Initial Environmental Examination

Project Number: 35173-013
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NEP: Third Small Towns' Water Supply and Sanitation Sector Project-Tikapur Town Subproject

Prepared by the Ministry of Urban Development for the Asian Development Bank.

Government of Nepal
Ministry of Urban Development
Department of Water Supply and Sewerage
Third Small Towns Water Supply & Sanitation Sector Project

Project Management Office

Panipokhari, Maharajgunj, Kathmandu

Initial Environmental Examination (IEE)

Of

Tikapur Town Water Supply and Sanitation Project




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Prepared by

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Abbreviations

ADB	Asian Development Bank
AP	Affected person
C-EMP	Contractor's environmental management plan
DWSS	Department of Water Supply and Sewerage
EARF	Environmental assessment and review framework
EIA	Environmental impact assessment
EMP	Environmental management plan
EMR	Environmental monitoring report
EPA	Environment Protection Act
EPR	Environment Protection Rules
EO	Environmental Officer
ES	Environmental Specialist
ESA	Environmental Safeguard Assistant
ESE	Environmental Safeguard Expert
HHs	Households
IEE	Initial Environmental Examination
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
MoSTE	Ministry of Science, Technology and Environment
MoUD	Ministry of Urban Development
NPR	Nepalese Rupee
PISU	Project Implementation Support Unit
PMO	Project Management Office
REA	Rapid Environmental Assessment
SPS	Safeguard Policy Statement
STWSSSP	Small Towns' Water Supply and Sanitation Sector Project
2ndSTWSSSP	Second Small Towns' Water Supply and Sanitation Sector Project
3rdSTWSSSP	Third Small Towns' Water Supply and Sanitation Sector Project
TDF	Town Development Fund
ToR	Terms of Reference
VDC	Village Development Committee
WHO	World Health Organization
WSSDO	Water Supply and Sanitation Divisional Office
WUSC	Water Users' and Sanitation Committee

Weights and Measures

Lps	Litre per second
C	Celsius/centigrade
dBA	decibel audible
Ha	hectare/s
Km	kilometer/s
Kph	kilometer/s per hour
M	meter/s
Kph	kilometer/s per hour
M	meter/s
m^3	cubic meter/s
Masl	meter/s above sea level
mg/l	milligram/s per liter
Mm	millimeter/s

NOTES

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कार्यकारी सारांश

नेपाल सरकारले साना तथा उदयमान सहरका जनताको स्वास्थ्य तथा जीवनको गुणस्तर सुधार्न साना शहरी खानेपानी तथा सरसफाई आयोजना लागु गरेको छ । जसअन्तर्गत खानेपानी वितरण प्रणालीको निर्माण तथा विस्तार, पानी निकासी तथा सरसफाई सुविधा र स्वास्थ्य र सरसफाईको शिक्षा कार्यक्रम पर्दछन् । तेस्रो साना सहरी खानेपानी तथा सरसफाई परियोजना एउटा यस्तो परियोजना हो जसले नेपालको, छनौटमा परेका साना सहरमा खानेपानी आपूर्ति तथा सरसफाईको सुविधालाई सुधार गर्दछ । साना शहरमा खानेपानी वितरण तथा सरसफाई सम्बन्धी सरकारको पन्ध्र वर्षे विकास योजना अन्तर्गत यस परियोजनाको विकास भएको हो जसलाई सरकारले सन् २००० मा तयार गरी लागु गरेको हो र २००९ मा पहिचान भएका शहर मध्ये ५० वटा शहरमा खानेपानी वितरण तथा सरसफाईको सेवा प्रदान गर्न पहिलो र दास्रो साना शहरी खानेपानी तथा सरसफाई उप परियोजना मार्फत सहयोग गरेको छ । पहिलो साना शहरी खानेपानी तथा सरसफाई आयोजना अन्तर्गत २९ वटा उप परियोजनाहरु निर्माण भएका छन् भने दोस्रो आयोजना अन्तर्गत २१ वटा उप परियोजनाहरुको कार्यान्वयन विभिन्न चरणमा भैरहेका छन् । पहिलो साना शहरी खानेपानी तथा सरसफाई आयोजना सन् २०१० मा सम्पन्न भएको हो भने दोस्रो आयोजना अझै कार्यान्वयनकै क्रममा रहेको र सन् २०१६ भित्र सम्पन्न हुने अनुमान गरिएको छ । तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना, पहिलो र दोस्रो आयोजनाको अनुभवले तयार भएको हो जसको कार्यान्वयन सन् २०१४ को मध्येबाट भैसकेको छ । यस आयोजनाले पुँजीको भौतिक लगानी चयन भएका साना शहरहरुमा खानेपानी तथा सरसफाईको पुर्वाधारमा लगाउँछ भने गैर-भौतिक लगानी नीतिगत क्षेत्र र संस्थागत क्षमता, सेवा प्रवाह र योजना व्यवस्थापनलाई बलियो बनाउन प्रयोग हुन्छ ।

यस आयोजनाको उद्देश्य शहरका मानिसहरुको जीवनस्तर सुधार गर्नु हो । आयोजनाको भौतिक पूर्वाधारमा गर्ने लगानी क्षेत्रको अनुमान यसप्रकार छन् : (क) लगभग २६ वटा शहरका खानेपानी वितरण प्रणालीमा सुधार तथा स्तरउन्नती हुने (ख) प्रतिफलमा आधारित सहयोग (ओ.वि.ए) अन्तर्गत सेप्टिक टैंक सहितको निजी तथा सार्वजनिक सौचालय निर्माण हुने (ग) सेप्टेज व्यवस्थापन सुविधा र उपकरणको साथै प्रायोगीक विकेन्द्रीकृत फोहोर पानी प्रशोधन सुविधाको निर्माणको प्रावधान हुने (घ) ढल निकासको गुरुयोजना तयार गर्ने र बाढी जोखिम शहरहरुमा प्राथमिकी नालीको प्रवन्ध हुने (ङ) विद्यमान पानी आपूर्ति प्रणालीको पुन:स्थापना र विस्तार हुने ।

यो आयोजनाको कार्यान्वयन योजना चरणदेखि निर्माण, संचालन र मर्मतसंभार सम्म खानेपानी उपभोक्ता तथा सरसफाई समितिको पूर्ण संलग्नतामा हुनेछ । प्रत्येक शहरको खानेपानी आयोजनाको लगानी व्यवस्थामा ७०% सरकारको अनुदान मार्फत ५% उपभोक्ता समितिको अग्रीम नगद योगदान र बाँकी २५% शहरी विकास कोषले (टि.डि.एफ) ऋण मार्फत लगानी गर्नेछ । आयोजनाको सार्वजनिक सरसफाईको पाटोमा भने लगानीको ८५% सरकारको अनुदान मार्फत र बाँकी १५% स्थानीय सरकार र उपभोक्ता मार्फत हुनेछ । खानेपानी संचालन र मर्मतको खर्च भने उपभोक्ताको महशुल मार्फत पुर्ति हुनेछ ।

आयोजना तयारी प्राविधिक सहयोग समूह (PPTA) ले नयाँ साना शहरी उपपरियोजनाको प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन (प्रा.वा.प) तयार गरेको छ जसमध्ये टिकापुर खानेपानी तथा सरसफाई उपआयोजनाको प्रा.वा.प पनी एक हो ।

प्रारम्भिक वातावरणीय परिक्षण (प्रा.वा.प) को उद्देश्य :-

प्रारम्भिक वातावरणीय परिक्षण (प्रा.वा.प) को उद्देश्य उपआयोजनाले पार्ने वातावरणीय प्रभावको छानविन गरी पर्यावरणीय स्थिरताको सुनिश्चित गर्नु, उपआयोजना तयारी प्रकृयामा वातावरणीय पक्षलाई समायोजन गर्नु र उपआयोजनाको कार्यान्वयनमा वातावरणीय व्यस्थापन प्रदान गर्नु हो । नेपाल सरकार र एसियाली विकास बैंकलाई सबै उप आयोजनाहरुको वातावरणीय मुल्याङ्कन आवश्यक पर्दछ । एसियाली विकास बैक (ए.डि.वि) को लागतका समपूर्ण आयोजनाहरु सुरक्षण नीति (एसपीएस) २००९ अनुरुप चल्नै पर्ने हुन्छ जसले आयोजनामा वातावरणीय कथन सुदृढता भएको , डिजाइन अनुरुप उचित नियामक आवश्यकताहरु अनुसार संचालन भएको र ठूलो वातावरणीय स्वास्थ्य वा सुरक्षा खतराको कारण हुने सम्भावना नभएको शुनिश्चित गर्छ । ऐशियाली विकास बैकको द्रुत वातावरणीय मुल्याङ्कनको ए.डि.विको (द्रु.वा.मु) चेकलिस्ट जसलाई प्रारम्भीक वातावरणीय परिक्षणको आवश्यक पर्दछ । नेपाल सरकारले कानुनी प्रत्रिया अनुसार यो प्रस्तावित परियोजनाले वातावरणीय सरक्षण ऐन २०५३ र वातावरण संरक्षण नियमावली (२०५४ र संसोधन २०५६ र २०६३)को पालना गर्नुपर्छ । वातावरणीय संरक्षण नियमावलीको तालिका १ को अनुसार यस उपआयोजना खानेपानी तथा सरसफाई क्षेत्र अन्तर्गतको सिमाक्षेत्रका गतिविधि भित्र रहेको छ जसलाई प्रारम्भीक वातावरणीय परिक्षणको आवश्यकता रहन्छ ।

(ग) उपआयोजनाका मुख्य अंशहरु

प्रस्तावित उपआयोजनाको दुई भागहरु हुनेछन् अर्थात खानेपानी वितरण र सरसफाई ।

सामाजिक आर्थिक सर्वेक्षण २०१४ ले ९८.४% घरधुरीमा शौचालय भएको र हालको मललाई सेप्टिक ट्याङ्कमा व्यवस्थापन गर्ने प्रणाली प्रति खुसी रहेका छन् । वडा नं ९ वाहेक, आयोजना क्षेत्र प्राय ग्रामीण प्रकृतिको रहेको र बस्ती छरिएर बसेको पाइन्छ । हाल मानिसहरु ढल प्रणालीलाई प्राथमिक पुर्वाधार लगानीको रुपमा लाने सोचमा छैनन् किनकि केहि ४८.३% आशिंक बर्तमान ढल व्यवस्थापन प्रणालीलाई सुधार गर्न इच्छुक छैनन् ।

तथापि अन्य सहरी क्षेत्रमा जस्तै यहाँका मानिसहरु पनि घरेलु मलजललाई नजिकैको सार्वजनिक निकासीमा बगाउने गर्छन् । तर आयोजना क्षेत्र भएकाले मलजललाई संकलन गर्न पम्पिङ गर्नुपर्ने र त्यस ढलको समथर पानीलाई फोहोर पानी प्रशोधन केन्द्रमा लानु पर्ने आवश्यकता देखिन्छ । आयोजना क्षेत्रको ठुलो जनसंख्या समथर भू–भाग र सम्वन्धित उच्च सञ्चालन र मर्मत खर्चलाई मध्यनजर गर्दा कुनैपनि आयोजनाको कार्यान्वयन गर्दा फोहोर पानी व्यवस्थापन प्रणालीको गहिरो अध्ययन गर्नु आवश्यक रहन्छ । तसर्थ ढल प्रणालीलाई आयोजना क्षेत्रमा हाल्न प्रस्ताव गरिएको छैन ।

वर्षायाममा सडक किनाराको बर्खेपानीको निकासमा केहि समस्या रहेका छन् । नगरपालिकाको केहि क्षेत्रमा बर्षेनी बाढीको समस्याले पिडित बनाएको अवस्था छ । यसलाई मध्येनजर गर्दै नगरपालिकाले सन् २०११ मा बर्खेपानी निकासको गुरुयोजना तयार गरेको छ । यसको लागि रु २५ करोड १० लाखको लगानी लाग्ने हिसाव निकालिएको छ । योजनाको डिजाइन समीक्षा गर्नु आवश्यक हुन्छ जसलाई केहि थप लगानीको आवश्यक पर्दछ । केहि क्षेत्रमा मात्र ढल निकासको निर्माणले समस्याको हल नहुने र पुरै योजनाको कार्यान्वयन गर्न अत्याधिक लगानी लाग्ने भएकाले बर्खेपानी निकासीको प्रस्ताव यस आयोजनामा गरिएको छैन । यसको लागि छुट्टै अध्ययन पछि कार्यान्वयन गर्नु पर्ने देखिन्छ ।

बातावरणीय प्रभाव, न्यूनिकरण उपायहरु र अनुगमन

निर्माण समयमा निकै थोरै उच्च स्तरको नकारात्मक असरहरु पर्ने देखिन्छ । यधपि यि प्रभावहरु अस्थायी, छोटो अवधि र स्थानीय स्तरको हुने अपेक्षा छ र सक्रिय कार्यस्थल र त्यसको आसपासमा मात्र सीमित हुनेछ । हावा चलेको दिन भारी वर्षा वा गरम मौसमको वेला वाहेक धुलो, स–साना गीट्टी र फोहोरहरु कार्यस्थल भन्दा वाहिर पुग्ने छैनन् ।

टिकापुर नगरपलिकामा हालको प्रशारण र वितरण पाइपहरुसमथर भु-भागमा स्थिर अवस्थामा छन् । भुक्षयको संकेत देखाएको छैनन् यद्यपि मध्यम र उच्च भिरालो जमिनलाई प्रशारण र वितरण पाइप

विछ्याउने क्रममा विचलन गरिएमा भुक्षयको संभाव्यता हुन सक्छ । केही अरु यस्ता संचित न्युनिकरणका उपायहरु राखिएमा जस्तै (क) संवेदनशील क्षेत्रमा विशेष ध्यान पुऱ्याउने जस्तै संवेदनशील भीर, जलाशयमा गर्नुपर्ने कटान , स्वास्थ्य तथा शैक्षिक संस्था र उच्च जनसँख्या भएको क्षेत्रमा काम गर्दा ख) व्यवहारिक रुपमा काम ठिकसँग चरणवद्ध विभाजित र सङ्गठित भएका शुनिश्चित गर्ने जसले गर्दा धेरै काम (वा कमसेकम लगभग पुरा) अर्को चरण क्षेत्रको काम प्रारम्भ हुनुअघि पूरा भैसक्नेछ र वर्खायाम भन्दा अगाडि सकिनेछ, निर्माण चरणमा संभावित नकारात्मक असरहरुलाई कम र साइट निर्दिष्ट राखिनेछ । वरिपरिको श्रोतहरुलाई खतरा र कमजोर बनाउन यस्ता प्रभावहरु पर्याप्त हुनेछैनन् ।

संचालनको समयमा असुरक्षित खानेपानीको वितरण एक महत्वपूर्ण चासोको विषय हो जसलाई न्यूनिकरण गर्न उचित सञ्चालन र मर्मत चुहावट भएमा तुरुन्तै कदम चाल्ने र राष्ट्रिय खानेपानी गुणस्तर मापदण्डको निर्देशनमा तोकिए बमोजिम वितरण भएको पानीको गुणस्तर अनुगमनको पालना गुर्नुपर्ने हुन्छ । संचालनको रुपमा रहेको खानेपानी उपभोक्ता समितिलाई पानी गुणस्तर अनुगमनमा क्षमता विकास गुर्नुपर्ने देखिन्छ । अनुगमन उपकरण र प्रयोगशाला कोठाहरुको प्रवन्ध भएतापनि उपभोक्ता समितिले उचीत ढङ्गले अनुगमन गर्नसक्छ भन्ने ग्यारेन्टी हुँदैन ।

यो आवश्यकिय क्षमता विकासलाई सचालनको पहिलो वर्षमा "गरेर सिक्ने" कार्यक्रमद्वारा संबोधन गर्न सकिन्छ जसमा लाइसेन्स प्राप्त प्रयोगशालामा विशेषज्ञको निर्देशन र त्यसपछि आवधिक क्षमतालाई निरन्तर अविवृद्धि गरिनुपर्छ । एक वातावरणीय व्यवस्थापन योजनाको तर्जुमा गरिएको छ, यसमा न्युनिकरणका उपायहरु र अनुगमनका गतिविधिहरुको संग्रह समावेश गरिएको छ , जसमा उपआयोजनाको वातावरणीय व्यस्थापन भूमिका र जिम्मेवार प्रमुख संस्थाहरु र प्रशिक्षण र क्षमता विकासको सल्लाहरुको रुपरेखा समावेश भएको हुन्छ ।

निष्कर्ष र सुझावहरु

टिकापुर शहरमा विश्वशनीय प्रणालीद्वारा वितरीत सुरक्षित पिउनयोग्य पानी र सार्वजनिक सरसफाइकोमा सुधारको खाँचो देखिन्छ । प्रस्तावित उपआयोजनामा वातावरणीय नाजुकता रहेको छैन । प्रारम्भिक वातावरणीय परिक्षणले उपआयोजना र त्यसको अंशहरु वातावरणीय सवेदनशिल क्षेत्र र त्यसको आसपासमा नभएको अंकित गर्दछ । निर्माणक्रममा हुने केही उच्च स्तरका नकारात्मक प्रभावहरु अस्थायी र क्षणिक, अधिक स्थानिय र कार्यस्थल केन्द्रित वरिपरिको वातावरणलाई खतरा वा कमजोर बनाउन नसक्ने

किसिमको हुनेछन् । सामान्य सरल निराकरणका उपायहरु मूलत : सामाजिक र वातावरणीय सम्बद्ध निर्माण अभ्यासका कुराहरु निर्माण स्थलमानै प्रयोग हुने र ठेकेदारलाई जानकारी हुन्छ । तसर्थ न्यूनिकरणका उपायहरु डिजाइन र लागु गर्न गाह्रो हुने छैन ।

उपआयोजनाको वातावरणीय व्यस्थापन संचालनमा चाहिने प्रमुख सस्थाहरुको क्षमता विकासलाई तेस्रो साना सहरी खानेपानी आयोजनाको दोस्रो प्रतिफलको अंशको रुपमा सिफारिस हुनेछ अर्थात संस्थागत क्षमताको अभिवृद्धि र अयोजना कार्यान्वयनको आधार तय गर्नेछ ।

प्रस्तावित उपआयोजनाले यि कुराहरु ल्याउनेछ (क) सुरक्षित र पिउनयोग्य खानेपानीको विश्वशनीय वितरणको झण्डै एक हजार घरधुरी भन्दा धेरैको पहुचबाट हुने लाभ र वसपार्कमा सर्वसाधारणको सुधारिएको सरसफाईको सुविधाको पहुँच हुनु (ख) सर्वसाधारणको स्वास्थ्यमा हुने सकारात्मक प्रभावहरु (ग) टिकापुर सहरमा गुणस्तरीय जीवनको वृद्धि हुनु। उल्लेखित आधारहरुमा तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजनाको वर्गीकरण श्रेणी "B" मा पर्ने पुष्टि भएको छ र एसियाली विकास बैकको सुरक्षा निती विवरणपालना गर्न कुनै थप विशेष अध्ययन वा विस्तृत वातावरणीय प्रभाव मुल्याङ्कनको आवश्यकता पर्दैन । नेपाल सरकारले यस उपआयोजनाको प्रारम्भिक वातावरणीय परिक्षण प्रतिवेदन अनुमोदित गरेको छ ।

EXECUTIVE SUMMARY

A. Background

1. The Government of Nepal (GoN) has been implementing small towns' water supply and sanitation projects to improve the health and the quality of life of people living in small and emerging towns by constructing and extending water supply systems, drainage and sanitation facilities and providing health and hygiene education programs. The Third Small Towns Water Supply and Sanitation Sector Project is one of such projects proposed for improving water supply and sanitation facilities to selected small towns in Nepal. This project has been developed in line with the Government's 15 year development plan for water supply and sanitation in Small Towns which was prepared and endorsed by the Government in 2000 and updated in 2009. The ADB has already supported the Government in providing water supply and sanitation services in 50 out of 265 identified small towns through the first and second STWSSSPs. 29 subprojects have been constructed under STWSSSP I and 21 subprojects are under various stage of implementation under STWSSSP II. STWSSSP I was completed in 2010 while STWSSSP II is still under implementation and is expected to be completed by 2016. The Third Small Towns Water Supply and Sanitation Sector Project, which is being implemented from mid-2014, has been prepared by drawing experience from the first and second projects. The project will fund physical investments in water supply and sanitation infrastructure in selected small towns and non-physical investments in strengthening sector policy, regulatory and institutional capacity, service delivery and project management.

2. The aim of the Project is to provide improved living conditions to people in project towns. The project's investment in physical infrastructure is expected in: i) upgrading and improvement of water supply systems in about 26 towns; ii) construction of private as well as public toilets with septic tank on output based aid (OBA); iii) provision of septage management facilities and equipment and construction of decentralized wastewater treatment facilities on pilot basis; (iv) preparation of drainage master plans and provision of priority drains in towns with flooding risks; and (v) rehabilitation and expansion of existing water supply systems.

3. The project is proposed to be implemented with the full involvement of Water Users' and Sanitation Committees (WUSCs) from the planning stage through construction to operation and maintenance. The funding arrangements for each towns' water supply project will be 70% grant from the Government and 30% funding by the Users, out of which at least 5% will be an upfront cash contribution from the WUSC and the remaining 25% will be funded through a loan from the Town Development Fund (TDF). The financing for the public sanitation part of the project shall be an 85% government grant and the remaining 15% through local government and users. O&M costs for water supplies will be fully recovered from consumers through tariffs.

4. The Project Preparation Technical Assistance Team (PPTA) has prepared Initial Environmental Examination (IEE) reports for new small towns' subprojects and the IEE of Tikapur Water Supply and Sanitation Subproject is one of them.

B. Purpose of the IEE

5. The purpose of this Initial Environmental Examination (IEE) is to investigate the environmental implications of the Subproject to ensure its environmental sustainability, to integrate environmental considerations into the Subproject preparation process, and provide for environmental management during Subproject implementation. The ADB and the Government

of Nepal (GoN) require all projects to undergo environmental assessment. All projects funded by the ADB must comply with the Safeguard Policy Statement (SPS) 2009 to ensure that projects 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. The rapid environmental assessment using ADB's REA Checklist has indicated that the Subproject is a Category B undertaking, requiring an IEE. On the GoN side, the statutory requirement that has to be adhered to is the Environment Protection Act (1996), and Environment Protection Rules (1997 and as amended in 1999 and 2007). Based on EPR Schedule 1, the Subproject is within the threshold of activities under the water supply and sanitation sector that will require IEE.

