed by Contractor during the early stage of construction phase for areas along the construction works to minimize traffic flow interference from construction activities. Local public will be notified about project construction activities in advance and schedules, routings and affected areas including road closures will be shared well ahead of time and

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discussed with the locals. Stockpiling or temporary stacking will be covered or barred using temporary facilities. Sign-boards in Nepali and English languages will be placed at properly visible sites.

ii. Social Dispute and Dissatisfaction

Code of Conduct will be developed and applied for the workforce. This will reduce mis-understandings and dissatisfaction among the workers and locals. On the onther hand, an employment policy will be prepared so that the local people may not be deprived of employment opportunities. Local people and women above the age of 16 will be given preference for employment. This will instill positivity among the locals seeking for employment opportunities.

iii. Occupational Health and Safety (OHS)

To mitigate or minimize the health risks for workers and to avoid any health hazards of the workers, adequate safety instructions will be provided to the contractor and monitored by the project. Following mitigation steps will be taken;

- Health and hygiene in the camp site (against unsafe working conditions, accidents, transmission of communicable diseases etc) will be given top priority. Potable drinking water and clean fuel for cooking will be made available for the workforce as needed
- Regular health checkups, proper sanitation and hygiene, health care will be provided. Awareness programs concerning human trafficking and the possibility of spread of STDs and HIV/AIDS will be conducted during focus group discussions.
- Personal protection equipment (PPE) viz., safety helmets, safety belt, boots, gloves will be provided to all construction workers.
- Provision of sanitary toilets at the rate of 1 toilet unit for 15 workers, and number of toilets meeting the maximum number workers accommodated in the camps during the peak construction period
- The loss of life or any type of injuries will be compensated and insurance to the workers will be provided. First aid kits, standby vehicle, and fire extinguishers will be provided in camp sites.

To avoid risks from accidents on site due to the movement of the public and workers, health and safety measures of the contract will also prohibit entry at of public in the construction sites. The active construction sites will be barricaded and warning signs will be placed. Awareness activities on occupation health & safety will be conducted at all the work-fronts.

iv. Community health and safety

Since some of the construction works take place near the settlements, and the pipelaying works will be through the settlements, there are chances that the local people may face small accidental cases. This is critical primarily for chilredn and old-aged people. Chances of communicable diseases are also a concern. Stock-piles sites, spoil disposal sites and

movement of vehicles for construction activities are some of the aspects of construction works which may pose threat to health and safety of the community.

v. Rehabilitation and Compensation

Any public infrastructure or private property damaged by the project activities will be reinstated to its original state or to a stable condition. This cost has been incorporated in the BoQ of the contract document. Compensation of crops will be provided if the pipe laying works damage standing crops in significant amount. This will be processed through User's Committee and compensation provision will be based on mutual understandings between the affected land owner and the User' Committee.

6.2. Operation & Maintenance Phase

6.2.1. Risks from exposure to chemicals

Exposure and ingestion of Chlorine (Bleaching Powder) are harmful, and the workers will have to deal with it during the operation of the system. The storage procedures, in-plant handling and dosages of chlorine (bleaching powder) will be addressed. Procedures and guidelines will be developed for its handling. These procedures and guidelines will be prepared by the contractor during the last period of construction phase and will be approved by the consultant. The cost will be included in the contract document itself. First aid measures will be introduced for emergencies. Training on the handling and on dosage of the chemicals will be given to the staff.

6.2.2. Impact on water bodies and aquatic life

The measures to be taken are to mitigate the impacts are as follows;

- The effluent produced from the periodic backwashing of the filter plant, if discharged directly to the river course may cause harm to the water bodies and aquatic life especially during the dry season when the flow will be less.
- As the backwash water mainly contains suspended solids a small pond of 20,000 litres capacity will be constructed for decantation and will be drained of to river/stream course.
- To avoid the impact to aquatic life, the effluent and sludge will be disposed off only in designated areas and regular monitoring of the river or stream water quality will be done.
- Septic tanks will be built as per design of public toilets, and standard designs will also be provided to the household latrines.

6.2.3. Risk due to supply of untreated or polluted water

To avoid any health risk due to any chance of supply of untreated or polluted water, the User's Committee must be very effective in proper operation and maintenance of the whole water supply system, and of the Water Treatment Unit and disinfection units in particular. Timely maintenance of any leaking pipes should be carried out. Water Safety Plan (WSP) must be well

prepared and effectively implanted through an active committee. Regular water quality tests and prompt actions should be carried out to correct any problems in water quality.

6.2.4. Impacts of operation of diesel generators

To mitigate the concern, under feasible conditions, the electromechanical components are located more than 200 meters far from the major settlement or market area. In addition to this, the specifications of pumps and generators have been worked out so as to meet also low noise and pollution emissions.

6.3. Mitigation measures for Cumulative Impacts

Measures to mitigate the adverse impacts during construction phase are based on source based monitoring of pollution sources, and coordination among offices while working in communities.

Mitigation measures of potential impacts of land use pattern and rapid urban growth would be rational land use planning of the municipality and the district, incorporating environmental management for sustainable growth.

6.4. Implementation of Mitigation Measures

Most of the mitigation measures specified will be incorporated as part of the contractual obligations during the project construction and therefore will be integrated into the project design and tender documents. By including mitigation measures in the contract monitoring and supervision of mitigation implementation will be covered under the normal engineering supervision provisions of the contract. The mitigation measures implementation will be monitored through direct observation, records of contractors, consultation with people etc weekly or daily as required.

i. Project Design for implementation

For most of the adverse environmental impacts likely to occur during project construction and operational phase, mitigation measures will be integrated in the design of the project itself so as to strengthen the benefits and sustainability of the project. This will enhance the mitigation measures in terms of specific mitigation design, cost estimation of the mitigation measure, and specific implementation criteria. The proponent will ensure that the mitigations measures are included in the design of the project.

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ii. Project Contract

The project contract will clearly specify the mitigations measures that are part of the project construction and the contractor will be bound by the parameters identified in the environmental assessment pertaining to specific mitigation measures. The proponent will ensure the compliance of the proposed measures from the contractor and the final acceptance of the completed work will not occur until the environmental clauses have been satisfactorily implemented.

iii. Bill of Quantities

The tender instruction to the bidders will explicitly mention the site-specific mitigation measures to be performed, the materials to be used, labour camp arrangements, and waste disposal areas, as well as other site specific environmental requirements.

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The environmental impacts related to different project activities and its corresponding mitigation measures are tabulated in Table 23;

Table 23: Impacts and Mitigation Measures

Detailed Design			
Selection of water supply source	Concerns over unsatisfactory raw water quality	Water quality sampling/testing, and its reconfirmation	Included in Detailed Design cost
Design of alignment for pipe-laying	Disturbance/damage to communities structures/facilities	Place water pipes away from existing utilities during design. Under unavoidable cases, identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase Consultation with local authorities, offices like Division Road Office Provide budget for restoration/replacement of damaged utilities, and require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services	
Designing of source/intake & reservoirs	Risk of tapping of contaminated water, and Seismic risks like cracking of reservoirs	Choosing of treatment unit with comparative analysis of the treatment options Preparation and implementation of WSP to be planned Design all reservoirs and structures under the project as per appropriate seismic resistance	
Designing of treatment units	Health hazards arising from inadequate design of facilities for receiving, storing and handling of Cl & other chemicals	Design has included a "housed" dosing unit. Standard operation methods has been prescribed in design	
Apply for relevant permits	Delay in project due to absence of necessary statutory permits and approvals	Obtain Letters of Approval and agreement for: (i) temporary acquisition/easements of land and properties; (ii) disruption of water supply and other utilities; (iii) requited permits from relevant authorities (e.g., District Forest Office - Kanchanpur, Department of Archaeology, etc.) prior to construction works; (iii) avoid tree cutting, and establish a requirement that if necessary, cut only trees that are marked and have been agreed from relevant authorities for removal; and compensatory tree plantation to be carried out at the rate of 10 saplings for each felled tree.	

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Construction			
Establishment of workers' campsite proposed at Tilachaur, Ward 8	Haphazard camps resulting in social stress and degradation of local environment	Establish workforce camps in designated sites only and in consultation with local community. All camps are to include sanitary facilities for men and women.	Civil works contract
Employment	Local people may be deprived of opportunities, minors may be employed	Employ local people (and women in jobs and follow core labor standards) Equal pay for men and women	
Transportation of materials	Traffic congestion and public annoyance	Prepare and implement traffic plans to prevent traffic jams and annoyances to the public in coordination with relevant local authorities and communities.	Civil works contract
sDumping of waste in the river Construction of toilets in the camps Storing of materials in the project area	Water and land pollution; and Spillage/leakage concerns	Provide designated areas with collection bins for wastes. Provide toilet facilities and prohibit open defecation. Prohibit washing of vehicles next to rivers and streams. Proper storage of construction aggregates, hazardous and toxic materials, lubricating oils and used batteries in safe areas and the proper segregation & disposal of chemical containers, packaging materials, plastic bags etc. Fuel and lubricants will be stored in containers over well concealed surfaces which are at safe distance from any water bodies. Absorbent pads/mats will be placed at the stockpiles, workshops and campsites to control seepage during accidental spillage.	Civil works contract
Handling of toxic materials; disposal of excess material	OHS risks	Provide training to workforce on safe handling of toxic materials and OHS measures during construction.	Civil works contract
Movement of vehicles	Air quality deterioration Degradation of existing roads	Dust suppression on roads or at open sites by sprinkling water as required at regular intervals.	Civil works contract
		Routine monitoring of dust (total suspended particulates) to meet air quality standards; and limit vehicle speed.	250,000
		See that vehicles comply with the National Vehicle Mass Emission Standards, 2056	
		Maintenance works	
Earthworks		Provide proper ventilation in confined working areas.	

Stockpiling of construction waste and construction materials		Covering of stacked spoil and soil Limit the time of temporary stacking of construction materials in residential and market areas Stockpiles to be maintained only at designated sites	
Movement of vehicles Operation of construction machineries and equipment Horn honking	Noise and vibration	Monitoring of noise levels regularly at site to meet the noise standards. Fit mufflers in vehicles to control noise. Limit the speed of vehicles and decreasing drop-heights Regular maintenance of equipment. Compensate and repair damages caused by vibration during construction activities.	50,000
Pipe laying	Land surface disturbance, Crop loss	Maintaining the land surface Vegetation protection, greenery promotion Pipe-laying will be conducted in coordination with Division Road Office Crop compensation under avoidable critical conditions	Included in BoQ 225,000
	Vegetation clearance	Avoid tree cutting, Obtain necessary tree cutting permits Plant tree saplings at the rate of 25 saplings for each felled tree	300,000
	Disturbance to community Impacts to business activity including temporary relocation of vendors	Prior to construction, hold community meetings to inform them of construction works. Distribute project information. Advanced notice should be provided at least 1-2 weeks in advance.	50,000

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		Place WUSC phone hotline on signs in visible areas. Make community fully aware of grievance mechanism and provide contact info of PMO and ICG unit. Maintain access to avoid disturbance to residents and businesses by providing planks and leaving spaces for businesses and residents to maintain access. Manage traffic flows, conduct work at night where possible. Trenches open for only 1-3 days & works should be quickly completed. Avoid full street closure to fullest extent possible. Businesses losing income due to disturbance are compensated as per the resettlement plan. Temporary sites to be restored to natural and stable conditions as per agreement with land owner Proponent report in writing that temporary areas have been vacated and restored to pre-project conditions before acceptance of the works Provide employment opportunity to the affected people to the extent possible Assist vendors in shifting prior to construction and to return to original location when construction is complete in relevant sections Avoid disturbance to tourist areas	
Construction of project components	Reinstatement of community services and infrastructures	Compensate or reinstate/relocate community assets that are disturbed such as irrigation canals, electricity poles, telephone lines, drinking water pipes, sewerage lines, roads, etc. to the satisfaction of the people. Avoid disturbance to any historic/heritage buildings or structures by taking necessary precautions (work away from any heritage buildings, hand digging, no heavy equipment, etc.)	425,000
Influx of outside workforce, money and unwanted activities	Increase in crime and community stress	Prohibit gambling and alcohol consumption in contractors' campsites. Instruct the outside workforce to respect the local cultures, traditions, rights etc.	

		Provide security in contractors' camps, and Implement code of conduct for the workforce	
Project activities relating to health and safety issues at work areas	Health and hygiene (unsafe working conditions, accidents, fire hazard, transmission of communicable diseases etc.)	Ensure measures (fencing and/or barriers) to protect public from construction site. Provide regular health check-ups, proper sanitation and hygiene, health care, and control of epidemic diseases to the workforce.	
		Launch awareness programs concerning human trafficking and the possibility of spread of STDs and HIV/AIDS using brochures, posters, and signboards	50,000
		Make available first aid kits, and fire extinguishers in campsites Make available protection gears to all construction workers and compensate for the loss of life or any type of injuries Provide insurance to the workers and training in OHS and community health and safety. Ensure all work areas are clearly demarcated and marked and protect public from getting near to the trenches. Provide alternate potable water supply during maintenance works and notify the public in advance.	Civil works contract
Traffic management at construction sites	Traffic congestion (temporary disruption to local access due to open trenches, excavation across roads or road closures due to construction).	Develop and implement a traffic plan and road safety plan to minimize traffic flow interference from construction activities Coordinate with local authorities (police, municipality, local area committees, etc.) to manage traffic during construction period Provide advance public awareness and public notification of construction activities, schedule, routing, and affected areas including road closures Erect alternative routing signage in Nepali and English. Arrange for night time construction for activities in congested/ heavy daytime traffic areas Arrange for onsite "grievance handling" through use of liaison officers Undertake trench closure and facilitate surface rehabilitation or paving as quickly as feasible	25,000

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Employment opportunities, project activities in settlement and market areas	Social disharmony; Sanitation issues, and gender issues	Awareness activities for environmental conservation; WASH trainings; social safeguards meetings	25,000
Operational Phase			
Operation of the system; Operation of treatment units	Health and hygiene (unsafe working conditions, accidents, fire hazard, transmission of communicable diseases etc.)	Provide regular health checkups, proper sanitation and hygiene, health care, and control of epidemic diseases to the staff. Make available first aid kits in worksites Provide insurance to the workers and training in OHS and Community Health and Safety.	WUSC to manage for the provisions
Operation of the system	Health risks due to contaminated water	Conduct regular monitoring of water quality from treatment plants to ensure water delivered to public meets national standards	100,000
		Conduct regular O&M of the system; provide alternate potable water supply during maintenance works and notify the public in advance Develop and Implement Water Safety Plan and promote Hygiene Behaviours, Total Sanitation	WUSC to manage for the provisions WSP cost is incorporated in the Civil Contract

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Total of NRs 1,500,000 has been provisioned for the implementation of the EMP activities.

7. ENVIRONMENT MANAGEMENT PLAN

7.1. Objectives of the Environment Management Plan

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

This EMP will be included in the BoQ of the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. The contractor will be required to prepare a site specific EMP by its own, and as per the EMP (S-EMP) of the IEE report. The contractor will have to submit the S-EMP to the RPMO/consultant, and needs to have approval of the same. A copy of the S-EMP and EMP will be kept at the project office of the contractor at all times. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

The basic objectives of the EMP are to:

- to ensure that all mitigation measures and monitoring requirements will actually be carried out at different stages of project implementation and operation - pre-construction, construction and operation and maintenance;
- to recommend a plan of action and a means of testing the plan to meet existing and projected environmental problems;
- to establish the roles and responsibilities of all parties involved in the project's environmental management;
- to describe mitigation measures that shall be implemented to avoid or mitigate adverse environmental impacts and maximizing the positive ones;
- to ensure implementation of recommended actions aimed at environmental management and its enhancement; and
- to ensure that the environment and its surrounding areas are protected and developed to meet the needs of the local people, other stakeholders and safeguard the interests of the common people.

A Safeguard Unit within the project should be established and be headed by a senior environmental expert, a sociologist and a legal expert with adequate support staff.

7.2. Institutional Arrangement

Executing and implementing agencies:
The Ministry of Water Supply (MoWS) is the executing agency with responsibility of project execution delegated to the Department of Water Supply and Sewerage Management (DWSSM). The Water Supply and Sanitation Division/Sub-division Office (WSSDOs) are the project implementing agencies. Water User's and Sanitation Committee is the implementing agency.

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

Prior to construction:

- The MoWS will depute a qualified staff to act as the Environmental Safeguard Officer of the Project management office (PMO).
- The MoWS will establish the grievance redress mechanism, including setting up the Grievance Redress Committee.
- The Water Supply and Environmental Division of the MoWS will be responsible for reviewing and approval of the IEE Report.
- The DWSSM will review the IEE Report prepared by the Design, Supervision and Management ConsultantTeam's Environmental Safeguard Expert (DSMC-ESE) prior to forwarding this to MoWS.
- The DWSSM will prepare 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 that will be appointed to prepare the projects

7.3. 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 DRTAC as specified below;

(i) Confirm existing IEE/EMP is updated based on detailed designs and is prepared in accordance with the EARF and government rules;
(ii) Confirm whether EMP is included in bidding documents and civil works contracts;
(iii) Provide oversight on environmental management aspects of projects and ensure EMP is implemented by Western RPMO and the contractor;
(iv) Establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the EMP;
(v) Facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances as well as any other environmental requirements as relevant;
(vi) Supervise and provide guidance to the RPMO to properly carry out the environmental monitoring and assessments as per the EARF;
(vii) Review, monitor and evaluate the effectiveness with which the EMP is implemented, and recommended necessary corrective actions to be taken as necessary;
(viii) Consolidate monthly environmental monitoring reports from RPMO and submit semi-annual monitoring reports to ADB;
(ix) Ensure timely disclosure of final IEE/EMP in project locations and in a form accessible to the public; and
(x) Address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEE.

Regional Project Management Office (Western RPMO):

The regional DWSSM engineer and social development officer of the RPMO will receive support from; (i) the PMO safeguards officers (environmental and social) and (ii) the safeguards specialists (environmental and social), the social mobilizer and environmental management plan (EMP) monitor of the design, supervision and management consultant (DSMC) teams as specified below;

(i) Prepare new IEE/EMP in accordance with the EARF and government rules;
(ii) Include EMP in bidding documents and civil works contracts;
(iii) Comply with all government rules and regulations;
(iv) Take necessary action for obtaining rights of way;
(v) Oversee implementation of the EMP including environmental monitoring by contractors;
(vi) Take corrective actions when necessary to ensure no environmental impacts;
(vii) Submit monthly environmental monitoring reports to PMO, and;
(viii) Address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEE.

Civil Works Contract and the Contractor:

EMP is to be included in bidding and contract documents and verified by the PMO and RPMO. The contractor will be required to designate an environment supervisor to ensure implementation of EMP during civil works. Contractor needs to carry out all environmental mitigation and monitoring measures outlined in their contract. The government will ensure that bidding and contract documents include specific provision requiring contractors to comply with all; (i) applicable labor laws and core labor standards on (a) prohibition of child labor as define in 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 OHS to employee/s 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) RPMO's engineers and social development officer. Training modules will need to cover safeguards awareness and management in accordance with both ADB and government requirements as specified below;

(i) Sensitization;
(ii) Introduction to environment and environmental consideration in water supply and wastewater projects;
(iii) Review of IEE 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 prior to deployment to work sites.

Project Management and Quality Assurance Consultant (PMQAC):

The Project Management and Quality Assurance Consultant (PMQAC) will provide support to the PMO in the following areas:

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

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Water Users and Sanitation Committees (WUSC):
WUSC is the eventual operator of the completed project. The key tasks and responsibilities of the WUSC are, but not limited to;

Prior to construction

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

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 Report.
- Facilitate public interactions, as necessary.

During operation

- Implement the EMP and the 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 redress 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 the WUSC on the same. 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 the WUSC.

7.4. Environmental Management Plan (EMP)

The mitigation measures for the potential impacts that are predicted in the Chapter 4 of this report need to be planned to be implemented at right time and to make it clear who does it. Its monitoring and its reporting is also very important. Thus this chapter will provide a mangament plan, and a monitoring plan. A total of NRs 15,00,000 has been allocated for implementation of activities under this EMP. Table 24 below presents the details EMP for this project;

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An Environmental Management Plan (EMP) is proposed for defining the mitigation activities, the responsible agencies for implementation of those mitigation measures and its effective monitoring. Table 24 presents the proposed EMP for the project;

Table 24: Environment Management Plan

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
1. Prior to Construction Activities					
Consents, permits, clearances, no objection certificate (NOC), etc.	Failure to obtain necessary consents, permits, NoCs, etc can result to design revisions and /or stoppage of works	- Obtain all of the necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. - Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. - Include in detailed design drawings and documents all conditions and provisions if necessary	PMO, RPMO,& DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Existing utilities	Disruption of services	- Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction - Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. - Require contractors to prepare spoil management plan	DSMC, RPMO	List of affected utilities and operators; Bid document to include requirement for a contingency plan for service interruptions (for example provision of water if disruption is more than 24 hours),	During detailed design phase
Drinking water supply	Extraction of unsatisfactory raw water quality Delivery of unsafe water to the distribution system	- During the detailed engineering design stage, water sample from existing tube well was tested. Total hardness and total alkalinity are significant. Although the water quality is found to be suitable as per NDWQS, the deposition of calcium in the pipe may be likely to occur due to high concentration of hardness and alkalinity. - The water treatment system consisting of pressure filter, softening and disinfection is recommended. This IEE proposes "hands on" training by a licensed & accredited laboratory for the first two years of operation under the Water Safety Plan included in the project design & continuing training thereafter.	PMO, RPMO & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Sanitation	Contamination of	The design of toilets includes septic tanks	PMO, RPMO, &	Incorporated in final	Prior to award of contract

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Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
(Toilets and septage disposal)	drinking water source and other environmental receptors from household and community toilets Risk to public and environmental health due to inappropriate sitting and design of septage disposal pit	that are designed as per national standards and codes to allow for maximum retention of septage. This includes ensuring septic tanks are sealed and water tight. Toilets will be established at least 30m downstream of the drinking water source. - The septage disposal pit (similar to sludge drying bed technology) is to be designed and constructed in accordance to international best practice and acceptable standards (e,g US EPA standards etc). This includes; (i) locating disposal pits at least 300m away from the nearest dwelling, and 30 m downstream of the drinking water source; (ii) pits are to be only established in relatively flat land with no more than 8% slope; and (iii) site selected for establishment of pits should not be where food crops are grown. - The sanitation condition will be maintained to deter flies, mosquitos, and other vectors for breeding, free from odor and aesthetically pleasing. - A proper septage management shall be developed and followed.	DSMC	design and communicated to contractors	
Construction work camps, stockpile areas, storage areas, and disposal areas	Disruption to traffic flow and sensitive receptors	- Determine locations prior to award of construction contracts	DSMC, RPMO	List of selected sites for construction work camps, stockpile areas, storage areas, and disposal areas. Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	During detailed design phase
Waste generation	Generation of solid waste, wastewater from labor camp and other construction waste may cause pollution	- Mechanism of safe disposal will be developed in the project site before the actual commencement of work	Contractor	Contractor records. visual inspection	During detailed design phase
EMP Implementation Training	Irreversible impact to the environment, workers, and community	- Project manager and contractors should undergo EMP implementation including spoils management for construction works;	PMO, RPMO and DSMC. Contractor's	Record of completion (safeguards Compliance	During detailed design phase prior to mobilization of workers to site

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		standard operating procedures (SOP) for construction works as it is a method of identifying a work process and breaking it into the specific step by step procedure needed to successfully execute the process right from the beginning and result to greater quality via conforming to proven steps therefore, the written SOP provide instruction for less experience workers and benefits to the contractor is it serves as a benchmark for all workers on how a work process is to be completed ; health & safety (H&S), Labor Act (2017), applicable environmental laws, etc.	Environmental Supervisor	Orientation)	
2. During Construction Activities					
A. Physical Characteristics					
Topography landforms, geology and soils and/or river morphology and hydrology	Excavation works may degrade surface land state. Impacts are possible in the public land at Sidhanath tole beside the open space of Thapachaur where the core construction works are planned. Aggregates use	- Excavations works should be carried out only after approval from the Supervision Consultant and after approval from the local authorities - Soil erosion will be minimized by taking precautionary measures such as; excavated soil will be reused and proper backfilling of the trenches will be done and the excavated soil will be placed properly against erosion. - Aggregates should be bought only from the authorized suppliers	Contractor	Records of potential areas of soil erosion; transmission mains and distribution pipelines core area	Monthly by RPMO Weekly by DSMC-ESE
Community facilities	Damage to existing facilities (like drains, compound walls and pavements) An open shed built for selling of local agricultural products will be relocated/compensated	- Existing infrastructure (such as water distribution pipes, electricity pylons, etc.) shall be relocated before construction starts at the project sites. - Prior permission shall be obtained from respective local authority for use of water for construction. Use of water for construction works shall not disturb local water users. - If construction work is expected to disrupt, users of community shall be served 7 days in advance and again 1 day prior to start of construction. - Ensure any damage to properties and utilities will be restored or compensated to	Contractor	List of any public or private infrastructure disturbed by the proje project works Minutes with the locals	Weekly prior-inspection to know if there could be any such cases As per need, field-inspection if any such case is foreseen

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Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		pre work conditions. - A new community block/unit will be built at suitable site nearby the existing location			
Water bodies and water quality	Pollution of water bodies, contamination of water sources due to waste disposal, transport of sediments, effluent disposal, leakage/disposal of oil and grease from construction campsites	- All earthworks must be conducted during dry season to maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff. - Location for stock yards for construction materials shall be identified at least 300m away from water courses. Place storage - Areas for fuels and lubricants away from any drainage leading to water bodies - Take all precautions to prevent entering of waste water into streams, watercourses, or irrigation system. Install temporary silt traps or sediment basins along the drainage leading to the water bodies. - While working across or close to any water body, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed off in a manner that may block the flow of water of any watercourse	Contractor	Water quality of the surface and ground water sources Areas for stockpiles storage of fuels and lubricants and waste materials; Number of physical measures (like silt traps installed along trenches leading to water bodies)	Visual inspection by RPMO and DSMC-ESS on weekly basis Weekly field monitoring, and quarterly water quality monitoring
Ambient air	Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon, monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites.	- Water sprinkling at dry exposed surfaces and stockpiles of aggregates at least twice daily, or as necessary. - If re-surfacing of distributed roads cannot be done immediately, spread of crushed gravel over backfilled surfaces - Require trucks delivering aggregates and cement to have tarpaulin cover and maintain a minimum of 2 feet free board - Limit speed of construction vehicles in access roads to maximum of 30kph. - Ensure use of equipment and fuel complying with applicable emission standards	Construction Contractor	Location of stockpiles; Number of complaints from sensitive receptors; Heavy equipment and machinery with air pollution control devices; Certification that vehicles are compliant with air quality standards.	Visual inspection by RPMO & DSMC-ESS on monthly basis Weekly field monitoring, and biannual air quality monitoring
Acoustic environment	Construction activities will be on settlements along and near schools, and areas with small-scale businesses. Temporary increase in	- Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. - Plan activities in consultation with local administration so that activities with the	Contractor	Results of monitoring noise levels (Maintain maximum sound levels not exceeding 80 decibels when measured at a	Inspection by RPMO & DSMC-ESS on monthly basis, and as required additionally

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	noise level and vibrations may be caused by excavation equipment, and the transportation of equipment materials, and people.	greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. - Restrict noisy activities to daytime. - Minimize drop heights when loading and unloading coarse aggregates. - Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; - Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufactures' specifications at all times. - All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent type generators (if required) - If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Identify any building at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.		distance of 10m or more from the vehicle/s) Number of complaints from sensitive receptors;	
Waste disposal	Pollution of water and land resources, and caes of vector borne diseases due to haphazard waste disposal	- Waste minimization and waste segregation will be prioritized based on 3R principles - Practices of composting will be promoted - Containment of hazardour waste will be carried out - Prohibition of unwanted littering and discharge of waste. - Municipal disposal site will be used for final disposal	Contractor	On-site situation in campsites and its vicinity	Monthly monitoring by RPMO & DSMC-ESS
B. Biological Characteristics					
Vegetation	Loss of vegetation cover during construction works and laying of the pipelines (Around 11 trees are expected to be felled)	- Greenery promotion around the construction sites and road alignments where possible - Tree felling will be avoided, and if any such cases occur, prior approval from the local bodies will be received and compensatory plantation @ 1:25 will be carried out	Contractor	Area of greenery that has been cleared Number of trees cut (only if unavoidable) Complaints or grievances by the locals	Weekly monitoring by RPMO & DSMC-ESS

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Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		- Trees of local economic value and aesthetic significance will be planted under compensatory plantation - Locally demanded plants like *lokta* will be promoted			
Impacts on Fauna	There could be some disturbances to local and migratory birds, reptiles and mammals No major impacts on animals area expected However, potentiality of occurrence of fauna with respect to the fact that Shuklaphanta National Park and its buffer zone is within around 5 km proximity from the project ara - the disturbances or any impact could arise	- No heavy vehicles will be made available to run on the road that may disturb the wildlife of the area - Horn prohibited sign will be placed in nearby wildlife inhibited area - Code of conduct will be developed and implemented for the workforce to prohibit them from any wood logging, hunting - Other mitigation measures include: (i) installing clear signage to direct traffic movement in sites; (ii) designating stockpiling areas; (iii) providing alternative fuel to workers for cooking. - Any applicable provisions and useful guidelines issues by the Shuklaphanta National Park will be used and followed by the project and additional awareness/sensitization will be carried out	Contractor	Vehicles running nearby wildlife inhibited area will be monitored; Number of complaints from sensitive receptors on disturbance of poaching fishing, etc.	Visual inspection by RPMO & DSMC-ESS on monthly basis
Aquatic system	Disposal of slurry from treatment plant directly onto water bodies, disposal of waste on or nearby water bodies, sediment transport and leakage/disposal of hazardous waste may harm the aquatic lives in the rivers/steams of project area	- Only sedimented back-wash will be disposed to rivers - Washing of vehicles on local rivers will be restricted - Disposal of waste of any kind on water bodies will be strictly prohibited - Fishing in rivers will be prohibited for workforce	Contractor	Local streams and rivers will be monitored; Any grievances from locals regarding disposal of waste onto water bodies will be referred	Visual inspection by RPMO & DSMC-ESS on monthly basis
C. Socioeconomic Characteristics					
Community activities	The construction related activities that generate dust, noise and impede access will disturb the local residents	- To minimize the disturbances, construction work will be conducted as quickly as possible. - The local residents will be consulted and informed about the work schedule and possible disturbances in advance. - Temporary diversions and signboards will be provided for the pedestrians.	Construction contractor	Time schedule of construction work; Information related to construction activity to local residents Number of temporary diversions sign, signboards etc.	Visual inspection by RPMO & DSMC-ESS on weekly basis

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
Social harmony	Poor sanitation practices by workforce may cause pollution of surrounding environment. Social problems may arise due to bad behavior of the workforce such as gambling, alcoholism and disrespect to local people and culture	- A Code of Conduct will be developed for the workforce - Local people should be given priority to work (recommended that more than 60% local workers whenever available) in the project which helps to minimize the chances of cultural discrepancy and conflict due to increased labor from outside.	Construction contractor	Daily entry-sheet of the workforce in the campsites Number of local people versus outside workers in the project area will be regularly monitored	Inspection at campsites by RPMO & DSMC-ESS on monthly basis
Occupational Health & Safety	During the construction work, the laborers involved in the construction activities may be exposed to different level of health risks and are prone to accidents	- A site Health and Safety Plan will be prepared encouraging use of safety measures (PPEs) such as mask, helmet, hand gloves and rubber boots. - The laborers will be insured for their health and safety. - Provide safe drinking water for labours - Workers working at height above the ground especially during the construction will be provided with safety gears. - First aid box will be kept at a proper and easily accessible place. - The child labour will be totally prohibited from all the constructional activities. - There will be no discrimination in wage for male and female workers in the project	Construction contractor	Site-specific H&S Plan, Equipped first-aid stations, Medical insurance coverage for workers, Number of accidents, Campsite standards, Record of H&S orientation trainings, Availability of personal protective equipment at construction site, Signage for storage and disposal areas Condition of sanitation facilities for workers	Visual inspection by RPMO (monthly) and DSMC-ESS on weekly basis.
Community Health & Safety Hazards	Overall, communities will be exposed to cross-cutting threats from construction's impacts on air and water quality, ambient noise level; Chances of accidents, Communicable and transmittable diseases may potentially be brought into the community by construction workers	- Contractor's will maintain adequate space and adequate lighting, temporary fence, barriers and signage at campsites; - Construct gender friendly toilet for labours - Children will be prohibited from active construction sites - Proper fencing of stockpile areas and campsites will be done - Awareness programs on communicable diseases and hygiene practices will be carried out - GRM will be formed & implementation of the GRM will be made mandatory	Construction contractor	Number of permanent signs, barricades and flagmen on worksites as per Traffic Management Plan (Annex 2-C); Number of complaints from sensitive receptors; Number of walkways, signs, and metal sheets placed at project location	Visual inspection by RPMO & DSMC-ESS on weekly basis
Resettlement, relocation and compensation issues	There is no any resettlement or relocation issue. Unforeseen/unavoidable	- Any disturbance or damage to local facilities or properties will be well recorded - Any relocation needed will be addressed properly and timely	Contractor/WUSC	Records of any grievance from the locals regarding any disturbance or damage	During O&M of the system.

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Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	small-scale cases of compensation may arise for disturbance on existing facilities	- Any compensation required will be paid through WSUC's coordination		on public or private properties	
D. Historical, Cultural, and Archaeological Characteristics					
Physical and cultural heritage	Project area holds no archaeological, paleontological, or architectural sites of heritage significance A temple (Siddhanath-Baijnath temple) is situated nearby the proposed site. Disturbances may occur during construction period	- If by chance any such findings are spotted or suspected, the contractor will immediately stop work to allow further investigation - Proper fencing will be provided to isolate the project site from the temple area, and adequate route for the visitors and local passer-bys will be maintained so as to minimize any disturbance to local cultural practices	Contractor	Records of chance finds	Visual inspection by RPMO and DSMC-ESS on quarterly basis.
During Operation and Maintenance Phase					
Exposure to chemicals	Excessive exposure to chlorine, hypochlorous acid, and hypochlorite ion generally results in irritation of the oesophagus, a burning sensation in the mouth and throat, and spontaneous vomiting	- (i) All disinfection chemicals require proper storage and handling practices: - (ii) providing safe storage for chemicals; - (iii) ensure that the person is hired, with knowledge of chlorine use for disinfection process during operation; - (iv) Ensure use of PPE while using chemicals; - (v) Use of chlorine guideline as per WHO	WUSC	Water quality test	
Water bodies	The effluent produced from the periodic backwashing of the filter plant, if discharged directly to the river course may cause harm to the water bodies and aquatic life especially during the dry season when the flow will be less.	- A settling tank is proposed for decanting of the slurry from the effluent during backwash	Contractor	Effluent status	For first year, DSMC After that WSUC every six months
Drinking water supply system	Delivery of unsafe water due to srouce contamination, leakage in pipes	- The operations and maintenance plan and training for staff will cover; (i) competent/cautions handling and storage of calcium Hypochlorite and qualified persons to implement/oversee disinfection	PMO, RPMO, DSMC and WUSC	Water Quality reports WTP records in the log book	During O&M of the system Quarterly monitoring

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		and treatment; (ii) providing safe storage for chemicals; (iii) ensure capacity of WUSC to implement quick response to hazardous substance/waste spills; (iv) implement SPS-complaint EMP and a water safety plan; and (v) monitor water quality.			

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7.5. Environmental Monitoring Program

Environmental monitoring will be done during construction at three levels:

(i) Monitoring development of project performance indicators by the PMO-ESS;

(ii) Monitoring implementation of mitigation measures by the Contractor/DSMC; and

(iii) Overall regulatory monitoring of environmental issues by the PMO/MoWS/MoFE. The compliance monitoring will be source based.

During the project construction phase, monitoring of key environmental parameters related to the mitigation measures is proposed as per Table 25 below which presents the indicative environmental monitoring plan for the project which includes relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards, and responsible agencies.

Table 25: Environmental Monitoring Program

Source-based monitoring							
SN	**Field and Source**	**Stages/Phases**	**Parameters**	**Location**	**Frequency**	**Standards**	**Responsibility**
1	Campsite monitoring	Construction, Post-construction	OHS aspects; SWM; Drinking water quality; Provisions of space & light; Code of conduct; First aid facilities	Temporary campsites; rented rooms/flats of workforce	2 weekly	NDWQS 2005, WHO Guideline values	Joint Monitoring Team (Biannually by RPMO/PMO)
2	Monitoring in work fronts	Construction	OHS aspects; Air quality; noise levels	All active working sites	Weekly	NAAQS 2003, WHO Guidelines	
3	Monitoring in access roads	Construction	Air quality; noise levels	All roads where project vehicles ply	Weekly	NAAQS 2003, WHO Guideline values	
4	Stockpile/Disposal site monitoring	Construction		Designated stockpile area, informal stockpiles, designated disposal sites	Monthly	Contract Specifications	
5	Workforce monitoring	Construction		All active working sites	2 weekly	Contract Specifications	

Sink-based monitoring

SN	Field and Source	Stages/Phases	Parameters	Location	Frequency	Standards	Responsibility
1	Monitoring in residential areas	Construction	Air quality; noise levels	Residential areas along pipelines	Monthly	NAAQS 2003, WHO Guideline values	Joint Monitoring Team (Biannually by RPMO/PMO)
2	Monitoring in religious sites/markets	Construction	Air quality; noise levels	Religious sites/markets areas along pipelines	Monthly	NAAQS 2003, WHO Guideline values	
3	Monitoring in surface water sources	Construction	Water quality SW disposal	Rivers/streams within 500 m of project components/units	Six monthly	NDWQS 2005	
4	Monitoring in proposed drinking water sources	Pre-construction, Construction and Post-construction	Water quality	Source/s identified for the project	Quarterly	NDWQS 2005	
5	Public/Open spaces	Construction	Greenery Promotion	Open spaces within the service wards	Quarterly	Contract Specifications	

Monitoring parameters selected for compliance monitoring during construction and operation phases are source based, and those for impact monitoring are sink baesd.

7.5.1. Environment Monitoring Cost

The cost of regular monitoring works will be inbuild in the EMP and the civil work's contract of the contractor. Other monitoring will works will have additional costs for involvement of a authorized team. The project level monitoring team will submit its report to MoWS. Total cost of environmental monitoring (field visits, observation, review of reports and report preparation) is estimated NRs. 335,000.

Table 26: Environmental Monitoring Cost

[illegible]	[illegible]	[illegible]	[illegible]
Team Leader/Environmental Specialist	1	75,000	75,000
Water Resource Engineer	½	60,000	30,000
Socio-economist	½	60,000	30,000
Cost of Monitoring by MoWS	1	50,000	50,000
Support staff	1	25,000	25,000
Transportation cost		LS	75,000
Report preparation & sampling/lab. Test		LS	50,000
Total			**335,000**

7.5.2. Types of Monitoring and Monitoring Parameters

Monitoring is an ongoing component of the environmental assessment process and subsequent environmental management and mitigation activities. There are basically three types of environmental monitoring:

Baseline Monitoring - It is done if the project is not going to be implemented recently (in this project not required)
Compliance Monitoring - It verifies whether contract environmental clauses and the mitigation measures are properly implemented in the field.
Impact Monitoring - It confirms whether the environmental mitigation measures specified in the project design and contract are correctly formulated.

The nature and purpose of environmental monitoring will be different in the pre-construction, stage, construction stage and operation stage of the project.

Pre-construction Stage

Monitoring at this stage of project is to:

i. Confirm that plan, route selection and design of the road has considered the recommendation made by IEE
ii. Judge the level of preparation for implementing the construction related mitigation, and
iii. Prepare up-to-date environmental status of specific site where the impacts are assessed to be significant

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Construction Stage

This stage of monitoring is to check compliance with the best practices, norms and standards and on implementation of the mitigation measures prescribed by IEE. The following parameters will mainly be focused on:

i. Disposal of spoil and construction wastes and its consequences
ii. Disruption of natural water courses, drainage work and its consequences
iii. Slope protection measures
iv. Loss, stratification or degradation of forest vegetation
v. Care, sensitivity or disruption of community infrastructures
vi. Loss or degradation or threat to private properties
vii. Care, sensitivity or disruption to cultural sites

Operation Stage

i. The monitoring in this stage is mainly related to road features, road induced activities and their impacts on receiving environment. The following parameters are mainly monitored during operation stage:
ii. Drainage structures, their outfall and damage to private properties, community properties and natural resources
iii. Effectiveness of the slope protection and soil erosion measures
iv. Encroachment into road side, public land, forest or marginal land
v. Status of waste disposal sites
vi. Road accidents
vii. Symptoms of emergence of road side settlements, changes in agricultural pattern
viii. Activities of road neighboring communities
ix. Illegal felling of trees and hunting of wildlife

7.6. 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/seminars on relevant topics.

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

engaged for both the monitoring requirements and to train WUSC. A Water Safety Plan is included in project 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 contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work site. The proposed training project along with the frequency of sessions is presented in Table 27. The Environmental Safeguard specialist & EMP Field Monitloring Staffs are responsible for organizaing different training program for Environmental Management.

Table 27: Training Program for Environmental Management

Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staffs	Experiences and best practices sharing
Purpose	To aware the participants of the environmental safeguard requirements of ADB and GoN and how the project will meet these requirements	To build the capacity of the staffs for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and GoN	To share the experiences and best practices aimed at learning lessons and improving EMP implementation
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 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 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 R/PMO
Participants	Executing and implementing agencies, PMO, and PMO staffs (technical and environmental) involved in the project implementation	PMO PIUs Contractors	PMO PIUs Contractors

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7.7. 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 stage will be incorporated into the contractor's costs, which will be binding on him for implementation. The surveys will be conducted by the contractors.

The operation phase for mitigation measures are good operating practices to mitigate the environmental impacts of this phase & he responsibility remains to WUSC. All monitoring during the operation and maintenance phase will be conducted by WUSC. The Water Safety Plan, included in the project design, will allocate NPR 500,000 annually for operation and maintenance particularly water quality monitoring. If a licensed laboratory will be engaged for the first 2-3 years of operation for training purposes, the cost can be accommodated under the Water Safety Plan. The indicative costs of EMP implementation are shown in Tables 28 (by source of funds);

Table 28: Indicative Cost of EMP and Safeguards Implementation and Its Monitoring

S N	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
A	**Mitigation Measures**						
1	Protection/Reinstatement works	Construction phase				425,000.00	Civil works contract
2	Greenary management/ Promotion	Construction phase				300,000.00	Civil works contract
3	Compensation costs	Construction phase				225,000.00	Civil works contract
B	**Monitoring Measures**						
1.	Air quality monitoring	- Pre-construction - Construction	Per location	5	30,000.00	150,000.00	Civil works contract
2.	Noise levels monitoring	- Pre-construction - Construction	Per location			50,000.00	Civil works contract
3.	Water Quality Test	Pre-construction - Construction	Per Location	12	5000.00	100,000.00	Civil works contract

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

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SN	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
C	**Capacity Building**						
1.	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguards Policy Statement, GoN environmental laws and regulations, and environmental assessment process; (ii) induction course contractors, preparing them on EMP implementation and environmental monitoring requirements (iii) lessons learned information sharing	Module 1 – immediately upon engagement of the (provide if DRTAC or DSMC) environmental specialists Module 2 – prior to award of civil works contracts (twice a year for 4 years) Module 3 - Upon completion of the project	lump sum	1 8 1	Module 1 – 300000.00 Module 2 – 100000.00 Module 3 – 200000.00	300,000.00 800,000.00 200,000.00	Covered under DRTAC or DSMC contract
D	**Administrative Costs**						
1.	Legislation, permits, and agreements	Permit for excavation, tree-cutting permits, etc					
		IEE preparation and its presentation in MoWS	Lump sum	1	500,000	500,000	DSMC contract
E	**Other Costs**						
1.	Public consultations and information disclosure	Information disclosure and consultations including public awareness campaign through media	As per requirement	Lump sum		50,000	Covered under DSMC contract
2.	Awareness and sensitization on Ecological Sensitivity and Biodivesrity	Specifically regarding Shuklaphanta National Park/BZ				75,000	Civil works contract
3.	Water Sprinkling	During dry seasons, during heavy plying of construction vehicles, near sensitive areas				100,000	Civil works contract
4.	GRM implementation	Meetings, consultations, communication, and reporting/information dissemination		Lump sum		25,000	PMO cost

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SN	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
5.	Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and		Lump sum	Contractor's liability	As per insurance requirement	Civil works contract – contractor 's defect liability period
F	**Expert Monitoring Costs**						
	Environmental Specialist			1 MM	100,000	100,000	This cost is under the Contractor's contract
	Sociologist			1 MM	75,000	75,000	
	Support staff			2 MM	25,000	50,000	
	Cost of monitoring by MoWS/DWSSM					200,000	
	Transportation and logistics					75,000	
	TOTAL					**3,800,000.00**	

7.8. Implementation Schedule

Table 29: Environmental Management Implementation Schedule

SN	Activity	Indicative Time Frame
1	PROJECT IMPLEMENTATION	
	Detailed Design & Bidding Documents	Q2 Y0
	Procurement	Q3 Y0
	Construction	Q4 Y0 – Q4 Y2
	Contractor Operating Period	Q3 Y2 – Q4 Y3
	Handover to WUSC for Operation	Q3 Y3 – Q1 Y4
	Defects Liability Period	Q3 Y2 – Q4 Y4
2	ENVIRONMENTAL MANAGEMENT	
2.1	Overall	
I	Design Review and Technical Audit Consultant (DRTAC)-Engagement of Environmental Specialist	Starting Q4 Y0 (5 yrs of intermittent inputs)
Ii	PMO's submission of Environmental Monitoring Report (EMR)	
Iii	Monthly EMR for project's MPR	8th day after effective month
iv	Semi-Annual EMR during construction for submission to ADB	8th day after effective 6-month period
V	Annual EMR for submission to ADB	8th day after effective year
2.2	Prior to Construction Mobilization	
I	Finalization of EMP, (if applicable) revision of IEE	Q2 Y0
Ii	ADB review & approval of revised IEE & EMP.	Q 2 Y0
Iii	Obtaining Government's approval of IEE Report	Q2 Y0 – Q3 Y0
iv	Community preparation (including disclosure of Final IEE & its EMP)	Q4 Y0
V	Establishment of baseline data (as set in the EMP)	Q4 Y0 (shall have been done prior to award of contract)
Vi	Preparation of C-EMP by selected Contractor, review of C-EMP against SPS-compliant EMP.	Q4 Y0, before Notice to Proceed is given
2.3	Construction Period	

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SN	Activity	Indicative Time Frame
	Mobilization to Demobilization	
I	Implementation of mitigation measures and conduct of environmental effects monitoring following SEMP	Q4 Y0 – Q4 Y2
Ii	Submission of Monitoring Report (EMR)	Q4 Y0 – Q4 Y2
	- Monthly, by Contractor	5th day of the month following the effective month
	- Quarterly, by Contractor or by Licensed Laboratory	3rd day of the month following the effective quarter
2.4	Operation Period (potentially could start even before DLP is over)	
I	Implementation of mitigation measures & monitoring activities as specified in the EMP	Starting anytime between Q3 Y3 & Q1 Y4
ii	Submission of EMR	Anytime between Q3 Y3 & Q1 Y4
	Monthly, by Operator	5thday of the month following the effective month
	Quarterly, by Operator or (if applicable) by Licensed Laboratory	3rd day of the month following the effective quarter

Note: Y0 = Design Year; Y1 to Y4 = Year 1 to Year 4 from start of Construction Contract

7.9. Monitoring and Reporting

RPMO will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the project's risks and impacts, and will be identified in the IEE for the project. In addition to recording information on the work and deviation of work components from the original scope PMO, ICG will undertake site inspections and document review to verify compliance with EMP and progress toward the final outcome.

RPMO will submit monthly monitoring and implementation reports to PMO, who will take follow-up actions, if necessary. PMO will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in Annex 2-E. Project budgets will reflect the costs of monitoring and reporting requirements. For the projects likely to have significant adverse environmental impacts during operation phase, reporting will be continued at bio-annual & annual basis. Monitoring reports will be posted in a location accessible to the public.

For projects likely to have significant adverse environmental impacts, PMO will retain qualified and experienced 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 MoWS's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

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(i) Conduct periodic site visits for projects with adverse environmental or social impacts;
(ii) Conduct supervision missions with detailed 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 as appropriate; 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.

7.10. Information Disclosure, Consultation and Public Participation

Stakeholder consultation and participation was an essential process in project preparation and IEE study. The process in engaging stakeholders and affected people involved key informant interviews, on-site discussions with WUSC, and random field interviews of stakeholders. Table 30 lists the persons consulted during the IEE Study.

Table 30: Lists of People and Institutions Consulted

SN	Name	Organization/Address
1	Mr.Kamal Chand	Treasurer/Water User Committee
2	Mr.Mahabir Jhakri	Local beneficiary
3	Mr.Dil Bdr. Dhami	Local beneficiary
4	Mr.Khagendra Singh Bista	Representative of ward-8
5	Mr.Hari Pratap Mishra	Secretary of ward-8
6	Mr.Tilak Khatri	Local beneficiary
7	Mr.Ganesh Giri	Senior Health Assistant/Jimuwa Health Post
8	Mr. Surendra Bista	Mayor, Bheemdatt Municipality
9	Mr. Permananda Joshi	Ward Chairman, Ward 10
10	Mt. Harak Singh Dhami	Member, Ward 6
11	Mr. Dal Bahadur Bohora	Ward Member, Ward 6
12	Mr. Dhwaj Bahadur Bista	Ward Chairman, Ward 8
13	Ms. Bhanu Devi Sunar	Ward Member, Ward 8
14	Mr. Bhawan Singh Bista	Teacher, Ward 8
15	Ms. Annu Khadayat	Member, Ward 8
16	Mr. Padam Singh Bista	Member, Ward 8
17	Mr. Mangal Singh Dhami	Member, Ward 8
18	Mr. Nanda Lal Fidali	Member, Ward 8
19	Mr. Deepak Bahadur Singh	Member, Ward 8
20	Mr. Nar Bahadur Dhanuk	Member, Ward 8
21	Mr. Nar Pati Dhami	Member, Ward 8
22	Mr. Gagan Khadka	Member, Ward 8

During the IEE preparation, consultations were undertaken in compliance with GoN's EPR.