6. This IEE fulfills the policy requirements of both the ADB and the GoN.

C. Components of the Subproject

7. The proposed Subproject will have two components viz. the water supply component and the sanitation component.

8. **The water supply component**shall consist of Water Source (Groundwater) and its Protection Structures, Water Treatment Plant, Transmission Main, Pumping, Service Reservoir, Distribution Network, House connections and Others (Office and other buildings).

9. **The Sanitation component** will have six toilets.Theporposed location for toilets are at the compound of Birendra Higher Secondary School (Teacher+ students), Tikapur Multiple Campus, at the compound of Shree BirendraBidyamandirHigher Secondary School (Teacher+ students), Shanti NiketenAdarshaVidyaMandir Higher Secondary School, Khadka Memorial English Boarding Schools, BramhaKumari Raj Yog Service Center (Om Shanti Bhawan)

D. Current Situation

10. The existing system has a 225 m^3 OHT and a deep bore which will be used through integration with new system. The distribution pipelines which were laid more than 20 years back and mostly consist of GI and HDPE will not be used as they are undersized in many places. The analysis of other shallow tube wells from the project area shows that the water is contaminated with iron, manganese and bacteria. Arsenic is within limit in all tested samples.

11. The socio-economic survey 2014 shows that only 132 HHs out of 8,413 i.e. 1.6% practice open defecation. The Municipality informed that till date ward nos. 1, 4, 7, 5 & 6 have been declared ODF. Ward no.3 is in process of declaring ODF and remaining wards 2, 8 & 9 will be declared ODF within this fiscal year. The Municipality is soon to be declared as an "open defecation free" zone. Considering this no private toilet construction is provisioned. There are four public toilets in the project area, which seems to be insufficient.

12. Tikapur has many large educational institutions but sanitary conditions in some of them are not satisfactory. One of the reasons is that they lack toilets with sufficient capacities. Due to financial problems, they could not construct on their own and requested Tikapur WUSC.

13. The socio economic survey 2014 shows that 98.4% of HHs has toilets and they are happy with current system of management of domestic sewage through septic tanks. Except ward no 9, the project area is mostly of rural nature and the settlement is scattered. At present,

the people do not consider sewerage system as a priority infrastructure investment as some 48.3% people are not willing to improve current sewage management system.

14. However as in other urban areas, people started discharging domestic sewage into nearby public drain. But the project area is so flat that pumping of sewage may be required to collect and convey sewage into wastewater treatment plant. Considering the large population of project area, flat terrain and related huge O & M cost, an in-depth study on wastewater management system is needed before implementation of any project on it. Hence, sewerage system has not been proposed at present for the project area.

15. There are some problems related with storm-water on the road side drains during rainy season. The parts of the Municipality used to suffer from flooding problems every year. Considering this, the Municipality already prepared master plan for storm-water drainage in 2011. It calculated an investment of NPR 251 million. The design review of the plan is needed, which may add some additional investment. Since the construction of some segments of drain will not solve the problem and requires a huge investment for comprehensive implementation of plan, the storm-water drainage is not proposed in this project. It requires separate study and subsequent implementation.

E. Environmental Impacts, Mitigation and Monitoring

16. During construction there will be few adverse impacts of significant magnitude. However, these will be temporary, short-term and are expected to be local, confined within the active work sites and their immediate vicinities. Except during windy days, heavy rainfall and/or extreme weather event, dust, fine aggregates, sediments and wastes would not be the transported beyond these sites. Although existing transmission mains and distributions pipes on flat terrain in Tikapur Municipality have remained stable and are not exhibiting signs of erosion, potential erosion may occur when moderately to highly sloping terrains are disturbed for the installation of transmission mains and distribution pipes. With proper mitigation measures in place, such as, among others: (i) special care taken at sensitive locations, e.g., sensitive slopes, water body crossings, works close to health care and educational institutions and populated area; and (ii) ensuring that, when practicable, works are properly phased, segmented and organized so that the bulk of works are completed (or at least almost complete) prior to the commencement of another phase/segment, and prior to the onset of the rainy season, the potential adverse impacts during construction would be minimized and kept highly site-specific. These impacts will not be sufficient to threaten or weaken the surrounding resources.

17. During operation, the delivery of unsafe water is a crucial concern that can be mitigated with good operation and maintenance, prompt action on leaks, and complying with the required quality monitoring of supplied water as prescribed in the National Drinking Water Quality Standards Directives. The WUSC, as operator, requires capacity development in water quality monitoring. Monitoring kits and laboratory rooms will be provided, however, this provision is not necessarily a guarantee that WUSC can handle monitoring appropriately. This capacity development need can be addressed through a “learning-by-doing” program in the first years of operation under the expert guidance of a licensed laboratory, with a continuing periodic capacity strengthening thereafter.

18. An EMP has been formulated. It contains sets of mitigation measures and monitoring activities, outlines the roles and responsibilities of key institutions in the environmental management of the Subproject, and recommends training and capacity development.

F. Conclusion and Recommendation

19. Tikapur Town needs a reliable system to supply its people with safe potable water and improvement in public sanitation. The proposed Subproject is not an environmentally critical undertaking. The IEE indicates that the proposed subproject, its components, are not within or adjacent to environmentally sensitive areas. The few adverse impacts of high magnitude during construction will be temporary and short-term, highly local and site specific, not sufficient to threaten or weaken the surrounding environment and resources. Simple/uncomplicated mitigation measures, basically integral to socially and environmentally responsible construction practices, are commonly used at construction sites and are known to Contractors. Hence, mitigation measures would not be difficult to design and institute.

20. Capacity development of key institutions in environmental management of the Subproject, essentially during operation, is recommended as part of the second output that the 3rdSTWSSSP will deliver, i.e., Improved Institutional Capacity and Project Implementation Platform.

21. The proposed subproject will bring about: (i) the benefits of access to reliable supply of safe and potable water by over one thousand households and access to improved sanitation facility by the public at the bus park; (ii) positive impacts on public health; and (iii) improved quality of life in Tikapur Town. Based on the foregoing, the classification of the 3rdSTWSSSP as Category B is confirmed, and no further special study or detailed EIA needs to be undertaken to comply with the Safeguard Policy Statement of the ADB. The GoN has approved the IEE Report of the Subproject.

I. INTRODUCTION

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

a. Name of the Proposal

1. The name of the Proposal is "Initial Environmental Examination" of Tikapur Town Water Supply and Sanitation Project in Kailali District.

b. Name and Address of the Proponent

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

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

Address of the Proponent

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

c. Consultant Preparing the Report

3. TAEC Consultant Pvt. Ltd. Joint Venture with Integrated Consultants Nepal Pvt. Ltd. is responsible in preparing this IEE report.

B. Background

4. In 2000, the Government of Nepal (GoN) endorsed the 15-year Development Plan for Small Towns Water Supply and Sanitation in order to improve health and economic and environmental living conditions of people in small towns in Nepal. The Plan adopts a community managed demand responsive approach, where the community is involved in all aspects of planning and implementation of its town's project. In support of GoN's endeavor, the Asian Development Bank (ADB) funded the Small Towns' Water Supply and Sanitation Sector Project (STWSSSP) in 2001-2008. Twenty-nine (29) small towns of about 570,000 people benefitted from the improved water supply and sanitation services delivered under the Project. The positive impacts of the STWSSSP led the GoN to embark on the Second Small Towns' Water Supply and Sanitation Sector Project (2ndSTWSSSP), also financed by the ADB and which benefitted another twenty-one (21) small towns. Following these two projects, the Third Small Towns' Water Supply and Sanitation Sector Project is currently being prepared to further support GoN's continuing efforts to improve water supply and sanitation service delivery in small towns in Nepal. The Project will follow the government's 15-year Development Plan, as updated in 2009, to develop the water and sanitation sector for small towns.

C. Purpose of the IEE

5. This report gives an account of the initial environmental examination (IEE) of the proposed Tikapur Town Water Supply and Sanitation Subproject (or, Subproject) to be implemented under the Improved Water Supply and Sanitation Infrastructure Output of the Third Small Towns Water Supply and Sanitation Project (or, Project).

6. The IEE was conducted to ensure the environmental sustainability of the Subproject, to integrate environmental considerations into the Subproject preparation process, and provide for environmental management during Subproject implementation. The ADB and GoN require all projects to undergo environmental assessment. All projects funded by the ADB must comply with the Safeguard Policy Statement (SPS) 2009 to ensure that projects 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. The rapid environmental assessment using ADB's REA Checklist has indicated that the Subproject is a Category B undertaking, requiring an IEE. On the GoN side, the statutory requirement that has to be adhered to is the Environment Protection Act (1996), and Environment Protection Rules (1997 and as amended in 1999 and 2007). Based on EPR Schedule 1, the Subproject is within the threshold of activities under the water supply and sanitation sector that will require IEE.

7. This IEE fulfills the policy requirements of both the ADB and the GoN

8. The IEE Report primarily: (i) provides information on the Subproject and its environmental requirements; (ii) provides the necessary baseline conditions of the physical, ecological, physical cultural and socio-economic environments and/or resources in and surrounding the Subproject's area of influence; (ii) identifies and assesses potential impacts arising from the implementation of the Subproject on these environments and/or resources; (iii) recommends measures to avoid, mitigate, and compensate for the adverse impacts; (iv) presents information on stakeholder consultations and participation during Subproject preparation (v) recommends a mechanism to address grievances on the environmental performance of the Subproject; and (vi) provides an environmental management plan.

9. Relevant reports/documents, sites reconnaissance, consultations with communities and relevant government agencies (Annex C) and reference to relevant government policies, laws and regulations have provided bases to this IEE.

D. Need for the Subproject

10. The Municipality is an attraction for internal migration from far western hill regions and hence the population growth is comparatively high. Because of its strategic location, urban planning and linkages with Indian border town, the city will tend to grow in the future. However the existing water supply system has not been able to meet the growing demand for water from the consumers. The present supply is intermittent and is limited to only certain parts of the city core area i.e. ward no 9. The current system serves only about 10% of the Municipality population. There is a demand from other parts of the Municipality for supply of regular and potable water to the consumers.

11. The water from the existing system is hardly treated. The people are mostly dependent on hand pumps/shallow tube wells, the quality of which are poor with bacteriological contamination and iron content among others. Considering the water demand and condition of existing system, there is a need for a project to upgrade the existing water supply situation in the service area to meet growing demand for private connections and to make drinking water available to the people of service area throughout the year.

E. Relevancy of the Project

12. As per TOR, it is stated that the Project needs to be studied from the environmental point of view as per EPA 1996 and EPR 1997 (Amendments 1999 and 2007). The Proposed Water Supply and Sanitation Project is intended to serve wards 4, 9 (fully) and wards 3,6,7,8 (partially) of Tikapur Municipality. It is expected that on implementation of the project the users of the area will be able to access reliable and adequate supply of safe and potable water and promotion of good hygiene and sanitation practices. The project needs to go through IEE process as stipulated in EPR 1997 (Amendments 1999 and 2007). The proposed project shall be using ground water sources. The Project does not involve construction of any tunnels; relocation of people or households, there is no need to settle any households above the gravity source, and construction of river training works is also not required. The project is expected to benefit a design population of about 95,801. As the proposed project falls within the definitions provided in the EPR 1997 (Amendments 1999 and 2007) Annex 1(G) for drinking water projects; an IEE is required. The regulation stated in Annex 1 (H) shall only be applicable, if the proposal does not fall under categories (A) through (H) of Annex 3.

F. Overview of the Subproject

13. The proposed sub-project shall consist two components i.e. water supply component and sanitary component.

14. The water supply component for the proposed subproject for Tikapur Municipality will consist of the rehabilitation of the existing system and the construction of new system. The existing system has a 225 m^3 OHT and a deep bore which will be used through integration with new system. The distribution pipelines which were laid more than 20 years back and mostly consist of GI and HDPE will not be used as they are undersized in many places.

15. The new system consists of four different sub systems; each one of them has 2 (Zone-A), 3 (Zone-B), 2 (Zone-C1), 3 (Zone- C2) number of Tubewells with treatment plant and OHT. But all of them are interlinked. The infrastructure of the existing system has been integrated with sub system 2. The coverage with served population of each system has been presented in table 1.1.

Table 1.1: Coverage of sub systems

Sub system	Zone	Coverage (Ha)	Current HHs	Current Population
Sub system 1	A	550.2	1,682	1,0708
Sub system 2	B	1051.0	2,322	14,528
Sub system 3	C1	2195.0	1,509	9,639
Sub system 3	C2		2,900	17,873
Total		3796.2	8,413	52,748

16. The source of the proposed system is ground water. The system consists of three sub systems and the system has been designed for a total discharge of 344.373lps. It includes use of existing system, which has been extracting about 4 lps ground water at the moment.

17. Based on the geophysical data/information so far obtained deep well is feasible. Reportedly there is no depletion of ground water sources and the existing bore well also has not witnessed any lowering of the water table. However, considering a comparatively significant extraction of ground water, geophysical survey is essential for the project. It has to be carried out to modify and update the existing tube well design adequately for proposed new deep tube well. The WSSDO Kailali has been carrying out a deep boring at Block 11, which is considered in the project design as test bore. The result of the said test bore will be used to finalize the size of deep borings. It also helps in ascertaining the water quality and proposing the treatment facilities. The production well of diameter up to 300mm x 200mm is proposed for this project.

18. There is a less possibility that the ground water will be used for other purposes in the project area. Department of Irrigation has been modernizing the Rani JamaraKulariya Irrigation Project and other potential industries can get water from the proposed project. However, the WUSC should be able to monitor this in order to avoid well interference and to maintain water business.

19. Water availability has been depleted in many parts of the country. The potential reasons for this are over extraction and climate change impacts. However, similar conditions do not exist at the moment but specific study and regular monitoring of ground water extraction can be considered preventive measures in case of Tikapur subproject.

20. Considering quality of water in Tikapur and other Terai towns, Mechanical Treatment Plant (MTP) with pressure filter has been proposed. Based on the water demand, the MTP will be installed at each OHT sites.

21. 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 will be carried out by the addition ofbleaching powder. The chlorine dose of 1 mg/l is proposed.

22. Lamki small town water supply project, which is just 14 km. north of Tikapur has serious problems with lime content in the ground water. The analysis of water shows that similar problem does not exist in Tikapur. However, regular monitoring is required to take preventive as well as controlling measures, if similar problem arises.

23. Being a groundwater system, the proposed project has only few km. of transmission lines. At each OHT site, the transmission line is the length from bore well to the OHT through treatment plant. Since bore well, treatment plant and OHT will be constructed in the same site, the transmission length will be nominal.

24. The Sub system in Zone A, B, C1, C2, there are 2, 3, 2, 3 number of borings respectively and they have to be connected through transmission lines. It will be around 3 km. in three OHT sites. In sub system 3, the new boring site at New Tikapur is linked with existing OHT site at Zone C1.

25. The whole system is designed as pumping system. Since treatment plant using pressure filters are proposed, pumping is only required to extract water from bore wells and fed to the treatment plant. Pumping is also required for chlorination process.

26. The project has three sub systems and the pumping is provisioned separately at each site.Submersible pumps with the required capacity to serve the design year demand have been recommended to be installed in the boreholes. In order to ease in replacement, maintenance and repair submersible pumps of same capacity of 35 HP for all bore holes shall be installed. The pumps will be connected to the control board by flat submersible cable. Each borehole shall have pumps installed and one pump will be provided as a standby for each zone

27. It is recommended to operate the pumps during non-peak hours to save the cost of pumping. It is assumed that the operation of diesel generator will be operated during emergency power failures only. The storage capacity is also enough to meet the water demand without operating the pumps during load shedding period of 9 hours at base year and is enough up to 12 hours duration for next 5 years.

28. The existing system has a 225 m^3 capacity RCC overhead tank which is presently in use and still in good condition which required minor repairing and used to supply to Zone C1. However, additional RCC overhead tanks with adequate capacities are required to balance the supply and

demand. Three RCC overhead tanks each having 450 cum capacities shall be constructed for the sub-project in zone A, Zone B and Zone C2. The base of the reservoir tank is proposed at an elevation of at least 20 meters above the ground. This will ensure adequate pressure at the pipeline of the system. The capacity of the reservoir has been determined by the recommended consumption pattern and proposed pumping hours.

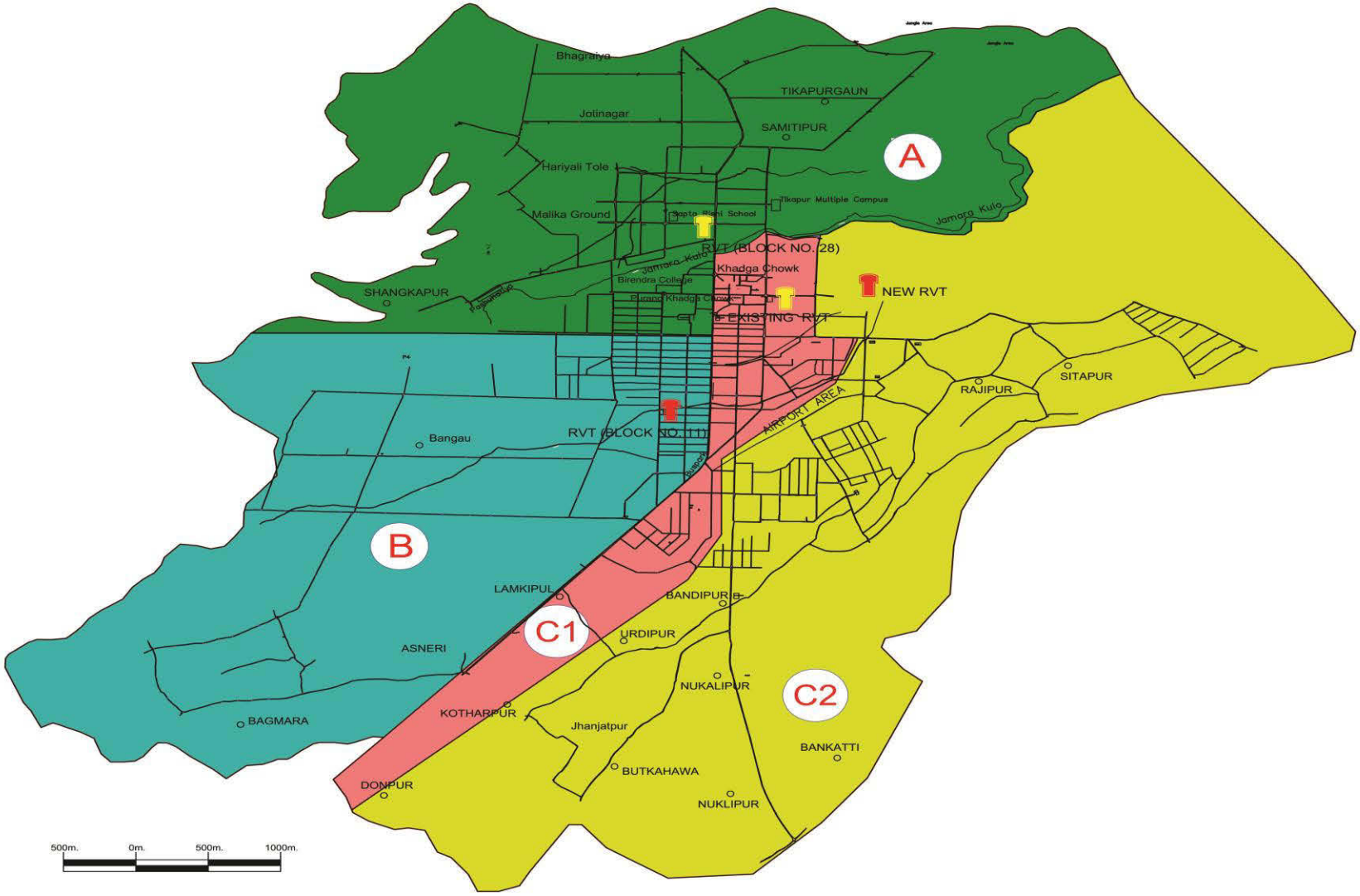

Figure1.1: Location map with Service area and Sub-system

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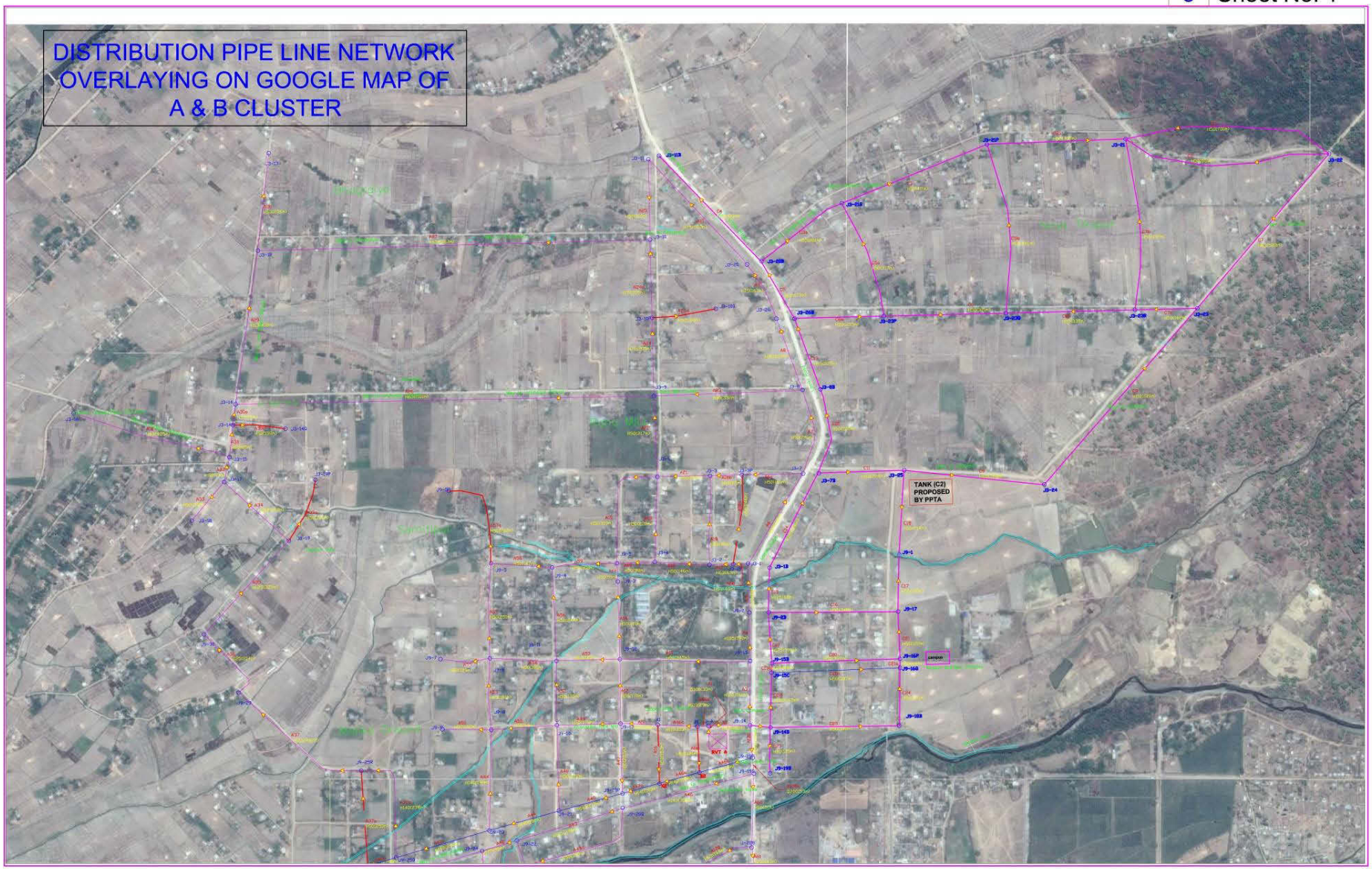
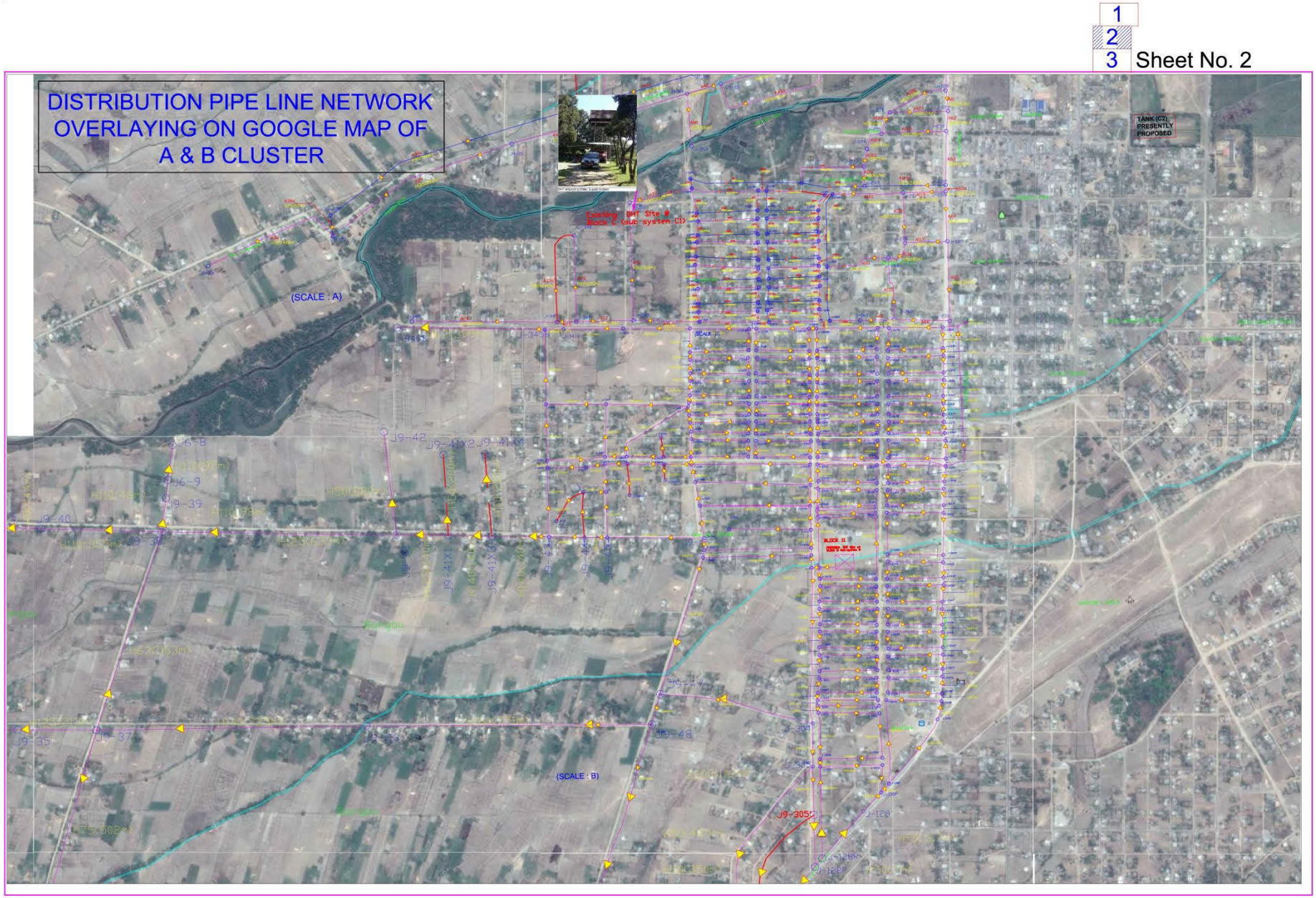
3 Sheet No. 1




1
2
3 Sheet No. 2
DISTRIBUTION PIPE LINE NETWORK
OVERLAYING ON GOOGLE MAP OF
A & B CLUSTER
(SCALE : A)
(SCALE : B)
TANK (C2)
PRESENTLY
PROPOSED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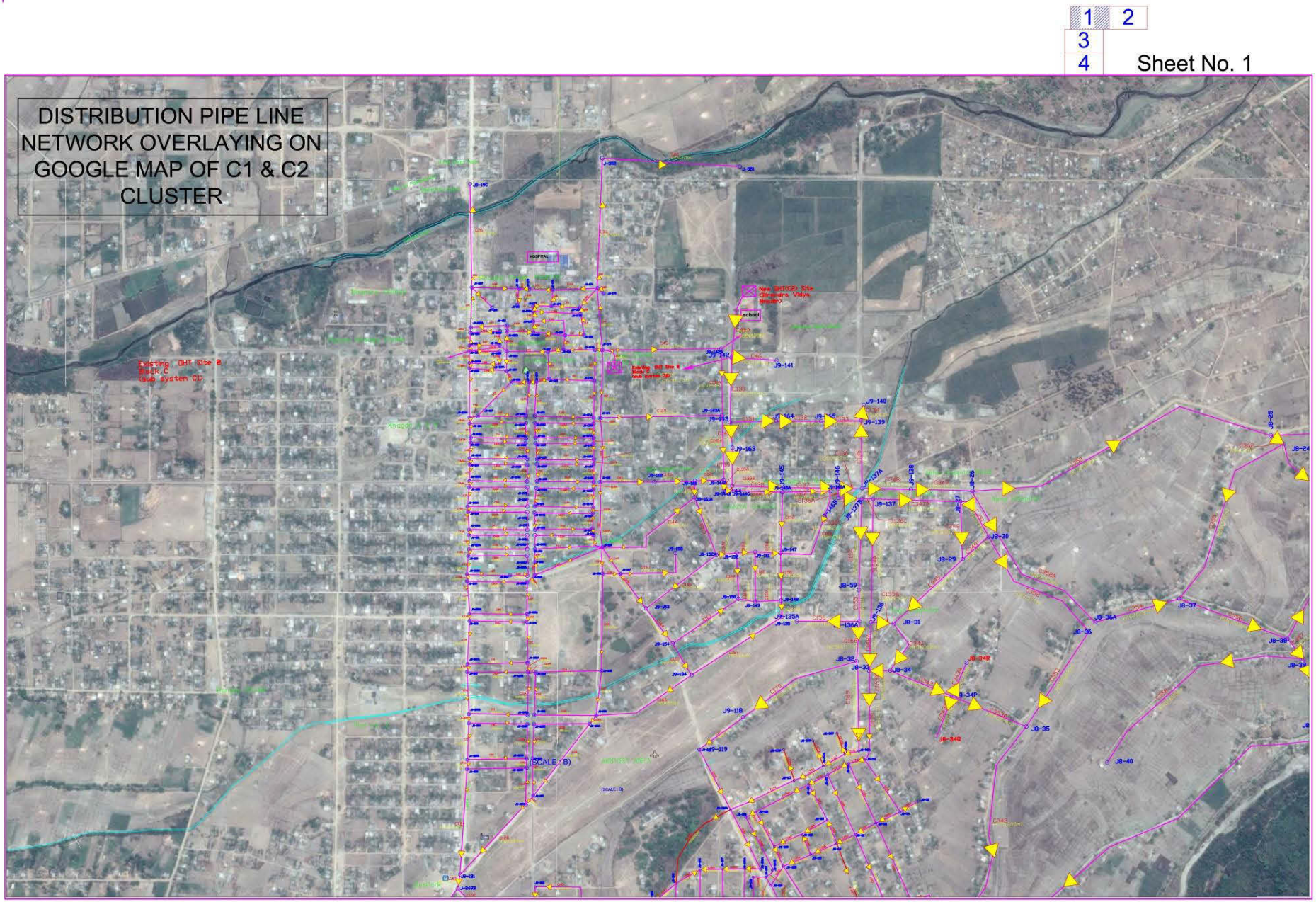
3 Sheet No. 3
DISTRIBUTION PIPE LINE NETWORK
OVERLAYING ON GOOGLE MAP OF
A & B CLUSTER
(SCALE : A)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Sheet No. 1
DISTRIBUTION PIPE LINE NETWORK OVERLAYING ON GOOGLE MAP OF C1 & C2 CLUSTER

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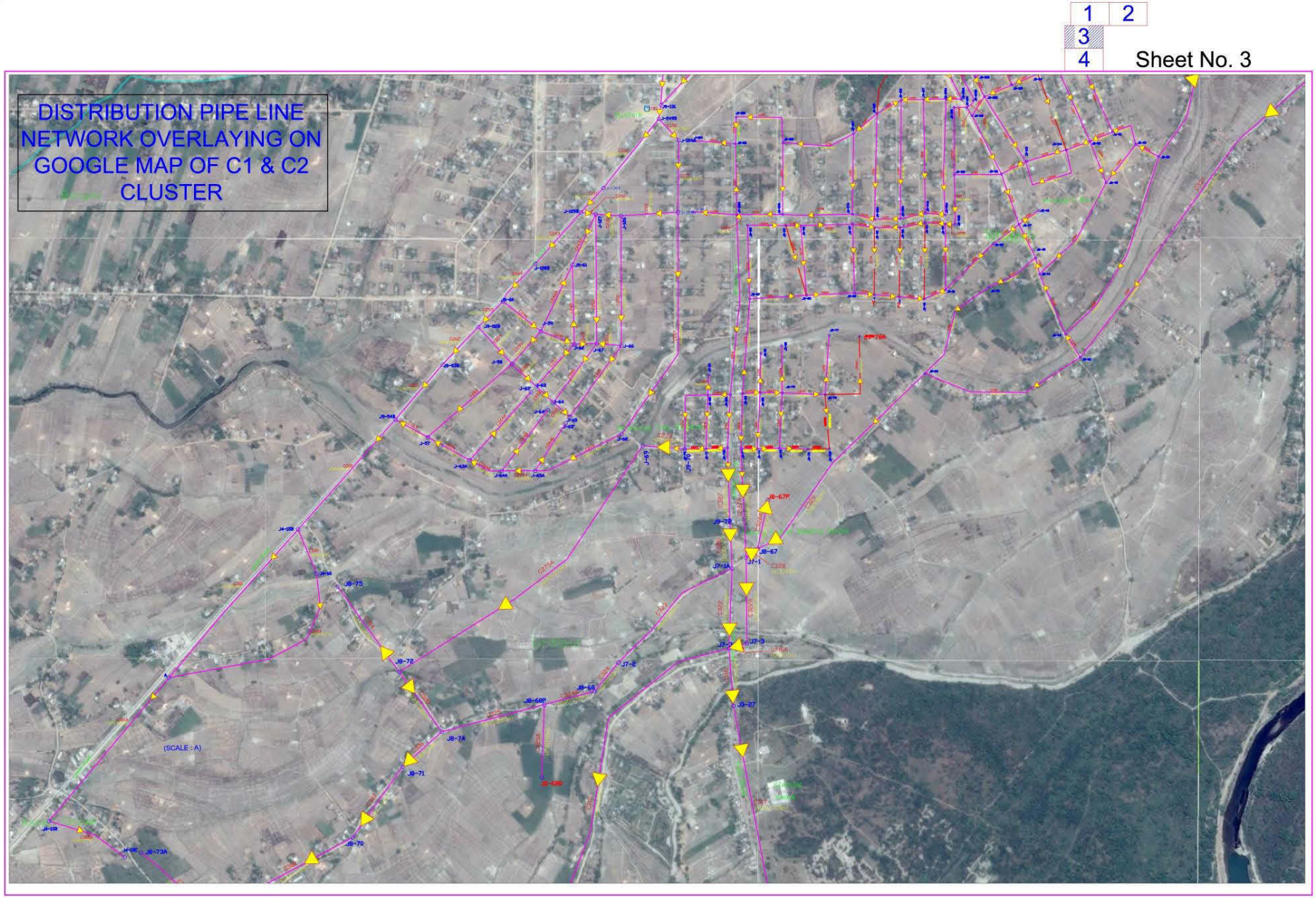
Sheet No. 2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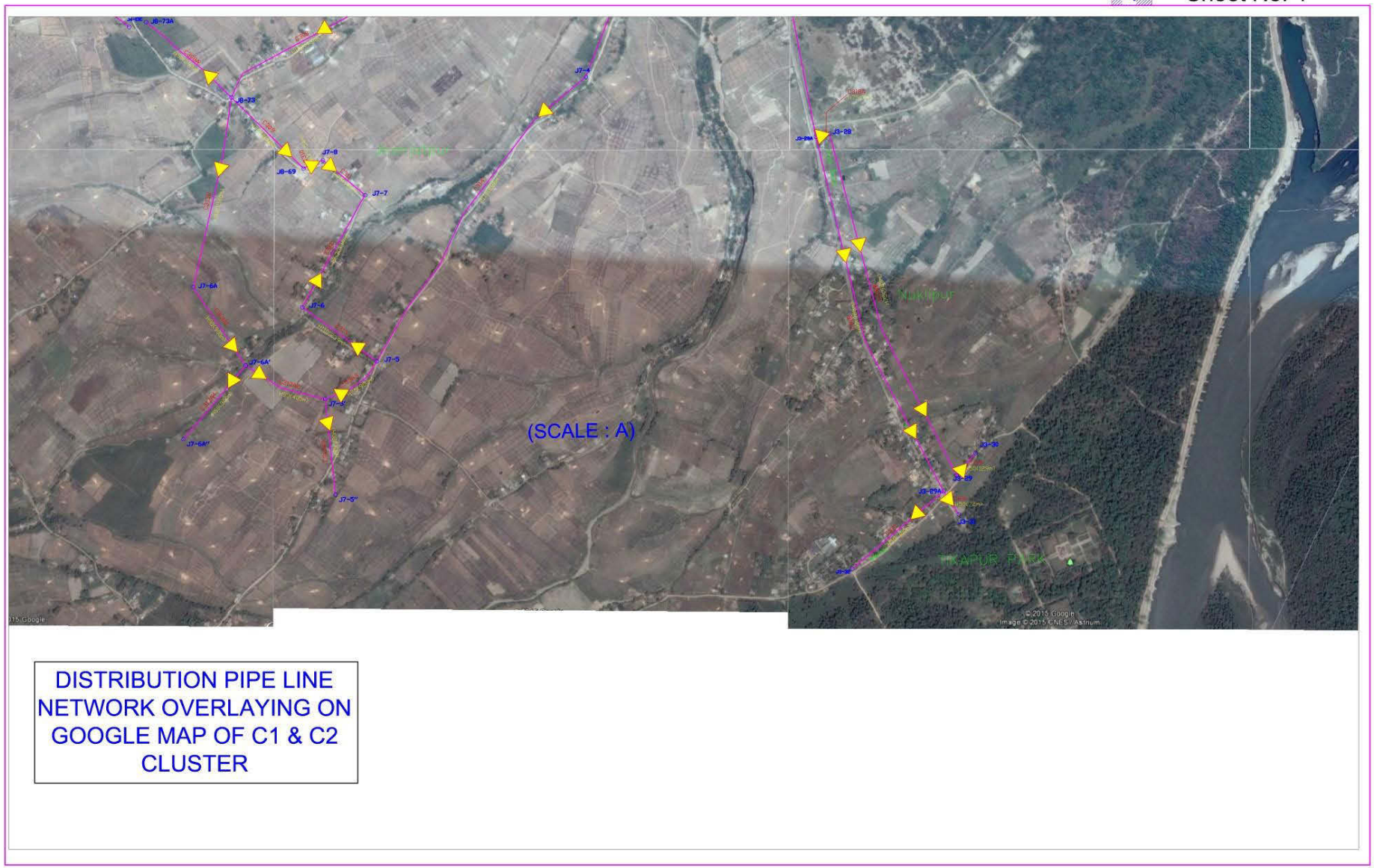
Sheet No. 3
DISTRIBUTION PIPE LINE NETWORK OVERLAYING ON GOOGLE MAP OF C1 & C2 CLUSTER
(SCALE : A)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Sheet No. 4
(SCALE : A)
Nukli pur
TIKAPUR PARK
DISTRIBUTION PIPE LINE NETWORK OVERLAYING ON GOOGLE MAP OF C1 & C2 CLUSTER

Table 1.2: Summary of OHTs

S.N.	Sub System	Size of OHT (m3)	Remarks
1	Sub system 1(A)	450	New
2	Sub system 2(B)	450	New
3	Sub system 3(C1)	225	Old will be used
4	Sub system 3(C2)	450	New
Total		**15,75**	

29. The system consists of three sub-systems based on location of OHT sites. The details on distribution pipelines have been shown in below table. The total pipe length of the proposed distribution system works out to 192,347 m. Total 12,304 m of DIpipes (150-350 mm dia) of spigot joint and 180,043 m PE pipes of 50 to 160 outer diameters have been proposed.

Table 1.3: Distribution network pipe size and Length

PE Pipes		**DI Pipes**	
Diameter	Length (m)	Diameter	Length (m)
160 mm Ø	18185	350 mm Ø	1006
140 mm Ø	9809	300 mm Ø	664
125 mm Ø	13036	250 mm Ø	2153
110 mm Ø	9809	200 mm Ø	7733
90 mm Ø	14980	150 mm Ø	748
75 mm Ø	17214		
63 mm Ø	23115		
50 mm Ø	73895		
Sub Total (m)	**180,043**		**12,304**
Total (m)			**192,347**

30. The existing distribution network will be replaced by above mentioned pipes.

31. A total of 8,450 house connections have been proposed. It includes 8,413 for private houses and 37 for institutions. The house connection will cover population ofwards 4, 9 (fully) and 3, 6, 7, 8 (partially) of the service area.

32. An office building has been proposed for the project at Block no. 28 as it is centrally located and the required land is available. The building will have a meeting room, accounts section, store room and other rooms for the operation and maintenance of the system. It also in-houses a water quality laboratory, where the water from different boring sites will be tested. Fencing will be done at Block no. 28 and New Tikapur site. The existing OHT site at Block no. C and 11 already have boundary wall. Guard house is provisioned for all new sites i.e. Block 11, Block 28 & New Tikapur.

33. The socio-economic survey 2014 shows that only 132 HHs out of 8,413 i.e. 1.6% practice open defecation. The Municipality informed that till date ward nos. 1, 4, 7, 5 & 6 have been declared ODF. Wards no.3 are in process of declaring ODF and remaining wards 2, 8 & 9 will be declared ODF within this fiscal year. The Municipality is soon to be declared as an "open defecation free" zone. Considering this no private toilet construction is provisioned.

34. At present there are four public toilets available in the project area, which seems to be insufficient.Therefore in consultation with municipality officials, another four new public toilets have

been porposed.The identified areas have been presented below in a tabular form. The required land is under ownership of Tikapur Municipality; however the exact location of these public toilets is yet to be established. The wastewater from public toilets will be treated through septic tank and soak pit at each site.

Table 1.4: Location of public toilets

S.N.	Location of Public Toilet	Ward No.	Area (Ha)
1	Bangla Park (Picnic Spot)	3	2.07
2	Public Open Theatre	9 (Block No.9)	0.8
3	City Health Centre	4 (Asnehari)	0.48
4	PashuHaat Bazar	9 (PashuHaat Bazar)	0.32

35. Tikapur has many large educational institutions but sanitary conditions in some of them are not satisfactory. One of the reasons is that they lack toilets with sufficient capacities. Due to financial problems, they could not construct on their own and requested Tikapur WUSC. The required land is available for this as shown in table 1.5.

Table 1.5: Location of Institutional Toilets

S.N.	Proposed location for toilet	Land availability (B-K-D)	Land ownership
1	At the compound of Birendra Higher Secondary School (Teacher+ students)	Adequate land available	Birendra Higher Secondary School
2	Tikapur Multiple Campus	Adequate land available	Tikapur Multiple Campus
3	At the compound of ShreeBirendraBidyamandirHigher Secondary School (Teacher+ students)	Adequate land available	Shree BirendraBidyamandirHigher Secondary School
4	Shanti NiketenAdarshaVidyaMandir Higher Secondary School	Adequate land available	AdarshaVidyaMandir Higher Secondary Schoo
5	Khadka Memorial English Boarding Schools	Adequate land available	Khadka Memorial English Boarding Schools
6	BramhaKumari Raj Yog Service Center (Om Shanti Bhawan)	Adequate land available	Om Shanti Bhawan a non-profit organization

Note: The location and features are as per the draft FS report dated Sept 2014. The consent to use the land for the toilet shall be obtained from the Tikapur municipality and included in social/RP report of the project.

36. The socio economic survey 2014 shows that 98.4% of HHs has toilets and they are happy with current system of management of domestic sewage through septic tanks. Except ward no 9, the project area is mostly of rural nature and the settlement is scattered. At present, the people do not consider sewerage system as a priority infrastructure investment as some 48.3% people are not willing to improve current septage management system.

37. However as in other urban areas, people started discharging domestic sewage into nearby public drain. But the project area is so flat that pumping of sewage may be required to collect and convey sewage into wastewater treatment plant. Considering the large population of project area, flat terrain and related huge O & M cost, an in-depth study on wastewater management system is needed before implementation of any project on it. Hence, sewerage system has not been proposed at present for the project area.