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

- During the construction stage , if there would be a major change in design/alignment/location, the PMO and ICG will hold at least one public consultation meeting early on in the construction period to solicit perceived impacts, issues, concerns and recommendations from affected communities;
- Prior to construction, the PMO and ICG will conduct an intensive information, education and communication (IEC) campaign to ensure sufficient level of awareness/information among the affected communities regarding the upcoming construction, its anticipated impacts, the grievance redress mechanism, contact details and location of the PMO and ICG, and status of compliance with the Government's environmental safeguard requirements, among others, are attained/provided. Billboards about the project, implementation schedule and contact details of the executing agency, PMO-ES, ICG and Contractors will have been set up at strategic locations within the projects' main areas of influence. The grievance redress procedure and details will have been posted at the offices of the ICG, WUSC and Municipality;
- During construction, regular random interviews will be conducted by the ICG every month to monitor environmental concerns of project communities;
- During operation, periodic random interviews will be conducted by the ICG and WUSC to monitor the environmental concerns of project communities;
- 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 UWSSP website.

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7.11. Grievance Redress Mechanism

Purpose of the Grievance Redress Mechanism

The Grievance Redress Mechanism (GRM) is meant for persons seeking satisfactory resolution to their complaints on the social and environmental performance of the project. 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 Project are protected; and (ii) their concerns are effectively and timely addressed.

7.11.1. Proposed Set Up

The MoWS, as the Project executing agency, will establish the GRM and its support system, including setting up the Grievance Redress Committee (GRC) at the project level. The GRC will comprise of 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., Municipality and DCC; (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 project level. He/she will be technically advised, supported and trained by DRTAC's environmental specialist and the DSMC ESE. PMO's Environmental Officer will oversee the implementation/observance of the GRM in all projects. 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 appeal is made by an AP 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 project's monthly progress reports, semi-annual project environmental monitoring report (EMR) during construction and annual project 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, posters declaring

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contact details and displayed at strategic locations, among others, will be in place to sustain the effective implementation of the mechanism.

7.11.2. Access to Mechanism

Any person who has environmental concerns/issues pertaining to the projects 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 projects, 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, Municipality, DCC and at strategic places within the main areas of influence of projects (posters to include names and contact details of the EO of the PMO and ESA of the ICG).

7.11.3. 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 complaint. Otherwise, the Contractor/Operator will direct the AP with non-Project-related and/or 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: (Figure VIII-1).

i. First level of GRM

The access point will be the ICG. The steps are detailed below;

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

<u>Step 2</u> 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/or invalid will be advised that he/she may raise complaint to the second level of the GRM, and ICG will forward the complaint to the GRC.

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Step 3 Investigations, Discussion and Agreement (Day 1)
ICG, together with the Contractor/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. 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).
- AP will be advised by the ICG 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 from discussion; or (iii) major action is not started within 5 days from 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.

ii. Second level of GRM

The AP will be notified by the ICG when 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/measure at the field level and assign clear responsibilities for implementing its decision within 7 days of receipt of 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.

iii. Third level of GRM

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

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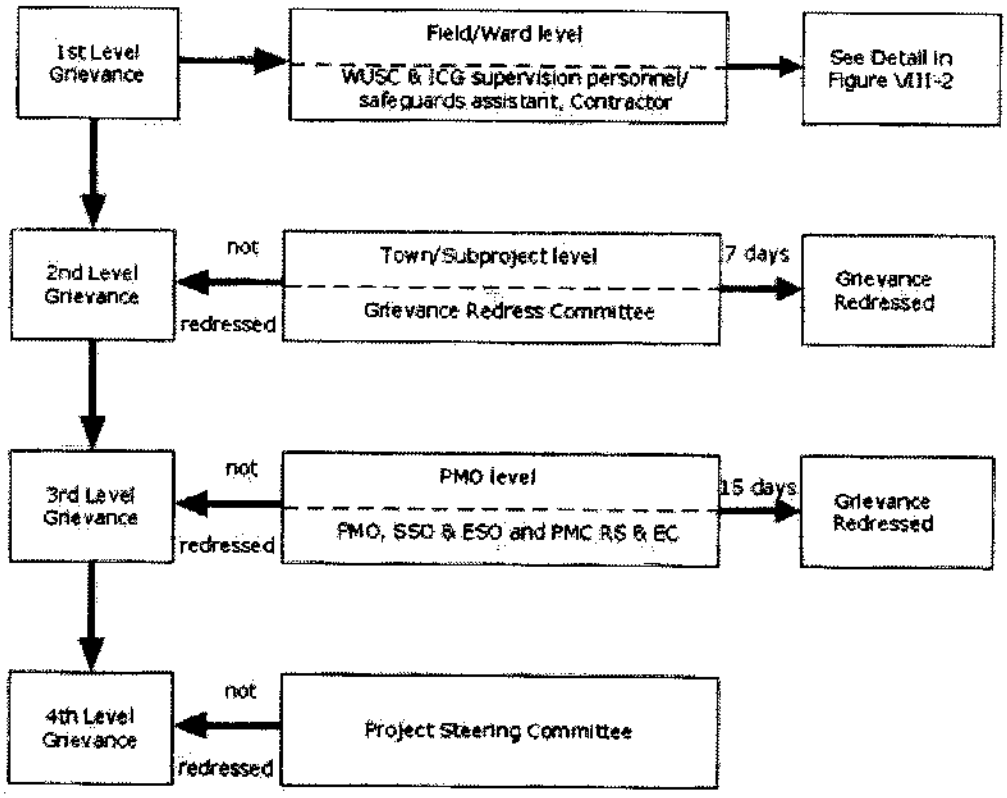
iv. Fourth level of GRM

Fourth Level: For extremely 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 at the third level.

Despite the GRM, an AP will have access to the country's legal system at any stage. Accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. In the event that 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.

Figure 5: Grievance Redress Mechanism (Formal Approach)



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

7.11.4. Record Keeping and Disclosure

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

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and resolved and the outcomes will be displayed at the offices of WSSDO, ICG, PMO and WUSC and reported in the monthly progress reports, semi-annual EMR during construction and annual EMR during operation, submitted to ADB.

7.11.5. Periodic review and documentation of lesson 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.

7.11.6. Costs

All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) at local (field/ward/town) level will be borne by the concerned focal organisations at each level: WUSC at town level; RPMO at regional level and PMO at central level.

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8. CONCLUSIONS

Field study and analysis of the environmental aspects of the proposed project shows that the proposed project is not an environmentally critical intervention. The IEE shows that;

- The proposed Siddhanath-Baijnath Urban Water Supply and Sanitation Project and its components are not within environmentally sensitive area. Although the project area lies in same district as Shuklaphanta National Park, there is safe distance and since the potential impacts are site specific or local in nature, there is no significant risk to the national park due to project activities. However, the project will follow the provisions and requirements not to disturb any environmentally sensitive areas or aspects in its vicinity.
- There will be some adverse impacts of the project implementation. However, the extent of adverse impacts is expected to be local, confined within the projects' main areas of influence, and the routes to and from these sites. With the EMP in place, the potential adverse impacts will either be eliminated or minimized to insignificant levels.
- The few adverse impacts of significance during construction will be temporary and short-termed (i.e. most likely to occur only during peak construction periods). These will not be sufficient to threaten or weaken the surrounding resources.
- 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 project will bring about: (i) the benefits of access to reliable supply of safe and potable water; (ii) promotion of good hygiene and sanitation practices and reduced health and safety risks as positive impacts; and (iii) enhanced community health, improved quality of life and safe communities as outcomes. Since it is near Birendranagar Municipality, the implementation of the project will help attract more development and investments in that belt of Sudurpaschim Province.

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

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- ✓ *Environment Protection Act, (1997). Ministry of Science, Technology and Environment Kathmandu*
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Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

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Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Project Management Office

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Annex 2:	Environmental Standards, Sample Forms, Formats and Reporting Templates
Annex 3:	Project Location and Service Area
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Annex 5:	Public Consultation minutes & Recommendation Letter
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Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

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Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage
Urban Water Supply and Sanitation Project
Project Management Office

ANNEX 1: Approved ToR

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Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Urban Water Supply and Sanitation Project
Project Management Unit

नेपाल सरकार

खानेपानी मन्त्रालय

फोन नं.: ४२११६९३
फ्याक्स : २७७-१-४२११४३३
सिंहदरबार,
काठमाडौं, नेपाल ।

पत्र संख्याः- ०६५।०६६
चलानी नं.:- ९९३

मितिः २०७५।०८।०३

श्री खानेपानी तथा ढल निकास विभाग
पानीपोखरी ,काठमाण्डौ ।

विषयः प्रारंभिक वातावरणीय परिक्षण (IEE) को कार्यसूचि(TOR) स्विकृत गरिएको सम्बन्धमा ।

उपरोक्त विषयमा तेश्रो साना सहरी खानेपानी आयोजना प्रस्तावक रहेको सिद्धनाथ, बैजनाथ कञ्चनपुर सहरी खानेपानी तथा सरसफाइ आयोजनाको को प्रारंभिक वातावरणीय परिक्षण (IEE) को कार्यसूचि (ToR) नेपाल सरकार(सचिवस्तर) को मिति २०७५।७।२९ को निर्णयानुसार स्वीकृत गरिएको ब्यहोरा निर्देशानुसार अनुरोध छ ।

(स्वीकृत कार्यसूचि (TOR) को १ प्रति संलग्न गरिएको)

मधुसुधन खनाल
(इन्जिनियर)

बोधार्थ
तेश्रो साना सहरी खानेपानी आयोजान
आयोजना व्यवस्थापन कार्यालय, पानीपोखरी ।

Terms of Reference (ToR)

For

Initial Environmental Examination (IEE) study

Of

Chakkifanta Small Town Water Supply & Sanitation Project (Chakkifanta, Kanchanpur)

Submitted to

Ministry of Water Supply and Sanitation

Government of Nepal

Singhadurbar, Kathmandu

Submitted by
Project Management Office
Third Small Towns
Water Supply and Sanitation Sector Project
Department of Water Supply and Sewerage
Panipokhari, Kathmandu

Prepared By
Building Design Authority Pvt. Ltd. and
Plush Engineers and Architects (P) Ltd.
(BDA-PEA JV)
Kamaladi, Kathmandu

January, 2018

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ACRONYMS

ADB	Asian Development Bank
BS	Bikram Sambat
CI	Cast Iron
Cum	Cubic meter
DDC	District Development Committee
DI	Ductile Iron
DMA	District Metering Area
DSMC	Design, Supervision &Management Consultant
DWSS	Department of Water Supply and Sewerage
EPA	Environment Protection Act
EPR	Environment Protection Rules
GI	Galvanized Iron
GoN	Government of Nepal
HDPE	High Density Polyethylene Pipe
ICG	Implementation Core Group
IEE	Initial Environmental Examination
LB	Local Bodies
LPCD	Liter Per Capita Per Day
m^3	meter cube (cubic meter)
MoWSS	Ministry of Water Supply and Sanitation
NAAQS	National Ambient Air Quality Standards
NDWQS	Nepal Drinking Water Quality Standards
NGO	Non-Governmental Organization
OHT	Overhead Tank
PAC	Public Awareness Campaign
PMO	Project Management Office
PPM	Parts Per Million
PPTA	Project Preparation Technical Assistance
RoW	Right of Way
RT	Reservoir Tank
TDF	Town Development Fund
TM	Transmission Main
TOR	Term of Reference
TPO	Town Project Office
TSTWSSSP	Third Small Towns Water Supply and Sanitation Sector Project
VDC	Village Development Committee
WHO	World Health Organization
WRDSMC	Western Region Design Supervision and Management Consultancy
WRPMO	Western Region Project Management Office
WSSDO	Water Supply and Sanitation Division Office
WSSUC	Water Supply and Sanitation Users' Committee
WSUC	Water Supply and Sanitation Users Committee
WUA	Water Users Association
WUSC	Water Users and Sanitation Committee

1. NAME AND ADDRESS OF THE INSTITUTION PREPARING THE REPORT

1. The Environment Protection Rules 1997 (and its amendments) mentions that a Terms of Reference (TOR) is to be prepared for an Initial Environmental Examination (IEE).

2. This Terms of Reference (TOR) has been prepared in order to carry out an IEE for Chakkifanta Small Town Water Supply and Sanitation Project in Kanchanpur district. The proponent of the proposed project is the Project Management Office (PMO), Third Small Towns Water Supply and Sanitation Sector Project (TSTWSSSP) of the Department of Water Supply & Sewerage. The name and address of the proponent is given below;

Name of the Proponent:

Project Management Office
Chakkifanta Small Town Water Supply and Sanitation Project
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, Nepal
Phone: 4423848, 4412348
Fax: 4413280
E-mail: info@stwsssp.gov.np
Website: www.sstwsssp.gov.np

2. DESCRIPTION OF THE PROPOSAL

2.1 General Introduction

3. The Third Small Towns Water Supply and Sanitation Sector Project is designed with the principle of community management, making it demand responsive, and adopting a participatory approach. Participatory approach aims for greater community participation in planning, implementation along with their O&M activities. Demand responsiveness is demonstrated by willingness to pay for improved service delivery and ultimately aims at 30% cost recovery. Community management is essential for making the community empowered so that the community could take full responsibility on financial, technical and managerial aspects on operation & maintenance activities.

4. In terms of financing, 70% of the cost will be contributed by GON. In regard to cash contribution to be made by WUSC, the initial cash contribution of WUSC should be minimum 5% of the civil works contract in the form of upfront cash contribution. The remaining 25 % to be borrowed from the TDF as a loan at an interest rate not exceeding 5% per annum with a maturity of 25 years including a grace period of five years. The project ensures full participation of Water Users and Sanitation Committee in the formulation, implementation and operation &maintenance of water supply, sanitation and drainage facilities.

5. The main objectives of the project are to;

i. Improve water supply and sanitation facilities and provide a health and hygiene education program in each town,
ii. Support community participation in the development of water supply and sanitation facilities, and
iii. Facilitate Sustainable development of the facilities thereby help/ improve health and quality of life of the people living in the project area.

6. Chakkifanta is a town in Bheemdatt Municipality in Kanchanpur district in Bheri zone, Province 7. It is bordered with Kailali district in east, Dadeldhura district in north and India in south and west.

7. The service area of Chakkifanta Small Town Water Supply and Sanitation Project covers wards 6, 8 and 10 of the municipality. The project area is the business and educational hub of the Mahakali Zone. As the land is fertile, paddy, maize, oil seeds, pulses and vegetables are grown.

8. The climate of project area is humid. The average maximum temperatures during summer fluctuates between 37° C and 40° C and minimum temperature in winter ranges from 4° C to 18° C. The relative humidity is in the range of 80 %. The average annual rainfall is estimated at approximately 1900 mm per year. About eighty percent of the total annual rainfall occurs during the monsoon season (June to September). The altitude of the town varies from 203 m-225 m above the mean sea level.

9. All the proposed sources are tube wells. The proposed tube well site for Tumdani Chakkifanta is located at Thapachauraha in ward 8 of the Bheemdatt Municipality. The water from tube wells will be pumped to overhead reservoir tank after proper treatment. There are two sources that are located in Siddinath Tole, Thapachauraha ward 8 and Gajjar Tole ward 10.

10. Total households and population of the project area is 9,310 and 1,603 respectively. Out of them 9,178 is permanent population and 132 is floating population. The average household size is 5.7.

2.2 Project Description

2.2.1 The Sub-systems

11. Tumdani Chakkifanta, Kanchanpur Small Town Water Supply sub-project has been conceptualized as a piped water supply system with pumping system. The proposed system is named as Chakkifanta system. This system is proposed to serve wards 6, 8 and 10 of the Bheemdatt municipality.

The system is designed to cater 21,464 permanent and 345 rented with total of 21,809 populations. The groundwater will be extracted through a deep tube well as water source. The water is pumped from tube well is first treated at the water treatment plant and then sent to the 450 cum overhead RCC reservoir. The water from the overhead reservoir is supplied to the service areas through gravity.

The service areas of this system are Baijath, Bhumi Raj Tole, Banagaun and Purnima Tole of ward 6, Sidhanath, Bhanu and Jyoti of ward 8 and Adarsha Tole, Amarjyoti Tole, Badimalika Tole, Basanta Tole, Baijnath Tole, Danu Baba tole, DivyaJyoti Tole, GaddaChauki Tole, Gajar, Gyanu Baba Tole, Gauri Shankar, Gorakhnath , .Jay Jagarnath, Jimuwa, Mahalaxmi Tole, Maheshori, Malikarjun Tole, Mankamana Tole, Nagarjune, Pashupati Tole, Pragati Tole, Purnagiri, Sangam Tole, Shanti Tole, Sarswati Tole, Shiva Tole, Sidhanath Tole, Sidheshori Tole, Sukasal, Tintara, and Bijaya Tole of ward 10 in Bheemdatt Municipality

2.2.2 Project Components

DRINKING WATER SOURCE

12. All the proposed sources are tube wells. The proposed tube well site for Tumdani Chakkifanta is located at Thapachauraha in ward 8 of the Bheemdatt Municipality. The water from tube wells will be pumped to overhead reservoir tank after proper treatment. The proposed water sources and their location are shown in Table 1.

Table 1: Sources and their locations

S.N.	Source Type	Well Number			Source Location
		Working	Standby	Total	
1	Tube Well	2	1	3	Siddhinath Tole,Thapachauraha, Ward 8, * Gajjar Tole ward 10

13. The water sample was thus collected from the existing tube well of about 30 m depth installed for irrigation purpose located inside Sidanath temple at Thapachauraha, ward 8 of Bheemdatt municipality on November 28, 2017 to assess the raw water quality of the groundwater in the project area. The physical and chemical parameters of the water sample were analyzed at the Nepal Environmental and Scientific Services (NESS) Laboratory, Thapathali, Kathmandu. The water quality of the existing tube well in the project area along with National Drinking Water Quality Standards is presented in Table 2.

Table 2: Water Quality Assessment

S.No.	Parameters	Units	Test methods	Observed Values	NDWQS, Nepal
1	pH at 27°C		Electromeric, 4500 – H^+ B, : APHA	6.8	6.5 – 8.5
2	Electrical Conductivity	µS/cm	Conductivity Meter, 2510 B, APHA	547	1500
3	Turbidity	NTU	Nephelometric, 2130 B, APHA	4	5
4	Total Hardness as $CaCO_3$	mg/l	EDTA Titrimetric, 2340 C, APHA	342	500
5	Total Alkalinity as $CaCO_3$	mg/l	Titrimetric, 2320 B,APHA	335	-
6	Chloride	mg/l	Argentometric Titration, 4500 – Cl^- B, APHA	13.9	250
7	Ammonia	mg/l	Direct Nesslerization, 4500 – NH_3C APHA	0.3	1.5
8	Nitrate	mg/l	UV Spectrophotometric Screening, 4500 –No_3 B, APHA	6.79	50
9	Nitrate	mg/l	NEDA, Colorimetric, 4500 –NO_2^- B, APHA	<0.02	-
10	Calcium	mg/l	EDTA Titrimetric, 3500 – Ca B &3500 –Mg B APHA	76.95	200
11	Magnesium	mg/l		36.46	-
12	Arsenic	mg/l	SDDC, 3500 - As, C: APHA	N.D. (<0.01)	0.05
13	Iron	mg/l	Direct Air – Acetylene AAS, 3111 B, APHA	0.27	0.3
14	Manganese	mg/l		N.D. (<0.01)	0.2

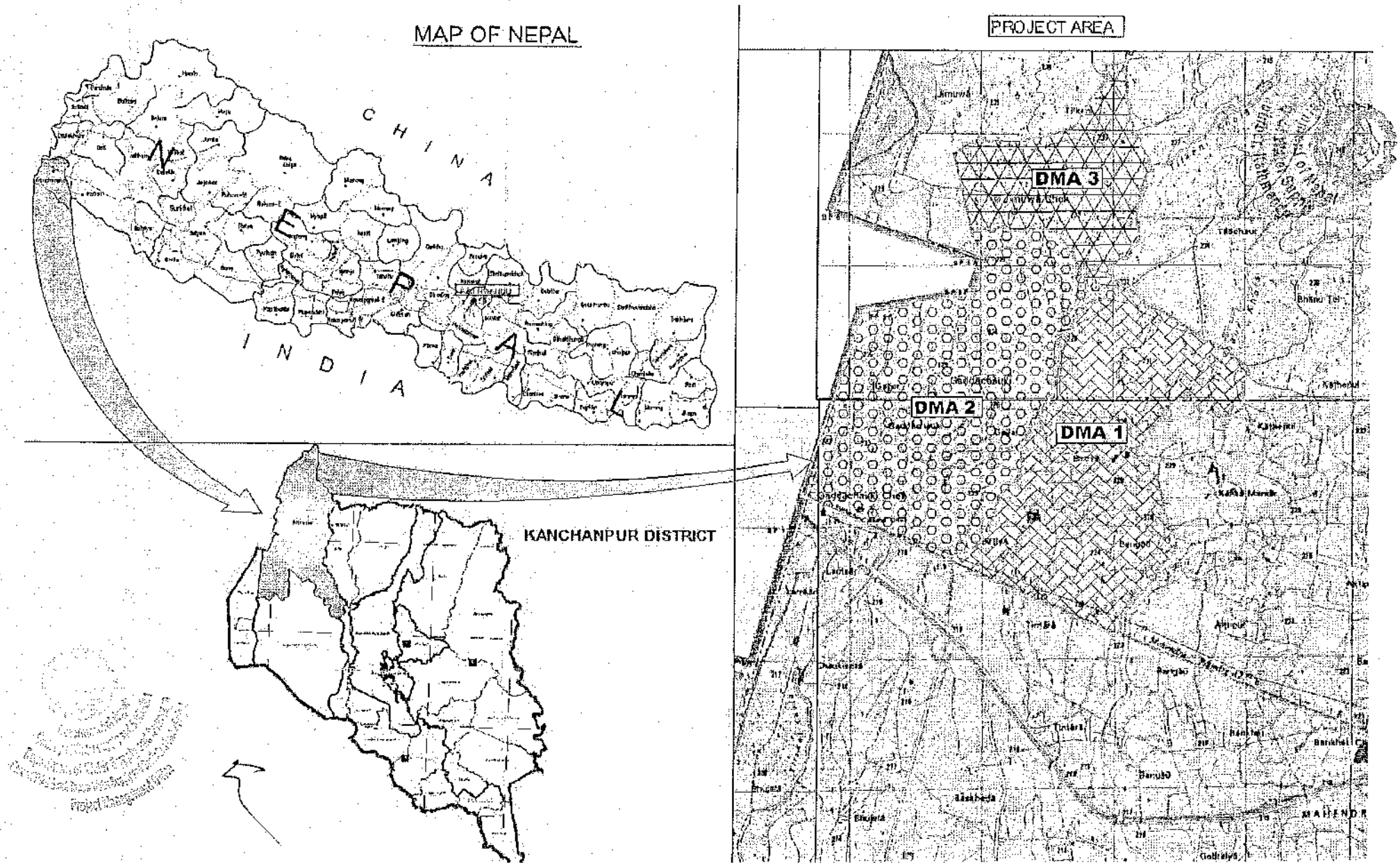

Figure 1: Location Map of the Project Area

14. Major components of the water supply scheme are briefly described below:

Water Treatment Units

15. The water treatment process has been selected based on the raw water quality. The proposed treatment process aims to remove the high concentrations of turbidity, hardness and alkalinity present in the raw water. The precipitated mineral like iron and manganese are also removed. It also kills pathogenic organisms present in raw water and ensures the presence of residual chlorine to kill the pathogenic organisms during the conveyance of treated water in pipelines. The treatment process consists of pressure filters, softeners and disinfection with associated accessories likes, valves and pipes.

16. Pressure filters made of mild steel with food grade epoxy coating inside is proposed to remove turbidity and precipitated minerals. The pressure filters is to be packed with sand and gravel as per the design specifications. The under drainage system and back wash system should also be installed in the pressure filters. The pressure filter is expected to bring down the turbidity of water as per the NDWQS. Large number of coliforms is also expected to be removed in the pressure filter due to biological action. Two numbers of pressure filters of 2.5 m diameter has been proposed.