38. A wastewater treatment plant has not been proposed in the project area as, due to the flat topography and low density of the town, no sewerage system is considered. Some Decentralized Wastewater Treatment Plant Systems (DEWATS) can be proposed for isolated settlements and large

institutions like schools and campuses. It requires specific study for this and hence DEWATS has not been considered at present.

39. Considering the current on-site sanitation system and urbanization of the Municipality, a sewage treatment plant has been proposed. It will be constructed in the land of Bhagaya Community Forest managed by the Municipality. Similarly the cost of a sewage suction vehicle is included, which will be used to collect sewage from private houses for disposal in the proposed plant.

40. There are some problems related with storm-water on the road side drains during rainy season. The parts of the Municipality used to suffer from flooding problems every year. Considering this, theMunicipality already prepared master plan for storm-water drainage in 2011. It calculated an investment of NPR 251 million. The design review of the plan is needed, which may add some additional investment. Since the construction of some segments of drain will not solve the problem and requires a huge investment for comprehensive implementation of plan, the storm-water drainage is not proposed in this project. It requires separate study and subsequent implementation.

II. POLICY, LEGAL & ADMINISTRATIVE FRAMEWORK

41. The Interim Constitution of Nepal 2007 defines the right to live in clean environment as one of the fundamental rights of its citizens (Article 16). It prescribes for the State to give priority to the protection of the environment and prevention of its further damage due to physical development activities (Clause 5 of Article 35). Proceeding from, and conformable to, the Constitution, the Government of Nepal has passed a series of environmental laws, policies and implementing regulations and standards. Among these, the basic legislation that provide the framework within which environmental assessment is carried out in Nepal are the:

- Environmental Protection Act (EPA), 1997, which requires a proponent to undertake IEE or environmental impact assessment (EIA) of the proposed project and have the IEE or EIA report approved by the concerned sector agency or Ministry of Science, Technology and Environment (MoSTE), 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 MoSTE) to conduct inspection of approved projects to ensure that pollution prevention, control or mitigation is carried out according to the approved IEE or EIA report; (iv) provides for the protection of objects and places of national heritage and places with rare plants, wildlife and biological diversity; and (v) states that any person/party affected by pollution or adverse environmental impact caused by anybody may apply to the prescribed authority for compensation to be recovered from the polluter/pollution generator.
- Environmental Protection Rules (EPR), 1997, and its amendments in 1999 and 2007, define the implementing rule and regulations of the IEE/EIA process, elaborating the provisions in the EPA. The preparation, review and approval of IEE and EIA reports are dealt with in Rules 3 to 7 and 10 to 14. Schedules 1 and 2 list down the projects of activities that are required IEE and EIA, respectively, as amended in 2007. Other environmental policies, laws and rules that are relevant to the Subproject are presented in Table 2.1.

42. Nepal is party to the following international environmental agreements that have broad relevance to works and environmental assessment of works under the Project: (i) World Heritage Convention, in 1978; (ii) Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), in 1987; (iii) Convention on Biodiversity, in 1992, (iv) Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol and subsequent London Amendment, in 1994, and (v) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, in 1996. The relevance of the aforementioned environmental agreements to the Subproject are 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.

43. The Subproject 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 MDG’s seventh goal by 2015

Table 2.1: Other Relevant Environmental Policies, Laws and Guidelines of Nepal

Policy/Law/Guideline	Year	Relevant Provisions	Remarks
Water Resources Act	1992	A comprehensive law on the development, use and conservation of water resources in Nepal, it aims to minimize damage to water bodies by requiring the conduct of EIA & preparation of EIA Report before granting license to use water resources for any purpose.	GoN IEE has been approved. Use of water resource has been granted by the District Office.
		Proponents shall make sure that the beneficial use of water resources does not cause damage to other water uses/users (Article 4).	The source is groundwater recharged by a perennial river. Existing wells are closer to the river than the proposed dug well for the Subproject.
		Article 17 requires proponents to apply for any necessary land acquisition accordingly;	Sites for main structures have been acquired accordingly. Unidentified sites for office building, guard house, guard house cum building, will be acquired accordingly.
		Article 18 requires the compliance to quality standards in making use of water resources. Article 19 prohibits the pollution of water resources. Under the Act 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.	EMP prescribes the compliance with NDWQS and its Directives during operation.
Forest Act	1993	The Act prohibits the extraction of boulders, rocks, pebbles, sand or soil from national forests, defined as all forests, excluding private forests, whether marked or unmarked with forest boundary, to include waste or uncultivated lands, or unregistered lands surrounded by the forest or situated near adjacent forests as well as paths, streams rivers, lakes, riverine lands within the forest.	Community Forest Users' Group has approved use of forest for the subproject. No trees will be cut. EMP stipulates no illegal quarrying of natural aggregate materials.
National Environmental Policy and Action Plan (NEPAP)	1993	Of its five objectives, most relevant to the Project are to: (i) mitigate adverse environmental impacts; and (ii) safeguard national & cultural heritage & preserve biodiversity, within & outside protected areas.	Subproject will not impact on physical cultural heritage & biodiversity. EMP provides measures to mitigate impacts.
National Water Supply and Sanitation Policy	1998	The Policy requires the: (i) monitoring of water quality supplied by completed WSS projects; and (ii) evaluation of their benefits in improving health (e.g., reducing water-borne diseases) and in relieving the sufferings of women and other disadvantaged groups in carrying out their responsibilities over water collection and maintenance of sanitation and hygiene.	Monitoring of the quality of supplied water is prescribed in the EMP following the NDWQS Directives.
Drinking Water Rules	1998	The Rules: (i) gives the procedure for the settlement of dispute on use of water sources; (ii) requires water supplier to maintain the quality of water as prescribed in the Water Resources Act; (iii) prohibits water supplier to construct structures and conduct activities that would pollute the water source and cause significant adverse effect on the environment.	Monitoring of the quality of supplied water is prescribed in eth EMP following the NDWQS Directives. GoN has approved the Subproject's IEE Report.
Local Self-Governance Act	1999	The Act gives Local Government the functions, duties & powers to: (i) conserve	Provides basis for Local Government to monitor

Policy/Law/Guideline	Year	Relevant Provisions	Remarks
		& protect their local environment & natural resources; (ii) plan, implement &/or operate & maintain local WS projects; (iii) implement or arrange for implementation local sanitation/sewerage & drainage projects; (iv) protect cultural heritage & religious sites; &/or (v) monitor project activities within their respective jurisdictions.	the environmental performance of the subprojects. EMP provides the responsibilities of LGs in EMP implementation.
National Urban Policy	2007	Policy gives importance to environment conservation while carrying out urban development works and natural resource use; thus, supporting the required environmental conservation and protection in donor-assisted development projects.	ADB IEE is conducted to ensure environmental conservation and protection.
National Urban Water Supply and Sanitation Sector Policy	2008	The Policy requires the IEE or EIA of proposed WSS projects in accordance with the EPA/EPR to: (i) incorporate consultations with key stakeholders, including end-point users; & (ii) specify measures to mitigate environmental impacts prior to, during construction & operation, as well as corrective measures.	GoN IEE has been approved. This ADB IEE will be submitted to ADB for review and approval.
Implementation Directives for the National Drinking Water Quality Standards	2005	It sets out the water sampling, testing, analysis, monitoring and surveillance procedures to certify that the quality of supplied drinking water conforms to the National drinking Water Quality Standards.	Monitoring of the quality of supplied water is prescribed in eth EMP following the NDWQS Directives.
Updated 15-Yr Development Plan for Small Towns Water Supply and Sanitation Sector	2009	The Plan defines the population threshold of “small towns” to be in the range of 5,000 to 40,000. Reference to Schedules 1 and 2 of the EPR, as amended in 2007, places water supply projects in small towns under Schedule 1 or within the threshold of water supply projects requiring only an IEE. The Plan emphasizes monitoring and evaluation as an important component of a project to determine the overall impact of a project.	EMP prescribes environmental effects and performance monitoring.
Solid Waste Management Act	2011	Article 4 provides that the management of hazardous, medical, chemical or industrial waste rests upon the generators of such wastes. Management should be as prescribed in the Act. Article 5 provides that individuals and entities have the duty to reduce the amount of solid waste generated while carrying out work or business.	EMP prescribes eco-friendly management of solid and hazardous wastes.
Labor Act	1992	The Act emphasizes on occupational health and safety of workers and stipulates provision of necessary safety gears and adopting necessary precautionary measures against potentially hazardous machine/equipment in the workplace. It also stipulates to make arrangements such as removal of waste accumulated during production process and prevention of dust, fume, vapor and other waste materials, which adversely affect the health of workers.	
Child Labor Prohibition and Regulation Act	2001	The section 3 of the act prohibits a child from engaging in work, sub clause 1 of the clause 3 states “Nobody shall engage in work a child who has not completed fourteen years of age as a labor and sub clause 2 states “Nobody shall engage a child in a risk full occupation 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”	

A. Environmental Impact Assessment Requirements

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

1.1.1. Environmental Impacts Assessment Requirements of the ADB

45. 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]

46. ADB's Environmental Safeguards policy principles are defined in SPS (2009), Safeguard Requirements 1 and the IEE is intended to meet these requirements.

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

Table 2.2: SPS 2009 Safeguard Requirements

SPS 2009 - Safeguard Requirements	Remarks
Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment (EA) so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	REA has been undertaken, indicating that Subproject is NOT: (i) environmentally critical; and (ii) adjacent to or within environmentally sensitive/critical area. The extent of adverse impacts is expected to be local, site-specific, confined within main and secondary influence areas. Significant adverse impacts during construction will be temporary & short-term, can be mitigated without difficulty. There is no adverse impact during operation. Hence, IEE is sufficient.
Conduct EA to identify potential direct, indirect, cumulative, & induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary global impacts, including climate change.	IEE has been undertaken to meet this requirement. (Section VI). No transboundary& global impacts, including climate change.
Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	Analysis of alternatives is presented in Section III.
Avoid, and where avoidance is not possible, minimize, mitigate, &/or offset adverse impacts and enhance positive impacts by means of environmental planning & management. Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.	An EMP has been prepared to address this requirement. Section IX
Carry out meaningful consultation with affected people & 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. Annex D. A grievance redress mechanism for the resolution of valid Project-related social and environmental issues/concerns is presented in Section VIII.
Disclose a draft EA (including the EMP) in a timely manner, before project appraisal, in an accessible place & in a form & language(s) understandable to affected people & other stakeholders. Disclose the final EA, & its updates if any, to affected people & other stakeholders.	The draft IEE will be disclosed on ADB's website prior to Project appraisal. 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, PISU 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.

SPS 2009 - Safeguard Requirements	**Remarks**
Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	The subproject does not encroach into areas of critical habitats. No tree will be cut. However, ground cover and low shrubs in the subproject footprint and some work easement will have to be removed for the transmission main. Although in due time, ground cover is expected to naturally grow over the backfilled affected area, EMP recommends seeding of the re-surfaced area to accelerated re-growth.
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 Subproject 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 Subproject 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 Subproject will not affect any physical cultural resource. The EMP recommends the measure/s to mitigate adverse impact on PCRs in case of chance find.

1.1.2. Environmental Impact Assessment Requirements of Nepal

47. The Environmental Protection Rules (EPR) defines the environmental impact assessment process that should be followed in the preparation, review and approval of environmental assessment reports. The process applicable to the Subproject is summarized in Table II-3 below. The key environmental quality standards applied in the GoN IEE (as well as in the ADB IEE) are listed in Table 2.3.

Table 2.3: The GoN IEE Report Preparation, Review, Approval and Implementation Process

Steps in the Process	Remarks
Proponent refers to EPR Schedules 1 & 2 for the required environmental assessment (IEE or EIA) to carry out.	Subproject requires an IEE.
If proposed project requires an IEE, Proponent prepares an IEE schedule of work/ToR using the format prescribed in Schedule 3 of the EPR and submit this to the CSA for approval.	Subproject has secured an approved ToR.
Proponent carries out IEE according to the approved work schedule/ToR and prepares an IEE Report following the format prescribed in EPR Schedule 5 and incorporating stakeholders' feedback applying the consultation procedure specified in the EPR.	Subproject carried out the IEE and prepared the IEE Report accordingly.
Proponent submits 15 copies of the IEE Report along with the project proposal and recommendation of the concerned VDC or Municipality to the CSA.	Subproject submitted documents accordingly for review and approval.
CSA conducts review and grants approval of IEE Report. If review reveals project implementation to have no substantial adverse impact on the environment, CSA grants approval within 21 days from receipt of report. If review reveals the necessity to carry out an EIA, Proponent conducts an EIA following the prescribed EIA process.	Subproject's IEE Report has been approved, without having To undertake EIA.
Proponent implements approved IEE Report and any terms and conditions given with the approval.	Subproject has not started implementation.
CSA monitors and evaluates impact of project implementation. When necessary, issue directives to the Proponent to institute environmental protection measures.	Subproject has not started implementation.
MoSTE conducts environmental audit after two years of project commissioning/operation.	Subproject has not started implementation.

CSA- Concerned Sector Agency; EPR- Environment Protection Rules, 2054 (1997); MoSTE- Ministry of Science, Technology and Environment; VDC-Village Development Committee

Table 2.4 Relevant Environmental Quality Standards

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

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

III. ANALYSIS OF ALTERNATIVES

A. With- and Without-Subproject Alternatives

48. Tikapur Town is the second town of Kailali district and has developed as the market center for surrounding VDCs. The town is facing the increased problems to water supply and sanitation.

49. 'Without-subproject' or 'do-nothing' alternative.Doing nothing about these challenges would be allowing the Tikapur Town to further develop as "under-serviced", the health of its residents and the general public at more risks, and its living environment, worsened. This would impede: (i) further social and economic development of Tikapur Town and in effect, of Kailali District as the Town is the market center for surrounding VDCs; and (ii) Nepal's delivery of its commitment to MDG7 to increase the proportion of population with sustainable access to safe drinking water and basic sanitation.

50. **'With subproject' alternative.** With the Subproject, 8,413 households in Tikapur Town will have convenient access to reliable and adequate safe and potable water supply and the Town's and surrounding VDC's bus commuters and workers will have access to a sanitary toilet facility. As a result, good hygiene and sanitation practices will be promoted; there will be reduced health and safety risks. Overall, the 'with subproject alternative' will bring about enhanced public health and living environment that will contribute to improved quality of life in Tikapur Town. There will be indirect benefits to VDCs surrounding Tikapur Town. Improved water supply and sanitation will create an enabling environment for local economic development and improved social services that communities within the sphere of influence of Tikapur Town will benefit from; thus, contributing to overall local economic development of the District.

51. The 'with subproject' alternative will contribute to the realization of the Updated 15-Yr Development Plan for Small Towns Water Supply and Sanitation Sector and to the delivery of Nepal's commitment to MDG7.

B. Alternatives Relative to Planning and Design

52. The existing system is a ground water system. The project area is surrounded by rivers from where water can be augmented. Karnaliriver is the eastern border of the Municipality and Jamara and Rani Kulos pass through the project area. Moreover Rani JamaraKulariya Irrigation Project (RJKIP) is being modernized with construction of Hydro Power Plant (HPP), the tailrace water of which can be used. In this way ground water as well as different water sources could be used for supplying water to the consumers.

53. The preliminary analysis shows that ground water, Karnali river water and tailrace of HPP are most potential sources for water supply to Tikapur Municipality. The existing system has been using ground water source, whereas Karnali river water was not used for any water supply system in the vicinity of Municipality. RJKIP is just going to construct HPP hence was not used as water source till date.

54. Both surface sources are located north of the project area and the transmission line will follow the same alignment from north to south. The Water Treatment Plant (WTP) has been proposed at NayaTikapur site for both surface water options and after that distribution network will remain the same. In order to maximize availability of sites (land), the whole service area has been divided into three sub-systems for distribution network. It also helps to design the system following principles of District Metering Area (DMA).

55. All three options have been analyzed to come up with optimum capital and O & M cost and analyze technical as well as financial, environmental and social viability of various arrangements for

discussion and to decide on the most feasible option for the project. The details of analysis have been presented below.

2.1.1. Option A (Ground Water System)

56. This option considers use of ground water with pumping system. The existing system is also ground water system which means that the operator is experienced enough to operate such system. It is expected that ground water is available more than enough however regular ground water monitoring is required to ensure that it is not depleted.

57. The Municipality has already acquired land for development of water supply infrastructures at three different locations including one at Block no. C. The other two locations are Block no. 11 and 28. In addition to this, Municipality is in process to acquire land at New Tikapur for the same purpose. Considering availability of land and operational easiness, the proposed system has been divided into three sub-systems. It will also reduce pipe cost considerably, provides flexibility to operate the system and follows principles of DMA. However all these sub systems are inter-linked.

58. The following table shows that the total water demand of the sub project is 344.373lps. The design of the system is done based on this.

Table 3.1: Design water demand of sub-systems

S.N.	Sub system	Zone	OHT Location	Design demand (lps)	Remarks
1	Sub system 1	A	Block no. 28	72.281	
2	Sub system 2	B	Block 11	95.992	
3	Sub system 3	C1	Existing	67.696	
4	Sub System 3	C2	Near B. V. Mandir	108.404	
		Total		344.373	

59. Each sub system has its own boring, water treatment plant, OHT, Generator and other associated structures. It can be operated independently. The three sub systems are also inter linked and water from one sub system can be supplied to another sub system in case of maintenance and other unforeseen events. Appropriate Valve Chambers have been proposed to regulate this. All options including option A considers integration of existing system.

60. The quality of ground water is generally good and meets both physical and chemical parameters of National drinking water quality standards except biological parameters. The water quality of ground water sources has been presented in Table 5.9.

61. The proposed water treatment system is conventional mechanical water treatment plant with pressure filter. It is recommended to review the proposed design after testing of water from test borings, which WSSDO has been carrying out.

62. The schematic diagram of **option 1** has been presented in Fig 1.1. The preliminary design of OHT, water treatment plant and transmission and distribution network has been carried out. The preliminary cost of the system has been estimated to be about NPR 663.26 million including contingencies and VAT.

63. The total annual O&M cost is estimated to be NPR 10.9 million. The Operator is required to finance this O&M cost and the debt service costs through revenue collected from the consumers.

2.1.2. Option B (Use of water from KarnaliRiver)

64. Option B considers use of surface water from the Karnali River, one of the largest rivers of Nepal which forms the eastern boundary of the Municipality. The availability of water is more than sufficient and will not be a problem to meet the water demand of the project area.

65. In general surface water is used to design gravity system and same principle has been applied to this system. However, Tikapur lies in Terai region and the level difference between the north and south points of the Municipality is only about 5 m over 8 kms length i.e. a grade of 0.06%. The Karnaliriver follows the almost same gradient. In order to obtain gravity flow, the Rani JamaraKulariya Irrigation Project constructed intake at Karnaliriver some 22 km. north of the Municipality. The water supply project has to tap water from almost the same location to have fully gravity system, which may not be financially feasible. Considering this the intake has been proposed at Jagatpur on the right bank of Karnaliriver, which is about 4 km. west north of the project area.

66. The technical analysis shows that it is possible to convey water from Karnaliriver from this site at Tikapur through gravity. It however requires about 4 m. excavations for transmission pipe laying. It is proposed to construct water treatment plant to treat surface water followed by a ground water tank (GWT) to store treated water. The water from the GWT is not possible to supply to the consumers through gravity. As a result, the treated water is then pumped to OHT at three different locations.

67. The quality of surface water (large river) is generally poor with turbidity during the wet season and contaminated with bacteria. The water from Karnaliriver is no exception. Considering this a centralized conventional water treatment plant (WTP) has been proposed. It includes sedimentation tank, roughing filter and slow sand filter followed by disinfection unit. The option on decentralized treatment plants at three different locations has been analyzed and found to be financially not feasible and difficult to operate the system.

68. The principles of three sub systems will be applied in this option as well. The water demand and the distribution network remains the same in all three options.

69. The preliminary design of ground water tank, water treatment plant, OHT and transmission and distribution network has been carried out. The preliminary cost of the system has been estimated to be about NPR 932 million including contingencies and VAT.

70. The total annual O&M cost is estimated to be NPR 14.29 million. The Operator is required to finance this O&M cost and the debt service costs through revenue collected from the consumers.

2.1.3. Option C (Use of water from Hydro Power Plant (HPP))

71. Option C considers the use of surface water from Main Canal of Rani JamaraKulariya Irrigation Project (RJKIP). RJKIP has been constructing various structures like Intake, Main Canal, Settling Basin, Feeder Canals and associated works. In order to maximize the project benefits, the RJKIP has been planning to construct 4.8 MW Hydro Power Plant (HPP) near Katase north of Tikapur Municipality. This option considers use of tailrace water from the HPP under RJKIP.

72. The RJKIP project structures have been designed for 100 m^3/sec and water demand of the proposed water supply project is only 144.52 lps (0.144 m^3/s). It is only about 0.14% of the irrigation structures demand. The PPTA team had preliminary discussions with RJKIP officials and they have no objection to this proposal.

73. The technical analysis shows that it is possible to convey the tailrace water of HPP to site at Tikapur by gravity. However the system cannot be designed as gravity system after that. The tailrace water needs to be treated and then store in a GWT. The treated water is then pumped to the OHT at three different locations like in option B.

74. The quality of surface water (large river) is generally poor with turbidity during rainy season and contaminated with bacteria. The water from Karnaliriver is no exception. The source of water in this option is also Karnaliriver. But the water is treated in Settling Basin by RJKIP for irrigation purpose. It reduces one step treatment process i.e. does not require sedimentation tank. So the Water Treatment Plant (WTP) includes, roughing filter and slow sand filter followed by disinfection unit. Here also, the option on decentralized treatment plants at three different locations has been analyzed and found to be financially not feasible and difficult to operate the system.

75. The principles of three sub systems will be applied in this option as well. The water demand and the distribution network remains the same in all three options.

76. The proposed water supply project is planned to commence construction works at the beginning of 2015 and will be completed within two years. The RJKIP has already started construction works through four large ICB contract packages but it seems that the water will not be available at HPP site within a year. If selected, this option has to delay commencement of works and wait for completion of RJKIP structures at least up to HPP site.

77. The preliminary design of water treatment plant and transmission and distribution network has been carried out.

78. The total cost of Option C is estimated to be NPR 962 million including contingencies and VAT. The annual O&M cost for this option has been estimated to be NPR 14.45.

79. All three proposed options are pumping systems but the sources are different. Due to the flat terrain in the area, even the surface water sources need to be designed using combined gravity and pumping. The division of the service area into three sub systems remains the same in all options with use of multiple OHTs at three different locations. The distribution network also will be the same for all options. The difference is in use of different sources with different transmission pipelines and treatment plants. Technically, all options are feasible.

80. The financial analysis of all three options as presented above has been carried out. The results of analysis show that all options are financially feasible. The capital cost of the option A is lower than other two options. In view of financial feasibility, stakeholder's interest and better sustainability of system, Option A has been chosen as the best option for the project.

81. The analysis of options show that option A is the best feasible option from technical, financial as well as social point of view as land acquisition is minimized. The comparisons of the proposed three options have been presented in Table 3.2.

Table 3.2: Comparison of Options

SN	Particular	Option 1	Option 2	Option 3
1	Total Capital Cost in NPR	663,261,178	931,996,923	962,050,373
2	Annual O&M Costs in NPR	10,896,907	14,286,632	14,451,790
3	Total Base Year Population (No)	54,146	54,146	54,146
4	No. of Service Connection (No.)	8,450	8,450	8,450
5	Length of Transmission Main (m)	0	12	16.5
6	Length of Distribution main (m)	139.5	139.5	139.5
7	Capital Cost/Pop served	12,249	17,213	17,768
8	O&M Cost/Pop Served	201	264	267
9	Remarks	Preferred Option		

Source: Feasibility Study Report, 2014, PPTA

82. Among the three proposed options**, option 1**(using groundwater) is most feasible and is recommended for detailed engineering design. It is technically feasible, socially acceptable as the

existing is also ground water system and less environmental impacts as compared to other two options.

IV. DESCRIPTION OF SUBPROJECT

A. Subproject Site

83. The existing water supply system has been serving major parts of ward 9. The delineation of service area of the proposed project has been discussed with stakeholders at local level. It has been done in ltation with the Municipality, WSSDO Kailali, WUSC, beneficiaries and other stakeholders based on the needs and the willingness to implement the project as per policy and the requirements of STWSSSP3. It was also based on the field observation of the technical team of design consultant, which considers efficient management of the water supply system.

84. It has been agreed that the proposed project should serve the core urban area of the Municipality. It will use structures of existing system to the extent possible. Out of 9 wards, the proposed project covers all areas of two wards and parts of four wards. The delineated service area covers all urbanizing areas of the municipality. The covered areas are ward 4 and 9 (fully), 3, 6, 7and 8 (partially).

85. The current of population of the service area is 52,641 with 8,413 households. The Project is located in Tikapur Municipality, which is situated in Kailali district in Seti Zone of the Far-western Development Region of Nepal. It lies between 28º27'30" N to 28 º33'30" N latitude to 81 º2'30"E to 81 º10'5"E longitude. It is at an altitude of 145-161 meter from the mean sea level.

86. Tikapur is second municipality in Kailali district. The total area of Tikapur Municipality is 10,490 Bigha i.e. 71.04 sqkm. It has 9 wards.

87. Tikapur Municipality is bounded by Karnali River and Bardiya Area-3 in the east, Munuwa and Thanapur VDC in the west, Durgauli VDC in the north and Narayanpur VDC in the south. The nearest national highway from Tikapur is the East West highway which is about 14 km north of Tikapur. It is located 14 km. north of Indian border and 95 km east of eastward of Dhangadhi. The nearest airports are Nepalgunj in Banke district and Dhangadhi in Kailali district.

88. Tikapur is located in the Terai region and its climate is essentially warm temperate or lower tropical. The temperature ranges from 3.4º to 42.8º Celsius. As in other Terai towns, it is very cold in winter and very hot in summer days. The average annual rainfall is 1500 mm.

The layout of sub project area map is presented in Figure 4.1.

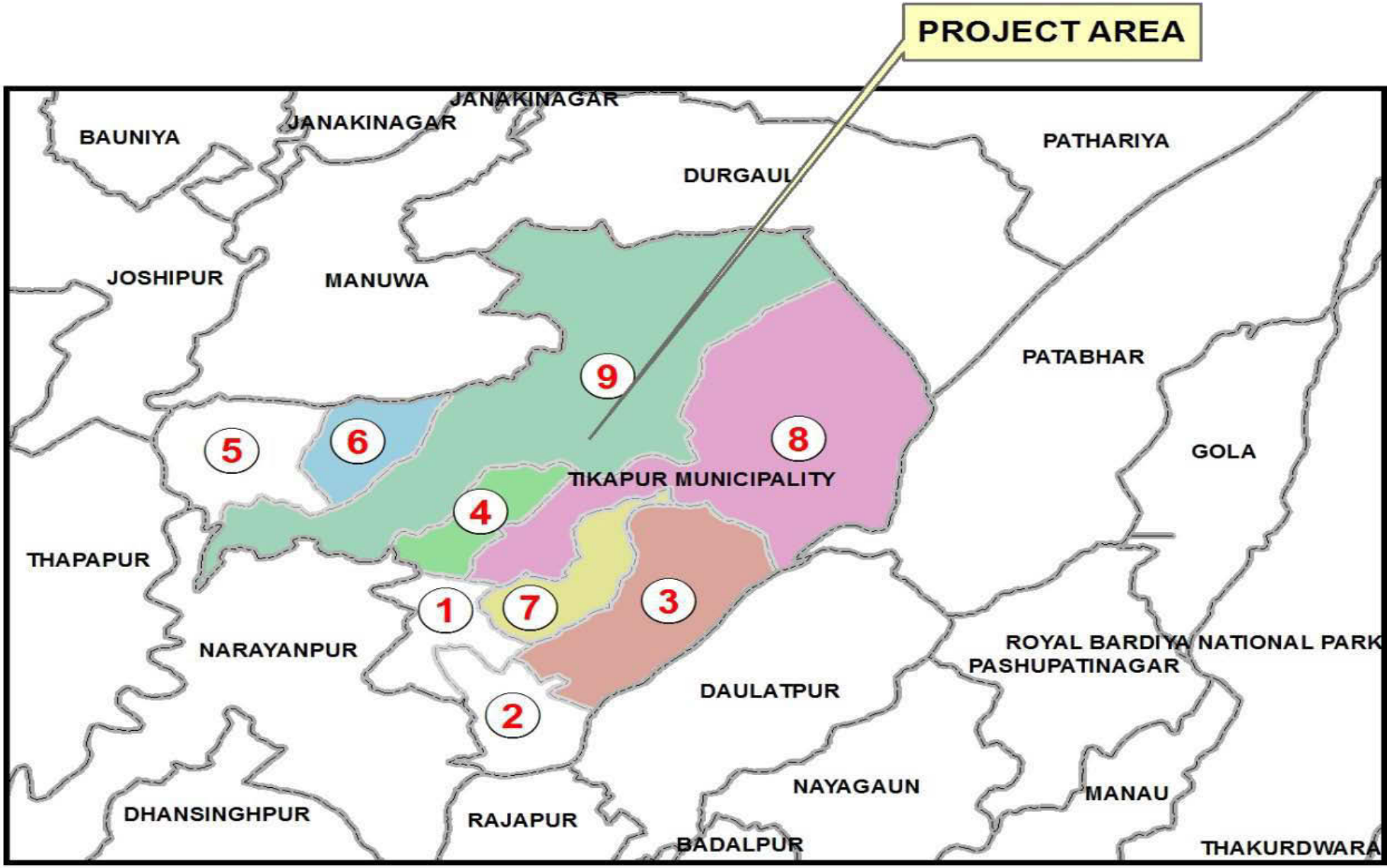


Figure 4.1: The Subproject Area

The following figure (**Figure 4.2**) presents the google image of the location of OHT.

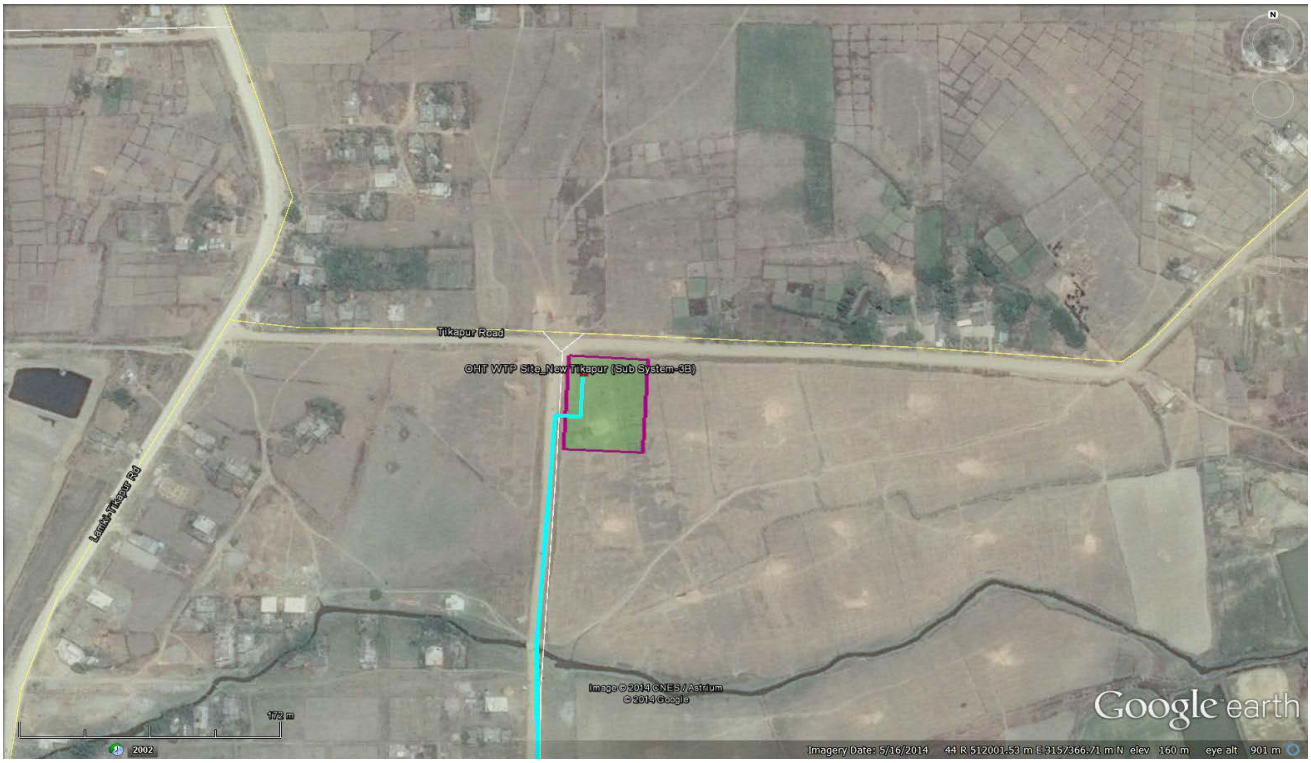


Figure 4.2: Location of OHT (Google Image)

The google image of the OHT site is presented in Figure 4.3.

Figure 4.3: Google Image of OHT Site

B. The Subproject

89. The Tikapur Town Water Supply and Sanitation Project have been designed as a ground water based water supply system that will provide sufficient quantity and good quality of water to the residents of Tikapur Municipality of Kailali District. The proposed Subproject will have two components viz. the water supply component and the sanitation component.

90. **The water supply component** shall consist of Water Source (Groundwater) and its Protection Structures, Water Treatment Plant, Transmission Main, Pumping, Service Reservoir, Distribution Network, House connections and Others (Office and other buildings).

91. **The Sanitation component** will have Six toilets.List of porposed location for toilets incluced in table 1.5

92. The salient feature of the project is given in Table 4.1

Table 4.1: Salient features of Subproject

S.N.	Items	Description
1	**Name of Project**	Tikapur Town Water Supply and Sanitation Project
2	**Type**	Pumping (Lifting)
3	**Study Level**	Detail Design
4	**Location Area**	
	Region	Far Western Development Region
	Zone	Seti
	District	Kailali
	VDC/Municipality	Tikapur Municipality
	Ward	Complete area of 4 and 9; Partial area of 3, 6, 7 & 8
5	**Available Facilities**	
	Road	Feeder road Lamki-Tikapur linked to East-West Highway
	Supply Water System	DWSS/Municipality/WUSC and Hand pumps
	Electricity	Available
	Communication	Available
	Health Services	Available
	Banking Facilities	Available
6	**Source Characteristics (option I)**	
	Source Name	Deep Tube well
	Source Type	Ground Water
	Source Location	Within Service Area
	Safe Yield (lps)	25-30 lps
7	**Type of Structures**	
	(a) Bore Hole Drilling	10 Sets
	(b) Pumps, Electricity line, Transformer and Generator	Pumps-14 (with 4 stand by pumps), Electricity line-11kV, Transformer-4 (3-125 and 1-150 KVA) and Generator-4(1-150KVA, 3-125KVA)
	(c) Overhead Tank (Nos.-Capacity m^3)	Existing 1-225, Proposed 3-450
	(d) Ground Reservoir	-
	(e) Valve Chamber (Bricks/RCC)	100/40
	(f) Office Cum GH /Guard House / Boundary Wall	1/2/2
	(g) Generator House	4
	(h) Household Connection	8,413
	(i) Fire Hydrant	16
	Total Length of pipe:	

S.N.	Items	Description
	Distribution Network (meter)	192,347
	Pipe Used (in m)	
	DI	12,304
	PE	180,043
8	**Social Status**	
	Present Population (2014)	52,748
	Base Year Population (2016)	55,750
	Design Year Population (2036)	98,010
	Weighted Growth Rate %	2.75
9	**Total Cost of WS Scheme (Inclusive of all) NRs.**	758,385,151
10	**Cost Sharing Arrangement**	
	GON Component (70 %)	530,869,605
	TDF Loan (25 %)	189,596,288
	WUSC's Contribution for upfront (Cash 5 %)	37,919,258
11	**Tariff**	
	Average Household	541
	Low Income Household	341
	Poor Household	177
12	**Economic Analysis**	
	EIRR (Base case) %	27.96
13	**Environment**	
	ADB Category	B, Only IEE necessary
	IEE finding	No significant adverse impact.
14	**Sanitation Cost (Inclusive of all) NRs.**	**21,812,974**
	GON Contribution (85 %)	21,434,714
	Local Authority / Users' (15 %)	3,78,260
	Total Cost of WATSAN Inclusive of VAT and Contingency, NRs	780,198,125
15	**Per Capita Cost for W/S component**	
	Per Capita Cost (for base year pop.)	13,603.32
	Per Capita Cost (for design year pop.)	7,737.83
16	**Per Capita Cost for Sanitation component**	
	Per Capita Cost (for base year pop.)	452.33
	Per Capita Cost (for design year pop.)	257.29

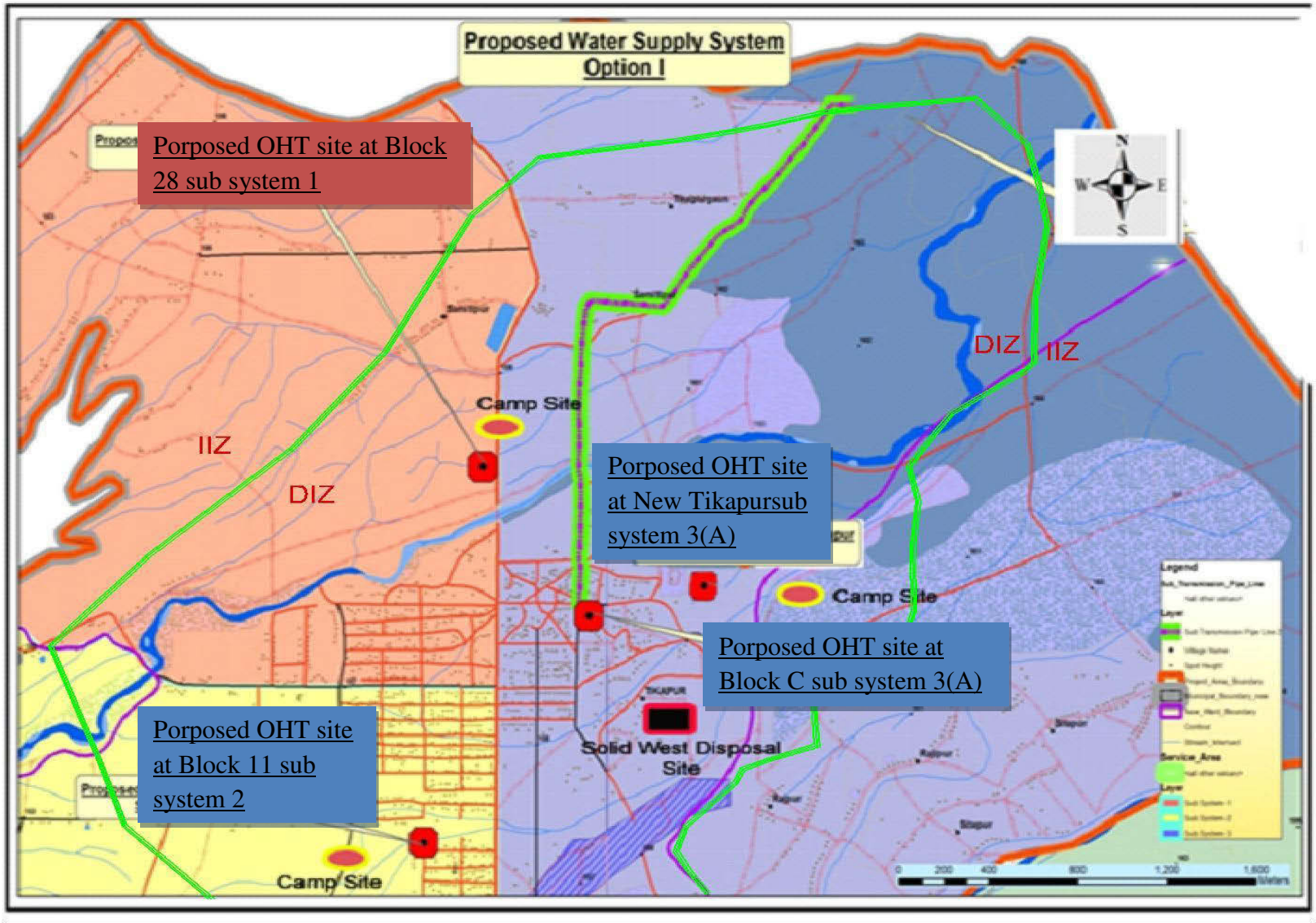


Figure 4.4: Designed Layout of Project Component.

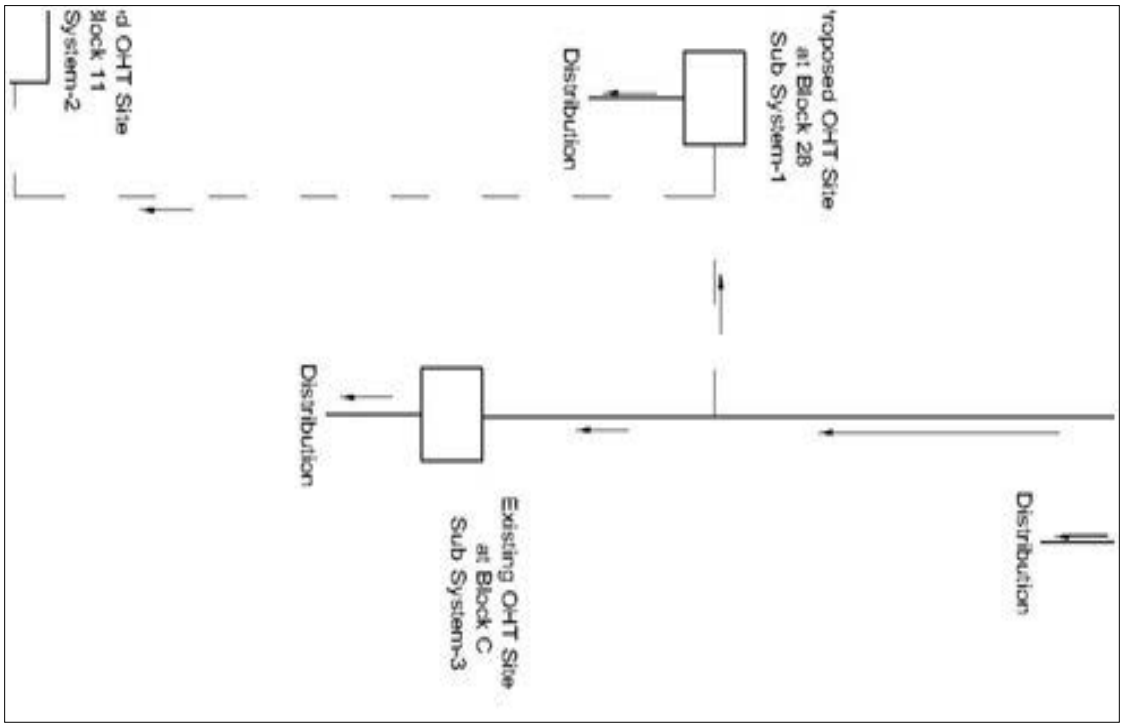


Figure 4.5: Schematic Layout Plan for PorposedTikapur Water Supply System.