17. Softeners made of mild steel with epoxy painted (MSEP) is proposed to remove hardness of water so that there is no calcium deposition in the pipelines. The softener is to be packed with Na cation exchange resin (zeolite). The expected hardness in the effluent of softener is 5 mg/l. Treating 40% water from softener and blending remaining 60% with filtered water is expected to produce 342*0.6+5*0.4 = 207 mg/l of hardness, which is quite acceptable and economical. The consumption of salt is about 0.80 kg per 1000 liter of water softened. Two numbers of softeners of 1.6 m diameter has been proposed.

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

Transmission Main

19. The transmission main conveys the water from the tube well to overhead service reservoirs. Since the water is conveyed by pumping it is also known as pumping main. Pipe sizes are so selected that velocity of water within the pipes remain within the range of 0.5 m/s to 1.5 m/s. DI pipes are proposed to use in both the systems. The water is pumped from the tube well with sufficient head so that the water passes through the water treatment plant and delivers it into the ground reservoir/sump well. The water is then pumped again from ground reservoir/sump well to overhead reservoir. The total transmission main pipe length of the proposed systems is 4.865 km. Thrust blocks are also provided to restrain the pumping mains in both the systems.

Service Reservoirs

20. The service reservoir is required to store the water to meet the hourly fluctuation of consumers' water demand. This allows the peak flow in the distribution network. The total storage requirement for the system at the end of design period i.e. 2039 is calculated as 450 Cum.

The following table summarizes the requirement of reservoir tank for the proposed system.

Table 3: Requirement of Reservoir

S.No.	Systems	Reservoir Size (Cum)	Type	Remarks
1	Chakkifanta	450	RCC – OHT	Proposed
Total		450		

Distribution Networks

21. The distribution system comprises of pipe network, which consists of mainly loops and branch. The water is supplied from the service reservoir to the consumers by the distribution pipe network. This network is analyzed using EPANET 2, a design analytical software tool. Distribution pipes are laid both sides of the all metalled and major roads. Single line pipes are proposed in earthen and other roads. HDPE pipes are predominantly used. Pipe of class and size lesser than 6 kgf and 50 mm is not proposed. Existing pipes will not be used as these are leaking and found substandard (class of 4 kgf). The length of the distribution network pipes proposed for various systems is shown in the table below. The total distribution pipe length of the proposed systems is 52.904 km.

Table 4: Distribution Pipe Network

S. No.	Systems	Length of Pipes (m)
1	Chakkifanta	52904
Total		52904

House Connections

22. The system has been designed, predominantly as house to house connections. The system has been analyzed for a design capacity of providing a total of 3749 house connections at the end of design period. However, initially during construction phase, only 1730 house connections are provided to satisfy the need for the base year population

Appurtenances

23. These will primarily comprise of valve chambers in flow control valves for controlling flow in the pipeline. Altogether 89 valve chambers and 10 pipe valve boxes are expected in the system. Other appurtenances as air valves, scour valves, fire hydrants will be provided at suitable locations. Some road crossing has been initially provided. This will also facilitate for less road cuttings during the operational phase.

Generator House, Office Building/ Laboratory Room

24. One permanent generator operator houses to accommodate the generators shall be constructed. In case of failure of power supply the generator shall be used to supply power to the pumps to deliver water. A permanent area to accommodate the pump / plant operator will be provided in this generator house. Accordingly a guard room is proposed. Refer Drawing Volume for details.

25. There is no office building in the project area. Thus new one is proposed to accommodate the required facilities Laboratory room, counters, managers room cannot be accommodated in the present office building. The new will consists of manager's room, cash counters, meeting hall etc. Lab room, store will be placed in the office building. Refer Drawing Volume IV for details

O&M Equipment and Tools

26. An assessment was done for the needed items. The TSTWSSSP has also some guide lines on it. The list of tools required for the operation and maintenance has been listed in Quantity/ Cost Estimate Volume. Besides the following equipment have been also considered in the project so that project works during construction period and for operational activities are effectively carried out.

a) Leakage detecting equipment- 1 set

b) Submersible sludge pump- 1 no

c) Electro-fusion machine for joining the HDPE pipes including portable Generator - 1 set

d) Water quality testing laboratory equipment – 1 set

Other Tools and Plants like: electric pipe cutters, pipe wrenches etc.

SANITATION ASPECTS

27. Training programme for proper construction toilet with local materials e.g. cement plaster un bamboo woven to make wall, strengthening pit wall by locally available stone, use of RCC rings, cover and its molding methods, etc. The community will construct the toilets themselves. A public toilet is also proposed.

Capital Cost of Water Supply and Sanitation Facilities

29. The cost for the proposed water supply component has been estimated as NRs. 278.794 million. The cost for the proposed sanitation facilities have been estimated as NRs. 6.791 million. The total project cost is NRs. 285.585 million including 15% contingency and 13% VAT. The cost has been based on prevalent unit rate for similar system components and district rate of Kanchanpur (FY 074/75) and is to be understood as a total cost estimate for the water supply facilities.

2.2.3 Salient Features of the Proposed Project

30. Salient features of the town project is summarized in the table below;

Table 5: Salient Feature of the proposed Project

S.N.	Items	Description
1	**Name of the Project**	Third Small Town Water Supply and Sanitation Sector Project, Tumdani Chakkifanta, Kanchanpur
2	**Type**	Ground (Pumping) scheme
3	**Study Level**	Detailed Engineering Design Report
4	**Location Area**	
	Province	Number 7
	Zone	Mahakali
	District	Kanchanpur
	VDC/Municipality	Bheemdatt Municipality
	Wards	Parts of Ward No 6, 8 and 10
5	**Available Facilities**	
	Road	East West Highway
	Nearest Airport	Bheemdatt
	Existing Water Supply System	None
	Electricity	Available
	Communication	Available
	Health Services	Available
	Banking Facilities	Available
	Attariya- Bheemdatt distance	42 km
6	**Source Characteristics**	
	Source Name	Deep Tube Well
	Source Type	Groundwater
	Source Location	Thapachauraha in Ward # 8, Bheemdatt Municipality
	Proposed Tapping yield (lps)	DTW:2 x 20,12 = 40.24 lps (Pumping)
7	**Project Components**	
	Storage Tank	RCC Overhead Tank 450 Cum : 1 # (Proposed)
	Valve Chamber (Nos.)	Type I (1500x900x1000) : 3 #
		Type 2 (900 x900x1000) : 86 #
		Pipe Valves (125mm dia) : 10 #
	Community Stand Posts	Nil
	Household Connection (Nos.)	1730 for base year
	Total Length of pipe (Km)	Transmission : 4.865 Km Distribution :52.904 Km
	Treatment Unit	Pressure filter, Softener and Disinfection
	Fire Hydrants	21 numbers
8	**Social Status**	
	Survey Year Population (2017)	9,178 (permanent) 132 (floating) [Total 9,310]
	Base Year Population (2019)	9,903 (permanent) 144 (floating)

		[Total 10,047]
	Design Year Population (2039)	21,464 (permanent) 345 (floating) [Total 21,809]
	Adopted Annual Growth Rate %	3.95 (Average)
	Household Numbers (2017, 2039)	1,603 HHs in 2017 and 3,745 HHs in 2039
	Average Family Sizes	5.73
9	**Total Water Demand**	
	Base year 2019 (m^3/day)	**Total 1,069.51**
	Design year 2039 (m^3/day)	**Total 2,606.66**
10	**Total Cost of the Project (NRs.)**	**285.585 million** with 15% contingencies & 13%VAT
	Water Supply Sector	NRs. 278.794 million
	Sanitation Sector	NRs. 6.791 million
11	**Cost Sharing Arrangement for water supply component (NRs)**	**278.794 million**
	1) GoN Grant @ 70%	NRs. 195.156 million
	2) WUSC Contribution	
	a) Upfront cash contribution @ 5%	NRs.13.940 million
	b) Loan through TDF @ 25%	NRs.69.699 million
12	**Cost Sharing Arrangement for Sanitation Component (NRs)**	**6.791 million**
	1) GoN Grant @ 85%	NRs.5.772 million
	2) Local Body (WUSC, VDC & others) 15%	NRs. 1.019 million
13	**Per capita Investment (for water supply sector)**	**Base Year** : NRs. 28,424.86 (considering permanent and floating population both) **Design Year** : NRs. 13,094.80 (considering permanent and floating population both)
14	**Environment**	
	ADB Category	Category B
	IEE finding	No adverse effect, IEE required
15	**Project Status**	
	Started	Oct-15

2.2.4 Environmental Conditions

(a) Physical Environment of the Project area

Climate, Topography and Geology:

31. The climate of the Tumdani Chakkifanta town area is humid. The maximum temperature varies from 37-40^0 C in summer and 4 to 18^0 C in the winter. The average rainfall is 1900 mm. Almost 80% of rainfall occurs during monsoon (June to September).The altitude of the project area is varying from 203 m- 225 m above the mean sea level (MSL).

32. The project area lies in a part of alluvial deposit of Mahakali River and its tributaries. Geologically it is situated in the foothills of Siwalik Hills of far western Nepal. The project area lies in a part of alluvial deposit of Mahakali River and its tributaries. The underline formation of the area is of cobbles, gravels and sand with pockets of clay. The area is rich in ground water potential, shallow as well as deep aquifers are being extracted for Drinking, Irrigation and Industrial purposes.

Water sources:

33. The project area is situated in a Terai belt; it has got high potential of the groundwater. The most suitable source for the water supply scheme seems to be tube well. Another probable source of water is Mahakali River which is located about 5 km west of the project area which defines boarder of Nepal and India at many places. The cost of tapping the water from Mahakali River will be considerably high due to high pipe and energy cost. The possibility of using Mahakali River as water source by integrating with other project should be further investigated.

(b) Ecological Profile

Flora, Fauna and Protected Areas:

34. The project area is primarily agricultural and settlement area surrounded by forest areas. There is only scattered tree cover and grassland within the project area. The main grass species are *Imperata cylindrica* and *Heteropogon contortus*, khagra reed (*Phragmite skarka*) and *Saccharum spontaneum*.The surrounding forest area is mixed forest with predominant sal (*Shorea robusta*) and salla (*Pinus roxburghii*), Sisau (*Dalbergia sisoo*), Karma (*Syzygium aromaticum*), Shag (*Carya ovate*), Jhamun (*Mangifera indica*) and Teak (*Tectona grandis*) are also found in the forest covers.

35. Many species of mammals and birds are observed in the project area. It is the habitat of both large and small mammals including Bengal Tiger, Sloth bear, Indian leopard, elephant, swamp deer, blue bull, porcupine and hog deer, etc. Weaver Sparrow(*Passer, Ploceidae family*), swamp francolin, chestnut-capped babbler, dusky eagle owl, white-rumped vulture, slender-billed vulture, sarus crane are among the bird species found in the area.

36. There is Shuklaphanta Conservation area close to the project area.

(c) Socio-Economic Profile

Population, Communities and Occupation:

37. There are total 1630 households in the service area (wards 6, 8 and 10) of the municipality. With an average household size of 5.7, the project area is quite densely populated. The permanent population is 9178 and among the permanent population, 4633 are male and 4545 are female. People are living in clusters in growing settlements. Brahmin and Chhettri comprising 75.7% of total families are prevailing caste group in the service

area. Dalits are the next major group with 23.8 percent, followed by Janajati which constitutes about 0.4 percent. Majority of the households are still dependent on agriculture. Nearly 43% of the households have agriculture as primary occupation. Service is another main occupation of 13% households, followed by 25% service and 13% business. About 11% of households are also involved as a wage labours.

Drinking Water, Sanitation and Health:

38. The finding of socio-economic census survey December 2017 is given in table below, which signifies that more than 80.2 percent households in the service area have Tube Well and 19.8 percent of them are getting water from other sources such as Dug Well, Kuwa, and River.

39. Till the date of survey, no Water User and Sanitation Committee have been formally registered in Tumdani Chakkifanta at ward no: 6, 8 and 10 of Bheemdatt municipality. There is no water supply distribution system in this area. Most of the locals are having water from tube-well and well for their day to day use.

40. The access of household to toilet facility is about 97.8% (1567 out of 1603). Among the households with access to household latrine, 90.3 percent of them have water seal type of latrine, 7.0 percent have ventilated pit type and 2.7 percent have pit latrine. Diarrhoea, typhoid, tapeworm, dysentery, jaundice and other vector borne diseases are the prevalent health cases in the project area.

Economic Characteristics:

41. Tumdani Chakkifanta is growing town with semi-urban and rural setting. As the municipality is the business and educational hub of the Mahakali Zone, this town is growing in fast pace. Students from neighboring districts come for education. There are reputed schools and colleges of the region. Governmental Services is a significant part of the economy. There are no major industries established in the Bheemdatt municipality but some hotels, lodges and small-scale cottage industries exist in the main Mahendranagar Bazaar. The land is fertile for agriculture and the rate of production is good. Socio-economic census survey shows that the household average monthly income is NRs. 39, 436 (*Survey, 2017*).

Infrastructural Facilities:

42. The project area is connected to the East-West Highway. Some district level and local level government offices and other institutions have been established in the service area. There are total 9 government offices including ward office. Besides these, a significant number of government and private institutions / organizations are in the town. Among them 3 are financial institutions, 8 educational institutions i.e. college / schools, 2 health intuitions (hospital / health centre) and 1 local club. The details of the institutions in the service area are presented in the following table.

2.2.5 Threshold Limits for Conducting IEE

43. For a drinking water supply project, according to Schedule-1 (Clause G. Drinking Water) of Environment Protection Rules, 1997 (and its amendments), an IEE study is required under the following conditions;

Table 6: Thresholds for IEE as per EPR, and the Project Conditions

Particulars	Status for proposed Tumdani Chakkifanta Town Project
1) Collection of rain- water in not more than 200 hectares, and use of water sources (springs and wetlands) located within the same area.	Not applicable
2) Surface water sources with not more	Not applicable

than 1 cubic ft. safe yield and supply of not more than 50 percent of the water during the dry season.	
3) Processing of water at the rate of 10 to 25 liters per second.	Within range
4) Recharging up to 50 percent of the total aquifer for the development of underground water source.	Not applicable
5) Construction of not more than one kilometer long tunnels for carrying water	Not applicable
6) Displacement of not more than 100 persons for operating a water supply scheme.	Not applicable
7) Settlement of not more than 500 persons on the upper reaches of water sources	Not applicable
8) Supply of drinking water to population ranging between 5,000 and 50,000	Within limits
9) Supply of drinking water to a population ranging between 10,000 and 100,000 upon connecting new sources.	Within Limits (9,178 permanent and 132rented;in total 9,310 population)
10) Installation of more than 20 kilometers long electricity transmission lines for pumping or processing water and consumption of more than one MW of electricity.	Not applicable
11) River training and diversion activities over an area of more than one kilometer.	Not applicable
12) Operation of a drinking water supply system with inclusion of sewage disposal system with sewage treatment system	Not applicable
13) 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	No non-point and point sources of pollution is present in the vicinity of the water source
14) Operation of water supply project included in a multipurpose project utilizing a source of 25 liter per sec water. (Construction of Multiple Purpose Reservoir Required)	This is not a multipurpose project and is solely for water supply.

44. For Drinking Water Supply Project: IEE is required for the water supply scheme having population between 10,000 - 100,000. As per point 9 of Table 6, population of the project falls within this criteria. Thus the IEE study has to be carried out.

2.2.6 Impact Area Delineation:

Direct Impact Zone (DIZ)

45. The area directly affected by the project activities are demarcated as Direct Impact Zone. DIZ can also be said to be the core project area. Chakkifanta Small Town Water Supply and Sanitation Project has been conceptualized as piped water supply system with pumping system. The areas where the project components lie and construction works take place are considered under DIZ.

Indirect Impact Zone (IIZ)

46. The area around the DIZ that could be indirectly affected due to project construction and implementation activities such as mobility of people, equipment, vehicles, noise, dust are demarcated as the Indirect Impact Zone. Thus area within 200 meters from the DIZ are considered as Indirect Impact Zone.

2.3 Relevancy of the Proposal

47. Any development project has some environmental implications, both beneficial and adverse. Therefore, it is pertinent to identify the complications/changes apparent in the environmental conditions along with the favorable or adverse impacts resulting from the activities associated with the project over the physical, biological, socio-economic and cultural environment of the project area. Similarly the assessment of the magnitude of the impacts is also equally important. The assessment techniques and methods to be adopted may however vary depending upon the nature of the project.

48. In recent years, environmentally sustainable development has become one of the major challenges faced by different development institutions. Accordingly, GoN has introduced a variety of instruments into the country's development activities. IEE is one of the tools for the environmentally sustainable development.

49. Taking in view of the statutory requirement of GoN to adhere with the environmental assessment of any development projects under EPA 2053 & EPR 2054, an IEE study is necessary and thus TOR is prepared. The Schedule-1 of EPR states to conduct IEE Study.

50. 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, are designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards. With respect to the environment, the SPS 2009 is underpinned by the ADB Operations Manual, Bank Policy (OM Section F1/OP, 2010).

2.4 Objectives of the Terms of Reference (ToR)

51. The primary objective of the ToR is to guide the IEE study to the relevant areas of environmental resources and most likely implications of the project activities on the resources. It further defines the scope of the study, study area, human and financial resources, and timeframe required for the accomplishment of the study.

2.5 Objectives of the IEE Study

52. IEE is a tool for incorporating environmental concerns at the project level and is carried out as a part of the detailed study. The objectives are:

- to provide information about the general environmental settings of the project area as baseline data,
- to provide information on potential impacts of the project and the characteristic of the impacts, magnitude, distribution, affected groups and duration,
- to provide information on potential mitigation measures to minimize the impact including mitigation costs
- to assess the best alternative project with most benefits and least costs in terms of financial, social and environmental aspects
- to provide basic information for formulating management and monitoring plans

53. The present IEE has been conducted for the water supply and sanitation subproject proposed for Chakkifanta Small Town Water Supply and Sanitation Project of Kanchanpur District. It discusses the environmental impacts and mitigation measures relating to the location, design, construction and operation and management of the scheme.

3. PROCEDURE TO BE ADOPTED WHILE PREPARING THE REPORT

54. Initial Environmental Examination report will be based on this Terms of Reference to be approved by the Ministry of Water Supply and Sanitation, GoN. The general methodology to be used in the preparation of IEE report will be as follows:

3.1 Desk Study and Literature Review

55. A desk review will be carried out with the following steps:

i. Collection and review of secondary information from various sources
ii. Initial interaction and consultation with the local community and district level stakeholders
iii. Collection and review of secondary sources of information from various sources
iv. Secondary information will be collected through published and unpublished reports and interpretation of maps and photographs will be done
v. Delineation of the geographical boundary of the Zone of Influence area on the topo-map
vi. Preparation of a project specific checklist
vii. A checklist is prepared to collect physical, biological, socio-economic and cultural environment-related information in the field. In addition, a ZoI household survey questionnaire will be used to collect socio-economic information of the households.
viii. Information on following aspects will be covered;
Physical:
Topography, Land Use, Air Noise and water Quality, Geology, Hydrology Soil Type, etc.
Biological:
Flora/Fauna, Endangered Species, NTFPs, etc.
Socio-Economic:
Population, Ethnicity, Existing Infrastructure, Health Facility, Public utilities, Economic status, etc.

3.2 Field Works

56. In order to identify the impacts, field visit and study will be carried out. A preliminary exercise to solicit information from planners, policy makers, project components, concerned authorities and the user community will be conducted.

57. Similarly, any cases related to hydrology, meteorology, geology and other aspects related to the environment will also be reviewed.

58. The consultant shall address the impact details by collecting information on physical, biological, socio-economic and cultural aspects of the environment. A description of relevant parts of the 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 shall be determined.

59. Nature of impacts, time duration of impacts and geographical extent of impacts will be defined for design, construction, and operation &maintenance phases of the project.

3.3 Public Consultation Program and Public Notice

60. Public consultation program in the project area will be organized to inform the broader communities and to collect the feedbacks and suggestions regarding the issues. This program mainly focus on the awareness about the project plans and programs, building of mutual consensus about the implementation of the project, identification of the key issues to be considered during IEE study and project design. Public consultation shall remain a continuous process during entire period of IEE study and during implementation of the project.

61. The proponent will affix a notice in the office of Bheemdatt Municipality and concerned ward offices, Office of the DDC, schools, hospitals, health post requesting the concerned authorities and individuals at project area to offer their written opinion and suggestions within fifteen days with regard to the possible impact of the implementation of the proposal on the environment. The notice will be published in a national daily newspaper. Deeds of the fixing of notice from the concerned offices will be collected and included in the IEE report.

3.4 Data Analysis and Report Preparation

62. The data collected shall be analyzed to identify both the negative and positive impacts of the project on the existing environment. During this stage, the socio-economic profile prepared by the NGO shall also be considered for further verification before finalization and prediction of the possible impacts both the adverse and beneficial. The consultant will submit the IEE Draft report within 45 days after approval of TOR. The draft IEE report will be presented to WUSC, local body representative etc. The consultant will incorporate the comments and suggestion made by PMO and WUSC. The consultant will submit the final IEE report within 7 days after receiving comments from PMO.

63. The proponent shall submit fifteen (15) copies of the proposal to the concerned Ministry (MoWSS) in accordance with Rule 10 of the EPR, 1997 for the approval of the proposal.

3.5 Identification, Prediction and Evaluation of Impacts

64. Considering the proposed project activities in terms of construction and operation stages of the project, identification and prediction of impacts will be carried out. The impacts of the activities will be on biophysical, social, economic, and cultural resources in a defined Zone of Influence (ZoI). The impacts will be classified in terms of extent (site specific, local, and regional), magnitude (low, medium, and high) and duration (short term, medium term and long term). The likely impact will be assessed covering both adverse and beneficial ones.

65. All the physical, biological, socio-economic and cultural information and data collected from both secondary and primary sources will be analyzed. The tools and techniques include checklists (simple, descriptive, scaling or questionnaire), interaction matrix (simple, Leopold, modified graded or impact matrix) and network methods. If required, expert judgment, GIS tools, Delphi method and experience from the past projects shall also be employed for the prediction of potential impact.

66. An IEE report will be prepared in accordance with the content given in Schedule 5 of the EPR '97, and the final report will be prepared after incorporating all the relevant comments and suggestions on the draft report. Requirements as per ADB's SPS 2009 will be complied during the study and while preparation of the report.

4. POLICIES, LAWS, RULES AND MANUALS TO BE TAKEN INTO ACCOUNT WHILE PREPARING THE REPORT

67. The IEE will be conducted in compliance with the following Policies, laws, Acts, Regulations, Standards and Guidelines as mentioned below;

Constitution

The Constitution of Nepal, 2072

Acts

- Water Resources Act, 2049 BS (1992 AD)
- Forest Act, 2049 BS (1992 AD)
- Environment Protection Act, 2053 BS (1996 AD)
- Local Self Governance Act, 2055 BS (1999 AD)
- Aquatic Animals Protection Act 1961 and First Amendment, 2055 BS (1999 AD)
- Land Acquisition Act, 2034BS (1978 AD)
- National Park and Wild Life Conservation Act, 2030 BS (1974 AD)
- Soil and watershed Area Conservation Act, 2039 BS (1983 AD)
- Labour Act, 2048 BS (1992 AD)
- Child Labour Prohibition and Regulation Act, 2056 BS (2001 AD)

Rules and Regulations:

- Forest Regulations, 2050 BS (1993 AD)
- Environment Protection Rules, 2054 BS (and its amendments)
- Local Self Governance Regulations, 2056 BS (2000 AD)
- Water Supply and Sanitation Regulation, 2062 BS (2005 AD)

Plan and Policies:

- Rural Water Supply and Sanitation National Policy, Strategy and Action Plan, 2060 BS (2004 AD)
- Water Supply and Sanitation National Policy and Strategy, 2060 BS (2004 AD)
- Urban Water Supply and Sanitation Policy, 2066 BS (2009 AD)
- ADB's " Safeguard Policy Statement (SPS) " 2066 BS (2009 AD)

Standards, Guidelines and Strategies

- National EIA Guidelines, 2050 BS (1993 AD)
- National Drinking Water Quality Standards 2062 BS (2005 AD)
- National Ambient Air Quality Standards, 2003 AD
- National Noise Standard Guidelines, 2012 AD
- Water Resources Strategy, 2055 B.S. (2002 AD)

5. PREPARING THE REPORTS

5.1 Time

68. Time schedule envisaged for the IEE study is as follows;

Duration: Within Two months of the approval of TOR.

Proposed Schedule of work for IEE Report Preparation

Table 7: Schedule proposed for IEE

S.No	Activities / Week	1 wk	2 wk	3 wk	4 wk	5 wk	6 wk	7 wk	8 wk
1	TOR Approval								
2	Public Notification								
3	Field investigation, experts view / focus group session and collection of public opinion								
4	Preparation and submission of Draft Report								
5	Collection of comments and suggestions								
6	Preparation and submission of Final Report								

5.2 Estimated Budget

69. Estimated budget for this IEE study is Rs. 800,000.Following inter-disciplinary human resources will be engaged with the co-ordination of team leader;

i. Environmental Specialist
ii. Water Supply Engineer
iii. Sociologist
iv. Geo-hydrologist
v. Ecologist/Botanist

6. SPECIFIC IMPACTS OF THE IMPLEMENTATION OF THE PROPOSAL ON THE ENVIRONMENT AND MITIGATION MEASURE

70. A distinction shall be made between the potentially significant positive and adverse impacts and immediate and long term impacts. Impacts that are unavoidable or irreversible shall be identified. Where ever possible, the significant impacts shall be quantified in terms of environment costs and benefits.

71. The impacts shall be identified mainly for the activities during the pre-construction, construction and post construction (O&M) phases on the existing physical, biological and socio-economic resources.

72. As a part of the study, enhancement of the positive impacts shall also be carried out. The potential impacts that shall be assessed are grouped and prioritized into three major impacts as follows:

6.1 Beneficial Impacts

a. Construction Phase

i. Employment Generation and Increase in Income

73. One of the major direct beneficial impacts of the water supply and sanitation project at construction stage is the creation of employment opportunity to the local community.

ii. Skill Enhancement

74. Although many people in the project area are found unskilled at present, the construction of the water supply system and the distribution network is likely to enhance their skills in plumbing, fittings and other construction works.

b. Operation and Maintenance Phase

i. Improvement in health and saving of time

75. After the water supply and sanitation project is complete, the people living within the project area will benefit from the supply of sufficient quantity and good quality water and improved sanitary conditions.

ii. Development of Market center

76. The availability of good supply of drinking water will accelerate development of market centers.

iii. Appreciation of Land Value

77. One of the major benefits of the project is that the land price will increase due to the availability of reliable safe drinking water and sanitation system.

iv. Women Empowerment

78. Women and girls in particular will largely benefit from this project, as they are the ones who spend a great deal of time in fetching water. With the operation of the water supply scheme, this time will be saved.

v. Quality of Life Values

79. The project will help to enhance the quality of life of the people by providing opportunities for jobs, providing good quality water, improved sanitation etc.

6.2 Adverse Impacts

6.2.1 Pre-construction Phase

80. The pre-construction works involved field survey and investigation, development of design & detailed drawings, carrying out cost estimate etc. This also includes discussion with WUSC and revision of design if necessary. Some of the issues of pre-construction phase are;

i. Social conflicts for any land requirements
ii. Water use conflicts
iii. Disturbance to vegetation and wildlife

6.2.2 Construction Phase

(a) Socio-economic Environment

i. Disturbance to the community activities
81. Construction activities particularly construction works in the roads may cause disturbances to the community activities, festivals and social events.

ii. Social Dispute and Dissatisfaction
82. There is possibility of influx of outside workforce. Their activities and consumption of local resources may cause conflicts with the local people. Use of public land for project infrastructures may also bring some complaints from the locals.

iii. Community health and safety
83. Accidental cases of local children near the work-sites, possibility of communicable diseases, and challenge on local sanitation status will be concerns related to project construction phase.

iv. Occupational health and safety (OHS)
84. Safety and health of workers particularly of those involved in concreting, trench cutting, formwork and other activities in construction sites is of prime concern.

(b) Physical Environment

i. Erosion and land surface disturbance
85. Construction activities may lead to erosion and caving thereby causing soil erosion, silt runoff, and unsettling of street surfaces. The activity as such will be a nuisance and discomfort to the road users and inhabitants.

ii. Damage to the existing facilities
86. During the construction time, while excavating the earth, existing water supply distribution pipe lines and telecommunication cable may get damaged in few places particularly in bazaar area despite of efforts to avoid such cases.

iii. Impact on water bodies
87. There will be some impacts on water bodies located within project area during construction phase. Construction activities are likely to influence the surface water quality.

iv. Air and Noise pollution

88. The construction activity will comprise of construction, laying of transmission and distribution pipelines, and construction of storage reservoirs, transport and installation of pumps. This will cause air pollution and noise nuisance.

v. Vibration effects

89. Vibrations during construction works may result in cracks and damages to local infrastructures and private properties.

(c) Biological Environment

90. The project area falls under vegetated land, built-up area with agricultural land. Loss of vegetation cover, although limited, will be a concern to be addressed in this project.

i. Impact on Flora

91. The loss of vegetation cover and species diversity due to earthwork primarily at direct impact area of intake will be minimum, yet these need to be accounted for.

ii. Impact on Fauna

92. Movement, inhabitation and population dynamics of resident and migratory birds and reptiles at the project site may be affected due to disturbances caused by construction activities.

iii. Impact on aquatic life

93. Construction activities will physically disturb the water quality for certain period of time and may cause impact on aquatic life.

6.2.3 Post-Construction and Operation Phase

94. i. Impacts on land resource and landscape aesthetics if decommissioning of construction facilities is not conducted in proper manner.

95. ii. Risk of health hazard if water supply system is not well maintained during leakages, and if disinfection is not well carried out

6.3 Prioritized Issues

96. Issues that are likely to occur during different phases of the construction have been prioritized as follows;

Table 8: Prioritized Issues

Project Phases and Environmental Issues	Physical	Biological	Socio-economic and Cultural
Pre-Construction Phase	Degradation of source areas through repeated access	Access and site clearance can affect the vegetation, especially at source and reservoir sites	Concerns of water rights

	Concerns during taking of test borings	Disturbance to wildlife	Issues of land requirement for project structures
Construction Phase	Disturbance to land-surface during construction of project components	Vegetation may be lost during construction of project components and during pipe laying works	Local festive and cultural activities, and social events may be disturbed due to construction activities
	Loss of top-soil	Disposal of spoil and waste onto water bodies may impact the aquatic lives	Social disharmony due to influx of outside workforce could be an issue
	In-use roads, electrical poles etc may be disturbed due to laying of transmission and distribution pipelines	Illegal hunting by workforce, encroachment of wild habitats could take place	Competitive sense of employment opportunities among the locals and outside workforce could bring conflicts
	Drying of water sources could be an issue		Elderly and young ones, and the people travelling to work and market may face health and safety challenges, especially if quarries and ditches are not well managed
	Ambient air pollution due to use of vehicles and equipment, its associate noise and vibration effects		Health and safety of the workers, e.g. workers involved in construction of water tanks, pipe-laying may have injuries, etc
Post Construction and Operation Phase	If campsites and temporary facilities are not well decommissioned after the completion of construction works, this may impact on local	Discharge of slurry from treatment plants onto water bodies may negatively affect the aquatic lives	If the water supply system is not well operated and maintained, there may be chances of supply of polluted water to its users

	land aesthetics		
	Issues of ground water level		

6.4 Mitigation Measure

97. Suitable, cost effective and environment friendly mitigation measures shall be recommended during the preparation of IEE report for all the perceived impacts in order to minimize the environmental impacts of project implementation. In general the following area shall be covered while preparing mitigation measures:

i. Project design and preparation phase
ii. Project construction phase
iii. Project operation and maintenance phase

98. Concerned agencies; TSTWSSSP, DWSS, WSSDO and local agencies, local administration office shall be consulted during the implementation of mitigation measures. National EIA Guidelines 1993 will be used for significance analysis of impacts.

7. ALTERNATIVES TO THE IMPLEMENTATION OF THE PROPOSAL

99. The study will consider different project alternatives for selection of the best option to achieve the sustainability of the proposed development works. The significant alternatives to be considered during the study are as follows;

7.1 Design

100. Alternative designs of project will be examined and analyzed to select most appropriate design of the proposed project so that the project caters best of its services to the project area. In doing so, environmental consideration and safety point of view will be given due considerations and will be analyzed accordingly.

7.2 Project site

101. Alternative sites will be considered and studied in the process so as to avoid significant environmental impacts. The options will primarily focus on reducing the felling of trees, avoiding disturbance on the wildlife habitats, avoiding the damage to public/private infrastructures and avoiding disturbances to local services, etc.

7.3 Technology, Procedure of Operation, Time Schedule, and Raw Materials to be used

102. The study will analyze different technology, procedures of operation, time - schedule and raw materials to be used to select the best alternative among them. The technological alternatives will include fully-mechanized, semi-mechanized, labor-intensive, labor-based etc options of proposal implementation.

103. Similarly methods of operation whether contractor based, community based, labor base or a mix of them will also be assessed.

104. Procedures of operation will be assessed in terms of round the year operation and peak-time operation services; types and specifications of equipments to be used, etc will also be assessed in terms of needs as well as demand in the area. Schedule of implementation of the proposal works including agricultural off-season, monsoon season, day and night time working etc will be assessed.

105. Alternative resources required for the proposed works, including cement, steel, gabion boulders, gravel, earth, sand, bioengineering sapling, etc will be assessed.

7.4 Other Factors

106. The study will also consider different options of project implementation. The IEE study will examine different alternatives for the environmental management system. The options will be assessed based on the institutional structures of the project implementation, monitoring options, extent of participation of the stakeholders, role of local bodies, including NGOs/CBOs etc.

8. MATTERS CONCERNING THE PREVENTION OF THE IMPACTS OF THE IMPLEMENTATION OF THE PROPOSAL ON THE ENVIRONMENT

107. The IEE team will study the mitigation measures for all the identified significant impacts and incorporate them in the report. The proponent will identify the most suitable of measures to prevent or to reduce significant adverse impacts. Measures to enhance beneficial project impacts will also be presented. The mitigation measures will deal separately for physical, biological, socio-economic and cultural environments in both the construction and operation phases. The proponent will be responsible for the implementation of environmental mitigation and enhancement program mentioned in IEE report.

108. The mitigation measures shall be specific and developed by applying a pragmatic approach that is technically and economically feasible, socially acceptable, and preferably of proven effectiveness. The cost required for each and every mitigation measure and enhancement measures will be estimated and incorporated in IEE report. Cost of mitigation and enhancement measures will be categorized in terms of construction and operation phases.

109. The enhancement and mitigation measures will be categorized in terms of the physical, biological, socio-economic and cultural environment for the construction and operation phases. A matrix of impact and mitigation measures shall also be included in the IEE report.

9. MATTERS TO BE MONITORED WHILE IMPLEMENTING THE PROPOSAL

9.1 Environmental Management Plan

110. 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 (EMP) 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.

111. 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.

9.2 Environmental Monitoring Plan

112. The project will develop Environmental Monitoring Plan for the project. The program will evaluate:

(i) Extent and severity of the adverse environmental impacts compared to predicted ones,
(ii) How effective the mitigating measures were and compliance with the regulations and
(iii) Overall effectiveness of the EMP.

113. 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 to the approved design and that the environmental mitigation measures are fully implemented in accordance with the EMP.

114. The DSC will prepare progress reports on EMP implementation and submits to relevant agencies on regular basis. The WSSDO Kanchapur will supervise the environmental monitoring activities undertaken by DSC.

115. Monitoring of the mitigation measures during the construction and operation phase will mainly consider the following impacts:

(a) Construction Phase:

116 Soil erosion, sedimentation and slope stabilization; spoil-tip protection and management; stock taking of species of urban vegetation during vegetation clearance along pipeline alignments and re-plantation; change in hydrology and morphology of streams and rivers; water, air and noise (vibration) pollution; solid waste; land intake and compensation; reinstatement of damaged structures and services; crime and community stress; health, safety and sanitation of the work force and camps; archaeological and cultural sites and chance finds; and traffic management.

(b) Operation Phase:

117. Discharge of water/ sludge during plant maintenance, leakage, backwash, treatment operations; silt disposal; quality of drinking water supplies; pipe flushing.

Monitoring mechanism:

118. The monitoring mechanism during construction will be of regular type whereas baseline monitoring, compliance monitoring and process monitoring shall have to be done during the operation and maintenance phase. The monitoring team shall visit the project site and monitor the effectiveness of the implementation of mitigation measures.

9.3Information Disclosure, Public Consultation and Participation

119. Public consultation is the process of exchanging information with those persons and organizations 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.

120. 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, 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.

121. Information is disclosed through public consultation and more formally by making documents and other materials available in a form 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.

122. 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.

123. 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.

9.4Grievance Redress Mechanism

124. Tumdani Chakkifanta Project Coordination Committee of Kanchanpur will be responsible to address the issues and problems raised by the local communities regarding the loss of assets, issues related to water and sanitation, etc. during the implementation of the project. The coordination committee shall ask the Environment Specialist and Social Specialist of the DSMC to assist in the handling of grievances and the community level stakeholders should be encouraged to help in the handling of grievances at the project sites.

125. The affected person / community will submit grievances / complaints to the committee. The committee will try to solve the grievance at the project level. If the grievance cannot be solved at the project level, the committee will forward it to Director General (DG)'s Office at Kathmandu through TSTWSSSP.

10. OTHER NECESSARY MATTERS

126. The report shall include all cited information, reference lists, maps, graphs, photographs, tables and charts, graphs, and questionnaires used during the IEE study as per the ERR 1997.The IEE Report will be prepared based on Schedule-5 (pertaining to Rule 7) of the EPR 1997.

127. IEE report shall be prepared as per this TOR and shall be submitted to MWSS and ADB through TSTWSSSP. The basic format of the report will be in accordance with the EPR, 1997 and National EIA Guidelines, 1993. Land use map of location sites, letters obtained from the stakeholders in response to public notification, and the newspaper cut piece of public notification and no objection letter from local authorities will be included in the IEE report. Similarly, wherever applicable maps, photographs, tables and matrix shall be presented. ADB requirements as per SPS 2009 will also be fulfilled.

128. The format for the IEE report should include, but not be limited to the following:

1. Name and Address of the Institution Preparing the Report

2. Summary of the Proposal
- 2.1 Background
- 2.2 Need of the Sub-project
- 2.3 Objectives of the Environmental Study
- 2.4 Scope of IEE
- 2.5 Relevancy of IEE

3. The Proposal
- 3.1 The Study Area
- 3.2 The Sub-project
- 3.3 Existing Situations
- 3.4 Size and magnitude of operation
- 3.5 Proposed schedule of implementation
- 3.6 Components of the project
- 3.7 Land Requirements and compensation
- 3.8 Construction and Operation Activities of the project

4. Review of Acts/Rules, Plans/Policies, Guidelines and Standards
- 4.1 Policy and legal frameworks
- 4.2 Conventions
- 4.3 Other documents
- 4.4 Relevant standards

5. IEE Study Methodology
- 5.1 Desk Study and Impact Area Delineation
- 5.2 Field Work
- 5.3 Data Processing
- 5.4 Consultation and Information Disclosure

6. Description of the Environment
- 6.1 Physical Resources
  - Topography, Geology and Soils
  - Land Use
  - Climate
  - Water Resources
  - Air quality
  - Noise levels

6.2 Ecological Resources
Flora
Fauna
Aquatic lives

6.3 Social and cultural resources
Households and Population
Caste and Ethnicity
Educational facilities
Occupation
Economic Characteristics
Existing water supply conditions
Existing sanitation conditions
Existing health conditions
Cultural heritage
Other Infrastructures

7. Anticipated Environmental Impacts and Mitigation Measures
7.1 Beneficial Impacts and Augmentation Measures
i. Construction Phase
ii. Operation and maintenance phase
7.2 Adverse Impacts and Mitigation Measures
i. Pre-construction Phase
ii. Construction Phase
(a) Physical Environment
(b) Biological Environment
(c) Socio-Economic and Cultural Environment
iii. Operation and Maintenance Phase
7.3 Indirect, Induced and Cumulative Impacts
7.4 Evaluation of Impacts
7.5 Implementation of Mitigation Measures

8. Analysis of Alternatives With and Without Project Situations

9. Environmental Management Plan (EMP)
6.2 Environmental Management Plan
6.3 Monitoring & Reporting
6.4 Implementation Arrangements
6.5 Information Disclosure, Consultation and Public Participation
6.6 Grievance Redress Mechanism

10. Conclusions and Recommendations

129. While preparing the report any issue / impacts found relevant will be included in the report, besides the issues /impacts mentioned in this TOR. The proponent shall submit fifteen copies of the final IEE Report of this project to the concerned ministry (MoWSS) in accordance with Rule 10 of the EPR1997 (and its amendments).

ANNEXES:

Annex I: References

Annex II: Schematic Layout of Project

Annex III: ADB's Rapid Environmental Assessment (REA) Checklist for IEE Study of Tumdani Chakkifanta Small Town Water Supply and Sanitation Project

Annex IV: Checklists and Questionnaires

Annex I: Reference

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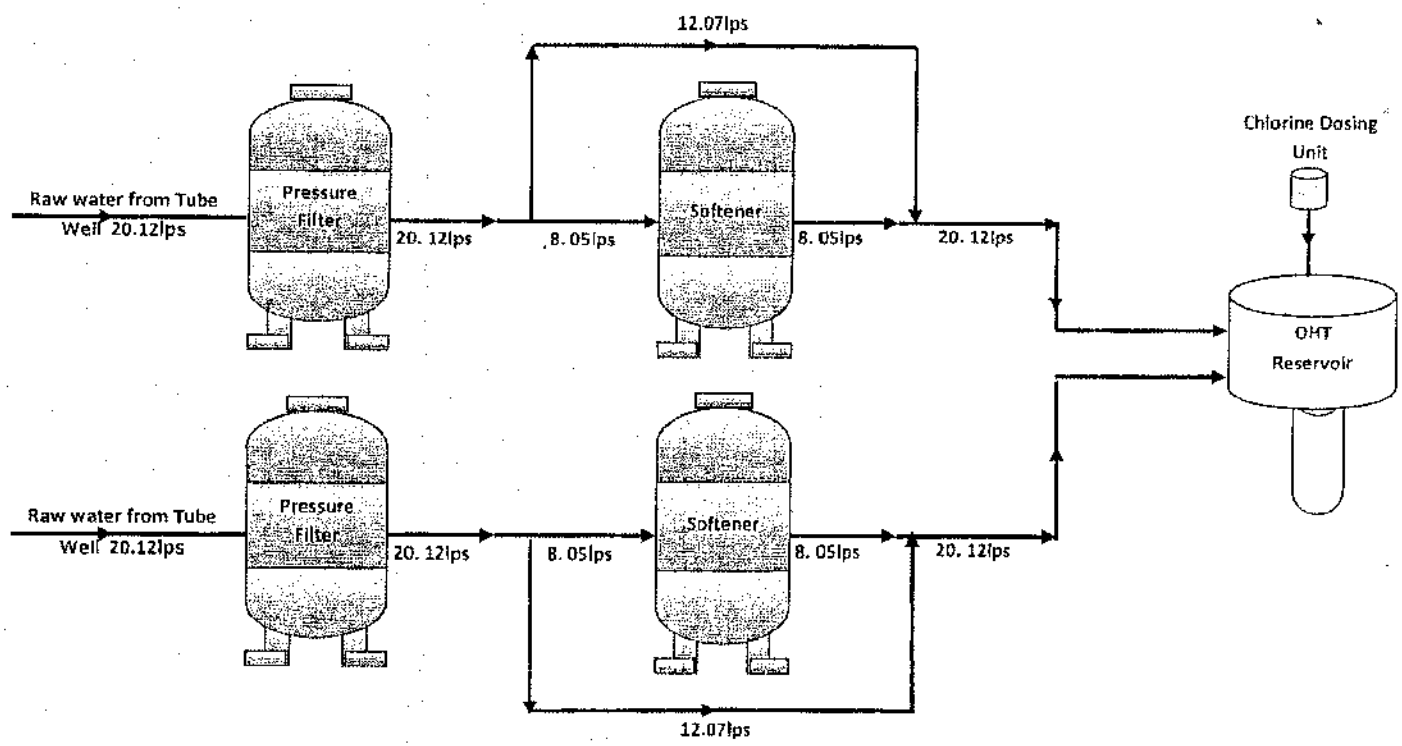
Annex II: Schematic Layout of Project



Annex III:

ADB's RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST FOR IEE STUDY OF CHAKKIFANTASMALL TOWN WATER SUPPLY AND SANITATION PROJECT

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area			
☐ Densely populated		No	
☐ Heavy with development activities?		No	
☐ Adjacent to or within any environmentally sensitive areas?		No	
☐ Cultural heritage site		No	
☐ Protected Area		No	
☐Wetland		No	
☐Mangrove		No	
☐ Estuarine		No	
☐ Buffer zone of protected area		No	
☐ Special area for protecting biodiversity		No	
☐ Bay		No	
B. Potential Environmental Impacts Will the Project cause...			
☐pollution of raw water supplyfromupstreamwastewaterdischargefromcommunities ,industries,agriculture,andsoilerosionrunoff?		No	
☐impairment of historical/cultural monuments/areas and loss/damage to these sites?		No	
☐ hazard of land subsidence caused byexcessive ground water pumping?		No	
☐ social conflicts arising from displacement of communities ?		No	
☐ conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		No	
☐ unsatisfactory rawwater supply (e.g. excessive pathogens or mineral constituents)?		No	Lab tests will be the basis
☐ delivery of unsafe water to distribution system?		No	
☐ inadequate protection of intake works or wells, leading to pollution of water supply?		No	

☐ over pumping of ground water, leading to salinization and ground subsidence?		No	
☐ excessive algal growth in storage reservoir?		No	
☐ increase in production of sewage beyond capabilities of community facilities?		No	
☐ inadequate disposal of sludge from water treatment plants?		No	
☐ inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and		No	
☐ impairments associated with transmission lines and access roads?	Yes		Options for minimum disturbance/damage will be considered
☐ health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		No	Standard procedures, precautions and provisions will be adopted
☐ 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?		No	
☐ dislocation or involuntary resettlement of people?		No	
☐ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		No	
☐ noise and dust from construction activities?	Yes		Low magnitude
☐ increased road traffic due to interference of construction activities?		No	
☐ continuing soil erosion/silt runoff from construction operations?		No	
☐ 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		No	
☐ delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		No	
☐ accidental leakage of chlorine gas?		No	
☐ excessive abstraction of water affecting downstream water users?		No	
☐ competing uses of water?		No	
☐ increased sewage flow due to increased water supply	Yes		
☐ increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	Yes		

☐ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		No	
☐ social conflicts if workers from other regions or countries are hired?	Yes		
☐ 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?		No	
☐ 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		No	
C. Potential Environmental Impacts Will the Project cause...			
☐impairment of historical/cultural monuments/areas and loss/damage to these sites?		No	
☐interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?	Yes		Minimal effects, such cases will be avoided as far as possible
☐dislocation or involuntary resettlement of people?		No	
☐disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		No	
☐impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		No	
☐overflows and flooding of neighboring properties with raw sewage?		No	
☐environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?		No	
☐ noise and vibration due to blasting and other civil works?	Yes		Minimal level
☐ risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	Yes		
☐ discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?		No	
☐ inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		No	
☐ road blocking and temporary flooding due to land excavation during the rainy season?		No	
☐ noise and dust from construction activities?	Yes		

☐ traffic disturbances due to construction material transport and wastes?		No	
☐ temporary silt runoff due to construction?		No	
☐ hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?		No	
☐ deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?		No	
☐ contamination of surface and ground waters due to sludge disposal on land?		No	
☐ health and safety hazards to workers from toxic gases and hazardous materials which may be contained in confined areas, sewage flow and exposure to pathogens in untreated sewage and unstabilized sludge?		No	
☐ large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		No	
☐ social conflicts between construction workers from other areas and community workers?	Yes		Slight possibility
☐ 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 construction and operation?		No	
☐ 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?	Yes		Some concerns of accidental possibilities

ANNEX IV:

Checklists and Questionnaires

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 pipeline 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

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Checklist for Plant Resources

Date:

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

Note:.....
.....
.....
.....

Checklist for Wildlife/Animals

Date:

S.N.	Wild Animals	Remarks

Note:.....

.....

.....

.....

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Checklist for Birds

Date:

S.No.	Birds	Remarks

Note:.....

.....

.....

१. परिचय

१.१ अन्तर्वार्तादिने व्यक्तिको नाम ठेगाना:

(क) जिल्ला: (ख) गा.वि.स:

(ग) टोल रस्थान: (घ) वार्ड नं.:

१.२ पारिवारिक विवरण

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

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

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

(ज) बसेको वर्ष: (झ) शिक्षा :

(ञ) कुल परिवार संख्या.....

उमेर समुह	पुरुष	पेशा	महिला	पेशा	जम्मा
०-५ वर्ष					
६-१० वर्ष					
११-१५ वर्ष					
१६-४५ वर्ष					
४५-६० वर्ष					
६० भन्दामाथि					
जम्मा					

१.३ विद्यालयजाने उमेरकाबालबालिका (६-१५वर्ष)

	विद्यालयगएका		विद्यालयनगएका	
जम्मा	पुरुष	महिला	पुरुष	महिला

२. साक्षरता : (तपाईको परिवारमा)

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

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३. कृषि (भु-उपयोग)

३.१ तपाईवा परिवार सदस्यको नाममागा.वि.स.र वडा भित्रजग्गा छ रु

छ ☐ छैन ☐

३.२ यदि छ भने कति छ ? रोपनीमाभन्नुहोस :

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

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

कस.	ठाउँको नाम	जग्गा				कैफियत
		खेत	बारी	खरवारी	वन	

३.४ तपाईको जग्गाआयोजनाभित्र पर्छ रु ९एभिबकभ नभलतष्यल तजभ अकउयलभलत या उचयवभअत धजभचभ ज्ज ।बिकि०

घर

☐ लम्बाई (फिटमा)

☐ चौडाई (फिटमा)

☐ छाना

☐तल्ला

☐ कोष

खेत

☐ पाखो बारी

☐ जंगल

☐ अन्य

☐ अन्दाजीमूल्य (चलनचल्तीमा) नेरु.