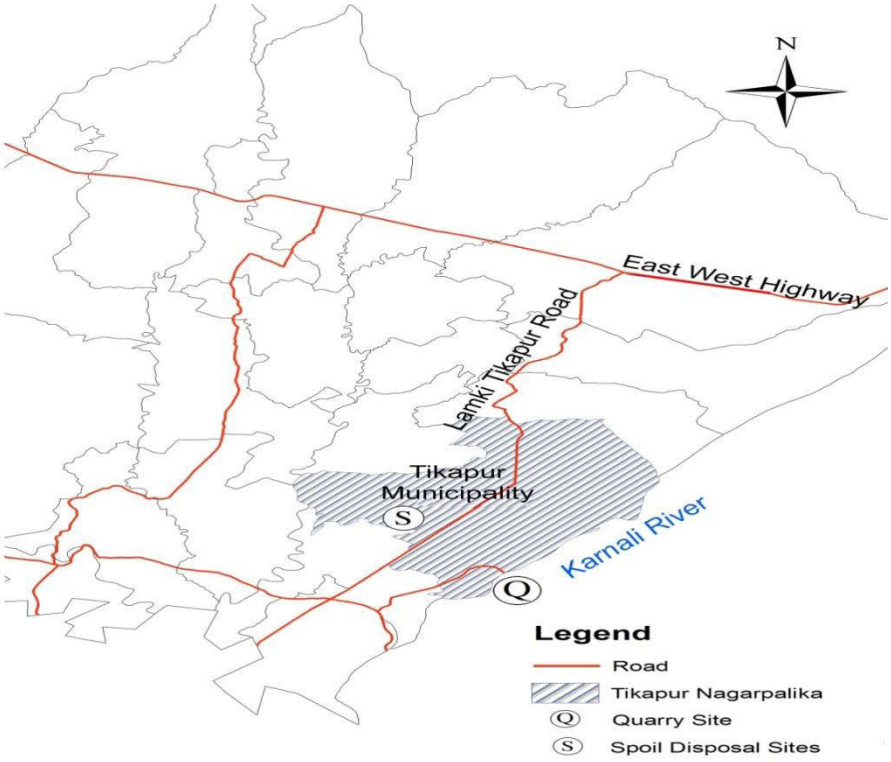


Figure 4.6: Schematic Layout showing quarry sites and spoil disposal sites

C. The IEE Study Area

93. The IEE study area covers the environment that will potentially be affected by the horizontal (installation of transmission mains and distribution pipes) and construction/installation of point objects (dug wells, treatment unit, ground reservoir tanks, pumps and appurtenances such as office building, laboratory unit, guard house and generator house). The study area is also referred to as Subproject's "main area of influence", covering component sites, i.e., footprints as shown in **Figure 4.4** and areas within 200 m from their edges, considering the potential reach of noise, dust and socio-economic impacts. Environmental Category and Requirements

3.1.1. Environmental Category and Environmental Assessment Requirements

94. Under ADB classification, the Subproject is a Category B undertaking and an initial environmental examination (IEE) is required for ADB review and approval. Under GoN policy, the scope/scale of the Subproject is within the threshold of subprojects requiring an IEE as listed in Schedule 1 of the EPR. The GoN has approved the Subproject's IEE Report.

3.1.2. Other Approval/Clearance/Permit Requirements

95. The Subproject requires and has acquired the following: (i) approval to use/extract groundwater resource from the District Office; No trees in the affected community will be cut to clear the way for the transmission main; hence, no tree-cutting permit is needed.

V. DESCRIPTION OF THE ENVIRONMENT

A. Physical and Chemical Environment and Resources

4.1.1. Tikapur Municipality

96. Tikapur is a mid-sized municipality located in Kailali district of Seti Zone in Far-Western Development Region. The Municipality is located in the Terai plains 14 km south of Lamki Bazaar, which is on the East-West Highway. Pathraiya River is located to the West and Karnali River to the East of the Municipality.

97. Tikapur is one of the few planned municipalities in Nepal. Tikapur Development Committee was formed back in 2013 to develop the town in a planned manner and it started its work in 2027. The original plan was to develop a total of 3000 bigah of land with 1000 bigah for allocated for modern agriculture, 1000 bigah for well-managed forests, 800 bigah for landless people, and 200 bigah for town development. Over the years, however, these plans have not really materialized. Nothing has been done on modern agriculture but the settlement area has developed beyond the allocated 200 bigahs.

4.1.2. Landforms and Topography

98. Kailali is a hilly district, lying in Seti zone of far-western development region of Nepal, extending between 28° 22' to 29° 05' north latitude and 80°30' to 81°18' east longitude.

99. Tikapur Municipality is bounded by Karnali River and Bardiya Area-3 in the east, Munuwa and Thanapur VDC in the west, Durgauli VDC in the north and Narayanpur VDC in the south. The nearest national highway from Tikapur is the East West highway which is about 14 km north of Tikapur. It is located 14 km. north of Indian border and 95 km east of Dhangadhi. The nearest airports are Nepalgunj in Banke district and Dhangadhi in Kailali district.

100. Topographically, the subproject area lies in the hilly region and is generally with an average elevation is 145-161 meterabovethe mean sea level. According to the topography of the district, it is divided into two regions, viz.40% Churia hilly region with fragile rocks and 60% Terai or plain area with the extended Gangetic plains of India. The terrain land is the most fertile for agricultural purpose while the hilly region is suitable for horticulture and livestock farming.

4.1.3. Geology and Soils

101. Tikapur is mostly dominated by clay soil along with boulders. Based on field observations during Subproject feasibility study, the project area has flat alluvial land consisting of 1-1.5 m thick top soil underlain by gravel, cobble and boulder of about 25.0 to 30.0 m thick in the center and slightly thinning outward to the foothills. In some areas, the due to deposits of Karnali, recent alluvial plain mainly consisting of LRMP 2C mapping type, extremely fertile soil is also found.

4.1.4. Climate

102. The climate of the project area is sub-tropical. Temperature of this area varies from 3-4^{0}C in winter to 30^{0}C in summer. In comparison to eastern Nepal, here the monsoon rain arrives late between July to September. The mean annual rainfall is 1703mm.

4.1.5. Water Quality

103. The socio economic survey 2014 shows that 96% people consider tube-well/hand-pump as main source of drinking water, whereas only 4% consider piped water supply system as main source. Depending upon the depth of water people are fetching, the water quality is found to be varied. The shallow tube well water users are complaining about turbidity, iron, coli form, and odor problem.

4.1.6. Air Quality

104. There are no major industries in Tikapur Town. The few and small cottage industry doesn't contribute significant aspect to create air pollution. Air pollution is caused by fugitive dust from vehicle movements particularly over unpaved roads and other unpaved grounds, construction activities, street sweeping and wind action on unpaved exposed surfaces. Gas emissions come from household cooking, open burning, and moving vehicles. Emissions from these sources are scattered/spread apart both in terms of locations and timing.

4.1.7. Acoustic Environment

105. The sources of noise in Tikapur Town are the construction activities and vehicle movement. The anthropogenic noise is confined in few clustered settlements and in market places in only in the daytime. At nighttime, noise is generated with the arrivals and departures of buses at the bus park.

B. Biological Environment and Resources

106. The project area lies in tropical climate zone and the forests are representative of a variety of plant communities which include diverse vegetation types corresponding to variations in climatic and edaphic factors. The study focuses on the present situation of the forest vegetation and wildlife, birds and fishes within the project area. Flora, fauna and vegetation types found in the areas have been described separately below.

4.1.8. Forest and Vegetation in project region

107. Tikapur municipality consists of 45.37 sq.km of agriculture area and forest covers an area of 11.82 sq.km. There are four community forests in the municipality; all of them are located in ward 8. The famous Bangla Park with an area of 495 Bigha has also been preserved as forest area. Forest types of the project area are categorized into 4 main types. They are:

a. Tropical hardwood mixed forest
b. Sal forest
c. Khayar-Sisau forest
d.Grassland forest

4.1.9. Agrobiodiversity found in project areas

108. In project region and in some part of ZoI the project is agricultural land. Various kinds of crops, cash crops, oilseeds, pulses, vegetables and fruits are grown there major of which are rice *(Oryza sativa),* wheat *(Triticumaestivum),* maize *(Zea mays),*musuro; lentil *(Lens culinaris*), mustard *(Brassica rapa),*peanut *(Arachishypogaea*), sugarcane (*Sacharumofficinarum*), sweet potato *(Ipomoea batatas),* potato *(Solanumtuberosum),* tomato *(Lycopersicumesculentum),* onion *(Allium cepa),* cauliflower (*Brassica oleracea),* pea *(pisumsativum),* carrot *(Daucascarrota),* garlic *(Allium sativum),* radish *(Raphanussativus),* mango *(Mangiferaindica),* banana *(Musa paradisiaca),* papaya *(Carica papaya),* jackfruit *(Artocarpusintegra),* litchi *(Litchi chinesis),*nibuwa (*Citrus limon),* lemon *(Citrus aurantifolia),* guava *(Psidiumguajava),* water lemon *(Citrulluslanatus)* etc.

4.1.10. Non-Timber Forest Products (NTFPs) in Kailali and project areas

109. The non-timber forest product available and collected from the project area include leaf letter Sal and Bahunia leaves, fruits like Amala, Amaro, Harro, Bel, Sal seed, Ritha, Satabari etc. Other important products are sal gum, honey and lac. Local people use Bahunia bark for making ropes for making dye.

4.1.11. Wildlife within project region

110. The wildlife of the project region is listed in table 5.1.

Table 5.1: Mammals of project area

1. Bagh (Tiger) *Pantheratigris*	2. Gainda (Rhino) *RhinocerousUnicornis*
3. Ban Hatti (Elephant) *Elephasmaximus*	4. Sambeer Deer *Carvusunicolar*
5. Jarayo Deer *Carvusunicolar*	6. Mirga Deer *Muntiacusmunjak*
7. KaloBhalu (Black Bear) *Selenarctosthibetanus*	8. Niyauri Musa *Herpestesedwardsi*
9. Azingar Python *molurus*	10. Nil gai *BaselaphusTragocamelu*
11. Fox Canis lupus	12. Lokharke *Funambuluspennant*
13. Ban biralo (wildcat) *Felisbengalensis*	14. Ban kukura *Cuonalpines*
15. Dumsi (Indian Crested Porcupine) *Hystrixindica*	16. Badel (Wild Boar)
17. Kharayo *Lepusnigricollis*	18. Langurbadar *Presbytisntellus*

Table 5.2: Name list Avi-fauna within ZoI

S.N	Local Name	Zoological name	Remarks
1.	Mayur	*Pavocristatus*	
2.	Piura Ban kukhura	*Arboraphilatorqueolo*	
3.	SetoSaras	*Liconiaciunia*	
4.	KaloSaras	*Liconianigra*	
5.	DhansaChara	*Bucerosbicornis*	
6.	Suncharedhanesh	*Acerosnipalensis*	
7.	Sano Bakula	*Egrettagarzetta*	
8.	Bakula large	*Casmerodinaalbus*	
9.	Mainachara	*Acridotheresps.*	
10.	Baz	*Falco sps.*	
11.	Uulu	*Bubo Sps.*	
12.	Daphe	*Lophophorusimpejanus*	
13.	KaloTitra	*Francolinusfrancolinu*	
14.	Simtitra	*Francolinusgularis*	
15.	Suga	*Psittaculasps.*	
16.	Giddha	*Gyps sps.*	
17.	Chil	*Pandionhaliactus*	
18.	Bhagera	*Passer haliactus*	
19.	Parewa	*Columba livia*	
20.	Kaga	*Corvussplerndens*	

4.1.12. Protected Area

111. The Subproject will not encroach into, or be in close proximity to, any protected area. The Banke National Park, the nearest protected area, is about 69.34km away from Tikapur Town.

C. Socio-Economic Environment and Resources

112. Tikapur Municipality has 9 wards. The service area of the proposed project covers all areas of two wards (wards 4 & 9) and parts of four wards (wards 3, 6, 7 & 8). The proposed service area includes entire north portion, Nuklipur& Bangla area (ward 3), Shankarpur (ward 6), Jhanjhatpur&Vijaynagar (ward 7) and Rajipur, Sitapur, Bandipur (ward 8). These settlements and wards 4 & 9 are the core urban areas of the municipality. The other parts of the Municipality are presently depend upon shallow tube wells and will continue.

113. The existing system serves major parts of ward 9, which will be considered under proposed project. WSSDO Kailali has been carrying out deep boring in Block 11, which is one of the sites allocated by Municipality for water supply purposes. This boring as test boring will be considered in proposed new project.

114. The project area was initially identified during the first site visit to the project area in December 2013. It was finalized in May 2014 in consultation with officials of Tikapur Municipality, WSSDO Kailali, Tikapur WUSC and the local community. Based on this, a topographic survey and socio economic surveys have been carried out which included the area served by existing system and some additional settlements adjacent to the city core area.

4.1.13. Population, Households and Settlement Pattern

115. Tikapur Municipality is newly established town with only about 5 decades history. The population of the Municipality increased rapidly in its early years. It averaged 7.72% per annum from 1991-2001. This decreased to 2.35% per annum between 2001-11. It is expected that the increase in population will continue as the town has been developing as educational and commercial center of the region.

116. The trend analysis of the population growth shows that it is not uniform across the Municipality. The recent trend shows that it is up to 7% per annum growth in ward 9, whereas wards 1, 2,3,4,5 and 7 have negative growth. However overall growth of the Municipality is positive but slightly less than the national urban growth rate.

117. The trend analysis of the population growth of last 25 years has been done to determine the population to be served by the project at the end of design period. The PPTA Nodal survey, 2014 shows that the total number of HHs and population in the project area are 8,413 and 52,748. The result of the survey has been used as the base data for further projection/estimation of population.

118. Apart from review of CBS and socio economic data, the analysis of land usage, settlement pattern and the population density has been also considered for the population forecast. The study shows that these parameters are different within the project area. Considering this, different growth rates have been adopted to arrive at the population prediction for the design year and the results used for nodal water demand calculation. The adjoining wards of the Bazar area i.e. wards 3, 4, 6,7& 8 have the potentiality to grow and is expected that the growth will increase with implementation of the water supply project. Although they have negative growth at the moment, it is expected that these areas will grow as well but at a slower rate. An annual growth rate of 2% has been considered for these wards. In some wards, the population is varies from CBS results as the service area of that particular ward does not cover the whole ward.

119. The projection of population of project area is based on above assumption/data, which has been presented in Table 5.3.

Table 5.3: Population Projection of service area to design period 2036

Sub-System	HHs as per survey 2014	Population as per survey	Population in year	
		2014	2016	2036
A (New)	1682	10,708	11,358	20,573
B (New)	2322	14,528	15,371	27318
C1(existing)	1509	9,639	10,257	19,260
C2(New)	2900	17,873	18,764	30,859
Total	**8413**	**52,748**	**55,750**	**98,010**

Source: Socio economic survey 2014

120. The population of service area is expected to be 52,748 in the base year 2016 and is expected to rise to 98,010 by the end of design period in 2036.

121. Tikapur is the second largest city in Kailali District and has a moderate growth of population due to migration from hilly districts mainly from Achham

122. The annual population growth of the Municipality is 2.35%. The project area covers ward 9, which is the most densely populated area of the municipality. In this ward, the growth rate is 6.98%, which is more than national urban growth rate and about triple the average municipality growth rate.

123. The proposed subproject does not cover all the wards of the Municipality. The PPTA conducted a socio economic survey in 2014 of the proposed service area. It shows that the total population of the service area is 52,748 which include both house owners and population residing in rented accommodation. Table 5.4 shows the coverage of population including beneficiary households in the project area.

Table 5.4: Beneficiaries households

Ward No.	Permanent			Rented		Total	
	HHs	Population	% of permanent	HHs	Population	HHs	Population
3	278	33,00	-	0	0	278	133,00
4	428	2,677	-	0	0	428	2,677
6	301	1,773	-	0	0	301	1,773
7	293	1,524	-	0	0	293	1,524
8	1373	8,818	-	0	0	1373	8,818
9	5740	34,656	-	0	0	5,740	34,656
Total	8,413	52,748		0	0	8,413	52,748

Source: Socio economic survey 2014

4.1.14. Land use pattern

124. Previously the area that is now Tikapur used to be a dense forest. Tikapur Development Master Plan was prepared in 2028 BS (1972 AD) and the development of area took place following the plan. It is said to be one planned city of the country. The municipality covers 3000Bighas of land. Out of that, 1000 Bighas of land was to be retained as forest land, next 1000 Bighas was to be developed as modern techno-farm land and the remaining land was proposed as well-planned urbanized area along with the provision of infrastructure like roads, drinking water, transportation, health, education, electricity etc. Tikapur became a popular place to migrate from different parts of Nepal especially from Achham and rapid urbanization has been thus taking place here.

125. The town planning consisted of 32 Blocks covering approximately 700 Bigha of land. The developed land is allocated to various individuals and institutions such as government employees who were allocated between 4 Bigha – 15 Katha of land as a part of their pensions, educational institutions, hospitals and others. Reportedly 6388 residential plots have been sold for residential purpose.

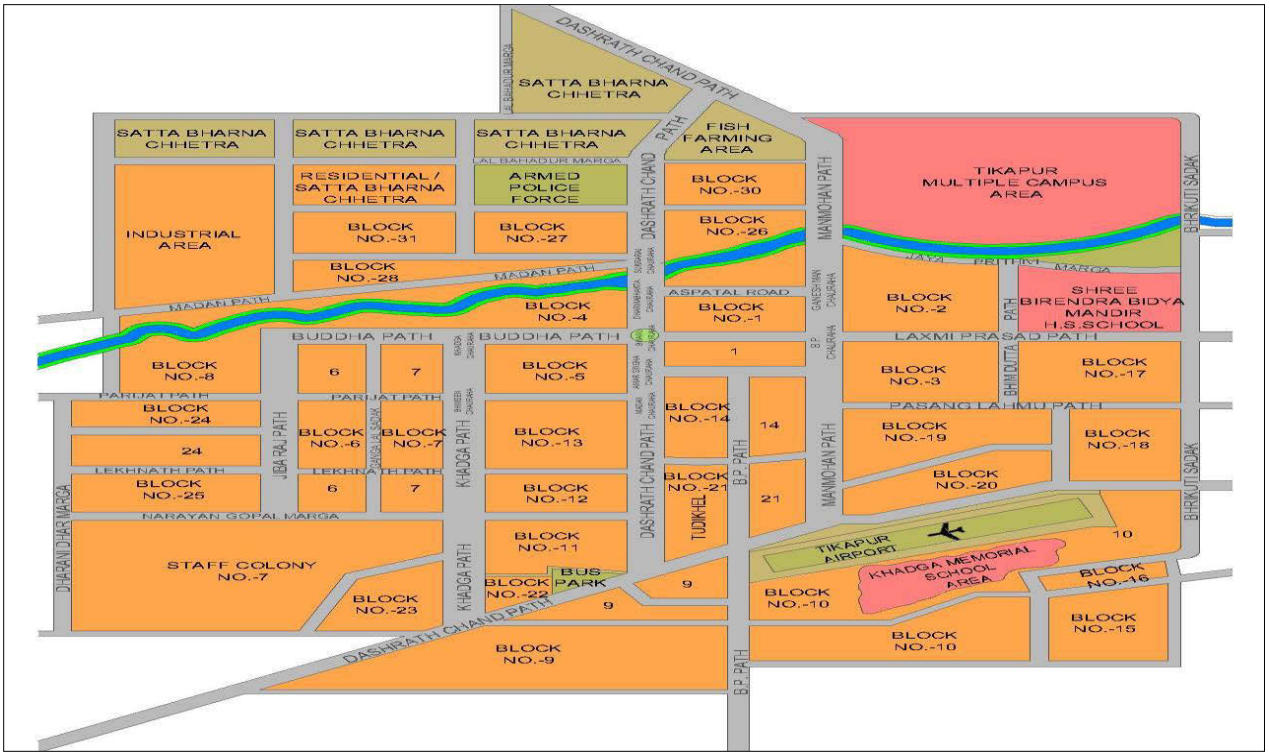


Figure 5.1: Land Planning in Tikapur Municipality

126. Tikapur Municipality spreads over an area of 71.04 km^2, the land use pattern of which is presented in table 5.5:

Table 5.5: Land-use pattern

S.N.	Land use	Area (km^2)	Area (%)
1	Agriculture	45.37	63.86
2	Forest	11.82	16.64
3	Residential area	7.06	9.94
4	Others	6.79	9.56
Total		71.04	100

127. Based on the land use pattern, the municipality can be divided into three broad groups: urban, semi urban and rural. Ward 9 is considered urban, whereas wards 3,4,5,6,7 and 8 are semi urban areas. The wards 1 and 2 are rural in nature. Part of ward 9 has been declared as an industrial area; but industrialization has not taken place in that area. The rural areas are large than urban areas in the municipality.

128. Agriculture area covers an area of 45.37 sqkm. The forest covers an area of 11. 82sq.km.There is four community forests in the municipality; all of them are located in ward 8. The famous Bangla Park with an area of 495 Bigha has also been preserved as forest area.

4.1.15. Ethnicity and caste

129. There are mixed ethnic and caste groups in the subproject area with more than 9 caste and ethnic groups. The most dominant ethnic groups are Brahmin and Chettry who occupy 60.4% of the total surveyed sample population followed by the Chaudhary (23.3%). Scheduled castes such as

Damai, Kami and Sarkee total around 10.9%% of the population. About 10.4% of households are headed by females with 49.1% of them represented from the Brahmin and Chettry castes.

4.1.16. Education and Health

Education

130. Tikapur is termed as an "educational city" as there are several educational institutes like schools and colleges in the Municipality. The socio economic survey, commissioned by the PPTA in 2014 shows that the overall literacy rate is 78.3%. About 21.7% are still illiterate and only 12.2% have graduated or above graduate level.

131. The Planning Handbook published by the Office of Tikapur Municipality in 2013 provides the information that some 82 educational institutions exist in the municipality, the details have been presented in Table 5.6.

Table 5.6: Status of educational institutions

S. No.	Educational Institution	Primary School	Lower Secondary School	Secondary School	Higher Secondary School	Campus	Training Centre	Child Development Centre	Total
1	Private	11	2	3	5	4	1	-	26
2	Community	11	5	5	-	-	-	10	31
3	Government	5	5	7	5	3	-	-	5
	Total	27	12	15	10	7	1	10	82

Source: Planning Handbook, Tikapur Municipality, 2013

132. The socio economic survey 2014 shows that there are 42 educational institutions in the project area. The total number of students enrolled in these schools is 29,338. The number of teachers is 841 with the total people in educational establishments to be 30,179. The largest institutions are Tikapur Multiple Campus (8,200 students and 60 teachers); BirendraBidyaMandir (2,200 students & 69 teachers); R.M.E. English Boarding School (1,600 students & 60 teachers); United Higher Secondary School (1,000 students & 30 teachers); Shree KhadgaSmriti Higher Secondary School (1,000 students & 30 teachers) and Ganesh Baba English Boarding School (1,00 students & 45 teachers).

133. Most of these educational institutions i.e. 72% are located in ward 9, the core urban center of the municipality.

Health

134. There is one hospital and 36 various health facility centers such as ayurvedic hospital, dental clinics, service centers and private clinics in the project town which provide health services, the details have been presented in table 5.7.