(क) आयोजना क्षेत्र भित्रतपाईको कतिवटा घर र गोठ छन् ।

घर ☐ गोठ ☐

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

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

	संख्या	क्षेत्रफल
गोठ		
अन्य (खुलाउने)		

३.५ (क) तपाईको आयोजना क्षेत्र भित्र पर्ने जमिनमाकुनकुनफसललगाउनु हुन्छ रु

कंसं.	खाद्यान्नवाली	वालीलगाएको क्षेत्रफल	उत्पादन परिणाम
१. खाद्यान्नवाली			
	धान		
	गहु		
	मकै		
	कोदो		
	दाल गेडागुडी		
	अन्य		
२. नगदे वाली			
	आलु		
	तोरी		
	तरकारी		
	अन्य		

(ख) उक्तजग्गामालगाएको फलफूल र अन्यबोटविरुवाको विवरण दिनुहोस

कंसं.	बोटविरुवा	विरुवा संख्या		जम्मा
		फललाएको	फलनलाएको	
१	फलफूल			
२	कागती			
३	सुन्तला			
५	आँप			
६	मेवा			
७	अम्वा			
८	लिच्चीं			
९	कटहर			
१०	केरा			
११	आरु			
१२	नास्पाती			
१३	आरुवखडा			
१४	अन्य			
१५	डाले घाँस			
१६	पाखुरी			
१७	काभ्रो			
१८	वडहर			
१९	खनायो			

क्र.सं.	बोटविरुवा	विरुवा संख्या		जम्मा
		फललाएको	फलनलाएको	
२०	टाकी			
२१	गिदरी			
२२	अन्य			
२३	इन्धनको लागिप्रयोग गर्ने बोट विरुवा			
२४	काठमा प्रयोग हुने बोटविरुवा			
२५	बाँस निगालो			

३.६ के तपाईको जग्गामाभएको गतवर्षको उत्पादनले तपाईको परिवारलाई खानपर्याप्तभयो रु

भयो ☐ भएन ☐

३.७यदिअप्रर्याप्तभयो भने कतिमहिनाको लागिपुग्ने रु महिना

(क) तिनमहिना (ख) छ महिना

(ग) नौ महिना (घ) बाह्र महिना

३.८ आफ्नो उत्पादितखाद्यान्नअप्रर्याप्तभएको बेलाआफ्नो परिवारलाई कसरी खुवाउनु हुन्छ ?

क. ऋण गरेर ख. नोकरीबाट भएको आम्दानीबाट

ग. व्यापारीको आम्दानीबाट घ. भारी बोकेर भएको आम्दानीबाट

ङ. दैनिक मजदुरबाट भएको च. अन्य .....

३.९ पशुपालन सम्बन्धी :

तपाईको घरमा कति /कस्ता पशु पक्षीहरु पालु भएको छ रु

क.सं.	पशुपंक्षी	संख्या
१	गाई	
२	गोरु	
३	भैंसी	
४	बाछा	
५	बाछि	
६	पाडा	
७	पाडि	
८	राँगो	
९	घोडा	
१०	बाख्रा	
११	बोका	
१२	खसी	
१३	पाठा/पाठी	
१४	सुँगुर/बंगुर	
१५	हाँस	

क.सं.	पशुपंक्षी	संख्या
१६	कुखुरा	
१८	अन्य (खुलाउने)	

४. घर परिवारको वार्षिक औषतआम्दानी :

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

५. घर परिवारको वार्षिक औषतखर्च :

विवरण	जम्मा रकम (रु.)	विवरण	जम्मा रकम (रु.)
चामल		चिया	
दाल		दाउरा	
मकै		बिजुली	
तरकारी		मट्टितेल	
दुध/दही		औषधि	
माछा/मासु		शिक्षा	
तेल/घ्यू		कपडा	
मर-मसला		चाडपर्व	
नुन		अन्य	
चिनी			
		जम्माखर्च	

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६.पानीको आपूर्ति

(क) तपाईले यस खोलाको पानीउपयोग गर्नु हुन्छ किहुदैन रु

गर्छु ☐ गर्दिन ☐

(ख) यदिखोलाको पानीप्रयोग गर्नु हुन्छ भने कुनप्रयोजनको लागिप्रयोग गर्नुहुन्छ रु

सिंचाई ☐ नुहाउने, कपडा धुने ☐

पिउने ☐ अन्य ☐

७.स्वास्थ्य सम्बन्धि:

(क) तपाईको परिवारमाकुनै सदस्यविगतवर्षमाविरामीभएकाथिए रु

थिए☐ थिएनन् ☐

(ख)यदिथिएभने निम्नविवरण दिनुहोस् रु

कसं	नाता	पुरुष	महिला	उमेर	रोग
१					
२					
३					
४					

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

(ग) विरामीपर्दा सर्वप्रथमकहाँ जानुहुन्छ रु .....

(घ) त्यहाँनिको नभएकहाँजानुहुन्छ रुक्रमशउल्लेख गर्नुहोस ।

क.सं	जाने ठाउँ	रहेको स्थान	दूरी (कि.मी.)
१	अस्पताल		
२	हेल्थपोस्ट		
३	हेल्थ सेन्टर		
४	आयुर्वेदिकऔषधालय		
५	निजिक्लिनिकरऔषधीपसल		
६	धामीझाकी		
७	अन्य		

८.महिलाको अवस्था

(क) श्रमको वर्गिकरण

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

(ख) सम्पत्तिमाअधिकार

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

(ग) निर्णय प्रकियामाअधिकार

क.सं	कामको विवरण	हिस्सा प्रतिशतमा	
		पुरुष	महिला
१	बाली रोज्ने		
२	पशु खरीदबिक्री		
३	गरगहना खरीदबिक्री		
५	अन्न खरीदबिक्री		
६	फलफूल खरीदबिक्री		
७	पशुजन्यपदार्थ खरीदबिक्री		
८	काठ दाउरा खरीदबिक्री		

क्र.सं.	कामको विवरण	हिस्सा प्रतिशतमा	
		पुरुष	महिला
९	विहावारी		
१०	परिवार नियोजन		
११	छोराछोरी पढाई लेखाई		
१२	अन्य		

९. मुआब्जा सम्बन्धी:(आवश्यक परेको अवस्थामामात्रै)

(क) तपाईको घर र जग्गाको मुआब्जा के माचाहनु हुन्छ रु

नगद ☐ जग्गाको सट्टा जग्गा ☐ अन्य☐

(ख) यदितपाईले मुआब्जानगदमापाउनु भयो भने उक्तमुआब्जा रकम के माप्रयोग गर्नु हुन्छ रु

जग्गाकिन्ने ☐ घर बनाउने ☐ ऋण तिर्ने ☐
व्यापार गर्ने ☐ अन्य ☐

१०. प्रस्तावकार्यान्वयनगर्दा के कस्तो प्रभाव पर्न सक्दछ सो सम्बन्धी राय सुझाव छ रु
सकारात्मक: नकारात्मक:

ANNEX 2:
ENVIRONMENTAL STANDARDS, SAMPLE FORMS, FORMATS
AND
REPORTING TEMPLATE

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ANNEX 2-A:
RELEVANT ENVIRONMENTAL QUALITY STANDARDS

B.1 Ambient Air Quality Standards

Parameter	Averaging Period	Nepal's Ambient Air Quality Standard (µg/m³) *	WHO Air Quality Guidelines (µg/m³) **	
			Global Update 2005	Second Edition ^ 2000
TSP	Annual	-	-	-
	24-hour	230	-	-
PM_{10}	Annual	-	20	-
	24-hour	120	50	-
$PM_{2.5}$	1-year	-	10	-
	24-hour	-	25	-
SO_2	Annual	50	-	
	24-hour	70	20	-
	10-minute	-	500	-
NO_2	1-year	40	40	-
	24-hour	80	-	-
	1-hour	-	200	-
CO	8-hour	10,000	-	10,000
	15-minute	100,000	-	100,000
Pb	1-year	0.5	-	0.5
Benzene	1-year	20	-	-

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

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

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

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

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B.2 Noise Level Standards

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

* Guidelines for Community Noise, WHO, 1999.

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

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B.3 National Drinking Water Quality Standards, 2006

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

* Health-based guideline values

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

^ These standards indicate the maximum and minimum limits.

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

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

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

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Singhadurbar, Kathmandu

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Ministry of Water Supply and Sanitation
Department of Water Supply and Sewerage Development
Urban Water Supply and Sanitation Project
Project Management Office

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ANNEX 2-B:
SAMPLE GRIEVANCE REDRESS FORM
(To be available in Nepalese and English)

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

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

FOR OFFICIAL USE ONLY

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

ANNEX 2-C:
SAMPLE TRAFFIC MANAGEMENT PLAN

SAMPLE: TRAFFIC MANAGEMENT PLAN (TMP)

A. Principles

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

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

B. Operating Policies for TMP

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

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

C. Analyze the impact due to street closure

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

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

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

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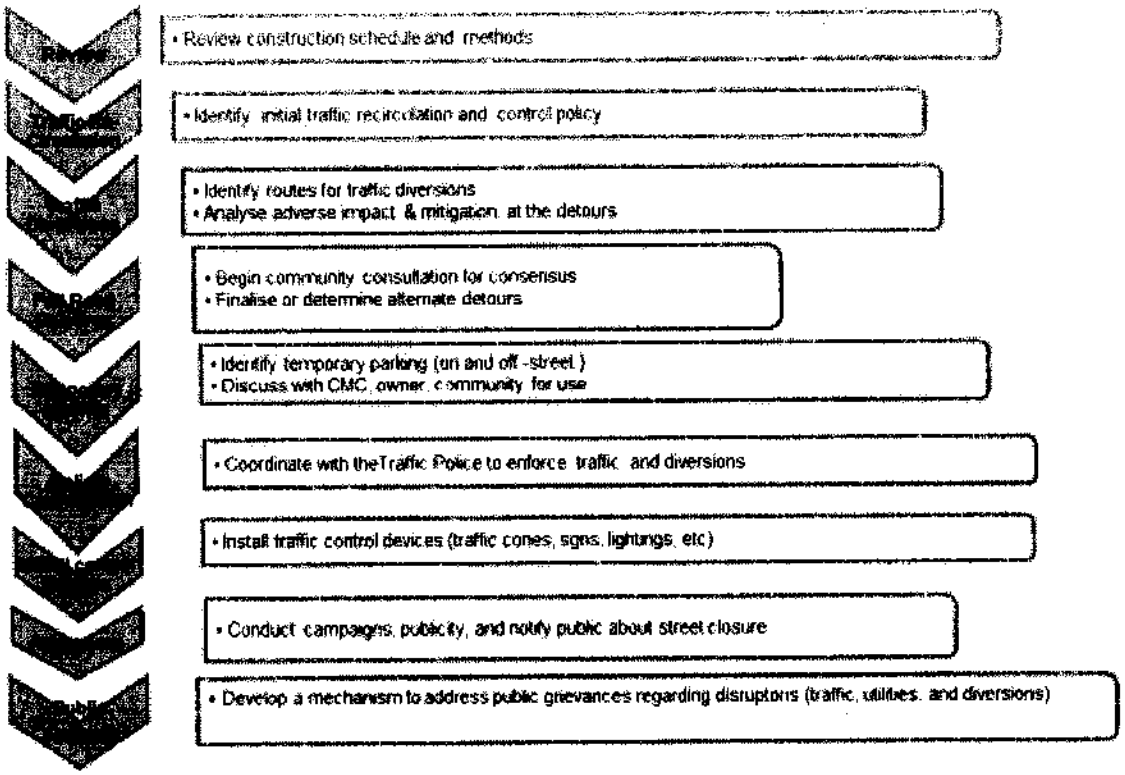
Figure A: Policy Steps for the TMP



D. Public awareness and notifications

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

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

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

- traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
- defensive driving behavior along the work zones; and
- reduced speeds enforced at the work zones and traffic diversions.

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

The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will

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also be available at the ICG, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

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

E. Vehicle Maintenance and Safety

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

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

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

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

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

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

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

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

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

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

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ANNEX 2-D:
SPOIL MANAGEMENT PLAN

Spoil Management Plan (SMP)

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

Objectives of SMP: The objectives of SMP are:

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

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

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

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

Spoil volumes, Characteristics and Minimization

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

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

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

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

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

Storage and stock piling

Transportation and haulage route

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

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

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

Appendixes

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

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ANNEX 2-E:
SAMPLE SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

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

INTRODUCTION

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

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

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS

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

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

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

COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

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

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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						

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Overall Compliance with CEMP/EMP

No.	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 project

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

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

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

Air Quality Results

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

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

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Water Quality Results

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

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

Noise Quality Results

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

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

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ANNEX 2-F:
SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

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

WEATHER CONDITION:

_____

INITIAL SITE CONDITION:

_____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory_____ Incident_____ Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:

_____

Intervention Steps:

_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

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

Site Restored to Original Condition Yes No

Signature

_____

Sign off

_____ _____

Name **Name**

Position **Position**

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ANNEX 2-G: TREES THAT MAY REQUIRE FELLING AND TENTATIVE PLANTATION COST BREAKDOWN (INDICATIVE)

Trees that may need to be felled

Location	Tree Species	Local name	No.	dbh (cm)	H (m)	Status	Proposed treatment		
							Fell	Retain	Transplant
Thapachauraha Site	*Dalbergia Sisoo*	Sisau	1	20.1	3	Normal	✔☐		
	Dalbergia Sisoo	Sisau	1	17.8	2.5	Normal	✔☐		
	Dalbergia Sisoo	Sisau	1	19.5	2.5	Normal	✔☐		
	Tectona grandis	Teak	1	21.3	3	Normal	✔☐		
	Psidium guajava	Guava	1	39.1	3	Normal	✔☐		
	Mangifera indica	Mango	1	55.8	3.5	Normal	✔☐		
	Mangifera indica	Mango	1	37.2	2.5	Normal	✔☐		
	Mangifera indica	Mango	1	41.5	2	Normal	✔☐		
	Eucalyptus grandis	Masala	1	65.9	11.5	Mature, weak	✔☐		
	Eucalyptus grandis	Masala	1	41.4	6.5	Normal, small	✔☐		
	Bambusa bambos	Bamboo	1	19.8	3.5	Bunch	✔☐		

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REFERENCE FOR PLANTATION COST BREAKDOWN (INDICATIVE)

SN	Activities	Unit	Description	Quantity	Area Req (ha.)	Rate, NRs	Total	Remarks
I	**Purchase of saplings**							
	Species A	Saplings		1000		15	15,000.00	
	Species B			1000		25	25,000.00	
II	**Pitting**							
	Pitting area for Species A	sq m	Spacing of 2.5mx2.5m	1000	0.625			Size: 45cm depth X 45cm diameter
	Pitting area for Species B	sq m	Spacing of 5mx5m	1000	2.5			
	Labour cost							
	Species A	Person/ha	25.6 per ha	16		500	8,000.00	
	Species B	Person/ha	6.4 per ha	16		500	8,000.00	
III	**Transportation**							
	Vehicle cost	Trip		2		10,000	20,000.00	
	Cost of unloading and manual carrying to site		100 saplings/ labour/day up to 3 km	2000		500	10,000.00	
IV	**Clearing plantation site**							
	Species A	Person/ha	4 persons/ha.		0.625	500	1,250.00	
	Species B	Person/ha	4 persons/ha.		2.5	500	5,000.00	
V	**Plantation**							
	Species A	Person/ha	9.6 persons/ha	6		500	3,000.00	
	Species B	Person/ha	2.4 persons/ha	6		500	3,000.00	
	Total						**98,250.00**	
	Overhead cost (@15%)						14,737.50	
	Grand Total						**112,987.50**	
VI	**After care (Cutting, prunning, ...)**	MM	Care taker	60	1	5000	**300000**	
							42,987.50	

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

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ANNEX 3:
PROJECT LOCATION AND SERVICE AREA

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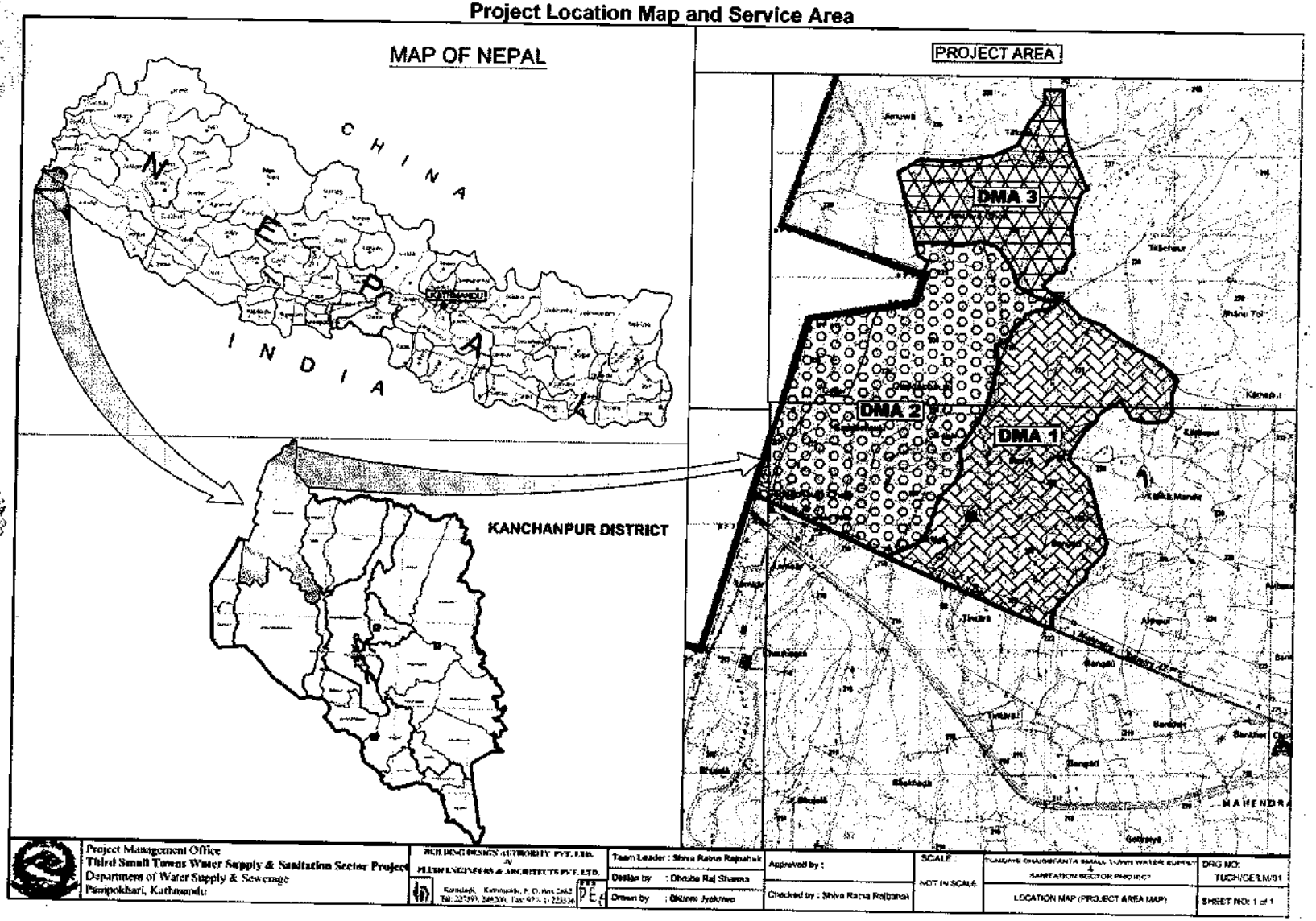
Project Location Map and Service Area



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ANNEX 4:

PUBLIC NOTICE AND *MUCHULKA*

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PUBLIC NOTICE

Published in Arthik Abhiyan, a national daily, on 18th December 2018

आर्थिक अभियान

शहरी खानेपानी तथा सरसफाई क्षेत्रगत आयोजना
सिद्धनाथ बैजनाथ खानेपानी तथा सरसफाई आयोजना
कार्यालय, भीमदत्त नगरपालिका
प्रारम्भिक वातावरणीय परिक्षणको लागि राय सुझाव दिन बारे सूचना
सार्वजनिक सूचना
प्रकाशित मिति: २०७५/०९/०३

नेपाल सरकार र एशियाली विकास बैंकको आर्थिक सहयोगमा सुदूरपश्चिम प्रदेशको कञ्चनपुर जिल्ला स्थित भीमदत्त नगरपालिकाको वडा नं. ६, ८ र १० मा संचालन हुनगइरहेको सिद्धनाथ बैजनाथ खानेपानी तथा सरसफाई आयोजनाको प्रारम्भिक वातावरणीय परिक्षण (Initial Environmental Examination) प्रतिवेदन तयार गर्नु पर्ने भएकाले सो आयोजनाबाट भौतिक, जैविक सामाजिक आर्थिक एवं सांस्कृतिक पक्ष तथा प्रणालीहरुमा के कस्ता असरहरु पर्दछन् वा पर्न सक्दछन् सो बारे लिखित राय सुझाव सहित १५ (पन्ध्र) दिनभित्र बाह्रपुगे गरी निम्न ठेगानामा पठाई दिनु हुन वातावरण संरक्षण नियमावली २०५४ को नियम ७ (२) अनुसार यो सूचना प्रकाशित गरिएको छ। साथै लिखित राय सुझावको प्रतिलिपी सम्बन्धित मन्त्रालय तथा विभागमा समेत दिन सकिनेछ।

राय सुझाव पठाउने ठेगाना

तेश्रो सीमा शहरी खानेपानी तथा सरसफाई क्षेत्रगत आयोजना
आयोजना व्यवस्थापन कार्यालय
पानीपोखरी, काठमाण्डौ
फोन: ०१-४४१२३४८
फ्याक्स: ०१-४४१३८८०

खानेपानी तथा सरसफाई उपभोक्ता
कार्यालय, अधिकफाटा
भीमदत्त नगरपालिका, कञ्चनपुर
फोन: ९८१२७१७३१८

वि.डि.ए.-पि.ई.ए. जे. भी.
कमलादी, काठमाण्डौ
पो.ब.नं.: २८८२
फोन नं.: ०१-४२४८२००
फ्याक्स: ०१-४२२३५१६
ई-मेल: bdapvtltd@gmail.com

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Ministry of Water Supply
Singhadurbar, Kathmandu

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सूचना टाँस गरिएको

आज मिति २०७५/०९/१६ गतेका दिन यस भिमदत्त न.पा., कञ्चनपुर जिल्लामा शहरी खानेपानी तथा सरसफाई आयोजना अन्तर्गत यस नगरपालिकामा संचालन हुन गईरहेको "*सिद्धनाथ-बैभनाथ खानेपानी तथा सरसफाई आयोजना*" को प्रारम्भिक वातावरणीय परिक्षण (IEE) का लागि वातावरण संरक्षण नियमावली २०५४ अनुसार मिति २०७५/०९/०३ मा प्रकाशित सार्वजनिक सूचना यस नगरपालिका तथा सम्वन्धि वडा कार्यालयहरु (६, ८ र १०) मा टाँस भई सो सम्वन्धी जानकारी प्राप्त भएको छ ।

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सूचना टाँसको मुचुल्का

आज मिति २०७५/०९/१६ गतेका दिन यस ..... वडा नं. ६, भिमदत्त न.पा., कञ्चनपुर जिल्लामा शहरी खानेपानी तथा सरसफाई आयोजना अन्तर्गत यस नगरपालिकामा संचालन हुन गईरहेको *"सिद्धनाथ-बैफनाथ खानेपानी तथा सरसफाई आयोजना"* को प्रारम्भिक वातावरणीय परिक्षण (IEE) का लागि वातावरण संरक्षण नियमावली २०५४ अनुसार मिति २०७५/०९/०३ मा प्रकाशित सार्वजनिक सूचना यस वडा कार्यालयमा टाँस भई सो सम्बन्धी जानकारी प्राप्त भएको छ ।

	नाम	ठेगाना	सं.नं.	दस्तखत
१.	[illegible]	[illegible]	.....	
२.	[illegible]	[illegible]	.....	
३.	[illegible]	[illegible]	.....	
४.	.....	.....	.....	
५.	.....	.....	.....	