Table 5.7: Status of health facilities

S. No.	Health Facilities	No.	Bed	Personnel	
				Doctor	Medical Staff
1	Tikapur Hospital	1	25	3	51
2	Private Clinics	16	-	-	-
3	Eye Treatment Centers	1	15	1	4
4	Dental Clinics	3	-	-	-
5	Ayurvedic Hospitals	1	-	1	4
6	Pharmacies	37	-	-	-
	Total	59	40	5	59

Source: Planning Handbook of Tikapur Municipality, 2013

The Tikapur Town Development Committee allocated 12 bighas of land in the master plan, where Tikapur Hospital is now operated with 3 blocks and 25 beds. It started providing health services from 2034 BS as a Health Post. It is considered one of the major hospitals in the far-western region of the Nepal. This hospital provides medical services to the people covering 20 VDCs of Kailali, 11 VDCs of Bardiya, and 3 VDCs of Surkhet district with total population of more than 6, 05,449.

4.1.17. Economic Activities

135. The economy of the municipality is extensively agrarian although most of the households in the project area depend on more than one occupation. The socio-economic survey shows that main occupation of the people is agriculture which accounts for 20.8% of total households. Service is the second largest occupation (17.9%) followed by trade and business (16.3%). A substantial number of people (15.1%) are involved in wage labor. Similarly about 9.3% people are engaged in foreign employment working mostly in India, Malaysia and the Gulf countries.

136. There are 12 hotels/lodges in the project area. At the moment, there are not many industries and business in Tikapur. The survey shows that there are 20 industries operating in the project area almost all in the ward no. 9. The type of industries operating in the municipality is rice mills, furniture, loaf, herbal, food industries, garment, cement etc.

137. However, many rice mills and industries are currently not in operation due to air pollution problems and lack of support from local people. Many industries do not consider industrial pollution as problem and there is lack of government mechanism to control it. Besides this, the absence of high voltage electricity supply line has also hindered operation of large industries.

138. There are three public banks, five private banks and four cooperatives provding banking services to the people of municipality.

139. Similarly, there are four cooperatives in the municipality, which have been providing banking facilities to the people. There are 27 major institutions including government offices. The major government offices are Ilaka Administrative office, Ilaka Police Post, Land revenue office, Survey

office, Post office, Rani JamraKulariyaIrrigation Project office, Nepal Telecom, Nepal Electricity Authority etc. Similarly there are some Non-Governmental Organizations (NGOs) like Nepal Red Cross Society, Nepal Jaycees, Nepal Scout, Intellectual Society, Tikapur Academic Society, Chamber of Commerce and Industry etc.

4.1.18. Poverty Conditions

140. In this project area different households have reported different income levels. The 2014 socio economic survey shows that the majority of the sampled households (27.8 %) in the town has an income less than NPR 8,250 per month. Only 11.3% of the sampled households earn more than NPR 29,667 month. Table 5.8 shows the income range of sampled households in the project area.

Table 5.8: Distribution of mean monthly household income

Ward No.	Income (NPR)/HH/Month						Total HHs
	<8250	8250-10916	10916-13750	13750-15500	15500-29667	>29667	
3	4	5	5	1	12	2	29
4	10	12	2	2	10	8	44
6	14	11	1	1	2	2	31
7	6	3	2	1	10	8	30
8	34	18	31	9	22	17	131
9	173	114	48	34	172	61	602
Total HHs	241	163	89	48	228	98	867
% of HHs	27.8	18.8	10.3	5.5	26.3	11.3	100

Source: Socio-economic survey 2014

141. The same survey shows that 0.1% of total population live below poverty level. It is also to be noted that more than 46.5% of the total sampled houses are semi-pakki construction (made with stone/brick with mud mortar) in project area and about 16.6% are pakki (made with brick walls, cement floor, RBC/RCC roof). Kachchihouses (rural hut made of wood, bamboo, or stone with mud mortar and thatched roof) constitutes about 36.9%. There are 126 slums HHs in the sampled households the project area.

D. Existing Water Supply Situation

4.1.19. Existing Water Supply

142. There is one piped water supply system constructed by Water Supply and Sanitation Division Office (WSSDO) Kailali. This ground water system serves only 10% households of the service area at the moment. This system was initially built in 1974-75, which consists of a overhead steel tank of 90 m^3 capacity of 10 meter height, 2 deep tube-wells and about 8-10 Km distribution pipeline with 39 public tap stand posts for the Block A area of Tikapur.

143. The system was then rehabilitated and extended in 1994. This included construction of one RCC Overhead Tank of 225 m^3 capacity and 2 deep bore wells. The pipeline was extended by 30 Km (150 mm dia CI pipe, 75 mm dia GI pipe and 40-90 mm dia. HDPE pipes. During this period, private house connections were promoted.

144. Currently, the existing system consists of one OHT with 225 m^3 capacity and one functional deep boring with 150 mm ø & about 50 m depth, which supplies about 4 liter per second. There is about 35km functional distribution pipe lines. There is 20 kVA Generator, which is inadequate for pumping water and hence only used for lighting purposes.

145. The total production, distribution and losses of water of the existing system are not known although all customers are connected with water flow meters. It is assumed that the total distribution is about 225 m^3 per day. The supply is intermittent up to 8 hours in a day (5-8 AM; 13-15 PM and 17-20 PM).

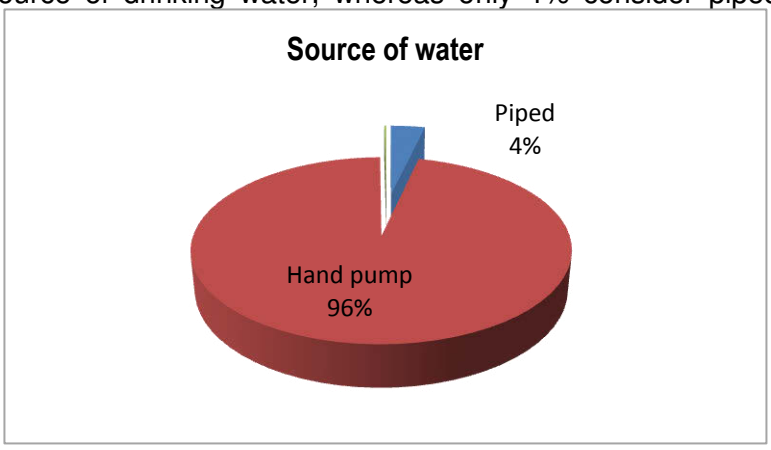
146. The Municipality has land ownership at three different places to develop the water supply project. They are in Bloc 'C', Block '11' and Block '28'. There are old bore wells one each in block 11 and 28, the information on these is not available. Based on the Municipality sources, they were never used and cannot be used for the future. In Block '11', WSSDO Kailali constructed boundary wall and is planning to drill new bore in this fiscal year, which can be used as test boring for the proposed project.

147. There are no other water supply systems in the project area.

4.1.20. Coverage

148. The Municipality has been supplying water to ward no. 9 (Block no 1 to 30) and some limited areas of other wards adjoining to the ward no. 9. Currently 861 HHs are connected to the system and 4 public taps are running at different public places. The Office of Tikapur Municipality estimated that some 5,500 people have been benefitted by the system. It is reported that due to limited supply of water, only 300 HHs get regular supply of water. The remaining HHs are connected to the system but they hardly get water and depend upon hand pumps (4,678 nos.) and shallow tube-wells. As a result, only 303 HHs of the project area considered piped water as source of water in socio economic survey 2014.

149. The socio economic survey 2014 shows that 96% people consider tube-well/hand-pump as main source of drinking water, whereas only 4% consider piped water supply system as a main source.



4.1.21. Service Level and Consumption

150. The supply is intermittent with up to 8 hrs. on a good day in certain areas. It is difficult to calculate the exact per capita water consumption, as the people mostly depend upon the hand pumps/shallow wells, the extraction of which is not recorded. The sample socioeconomic survey carried out in 2014 revealed that in on average a household consumes 300 liter/day during the rainy season and 222 liter/day during the dry season. The existing piped system supplies up to 40 liters per capita per day to each household, which has good supply system.

151. As explained earlier, most of the people rely on hand pumps. Most of these hand pumps are installed by HHs themselves, a few of them by the Municipality and others. Even these shallow tube-

wells function hardly for all around the year. The water table goes down and the tube-wells dry out/defunct in dry season for 2-3 months.

4.1.22. Water Quality

152. The survey result shows that 96% of the populations rely on their hand pumps/shallow tube-wells which is only the source of supply for them. The water quality of these shallow tube-wells is of dubious quality because there is no sanitary sealing in most of the tube-wells which taps the water from shallow aquifer ranging from 4-12 m depth. Some tube-wells have significant iron content which is observed physically.

153. Water Samples collected from existing boring at OHT site and local user's hand pumps/shallow tube wells (STW) of different depths were tested for various physical, chemical and bacteriological parameters. The results of the test are given in tabular form in table 5.9.

Table 5.9: Result of water quality tests

Parameters	Unit	Samples				NDWQS
		Existing DTW (OHT Site)	STW of 21.3 m.	STW of 9.8 m. (Chaudhary's house)	STW of 19.8 m. (Green Asia)	
Physical						
pH (23^{o}C)	-	8.1	7.3	7.2	7.0	6.5-8.5
Turbidity	NTU	1	1	1	3	5(10)
Electrical Conductivity	uS/cm	371	524	767	156	1500
Total dissolved solids	mg/l	182	238	350	71	
Color	TCU	<1	<1	<1	<1	
Lab. Temp.	^{0}C	26.5	26.5	26.5	26.5	
Chemical						
T. Alkalinity	mg/l	241	241	407	83	
Bicarbonate	mg/l	241	241	407	83	
Carbonate	mg/l	Nil	Nil	Nil	Nil	
Hydroxide	mg/l	Nil	Nil	Nil	Nil	
Chloride	mg/l	9	7	20	1	250
T. Phosphate	mg/l	<0.1	<0.1	<0.1	<0.1	
Nitrate	mg/l	<0.1	23.9	22.7	0.1	
Ammonia	mg/l	<0.1	0.1	0.7	<0.1	1.5
Total Hardness	mg/l as $CaCo_3$	182	218	335	58	500
Calcium	mg/l	48	63	99	19	200
Magnesium (Mg)	mg/l	15	15	21	3	-
Iron (Fe)	mg/l	<0.1	0.2	0.6	0.3	0.3 (3)
Manganese	mg/l	<0.1	<0.1	0.5	0.1	
Arsenic (As)	mg/l	0.01	<0.01	<0.01	<0.01	0.05
Total Coliform	Cfu/100 ml	27	25	Nil	2500	Nil

154. The analysis of water samples shows that the water is not safe for drinking from bacteriological point of view. The iron content is more than permitted value in one of the four tested samples.

155. The socio economic survey 2014 shows that only 7.7% of sampled households consume water after some kind of purification process at household level. It shows that 40.3% people boil water for drinking purpose; 14.9% drinks after filter and 26.9% use filter for purification. On average, each household invests about NPR 2,654 for water purification.

4.1.23. Operation costs and current Tariff

156. The municipality has been operating the system, for which it has assigned one water supply technician (Mr. ShyamThapa) for managing water distribution, maintenance and meter reading.

157. The municipality has not separately maintained the account related with operation of existing system from its general account. It is estimated that average annual water tariff collection is around NPR 500,000 and spending is also about NPR 500,000 for operation and maintenance. It includes energy cost for pumping (NPR 276,000; staff costs NPR 193,200 and repair & maintenance NPR 31000.

Table 5.10: Annual Revenue from Water Tariff Collection

S. No.	Fiscal Year	Annual Revenue (NPR)
1	2010 – 11	405,622.00
2	2011 – 12	481,050.00
3	2012 -13	563,438.00
	Average	483,370

Source: Tikapur Municipality, 2014

158. The municipality has fixed water tariff rate of NPR 50 up to 8 m^3 use and NPR 10 per m^3 for additional use. There is a penalty system for delays paying of water bill e.g. 5% for one month delay, 7% penalty for 2 month delay and 10% penalty for 3 month and more. In addition to the monthly tariff, the municipality collects NPR 500 for new connection as connection charge. The HH has to manage all materials for new connection including water meter. The municipal revenue section is responsible for water tariff collection.

4.1.24. Problems of Existing System

159. The existing system does not cover the whole area, is not able to meet the water demand and the supply is intermittent. The major problems of the existing system are presented below:

- The municipality has been supplying water to ward 9 that is also in limited areas only. Urbanization has been taking place in adjoining areas of ward 9 as well but these areas do not come under the existing service area;
- The existing system is old and the available water infrastructures (OHT capacity, tube-well, pipelines, coverage etc.) are not sufficient to meet current water demand. The supply is intermittent with supply up to 8 hrs. that is also in a good day and only in limited area;
- The supplied water is not sufficient to meet the water demand of the service area. The consumers are largely dependent on the hand pumps;
- The water is supplied as it comes from the bore wells with no treatment. The municipality carries out occasional disinfection with bleaching powder provided by WSSDO Kailali in the wet season;
- The municipality assigns only one technician who operates the pump, applies bleaching powder, runs different valves, carries out maintenance of system including pipelines, does meter reading etc. The current operation and maintenance service is poor and involvement of human resources is not enough to operate the system;

- The municipality does not maintain a separate account for operation of water supply system making it difficult to conduct financial analysis;
- The municipality does not have the inventory of existing assets. The existing facilities are in need of repair/rehabilitation but the operator is unable to do it due to limited financial resources.

E. Existing Sanitation Situation

4.1.25. Sanitary Facilities

160. The overall sanitary condition of the Municipality is found to be reasonably satisfactory. In the core area, almost all HHs have their private water seal toilets whereas in isolated/semi-urban areas some people still practice open defecation. The socio-economic survey (2014) reported that 1.6% HHs still practice open defecation in project area and majority of HHs i.e. 78.5% have water-borne private toilets outside house. Table 5.11 shows that 98.4% have one or other type of toilets.

Table 5.11: Toilet coverage (HHs)

Ward No.	Total No of Surveyed HH	Type of Toilet in Use				
		Water-borne (inside	Water-borne (outside house)	Dry pit latrine	Communal latrine	Open Defecation
3	278	10	238	17		13
4	428	6	376	36	8	2
6	301	9	152	105		35
7	293		269	19		5
8	1373		1340	3	4	26
9	5740	1016	4229	442	2	51
Total	8413	1041	6604	622	14	132
%of	100	12.4	78.5	7.4	0.2	1.6

Source: Socio-economic survey, 2014

161. Reportedly ward nos. 1,4, 5,6 & 7 have been declared Open Defecation Free (ODF) although some people still do not have toilets. The Municipality is in the process of being declared ODF in this fiscal year.

162. The same survey shows that majority of houses (72.43%) have pour flush/water seal type toilets. Similarly, 17.88% HHs have pit latrine, 9% have ventilated pit latrine and only 0.35% have cistern flush. The existing latrines in the houses as well as in the schools are not maintained properly. The community has very limited knowledge on the use of sanitary latrines and personal hygiene especially in the city periphery.

163. There are four public toilets within the project area. They are at National Park in ward no-3 and remaining 3 at Buspark, KancchiBazzarChowk and Hospital Chowk (ward -9). These toilets have been operated by various organizations but the condition of most of them is not satisfactory.

4.1.26. Drainage Facilities

164. There is no proper drainage system for stormwater as well as for the domestic sewage in Tikapur Municipality. The core area of the city has about 4 kms. of open surface drains in ward 9. These drains are of rectangular channels with cover slabs and also open drain. These drains are not used frequently and get choked every rainy season due to lack of maintenance. There is no defined outlet for stormwater, so during the rainy season many parts of the Municipality are inundated.

165. Since the project area is situated at flat terrain with gentle slope, water logging in the wet season is an issue despite there being ample space and sufficient outlet points to drain off stormwater naturally. Flooding occurs due to overflowing of the nearby Karnali River. The core area of project (Bazzar) lies in north-south direction along the main feeder road and does need surface drains.

166. In order to address these drainage issues, Tikapur Municipality prepared report on "Detailed Engineering Design of Sewer and Storm Water Drainage Network (Periphery Area)" in June 2011. It proposed construction of 31 kms of stormwater drains with 3 outlets with an estimated cost of NPR 251 million. However, due to limited financial resources the proposed woks have not been implemented yet.

4.1.27. Wastewater Management Practices

167. There is no sewerage system in the project area. Waste water from individuals is managed inside the house except for a few HHs that discharge excess water to the adjacent road side drains. In the wet season, waste water overflows in these roads and drains to the Rani Canal that passes through the Municipality. Most of households do have septic tanks but the outlets are connected to the road side storm water drains.

168. The socio economic survey commissioned by the PPTA team in 2014 shows that 98.4% HHs have their own toilet. Some of them have constructed septic tanks and some have directly connected with surface drains. There is no wastewater treatment plant in the Municipality to treat domestic sewage. The septage is either dumped into nearby water courses or discharged into surface drains. However,the survey shows that only 51.7% of the sampled HHs showed an interest in improving the septage management system and are interested to pay for it.

4.1.28. Solid Waste

169. The major sources of waste generation in Tikapur Municipality are households, hotels, hospitals, vegetable and fruits market, meat stores, groceries, clothing/ fancy stores/tailors etc. The average per capita household waste generation rate in Tikapur Municipality was 0.19 kg/person/day according to the report “Strategic Plan and Action Plan for Solid Waste Management in Tikapur Municipality, 2013”. It is estimated that the waste generation is about 11.0 tons per day.

170. The municipal waste from household level comprised of organic waste 39.0%, plastic waste 17 %, paper waste 12 %, Glass 7 %, Metal 3%, Inert 4%, Medical 2%, Sand/ Dust 10%, Wood 1 % and others 5 % .

171. Tikapur municipality is the only service provider in waste collection within the municipality. It collects waste from city core area, ward 9, every day. This ward is the only area to benefit from the collection service of the municipality. Other areas are partially serviced or not served at all with collection of solid waste. The house owners take out waste from the houses and municipal collectors empty into the tractor. These collectors sweep the city streets and the waste is collected in rickshaws using shovels and unloaded into the tractor to bring to the dumping site. It is estimated that the waste collection is about 0.75 Ton/day.

172. The Municipality doesn’t have any land for solid waste disposal and they are trying to find an appropriate disposal site. Currently, it is dumped in an open low lying area of Block 5 near Khadga’s School and block 29 near Mentha of the Municipality. From time to time mud is spread over the waste materials as instructed by the municipality personal.

173. The Municipality has assigned 8 personnel (1 supervisor, 1 driver and 6 sweepers) for solid waste management activities. It has a tractor and 3 rickshaws (0.6 m^3capacity) to collect and transport all municipal waste to dumping site.

F. Existing Institutional Situation

4.1.29. Existing Institutions involved in Water Supply and Sanitation Field

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

175. DWSS through WSSDO Kailali constructed and then rehabilitated the water supply system and formally handed it over to the Municipality. The Municipality has been managing the existing system. It has separate section with specified responsibilities. It has been collecting water revenue and spending on the sector to maintain the system.

4.1.30. Water Supply and Sanitation User's Association

176. Tikapur Small Town Water Supply and Sanitation Users Committee was registered with the District Water Resources Committee, Dhangadhi, Kailali on 11 Bhadra 2070 (27 August 2013) as per water resources Act 2049. It is intended that the WUSC will assist the PMO to implement the proposed project and it will operate and maintain Tikapur water supply system to provide regular and quality drinking water to the consumers.

177. The Tikapur WUSC has formed with an 11 member executive committee consisting of Chairman, Vice Chairman, Secretary, Treasurer and 7 executive members. However, the current composition of the executive committee does not meet the government requirements to have 9 executive committee members including at least 3 female members.

178. The name of present WUSC members and their designation are presented in table 5.12.

Table 5.12: Members of Tikapur Small Town Water Supply Users and Sanitation Committee

S.N.	Name of Person	Designation
1	Mr. Nav Raj Rawal	Chairman
2	Ms. Kamala K.C.	Vice Chairman
3	Mr. Bhairab Singh Rawal	Secretary
4	Mr. Prem Singh Bishwokarma	Treasurer
5	Mr. PrakashBahadurBudhathoki	Member
6	Mr. Naresh Kumar Khatri	Member
7	Mr. PhiruLalChaudhary	Member
8	Mr. KeshariSodari	Member
9	Ms. Upama K.C.	Member
10	Mr. Daya Ram Sanjyal	Member
11	Mr. SumanChaudhary	Member

4.1.31. Organization Structure of operators of Existing System

179. Tikapur Municipality is the operator of the existing system. There is a separate section "Water Supply Section". The Municipality has assigned one water supply technician (Mr. ShyamThapa) for managing water distribution, maintenance and meter reading of the whole system.

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Positive Environmental Impacts and Benefits

180. There will be opportunities for local employment and increased earnings of local enterprises during construction. When completed, the Subproject will bring about the following environmental benefits, impacts and outcomes:

Water supply

i. The benefit of having access to reliable and adequate 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 public health, improved quality of life and safe communities as outcomes.

Sanitation

iv. the benefit of public commuters having access to improved sanitation facility;
v. Enhanced public environment (bus park environment), enhanced public health and safe communities as outcomes.

181. Overall, the Subproject will lead to enhanced public health and urban environment, significantly contributing to a qualitative improvement in the lives of Tikapur Town residents.

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

B. Impacts/Issues/Concerns and Mitigation Measures Relative to Sitting, Planning and Design

183. The Rapid Environmental Assessment (REA) Checklists for water supply and sewerage were used to identify potential impacts/issues/concerns of the Subproject. (Annex B). The REAs identified the issues and concerns that should be considered during design, impacts that should be mitigated during construction and impacts that should be mitigated or enhanced during operation. Table 6.1 presents the measures taken during project preparation and IEE to mitigate them.

184. Relative to design, the salient concerns would be the inadequate consideration/ incorporation in the respective designs of the REA-identified impacts/issues/concerns that should be considered during design and the following:

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

C. Impacts/Issues/Concerns and Mitigation Measures during Construction

5.1.1. Erosion and land surface disturbance

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

186. However,since the proposed area is flat terrain, the chances of slope disturbances and landslides are minimal while digging trenches for the distribution lines.

187. During construction, precautionary measures will be taken, proper backfilling of excavated trenches will be done and the excavated soil will be placed against erosion. Temporary diversions and sign boards for pedestrians will be provided.