लक्ष्मी दत्त भट्ट
वडा सचिव
वडा नं.६

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Engineer

Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage
Urban Water Supply and Sanitation Project
Project Management Office

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Engineer

Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management

ANNEX 5:
PUBLIC CONSULTATION MINUTES & RECOMMENDATION LETTER

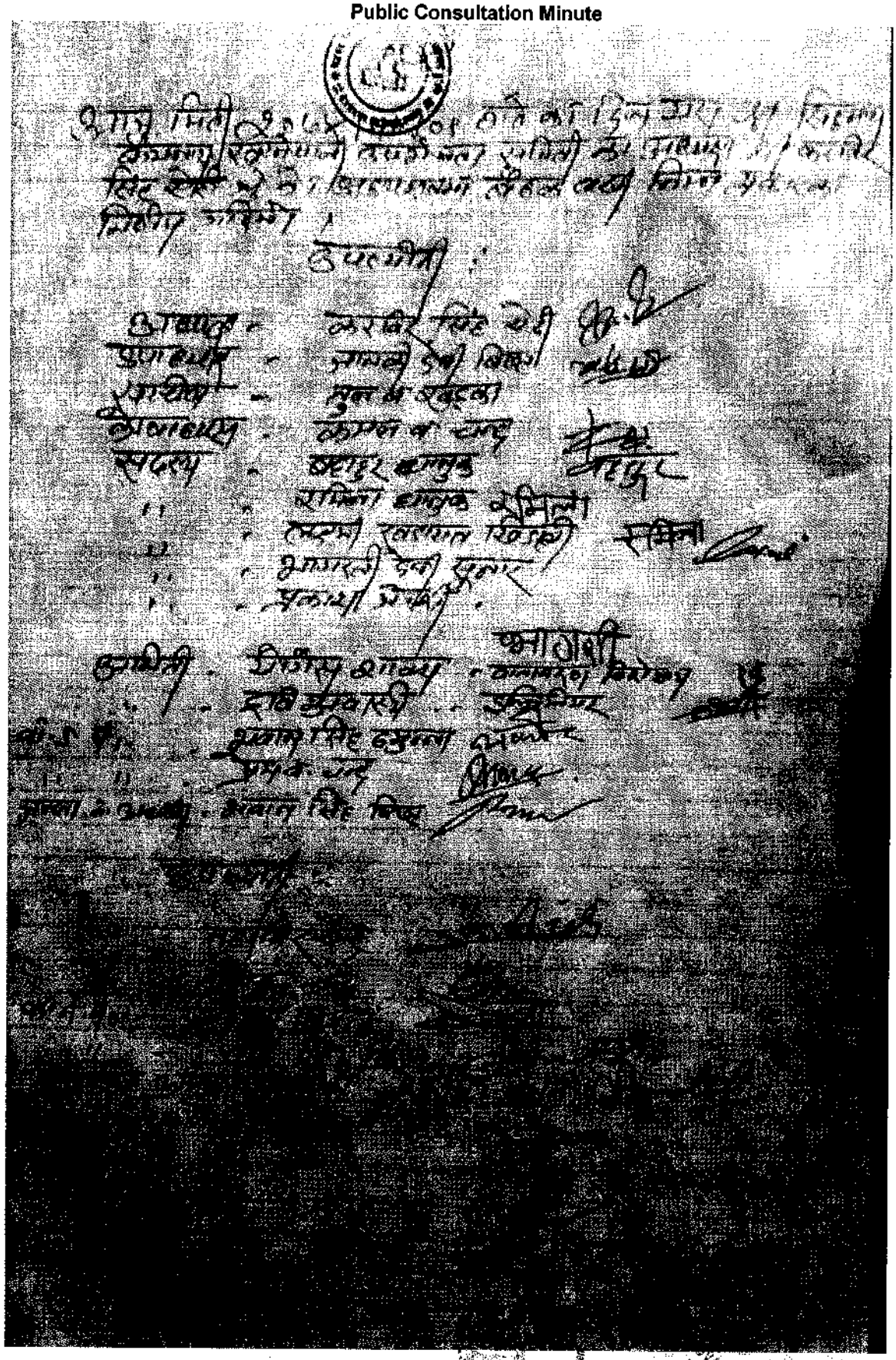
Engineer

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Enaineer

Government of Nepal
Ministry of Water supply
Department of Water Supply and Sewerage Management
Urban Water Supply and Sanitation Project
Project Management Office

Public Consultation Minute



Engineer

उपस्थिति

निर्णय नं. १. आज मिति २०६५/१०/०९ गते का दिन सिद्धनाथ, बैजनाथ खानेपानी तथा सरसफाई योजनाको प्रारम्भिक वातावरणीय परिक्षण (IEE) को मस्यदा नेपाल सरकारको वातावरण व्यवस्थापन निर्देशिका २०५४ अनुसार मि.न.पा. र विज्ञहरु मा परामर्शदाता BDA/PEA JV का प्रतिनिधी र स्थानीय सरोकारवाला हरुको बिच्चमा उपस्थितिमा छलफल हुन तयारिका संचालन भएको छ ।

निर्णय नं. २. आज को प्रस्तावमा वातावरणीय प्रभाव न्यूनीकरण हाम्रो भूमिगत ढोकर भएको ले वातावरणमा प्रभाव रहाँ दैन । सम्बन्धित निर्माण क्षेत्र मा पहेला फुल मलमलको फुल र विरुवाका रुखहरु भएको ले स्थानीय सिफारिस लिई निर्माण क्षेत्र स्थल तिने र रुखको १ रुपै बराबर २५ वटा बिरुवा रोपने निर्णय गरियो ।

निर्णय नं. ३. स्थानीय रोजगारी लगी प्राथमिकता र निर्माण कार्यमा स्थानीय प्रयोग गरी श्रमिकको लागि

निर्णय नं. ४. यसै योजना को वातावरणीय परिक्षण र पारित भएपछि प्रस्ताव अगाडि बढाउने ।

दुई पक्ष

निर्णय नं. ५. निर्माण [illegible]

निर्णय नं. ६. [illegible]

Ministry of Water Supply
Singhadurbar, Kathmandu

Engineer

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Department of Water Supply and Sewerage Management
Urban Water Supply and Sanitation Sector Project
Project Management Office

[illegible] Small Town Water Supply and Sanitation [illegible]
[illegible] पूर्व [illegible] लागि [illegible],
[illegible] IEE [illegible] वातावरणीय [illegible] [illegible]
र [illegible] [illegible] [illegible] [illegible]
खानेपानी तथा फोहरपानी [illegible] [illegible]
र PCR/PEA JV का [illegible], [illegible]
[illegible] [illegible] [illegible] र,

क्र.सं.	नाम	संस्था	भरी
१	[illegible] सिंह [illegible], १०	[illegible], WUSC,	
२	[illegible] [illegible], र	[illegible], WUSC,	
३	[illegible] देवी [illegible] १०	[illegible], WUSC,	
४	[illegible] [illegible] [illegible], OC	[illegible], WUSC,	
५	[illegible] [illegible], TL	[illegible]/PEA JV	
६	[illegible] [illegible], [illegible] Expt	,	
७	Keshav Dhungana, Environmental Expt.		
८	[illegible] Shakya, Environmental Expert		
९	[illegible] Team member		
१०	[illegible] [illegible] [illegible], OC	[illegible], WUSC	[illegible]

[illegible] विषय :

[illegible] प्रक्रिया [illegible] [illegible] ।
[illegible] [illegible] [illegible] ।
[illegible] DPR [illegible] [illegible] ।
[illegible] वातावरणीय [illegible] (IEE) [illegible] प्रक्रिया
[illegible] र [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] ।

[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] ।

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Engineer

Government of Nepal
Ministry of Water Supply and Sanitation
Department of Water Supply and Sewerage
Urban Water Supply and Sanitation Project
Project Management Office

RECOMMENDATION LETTER

भीमदत्त नगरपालिका

नगर कार्यपालिकाको कार्यालय

कञ्चनपुर
सुदूरपश्चिम प्रदेश, नेपाल

पत्र संख्या: २०७५/०७६
चलानी नं.: ५१६२

मिति: २०७६/०१/१५

श्री खानेपानी मन्त्रालय
सिंहदरबार, काठमाण्डौं।

विषय: सिफारिस सम्बन्धमा।

उपरोक्त सम्बन्धमा स्वस मन्त्रालय अन्तर्गत प्रदेश नं. ७ को कञ्चनपुर जिल्ला स्थित भीमदत्तनगरपालिकामा संचालन हुने सिद्धनाथ बैजनाथ खानेपानी तथा सरसफाई आयोजना वडा नं. ६, ८ र १० को प्रारम्भिक वातावरणीय परिक्षण (Initial Environmental Examination) प्रतिवेदन तयार गर्ने क्रममा सो आयोजनाबाट भौतिक, जैविक, समाजिक, आर्थिक एवम् सास्कृतिक पक्ष तथा प्रणालीहरुमा के कस्ता असरहरु पर्दछन् वा पर्न सक्दछन् सो बारे लिखित राय सुझावका लागि मिति २०७५/०९/०३ मा प्रकाशित १५ दिने सार्वजनिक सूचना यस नगरपालिकामा र सार्वजनिक स्थलहरुमा टास गरिएको र यस वातावरणीय अध्ययनका बारेमा छलफलहरु संचालन गरिएको तथा सो अवधि भित्र यस कार्यालयमा कुनै विरोध पर्न नआएको व्यहोरा जानकारी गराउदै उक्त आयोजना संचालनबाट वातावरणीय क्षेत्रमा कुनै किसी प्रतिकूल प्रभाव नपर्ने देखिएको व्यहोरा समेत सिफरिस साथ अनुरोध गरिन्छ।

०६३/९/१५
प्रमुख प्रशासकीय अधिकृत

सम्पर्क:
नगर प्रमुख - ०९६-५२०७०८, नगर उपप्रमुख - ०९६-५२२५२९, प्रमुख प्रशासकीय अधिकृत - ०९६-५२१३२३, टेलफक्स - ०९६-५२४४०१

Government of Nepal
Ministry of Water Supply
Siddhanath, Kathmandu

Engineer

Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Urban Water Supply and Sanitation Project
Project Implementation Office

Engineer

ANNEX 6:

WATER QUALITY TEST REPORTS

Engineer

Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Urban Water Supply and Sanitation Sector Project
Project Management Office

Nepal Environmental & Scientific Services (P) Ltd.
G.P.O. Box: 7391, Tripureshwor, Kathmandu, Nepal
Phone : +977-1-4244989, 4241001, Fax No.: +977-1-4226028, Email: ness@mos.com.np
http://www.nesspltd.com

NESS/Lab, M-03/R1.1

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 218(W) (1) - 12 - 2017 Date Received : 05 - 12 - 2017

Sample : Ground Water Date Completed : 14 - 12 - 2017

Client : BDA/PEA JV Sampled By : Client

Location : Jhapachourahe Bhimdutta Municipality, Ward No. 8 (Inside Sidhanath Temple)

Owner : Public Land

Area : 5 Katha/ for Used 3 Katha

S. N.	Parameters	Test Methods	Observed Values	NDWQS, Nepal
1.	pH at 19°C	Electromeric, 4500 - H^+ B, APHA	6.8	6.5 - 8.5
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	647	1500
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	4	5
4.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	342	500
5.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	335	-
6.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl B, APHA	13.90	250
7.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	0.30	1.5
8.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	8.79	50
9.	Nitrite, (mg/L)	NEDA, Colorimetric, 4500 - NO_2^- B, APHA	<0.02	-
10.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B APHA	76.95	200
11.	Magnesium, (mg/L)		38.46	-
12.	Arsenic, (mg/L)	SDDC, 3500 - As, C, APHA	N. D. (<0.01)	0.05
13.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	0.27	0.3
14.	Manganese, (mg/L)		N. D. (<0.02)	0.2

N. D.: Not Detected

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

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

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

Note:
1. This report/certificate is in reference to Laboratory Quality Control Manual, QS [017].
2. The result of parameters refers only to the tested samples. Endorsement of products is neither inferred nor implied.
3. Liability of our institute is limited to the invoiced test parameters & amount only.
4. Samples will be destroyed after three months from the date of issue of test certificate unless otherwise specified.
5. This report is not to be reproduced wholly / partially & cannot be used as an evidence in the Court of Law & should not be used in any advertising media without our permission in writing.
6. The clients are requested to take back their hazardous samples along with the report/certificate.

Engineer

Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Urban Water Supply and Sanitation Sector PMO
Project Management Office

Nepal Environmental & Scientific Services (P) Ltd.
P.O. Box 7301, Thapathali, Kathmandu, Nepal
Phone : +977-1-4244585, 4241001, Fax No.: +977-1-4226028, Email: ness@mos.com.np
Internet: www.nessgrid.com

NESS/Lab. M-03/R1.1

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 322 (W) (3) - 02 - 2018 Date Received : 12 - 02 - 2018

Sample : Water (Thapa Chok) Date Completed : 27 - 02 - 2018

Client : PEA-BN JV Sampled By : Client

S. N.	Parameters	Test Methods	Observed Values	NDWQS, Nepal
1	pH at 18°C	Electrometric, 4500 - H⁺ B, APHA	7.3	6.5 - 8.5
2	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	579	1500
3	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	10	5
4	Color, (Chromatity Unit)	Spectrophotometric, 2120 C, APHA	N. D. (<0.06)	5
5	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	378	500
6	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	348	-
7	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl⁻ B, APHA	12.82	250
8	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C, APHA	N. D. (<0.06)	1.5
9	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	14.76	50
10	Nitrite, (mg/L)	NEDA Colorimetric, 4500 - NO_2^- B, APHA	N. D. (<0.02)	-
11	Fluoride, (mg/L)	SPANDS, 4500 – F⁻ D, APHA	<0.05	0.5-1.5
12	Sulphate, (mg/L)	Gravimetric Method with Ignition of Residue, 4500 – SO_4^{2-} C, APHA	2.47	250
13	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B, APHA	101.80	200
14	Magnesium, (mg/L)		30.14	-
15	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	0.46	0.30
16	Manganese, (mg/L)		N. D. (<0.02)	0.20
17	Arsenic, (mg/L)	SDDC, 3500 - As C, APHA	N. D. (<0.01)	0.05

N. D.: Not Detected

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

Remarks: *Except turbidity and iron, all observed values complied the prescribed NDWQS for drinking water.*

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

Note:
1. This report/certificate is in reference to Laboratory Quality Control Manual, QB (017).
2. The result of parameters refers only to the tested samples. Endorsement of products is neither inferred nor implied.
3. Liability of our Institute is limited to the invoiced test parameters & amount only.
4. Liability of our Institute is limited to the issue of test certificate unless otherwise specified.
5. Samples will be destroyed after three months from the date of issue of test certificate & cannot be used as an evidence in the Court of Law & should not be used in any advertising media without our permission in writing.
6. This report is not to be reproduced wholly / partially & cannot be used as an evidence in the Court of Law & should not be used in any advertising media without our permission in writing.
6. The clients are requested to take back their hazardous samples along with the report/certificate.

Engineer

Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Urban Water Supply and Sanitation Sector Project
Project Management Office

ANNEX 7:
SURVEY QUETIONNAIRE AND CHECKLISTS

Engineer

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Engineer

Government of Nepal
Ministry of Water supply
Department of Water Supply and Sewerage Management
Urban Water Supply and Sanitation Sector Project
Project Management Office

SURVEY QUESTIONNAIRE

Household Survey

१. परिचय

१.१ अन्तर्वाता दिने व्यक्तिको नाम ठेगाना:

(क) जिल्ला: (ख) गा.वि.स:

(ग) टोल रस्थान: (घ) वार्ड नं.:

१.२ पारिवारिक विवरण

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

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

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

(ज) बसेको वर्ष: (झ) शिक्षा :

(ञ) कुल परिवार संख्या .....

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

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

जम्मा	विद्यालय गएका		विद्यालय नगएका	
	पुरुष	महिला	पुरुष	महिला

२. साक्षरता : (तपाईको परिवारमा)

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

३. कृषि (भु-उपयोग)

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

छ ☐ छैन ☐

३.२ यदि छ भने कति छ ? रोपनीमा भन्नुहोस :

क.स.	स्वामित्व	खेत	बारी	खरवारी	वन	कैफियत
१	आफ्नै					

Engineer

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

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

क्रस	ठाउँको नाम	जग्गा				कैफियत
		खेत	बारी	खरवारी	वन	

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

घर

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

खेत

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

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

घर ☐ गोठ ☐

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

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

	संख्या	क्षेत्रफल
गोठ		
अन्य (खुलाउने)		

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

क्रस	खाद्यान्न बाली	बाली लगाएको क्षेत्रफल	उत्पादन परिणाम
१. खाद्यान्न बाली			
	धान		
	गहु		
	मकै		
	कोदो		
	दाल गेडागुडी		
	अन्य		

Engineer

२. नगदे वाली			
	आलु		
	तोरी		
	तरकारी		
	अन्य		

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

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

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

भयो ☐ भएन ☐

३.७ यदि अप्रर्याप्त भयो भने कति महिनाको लागि पुगेन रु महिना

(क) तिन महिना (ख) छ महिना
(ग) नौ महिना (घ) बाह्र महिना

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

क. ऋण गरेर ख. नोकरीबाट भएको आम्दानीबाट
ग. व्यापारीको आम्दानीबाट घ. भारी बोकेर भएको आम्दानीबाट
ङ. दैनिक मजदुरबाट भएको च. अन्य .....

३.९ पशुपालन सम्बन्धी
तपाईको घरमा कति /कस्ता पशु प्रजीहर पालनु भएको छ रु

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

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

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

५. **घर परिवारको वार्षिक औषत खर्च :**

विवरण	जम्मा रकम (रु.)	विवरण	जम्मा रकम (रु.)
चामल		चिया	
दाल		दाउरा	
मकै		बिजुली	
तरकारी		मट्टितेल	
दुध/दही		औषधि	
माछा/मासु		शिक्षा	
तेल/घ्यू		कपडा	
मर-मसला		चाडपर्व	
नुन		अन्य	
चिनी			
		जम्मा खर्च	

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६.पानीको आपूर्ति

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

गर्छु ☐ गर्दिन ☐

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

सिंचाई ☐ नुहाउने, कपडा धुने ☐

पिउने ☐ अन्य ☐

७.स्वास्थ्य सम्बन्धि:

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

थिए ☐ थिएनन् ☐

(ख)यदि थिए भने निम्न विवरण दिनुहोस् रु

क्रस	नाता	पुरुष	महिला	उमेर	रोग
१					
२					
३					
४					

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

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

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

क.स	जाने ठाउं	रहेको स्थान	दूरी (कि.मी.)
१	अस्पताल		
२	हेल्थपोस्ट		
३	हेल्थ सेन्टर		
४	आयुर्वेदिक औषधालय		
५	निजि क्लिनिकरऔषधी पसल		
६	धामी झाकी		
७	अन्य		

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८. महिलाको अवस्था:

(क) श्रमको वर्गिकरण

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

(ख) सम्पत्तिमा अधिकार

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

(ग) निर्णय प्रक्रियामा अधिकार

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

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९. **मुआब्जा सम्बन्धी:**

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

नगद ☐ जग्गाको सट्टा जग्गा ☐ अन्य ☐

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

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

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

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CHECKLISTS

Simple Checklists for Baseline Information Collection

A. Physical Environment

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

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B. Vegetation and Wildlife

Vegetation in the project area

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

Mammals in the project area

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

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Birds Sighted in the project area

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

Herpeto-fauna in the Project Area

SN	Local Name	Scientific Name	Habitat	Local Status	Status Code			Local Use
					CITIES	IUCN	GoN	

Fish in the Project Area

SN	Local Name	Scientific Name	Status of Occurrence	Migratory Status/Season	Observed Location

C. Socio-Economic and Cultural Environment

Parameter	Description
Demography a) Population (Male, Female) b) Caste Ethnicity c) Language d) Religion and Culture e) Literacy	
Occupation	
Migration Patten	
Public Health and Sanitation	
Drinking Water Supply	

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Education Facilities	
Communication	
Fuel and Energy	
Road and Transportation	
Land Holding	
Food Sufficiency	
Irrigation	
Health Care System	
Market	
Business and Industries	
Religious and Cultural Sites	
Non governmental activities	
Development Potential	
Detail of Project Affected Structures	

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Settlements and Population

SN	Settlement	Municipality & Ward	HH	Population			Caste/Ethnicity
				Male	Female	Total	

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ANNEX 8:

PHOTOGRAPHS

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Photo 1: Meeting / Interaction with stakeholders including Municipality at land acquisition site: Thapachaur, Bhimdatta Municipality

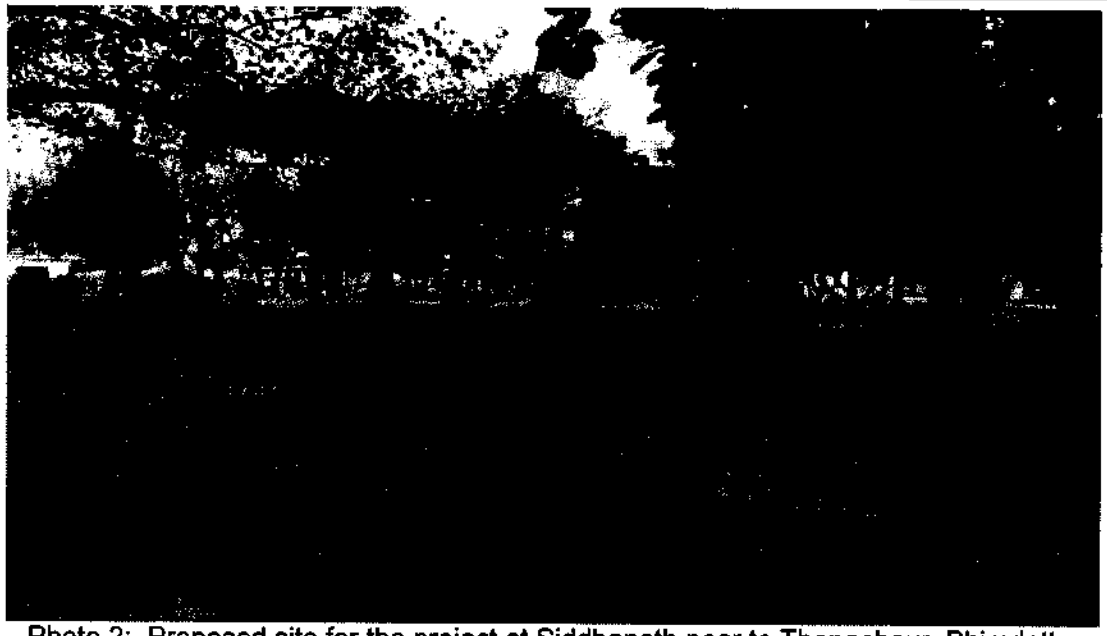

Photo 2: Proposed site for the project at Siddhanath near to Thapachaur, Bhimdatta Municipality-8

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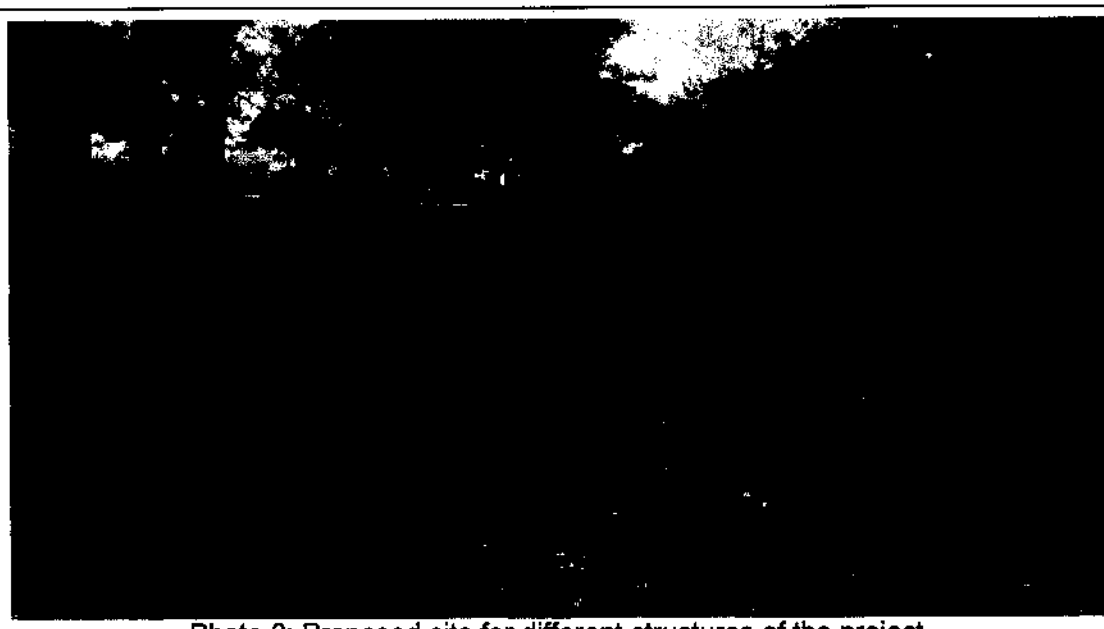

Photo 3: Proposed site for different structures of the project

Photo 4: Site visit and interaction with WUSC/local people at proposed site
(*the open shed at the right of the photo-view will be relocated*)

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Photo 5: A temple, Sidhanath-Baijnath Temple, nearby the proposed site
(*the area proposed is to the left o the photo-view and is a part of the land bounded as public land*)

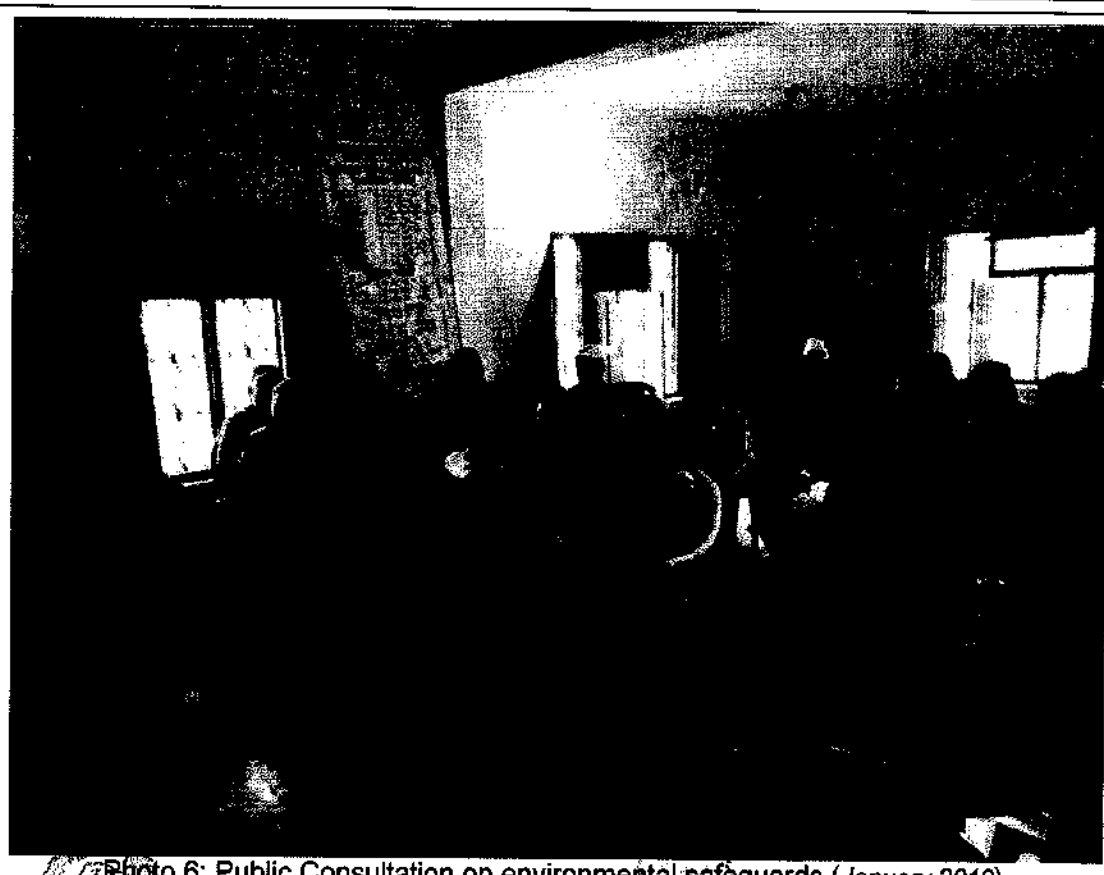

Photo 6: Public Consultation on environmental safeguards (*January 2019*)

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ANNEX 9:

COMMENTS INCORPORATION MATRIX

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खानपानी मन्त्रालय

सिंहदरबार,
काठमाण्डौं, नेपाल ।

मिति: २०७६।०८।१२

श्री खानेपानी तथा ढल व्यवस्थापन विभाग,
पानीपोखरी, काठमाण्डौं ।

२०७६ - ८ - १२

विषय : IEE प्रतिवेदन Revise गरी पुन: पेश गर्ने सम्बन्धमा ।

प्रस्तुत विषयमा तहाँको पत्र साथ पेश भएको सहरी खानेपानी तथा सरसफाइ (क्षेत्रगत) आयोजना, प्रस्तावित रहेको चन्द्रपुर जिल्लामा संचालन हुने सिद्धनाथ बैजनाथ सहरी खानेपानी तथा सरसफाइ आयोजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) का सम्बन्धमा मिति २०७६।०८।१२ मा यस मन्त्रालयमा बसेको वातावरण प्रतिवेदन सुझाव समितिको बैठकमा प्राप्त बसै पत्रसाथ संलग्न लिखित राय सुझावहरु अनुरुप प्रतिवेदन परिमार्जन गरी ती सबै Comments को Comments Incorporation Matrix सहित पुन: पेश गर्नुहुन निर्देशानुसार अनुरोध छ ।

अन्जना महर्जन
(इन्जिनियर)

बोधार्थ:
श्री आयोजना व्यवस्थापन कार्यालय,
सहरी खानेपानी तथा सरसफाइ (क्षेत्रगत) आयोजना, पानीपोखरी ।

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Comments on IEE of Siddhanath-Baijanath Urban Water Supply and Sanitation Project, Bheemdatt Municipality, Mahendranagar, Sudurpaschim Province:

1. Approved ToR letter is missing.
2. Include a copy of 15 days notice showing the name of a newspaper in which it was published.
3. As Mahakali river is nearby and most of the report says that Arsenic content in Kanchanpur district is quite high in ground water then why the project has chosen to use ground water, better to have an alternative analysis of source as well.
4. Correct a date of EPA as 2053 throughout the nepali executive summary.
5. Mention clearly about the word उचित डिजाईन, whether it tries to say permanent structure?? In nepali executive summary, page-ix.
6. Better to mention ToR approval date.
7. In GoN's legal requirement section of executive summary, clearly mention the whole sentence of threshold of EPR, 1997 schedule 1 related to water supply.
8. In both executive summary mention a gist of mitigation measures of main report.
9. In English executive summary (public participation topic), mention clearly that GRC will be formed before construction of the project.
10. Need to follow the format of schedule 5 of EPR, 1997.
11. In 2.3, recalculate the percentage of people using water supply.
12. In 2.4, replace 'rule' with 'section' in 2nd line.
13. In salient features table mention about the depth of trench, volume of muck generation, construction period.
14. Mention clearly about crossings of river, road etc (if there is any)
15. Mention about duration of water supply whether it is for 24 hrs?
16. Mention clearly about date, place of public consultation and field work as well.
17. Add impact identification in topic 3.8.5 and clearly define the methodology of impact identification and prediction.
18. In baseline, correct the topic by replacing 'resources' with 'environment' in 3.9.1.

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19. In 3.9.1.6 water quality section, better to mention about the existing quality of ground water and existing water table level in ward no. 6,8,10, also better to add about current water recharge capacity.
20. In 3.9.1.7, SWM section and 3.9.1.8 sanitation service section mention about municipal drainage system.
21. Clarify whether proposed project lies in chure region or not as most part of Kailali and Kanchanpur lies in chure region?
22. In physical environment section, add about land use pattern, landslide prone area (if any), existing ground water table level and ground water recharge capacity.
23. Include a table of land requirement for the proposed project showing clearly about area, type and ownership.
24. Mention clearly about the public, private, community infrastructures that lies in the alignment of proposed project.
25. As about 23.8% caste of project area seems to be prevailed by Dalit, clearly mention about the existing untouchability practice and also about their accessibility to basic public infrastructures. Also relate this project with the accessibility to these castes.
26. As Kailali and Kanchanpur are the migratory route of 7 districts of hilly region, better to mention about existing in-migration pattern so that it can be easily predicted about the trend of migration in future during monitoring after having good supply of water.
27. Table 7 in 3.9.3.4 reflect the economic condition of service area, as the proposed project is based on cost sharing by community, whether the marginalized people and lower caste group of that area will be able to contribute financially or not???
28. Whether 'tubewell' and 'handpump' is same or not? In project area most of the households seems to be use handpump and in field the number of well is also minimal but in table 8, it seems to be 316, better to revisit the data.
29. Better to use municipal profile as a source.
30. The cost of water supply after the implementation of the project seems to be a bit high, so marginalized and lower caste people having low income is likely to revert back to use the existing water supply source (without proper treatment and filtration). It would have been better to mention per unit cost after implementation of the project and if there is any chances to have discount for under marginalized people better to reflect it in the report.

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31. Remove date from Constitution of Nepal, review fifteenth plan (approach paper), National Environment Policy, 2076, Land use policy, 2072, National Land Policy, 2075, consumer protection act, 2075, forest act, 2076. Add environment protection act, 2076, Solid waste management rule, 2070. Review working procedure with standard for using national forest by national priority project, 2076 if relevant (if proposed project needs forest area and also if it needs to cut the trees of forest area).
32. Sources are missing in most of the tables so revisit the tables.
33. There is repeatation of information in 3.9.3.5, 3.9.3.6 and 3.12 so better to remove one of them.
34. In 3. 15(xi) section, clearly mention component wise land requirement.
35. The depth of tubewell is different throughout the report. Make consistent (in page 33, it is 100m whereas in page 40 it is 120m).
36. It seems like there is no any existing water supply system so better to remove about it in page 40, "damage to existing facilities" section.
37. Mention clearly about the amount of construction material, location and number of camp site, facilities to the workers location of stockpiling site.
38. Mention in detail about water treatment process and frequency of backwashing process.
39. In table 23, clearly mention the designated sites for camp site (as only ward no. 8 has been mentioned before-number should specify), waste disposal.
40. As landslide has been mentioned in impact but land type hasn't been mentioned in detail in the report.
41. Add existing road damage as an impact.

.....

Jwala Shrestha
Undersecretary
Ministry of Forests and Environment

Government of Nepal
Ministry of Water Supply
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Comments on the IEE Report of Siddhanath-Baijnath UWSS Project

1. Chapter 2 seems unnecessary. However, part of its content can make up a chapter on Introduction.
2. Linkage of core area and surrounding area with direct impact and indirect impact respectively is technically wrong and hence the concerned section i. e. section 3.4 (a) & (b) needs to be revised accordingly.
3. Besides service area, core area should include all construction hotspots/pipe laying works as well.
4. Designated sites for disposal of sludge/extra spoil/solid waste/demolition waste need to be indicated as well in Figure 2.
5. In Figure 2, symbols and legends are missing.
6. Sub-chapter 3.8 on IEE Methodology needs to be presented in a separate chapter.
7. In-situ measurements and sampling seem to have been overlooked as methods of field assessment of physical environment. Besides, methods used for quantification of adverse impacts on physical environment, if any, need to be mentioned as well under Methodology.
8. Sub-chapter 3.9 on Environmental Baseline Information should be presented as a separate chapter.
9. In sub-section 3.9.1.2, it'd be highly preferable to give percentage distribution of various land-uses existing within the core area as well.
10. In sub-section 3.9.1.4, it'd be better to mention the impression of air quality situation of the core area based on direct observation or field measurement.
11. Merely based on field observation, how can it be concluded that the noise level is within national/international standards as presented in sub-section 3.9.1.5?
12. In sub-section 3.9.1.6, it'd be better to mention the impression of water quality situation of water bodies existing within the core area based on direct observation or field measurement. The names of the water bodies existing within the core area should have been given too.
13. In sub-section 3.9.1.7, it'd be better to present the existing practice of final disposal of solid waste within the core and surrounding areas.
14. A brief description of temporary construction facilities required is missing under project description.
15. The following could be considered as some additional construction activities.
    a) Drilling?
    b) Stockpiling of construction materials/fuel
    c) Storage/disposal of extra spoil/solid waste
    d) Operation of DG sets during construction/operation phases
16. It'd be highly desirable to present an estimation of land-use change due to placement of project structures/components.
17. The mitigation measures proposed with respect to damage to existing facilities would be those that should be undertaken during pre-construction phase rather than construction phase.
18. Proposed proper disposal of the inorganic fraction of solid waste generated from workers' camps and construction waste needs to be further elaborated to ensure that the disposal is environmentally safe.

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19. It needs to be ensured that the proposed sanitary toilets for the workers need to be in adequate number with respect to the maximum number workers accommodated in the camps during the peak construction period.
20. It's not clear how wastewater generated from workers' camps will be finally disposed of in an environmentally safe manner.
21. Mitigation measures for addressing impacts of operation of pumps and DG sets during operation phase seem to be missing.
22. Monitoring parameters selected for compliance monitoring both during construction and operation phases should be source oriented rather than sink oriented.

(B. R. Manandhar)
Environmental Engineer & Freelancer
Expert on physical environment, EIA/IEE Report Suggestion Committee, MoWS, GoN

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Engineer

Government of Nepal
Ministry of Water Supply
Department of Water Supply and Sewerage Management
Water Supply and Sanitation Project
Project Management Office

Annex 9: Comments Incorporation Matrix

(Based on comments on IEE Report provided during presentation in MoWS)

SN	Comments by MoFE (Jwala Shrestha, Head - EA Section)	Response/Updates
1	Approved ToR letter is missing	The ToR approval letter from PMO has been replaced by approval letter from MoWS (Annex 1)
2	Include a copy of 15 days notice showing the name of a newspaper in which it was published	The Public Notice showing the name of the newspaper has been provided (Annex 4)
3	As Mahakali river is nearby and most of the report says that Arsenic content in Kanchanpur district is quite high in ground water; then why the project has chosen to use ground water, better to have an alternative analysis of source as well	The chapter on alternative analysis has already discussed that pumping of water from Mahakali river will be more costly than pumping from deep tubewell. (sub-section 5.3, Page 48) The water quality test report of deep tubewell of the project area shows arsenic below the standards. (Annex 6)
4	Correct a date of EPA as 2053 throughout the nepali executive summary	This has been addressed in pages vii & viii
5	Mention clearly about the word उचित डिजाईन, whether it tries to say permanent structure?? In nepali executive summary, page-ix	Yes, there are some temporary toilets. The term उचित डिजाईनको चर्पी has been replace by the term पक्की चर्पी
6	Better to mention ToR approval date	This has been added in the Executive Summary as well; page viii & xi
7	In GoN's legal requirement section in executive summary, clearly mention the whole sentence of threshold of EPR, 1997 schedule 1 related to water supply	This has been added in the executive summary; page vii & page xi
8	Mention a gist of mitigation measures of main report in executive summary	The gist of mitigation measures have been added in both the executive summaries (Page ix: Nepali Executive Summary; & Page xiii: English Executive Summary)
9	In English executive summary (public participation topic), mention clearly that GRC will be formed before construction of the project	This has been mentioned as per; 2nd last paragraph of page xiii
10	Need to follow the format of schedule 5 of EPR, 1997	The report was submitted in the format as per Schedule 5 of EPR 1997
11	In 2.3, recalculate the percentage of people using water supply.	The corrections has been made; page 2
12	In 2.4 section, replace 'rule' with 'section' in 2nd line.	The correction has been made in 1st paragraph of section 2.4; Page 3
13	In salient features table mention about the depth of trench, volume of muck generation, construction period	All these information are not relevant to salient features of the project. Construction period has been added in 14th heading of table 3.1; Page 6 Depth of trench and muck volume have been added in sub-section 3.15; page 36
14	Mention clearly about crossings of river, road etc (if there is any)	Road crossings have been mentioned under sub-section 4.2.2.1 (iii); page 40

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		River crossing has been mentioned under sub-section 4.2.2.1 (v); page 41
15	Mention about duration of water supply whether it is for 24 hours?	This has been mentioned in the salient features table (7th heading number of Table 3.1, Page 5)
16	Mention clearly about date, place of public consultation and field works as well.	It was already mentioned in sub-section 7.10 (Page 83). The information has been added in sub-section 3.8.6; page 14 Time of field works have been added in sub-section 3.8.3; Page 10
17	Add impact identification in topic 3.8.5 and clearly define the methodology of impact identification and prediction	This has been addressed in sub-section 3.8.5; page 12
18	In baseline, correct the topic by replacing 'resources' with 'environment' in 3.9.1	The corrections have been made (Sub-headings 3.9.1., 3.9.2 and 3.9.3)
19	In 3.9.1.6 water quality section, better to mention about the existing quality of ground water and existing water table level in ward no. 6, 8, 10, also better to add about current water recharge capacity	The ground water quality has been tested, and presented in the report (Annex 6)
20	In 3.9.1.7, SWM section and 3.9.1.8 sanitation service section mention about municipal drainage system	There is no municipal drainage system in the project area as mentioned in sub-section 3.9.1.8; page 14
21	Clarify whether proposed project lies in chure region or not as most of Kailali and Kanchanpur lies in chure region?	This has been clearly mentioned in last paragraphs of sub-section 3.9.2.2; Page 14
22	In physical environment section, add about land use pattern, landslide prone area (if any), include date of ground water table, water recharge capacity	Landuse pattern is discussed in sub-section 3.9.1.2; Page 13 There is no case of landslide mentioned. Ground water information has been discussed in sub-section 4.2.2.1 (ii); page 40
23	Include a table of land requirement for the proposed project showing clearly about area, type and ownership	All the structures are proposed at one site, so no table is required, and this has been mentioned in sub-section 3.15 (xi); page 35
24	Mention clearly about the public, private, community infrastructures that lies in the alignment of proposed project	This details is not required for laying of water supply pipelines
25	As about 23.8% caste of project area seems to be prevailed by Dalit, clearly mention about the existing untouchability practice and also about their accessibility to basic public infrastructures. Also relate this project with the accessibility to these castes.	This has been discussed in sub-section 3.9.3.2; page 16
26	As Kailali and Kanchanpur are the migratory route of 7 districts of hilly region, better to mention about existing in-migration pattern so that it can be easily predicted about the trend of migration in future during monitoring after having good supply of water.	This has been discussed in sub-section 3.9.3.1; page 15
27	Table 7 in 3.9.3.4 reflect the economic condition of service area, as the proposed project is based on cost sharing by community,	This has been discussed under the sub-section 3.9.3.4; page 17

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	whether the marginalized people and lower caste group of that area will be able to contribute financially or not??	
28	Whether 'tubewell' and 'handpump' is same or not? In project area most of the households seems to be use handpump and in field the number of well is also minimal but in table 8, it seems to be 316, better to revisit the data.	Shallow tube well and hand pumps are the similar and common existing sources in the project area, as discussed in Table 8; page 17
29	Better to use municipal profile as a source	Since the service area is partial portions of the wards of the municipality, the survey data of 2017 has been used
30	The cost of water supply after the implementation of the project seems to be a bit high, so marginalized and lower caste people having low income is likely to revert back to use the existing water supply source (without proper treatment and filtration). It would have been better to mention per unit cost after implementation of the project and if there is any chances to have discount for under marginalized people better to reflect it in the report.	This has been discussed under the sub-section 3.9.3.4; page 17 13th heading of Table 3; page 6 has the per capita cost
31	Remove date from Constitution of Nepal, review fifteenth plan (approach paper), National Environment Policy 2076, Land use policy 2072, National Land Policy, 2075, consumer protection act 2075, Forest Act 2076. Add environment protection act 2075, Solid waste management rule, 2070. Review working procedure with standard for using national forest by national priority project 2076 if relevant (if proposed project needs forest area and also if it needs to cut the trees of forest area)	The date has been removed from title of the Constitution of Nepal. No forest land will be used. The suggested relevant policies and acts have been reviewed (Page 21, 22, 23)
32	Sources are missing in most of the tables so revisit the tables	Source has been mentioned as DEDR of the project; sub-section 3.15 (a); page 31
33	There is repeatation of information in 3.9.3.5, 3.9.3.6 and 3.12 so better to remove one of them	This repeated text has been revised in sub-section 3.12; page 29
34	In 3.15 (xi) section, clearly mention component wise land requirement	All the structures are proposed at one site, so no table is required, and this has been mentioned in sub-section 3.15 (xi); page 35
35	The depth of tubewell is different throughout the report. Make consistent (in page 33, it is 100m whereas in page 40 it is 120m).	It has been made consistent as 100 m to 120 m (pages 33 & 40) as this is an estimated range of the depth
36	It seems like there is no any existing water supply system so better to remove about it in page 40, "damage to existing facilities" section.	It has been removed; sub-section 4.2.2.1 (iii)
37	Mention clearly about the amount of construction material, location and number of campsite, facilities to the workers, location of stockpiling sites.	The details of construction materials are estimated in sub-section 3.5, page 8 There will be only one campsite and stockpiling site and the site has been

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		mentioned in sub-section 3.16 (v); page 36
38	Mention in detail about water treatment process and frequency of backwashing process	This has been explained in page 33
39	In table 23, clearly mention the designated sites for camp site (as only ward no. 8 has been mentioned before-number should specify)	This has been mentioned; and there will be only one campsite; page 36, 58
40	As landslide has been mentioned in impact but land type hasn't been mentioned in detail in the report	This is not relevant as per the content of this report.
41	Add existing road damage as an impact	This has been added under sub-section 4.2.2.1 (iii); page 40

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SN	Comments by Expert (Environmental Engineer, BhaiRaja Manandhar)	Response/Updates
1	Chapter 2 seems unnecessary. However, part of its content can make up a chapter on Introduction	The report is prepared based on Schedule 5 of EPR 2054
2	Linkage of core area and surrounding area with direct impact area and indirect impact area respectively is technically wrong and hence the concerned section i.e. section 3.4 (a) & (b) needs to be revised accordingly	This sub-section 3.4 has been updated; page 8
3	Besides service area, core area should include all construction hotspots/pipe laying works as well	In this project, core area and service area are the same
4	Designated sites for disposal of sludge/solid waste/demolition waste need to be indicated as well in Figure 2	Residual solid waste, dried sludge and demolition waste will be disposed either at municipality's designated disposal site shown in Figure 2
5	In Figure 2, symbols and legends are missing.	The correction has been made, Figure 3.2; page 9
6	Sub-chapter 3.8 on IEE Methodology needs to be presented in a separate chapter	The report is prepared based on Schedule 5 of EPR 2054
7	In-situ measurements and sampling seem to have been overlooked as methods of field assessment of physical environment. Besides, methods used for quantification of adverse impacts on physical environment, if any, need to be mentioned as well under Methodology.	This has been added under Physical assessment sub-section 3.8.3; page 11 This methodology aspect has been mentioned under sub-section 3.8.5; page 12
8	Sub-chapter 3.9 on Environmental Baseline Information should be presented as a separate chapter.	The report is prepared based on Schedule 5 of EPR 2054
9	In sub-section 3.9.1.2, it'd be highly preferable to give percentage distribution of various land-uses existing within the core area as well.	The land use situation has been added in sub-section 3.9.1.2; page 13
10	In sub-section 3.9.1.4, it'd be better to mention the impression of air quality situation of the core area based on direct observation or field measurement	This has been mentioned in sub-section 3.9.1.4; page 13
11	Merely based on field observation, how can it be concluded that the noise level is within national/international standards as presented in sub-section 3.9.1.5?	This has been corrected; page 13
12	In sub-section 3.9.1.6, it'd be better to mention the impression of water quality situation of water bodies existing within the core area based on direct observation or field measurement. The names of the water bodies existing within the core area should have been given too.	This has been mentioned in sub-section 3.9.1.6; page 14 The names have been provided in sub-section 3.9.1.6; page 14
13	In sub-section 3.9.1.7, it'd be better to present the existing practices of final disposal of solid waste within the core and surrounding areas.	The situation of waste disposal has been added in sub-section 3.9.1.7; page 14
14	A brief description of temporary construction facilities required is missing under project	This description has been added in sub-section 3.16; page 36

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	description.	
15	The following could be considered as some additional construction activities; a) Drilling? b) Stockpiling of construction materials/fuel c) Storage/disposal of extra spoil/solid waste d) Operation of DG sets during operation phase during electric power failure	Relevant activities have been added in sub-section 3.16, page 36
16	It'd be highly desirable to present an estimation of land-use change due to placement of project structures/components.	This has been quantified in sub-section 4.2.2.1 (i); page 40
17	The mitigation measures proposed with respect to damage to existing facilities would be those that should be undertaken during pre-construction phase rather than construction phase	This has been discussed under sub-section 4.2.2.1 (iii); Page 40. This is also mentioned in sub-section 4.2.1; page 39
18	Proposed proper disposal of the inorganic fraction of solid waste generated from workers' camps need to be further elaborated to ensure that the disposal is environmentally safe.	The elaborations have been provided in sub-section 6.1.1 - vi; Page 51
19	In needs to be ensured that the proposed sanitary toilets for the workers need to be in adequate number with respect to the maximum number workers accommodated in the camps during the peak construction period	This has been specified in sub-section 6.1.3 - iii; Page 53
20	It's not clear how wastewater generated from workers' camps will be finally disposed of in an environmentally safe manner.	This has been discussed in sub-section 6.1.1 (v), page 51
21	Mitigation measures for addressing impacts of operation of pumps and DG sets during operation phase seems to be missing	This has been discussed in sub-section 6.2.4 (iii); page 55
22	Monitoring parameters selected for compliance monitoring both during construction and operation phases should be source oriented rather than sink oriented.	It has been mentioned that the monitoring of compliance will be source based, and monitoring of impacts will be sink based; sub-section 7.5; page 76, and also in page 77

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Engineer