Table 6.1: REA-identified Impacts/Issues/Concerns and Mitigation Measures Taken during Project Preparation and IEE

REA identified Impacts/Issues/Concerns	Measures taken during FS and IEE to mitigate impacts/issues/concerns
Water Supply	
Issues & concerns that should be considered during design	
Unsatisfactory raw water quality	During FS stage, water samples from 3 sources were tested. Tests revealed quality of water samples to be within NDWQS and WHO Guideline values for the few parameters they were tested for.
Delivery of unsafe water to the distribution system	Design includes basic treatment using $Ca(ClO)_2$ and proposes lab unit and kits. This IEE proposes "hands on" training by a licensed laboratory for the first few years of operation under Output 2, & continuing training thereafter.
Inadequate protection of intake structures	Intake well has adequate land for perimeter fencing.
Health hazards arising from inadequate design of facilities for receiving, storing and handling of Cl& other hazardous 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 a better quality GI, DI, and HDPE pipes.
Community safety risks due to both accidental and natural hazards	Design proposes perimeter walls for all point works.
Impacts that should be mitigated during construction	
Impairments associated with transmission lines and access roads	EMP incorporates mitigation measures.
Workers health and safety hazards	EMP incorporates mitigation measures.
Noise and dust	EMP incorporates mitigation measures.
Increased road traffic	EMP incorporates mitigation measures.
Social conflicts of workers from other regions/countries	EMP incorporates mitigation measures.
Risks to community health and safety due to transport, storage and use and/or disposal of materials such as explosives, fuel and other chemicals	EMP incorporates mitigation measures.
Community safety risks due to both accidental and natural hazards	EMP incorporates mitigation measures.
Impacts that should be mitigated/enhanced during operation	
Excessive algal growth	EMP incorporates mitigation measures.
Increase in production of raw sewage	EMP incorporates mitigation measures.
Inadequate disposal of sludge from water treatment	EMP incorporates mitigation measures.

REA identified Impacts/Issues/Concerns	Measures taken during FS and IEE to mitigate impacts/issues/concerns
Occupational health and safety hazards from handling & U management of Cl, other contaminants, andbiological and physical hazards during project construction and operation	EMP incorporates mitigation measures.
Delivery of unsafe water due to poor O&M treatment processes	EMP incorporates mitigation measures.
Delivery of water to distribution system, which is corrosive due to inadequate attention of feeding of corrective chemicals	EMP incorporates mitigation measures.
Increased sewage flow due to increased water supply	EMP incorporates mitigation measures.
Increased sullage	EMP incorporates mitigation measures.
Risks to community health and safety due to transport, storage and use and/or disposal of materials such as explosives, fuel and other chemicals	EMP incorporates mitigation measures.
Sanitation	
Impacts that should be mitigated during construction	
Noise, vibration and dust	EMP incorporates mitigation measures.
Social conflicts between construction workers from other areas and community workers?	EMP incorporates mitigation measures.
Health & safety hazards to workers from toxic gases and hazardous materials	EMP incorporates mitigation measures.
Impacts that should be mitigated/enhanced during operation	
Environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?	EMP incorporates mitigation measures.
Deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water	EMP incorporates mitigation measures.
Contamination of surface and ground waters due to sludge disposal on land	EMP incorporates mitigation measures.

5.1.2. Impact from Quarrying of Raw Materials

188. The construction of borehole, sludge drying bed, overhead tank and other structures of the project will require river bed materials, boulders, and other construction materials. The extraction of these materials from inappropriate places or in excessive amount will cause damage to the local environment andaccelerate erosion, disturb drainage pattern and cause water logging and water pollution.

189. To mitigate such impacts unstable and erosion prone sites will be avoided for quarrying and only approved quarries will be used. After the extraction is complete, the quarry site will be properly leveled to suit the locallandscape.

5.1.3. Impacts on Air Quality

190. Dust will be generated from inadequately managed or haphazard: (i) earthworks such as clearing, grubbing, excavations and drilling; (ii) demolition works; (iii) stockpiling of natural aggregates, excavated materials and spoils; (iii) transport, loading and unloading of natural aggregates; (iv) movement of construction-associated vehicles; and (v) on-site rock crushing, cement mixing, borrowing. The significance of dust impact will be high in the bazaar areas where more population reside and work and where urban socio-economic activities concentrate.

191. Some mitigation measures include: (i) watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; (ii) if re-surfacing of disturbed roads cannot be done immediately, spreading of crushed gravel over backfilled surfaces; (iii) during demolition, watering of exterior surfaces, unpaved ground in the immediate vicinity and demolition debris; (iv) hoarding active work sites in populated areas; (v) requiring trucks delivering aggregates and cement to have tarpaulin cover and maintain a minimum of 2' freeboard; and (vi) limiting speed of construction vehicles in access roads and work sites to maximum of 30 kph.

5.1.4. Noise

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

193. Some mitigation measures include: (i) using equipment that emit least noise, well-maintained and with efficient mufflers; (ii) restricting noisy activities to daytime and overtime work to avoid using noisy equipment; (iii) limit engine idling to a maximum of 5 minutes; (iv) spread out schedule of material, spoil and waste transport; and (v) minimizing drop heights when loading and unloading coarse aggregates.

5.1.5. Damage to the Existing Facilities

194. During the construction time, while excavating the earth, water supply distribution pipe lines may get damaged in few places particularly in bazaar area in spite of great care. A repair team consisting plumber will be kept standby so that immediate repair can take place.

195. To avoid damage to telephone/ telecom line coordination with the office will be setup. Layout drawing if possible will be received from concerned office to avoid possible damage.

5.1.6. Impacts on Flora and Fauna

196. The proposed project will have less or no impacts on biodiversity. The parts of the project area where construction activities will take place do not lie within forest area. The project components require a very small area of land for implementation; environmental impacts on the vegetation and natural eco- system do not seem to be significant.

197. No terrestrial fauna and bird species in the community forest will be affected. For mitigating impacts on flora and fauna, hunting and poaching by workers will be strictly prohibited.

5.1.7. Impacts on Physical Cultural Resources

198. Subproject will not encroach into, or be in close proximity to, physical cultural resources. In case of chance find, work should be stopped at once; relevant work site hoarded securely; and VDC informed immediately for proper action. No chance find has ever been reported or heard of, according to the WUSC

5.1.8. Impacts on the Socio-Economic Environment and Resources

199. **Slow mobility in the core areas, blocked accesses to properties and work sites, local flooding, utility service disruptions:** These will result from excavation works, stockpiling, movement and parking of construction vehicles and equipment, and/or accidental damage of existing utilities (e.g., power supply poles, open drains and water taps or hoses). Nuisance and safety hazards are the indirect impacts.

200. Some mitigation measures include: (i) preparing a traffic management scheme jointly with local authorities; (ii) posting of traffic flagmen during the entire working hours; (iii) providing compensation for affected properties; (iv) managing stockpiling; (v) leading pumped water from excavations to drains or storing in drums for use in watering dry surfaces; (vi) coordinating the relocation of affected power supply poles, embedded private water hoses prior to excavation; and (vii) in case of accidental damage to existing utilities, advise concerned authority at once.

201. **Social Dispute and Dissatisfaction:**There is possibility of influx of outside workforce and with them money from the construction work and unwanted communities can cause some strife with the local community. Local population may not get employment benefit from the project causing dissatisfaction and conflict in the area.

202. An employment policy will be prepared so that the local people may not be deprived of the employment opportunities. The local people and women above the age of 18 will be given preference for employment. Wages will be settled based on DWEC (District Wage Evaluation Committee) with the list of employees.

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

204. Health and hygiene in the camp site (against unsafe working conditions, accidents, transmission of communicable diseases etc.) will be given top priority. Regular health checkups once in a week/month, proper sanitation and hygiene, health care will be provided. Available personal protection equipment (PPE) to all construction workers will be provided. Any type of injuries will be compensated and insurance to the workers will be provided. First aid kits, ambulance, and fire extinguishers will be provided in camp sites.

205. To avoid risks from accidents on site due to the movement of public and workers, the health and safety measures of the contract will also prohibit entry at construction sites to the public and the area will be barricaded and warning signs will be placed.

206. **Community health and safety hazards:** Overall, communities will be exposed to cross-cutting threats from construction's impacts on air and water quality, ambient noise level; mobility of people/goods/services; accesses to properties/economic activities/social services; local flooding; service disruptions; and potential fire and explosion, among others. Communicable and transmittable diseases may potentially be brought into the community by construction workers.

207. Mitigation measures include: (i) Contractor's implementation of the ADB-cleared C-EMP; (ii) adequate lighting, temporary fence, reflectorized barriers and signage at active work sites; (iii) Contractor's preparedness in emergency response;

D. Impacts/Issues/Concerns and Mitigation Measures during Operation

5.1.9. Delivery of Unsafe Water

208. Unsafe water delivered due to any one or combinations of the following will impact on public health: (i) accidental human error in chlorine dosing; (ii) accidental spill of hazardous substances; (iii) leaks in the system; (iv) lack of environmental quality monitoring; (v) inadequate maintenance and housekeeping; and (vi) deteriorating quality of groundwater resource without parallel upgrade of water treatment.

209. Some mitigation measures include: (i) ensuring competent/cautious handling and storage of Calcium Hypochlorite and qualified persons to implement/oversee disinfection; (ii) providing safe storage for chemicals; (iii) ensure capacity to implement quick response to hazardous substance/waste spills; (iv) implement SPS-compliant EMP; (v) monitor raw water quality.

5.1.10. Toxic chemical hazard

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

211. The storage, in-plant handling and dosages of chlorine (bleaching powder) will be addressed. Procedures and guidelines will be developed for its handling and first aid measures will be introduced for emergencies. Training on handling and on dosage of the chemicals will be given to the system staff.

E. Indirect, Induced and Cumulative Impacts

5.1.11. During Construction

212. **Indirect and Induced Impacts.** The volume of vehicle movements that will be generated from the simultaneous construction of component at three sub system 1 (zone A), sub system 2 (zone B), sub system 3 (zone C2) and one rehabilitation of existing well and minor repair of existing OHT ofsub system 3 (zone C1) will create choke points at the narrow access roads and slow down mobility of people, good and services, particularly in the bazaar areas. A greater number of people will be exposed to safety hazards from constricted road space. Coupled with disruption of economic activities and social services from extended interrupted power supply due to relocation of power poles and/or likely accidental damages, production outputs will suffer some slowdown. Apart from the applicable mitigation measures from among those mentioned for direct impacts, proper coordination with the relevant ward authorities, social service institutions and businesses should enable further mitigation of indirect and induced the impacts. Social preparation of communities potentially affected by indirect and induced impacts during construction.

213. **Cumulative Impacts:** There are no known ongoing or proposed water and sanitation related developments in Tikapur Town as well as planned extension of the subproject as yet. Hence, cumulative impacts will arise mainly from the construction of main Subproject components and associated facilities. For purposes of common understanding in subsequent paragraphs: (i) Subproject's "main area of influence", as defined in Section IV-4.3, covers component sites, i.e., footprints and areas within 200 m from their edges, considering the potential reach of noise, dust and socio-economic impacts. (ii) "Point works" refer to such main components as pumps, RVTs, dug wells/treatment unit/ancillaries, public market. (iii) "Horizontal works" refer to transmission main and distribution pipes. (iv) "Construction period" (excluding O&M) for horizontal works is estimated to be 1 year, for Pump and RVT is 6 months, for dug well/treatment unit/ancillaries is 6 months.

214. The horizontal works for transmission mains and distribution pipeline will be commonly in the same area of influence of point works. Such associated facilities as stockpiles and some sections of access roads are assumed to be within the respective main area/s of influence of Subproject components. Other associated facilities as workers' camp and Contractor's work area, waste dump sites, areas for reuse of excess soils/spoils and quarries/borrow pits are outside the respective main areas of influence of Subproject components.

215. 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 which magnitude of cumulative impacts will lessen to "moderate" magnitude. The sensitiveness of the resourceswithin the main areas of influence are taken into account, together with types of works involved and their intensities. Considering all these:

216. The potential moderate and high cumulative impacts would be dust, noise, road space limitation leading to slow mobility, access blocking, disruption of social services and economic activities, community and workers' health and safety, generation of solid wastes and spoils.

217. To bring cumulative impacts down to acceptable levels:

- Civil works must be well planned, strategized and completed promptly.
- Contractor should implement the ADB-cleared C-EMP fully; key institutions to act their roles in EMP implementation effectively.
- There must be adequate consultations with stakeholders, including bus operators, and local authorities and coordination, particularly regarding expected cumulative impacts. Bus operations to temporarily adjust to the circumstances to relieve some road space limitations and for public safety and convenience.
- The grievance redress mechanism should be disclosed (through public meetings, display at strategic places and media) to the communities affected by the cumulative impacts.

5.1.12. During Operation

218. The indirect and induced impact of a reliable and sufficient water supply would be increased generation of wastewater and sullage from the water treatment plant during maitainence and cleaning. If inadequately managed, this situation would lead to contamination of supplied water through leaks or broken pipes in the distribution system. Mitigation measures would be: (i) prompt action on broken pipes/leaks; and

219. 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. Adequate projections of these induced changes must be incorporated in the design for sustainability of works. The cumulative impact would be the rapid urban growth driven earlier by the existing water supply system and the future urban growth that will be driven by the proposed improved water supply. Measures to mitigate the adverse impact of rapid urban growth would be rational land use planning of the VDC and District, incorporating environmental management for sustainable growth.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

220. Stakeholder consultation and participation was an essential process in project preparation and this IEE. The process in engaging stakeholders and affected people during the conduct of the IEE involved key informant interviews, joint sites reconnaissance and on-site discussions with WUSC, and field random interview of stakeholders. Table 7.2 lists down the persons consulted during the IEE. Annex I presents the notes of some of the consultations.

221. The IEE team organized a series of public meetings, consultations, interactions and group discussions at field level with general public and key stakeholders on the water supply project. The discussion went on importance of water supply project, quality of water, different alternatives to implement the project, project modality etc.

222. The socio-economic survey team carried out a census survey covering 100% HHs in project area. The topographic survey team did its work in close coordination with the WSSDO and Municipality authorities.

223. The minutes of all formal meetings are annexed. The summary has been presented in table 7.1 and 7.2 in a tabular form.

Table 7.1: Summary of public consultations

S.N.	Meeting Date	Facilitator	Venue	Remarks
1	Dec. 25, 2013	Tikapur Municipality	Tikapur Municipality	
2	May 05, 2014	Tikapur Municipality	WUSC	
3	Sept. 5, 2014	Tikapur Municipality	Tikapur Municipality	
4	Sept. 6, 2014	WUSC	NayaTikapur	
5	Sept. 6, 2014	WUSC	LamkiTole	
6	Sept. 6, 2014	WUSC	MallikaTole	

Table 7.2: Lists of People and Institutions Consulted

	Name	Organization/Address	Contact No
1	Mr Yam LalAdhikari	CEO, Tikapur Municipality	9851142885
2	Mr. NR Rawal	Chairman, WUSC, Tikapur	9851151467
3	Mr. Moti Ram Chaudhary	Landless Upliftment Committee, Dhangadi, Kailali	9848422474
4	Mr. BhairabRawal	Secretary, WUSC, Tikapur	9858421984
5	Mr. Kashi Ram Dhungana	District chief, Nepal Scout	984868369
6	Mr. Dharma BahadurBista	Campus chief	9848426969
7	Mr. Dwarika P. Bhandari	Lecturer, BirendraBidyaMandir	9848433066
8	Mr. Chakra B. Bhandari	Lecturer, BirendraBidyaMandir	9848433356
9	Mr. DandaPaniPokharel	Lecturer, BirendraBidyaMandir	9848430831
10	Mr. KeshavKunwar	Campus Chief, Tikapur Multiple Campus	9851148826
11	Mr. DhavindraRawal	Asst Campus Chief, TMC	9848489786
12	Ms. Kamala Rawal	Local resident, New Tikapur	
13	Ms. SanmatiRawal	Local resident, New Tikapur	
14	Ms. RituTiruwa	Local resident, New Tikapur	
15	Mr. Nara Tiruwa	Local resident, New Tikapur	
16	Mr. BhuwaneshworAdhikari	Journalist, Tikapur Daily	

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

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

- During detailed design, if there would be a major change in design/alignment/location, warranting an update of the IEE, the PMO and PISU will hold at least one public consultation meeting early on in the IEE update to solicit perceived impacts, issues, concerns and recommendations from affected communities.
- Prior to construction, the PMO and PISU 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 PISU, and status of compliance with Government's environmental safeguard requirements, among others, are attained/provided. Billboards about the subproject, implementation schedule and contact details of the executing agency, PMO-ES, PISU-ESA and Contractors will have been set up at strategic locations within the subprojects' main areas of influence. The grievance redress procedure and details will have been posted at the offices of the PMO, PISU, WUSC and VDC.
- During construction, regular random interviews will be conducted by the PISU-ESA every month to monitor environmental concerns of subproject communities.
- During operation, periodic random interviews will be conducted by the PMO and PISU and WUSC to monitor the environmental concerns of subproject communities.
- The public consultations and information disclosure will be continuous throughout the project cycle. PMO and PISU will be responsible for designing and implementing such aspects on the ground.

225. The IEE (in both English and Nepalese), as well as the GoN-approved IEE Report (in Nepalese), will be available at the offices of the PMO, PISU 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 website.

VIII. GRIEVANCE REDRESS MECHANISM

A. Purpose of the Grievance Redress Mechanism

226. The Project-specific grievance redress mechanism (GRM) is meant for persons seeking satisfactory resolution to their complaints on the social and environmental performance of the subprojects under the 3STWSSP. The mechanism, developed in consultation with key stakeholders, will ensure that: (i) the basic rights and interests of every person adversely affected by the social and environmental performance of a Subproject are protected; and (ii) their concerns are effectively and timely addressed.

B. Proposed Set-Up

227. The MoUD, as the Project executing agency, will establish the GRM and its support system, including setting up the Grievance Redress Committee (GRC) at the subproject level. The GRC will comprise 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., VDC and DDC; (vii) DSC social safeguard expert; and (viii) DSC environmental safeguard expert (ESE). The environmental safeguard assistant (ESA) of the PISU will oversee the implementation/observance of the mechanism for environmental complaints at the subproject level. He/she will be technically advised, supported and trained by PMC's environmental specialist and the DSC ESE. The PMO's Environmental Officer will oversee the implementation/observance of the GRM in all subprojects. Representatives of affected persons (APs), civil society and eminent citizens will be invited as observers during GRC meetings. Contractors and WUSCs (as Operators) will be required to designate their respective counterpart GRM staff.

228. 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 PISU office. The PISU, GRC and PMO maintain records of all grievances, informally- and formally-lodged, valid and invalid, and appealed. The PISU 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) PISU ESA in the subproject's monthly progress reports, semi-annual subproject environmental monitoring report (EMR) during construction and annual subproject EMR during operation; and (ii) PMO EO in the Project's monthly progress report, semi-annual Project EMR during construction and annual Project EMR during operation.

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

C. Access to the Mechanism

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

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

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

D. GRM Steps and Timeframe

7.1.1. Informal Approach

231. 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 PISU. The Contractor/Operator will secure a confirmation of completion of action from the AP. For at least a week after confirmation of completion, the PIU will monitor the effectiveness of the action/resolution taken. After which, PISU will secure a written confirmation of satisfaction from the AP. The Contractor/Operator shall report to the PISU all complaints received, eligible or ineligible, actions agreed on and taken and confirmation of completed action.

7.1.2. Formal Approach

232. If complaint is eligible but is not acted on within three days from receipt of 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)

First Level: The access point will be the PISU. The steps are detailed below. (Figure VIII-2)

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

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

Step 3 Investigations, Discussion and Agreement (Day 1)
PISU, 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; PISU, AP, Contractor/Operator will have copies.

Step 4 Implementing the Agreed Action
If 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 PISU 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 PISU a copy.

Step 6 Confirmation of Satisfaction (1 week after confirmation of completed action)
The PISU 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, PISU will secure a written confirmation of satisfaction from the AP.

Second Level: The AP will be notified by the PISU when complaint is forwarded to the GRC. The GRC will call for a hearing if necessary, where AP can present his/her concern/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.

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

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.

233. 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.

7.1.3. Record keeping and disclosures

234. The PMO, GRC, PISU 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, lessons learned. The number of grievances recorded and resolved and the outcomes will be displayed at the offices of WSSDO, PISU, Town LGU, PMO and WUSC and reported in the monthly progress reports, semi-annual EMR during construction and annual EMR during operation, submitted to ADB.

7.1.4. Periodic review and documentation of lessons learned

235. 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.

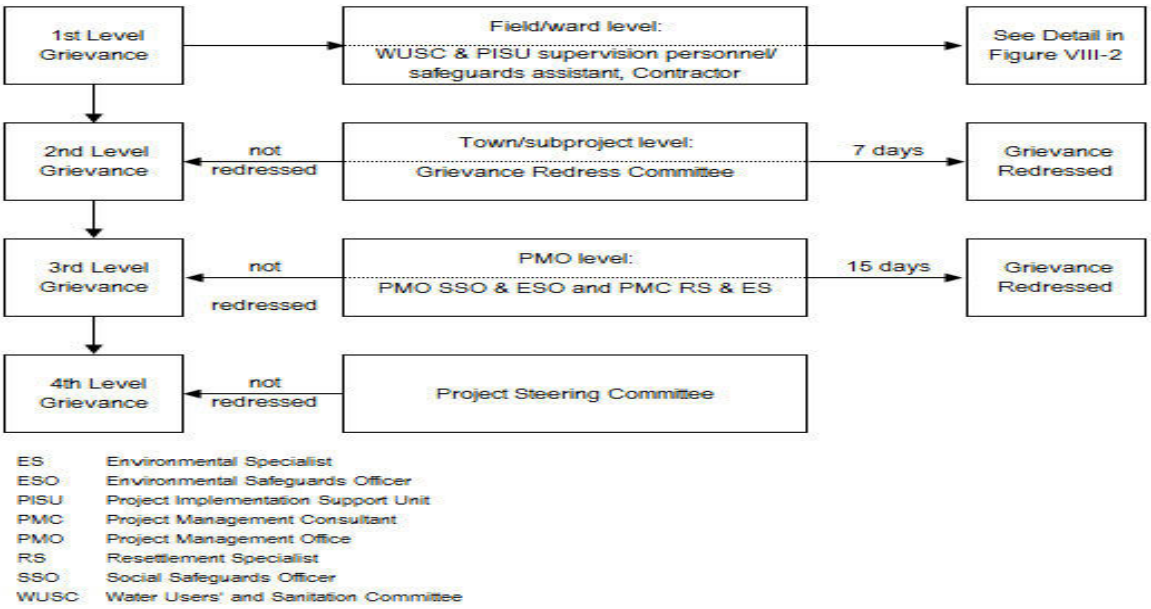


Figure 8.1: Grievance Redress Mechanism (Formal Approach)

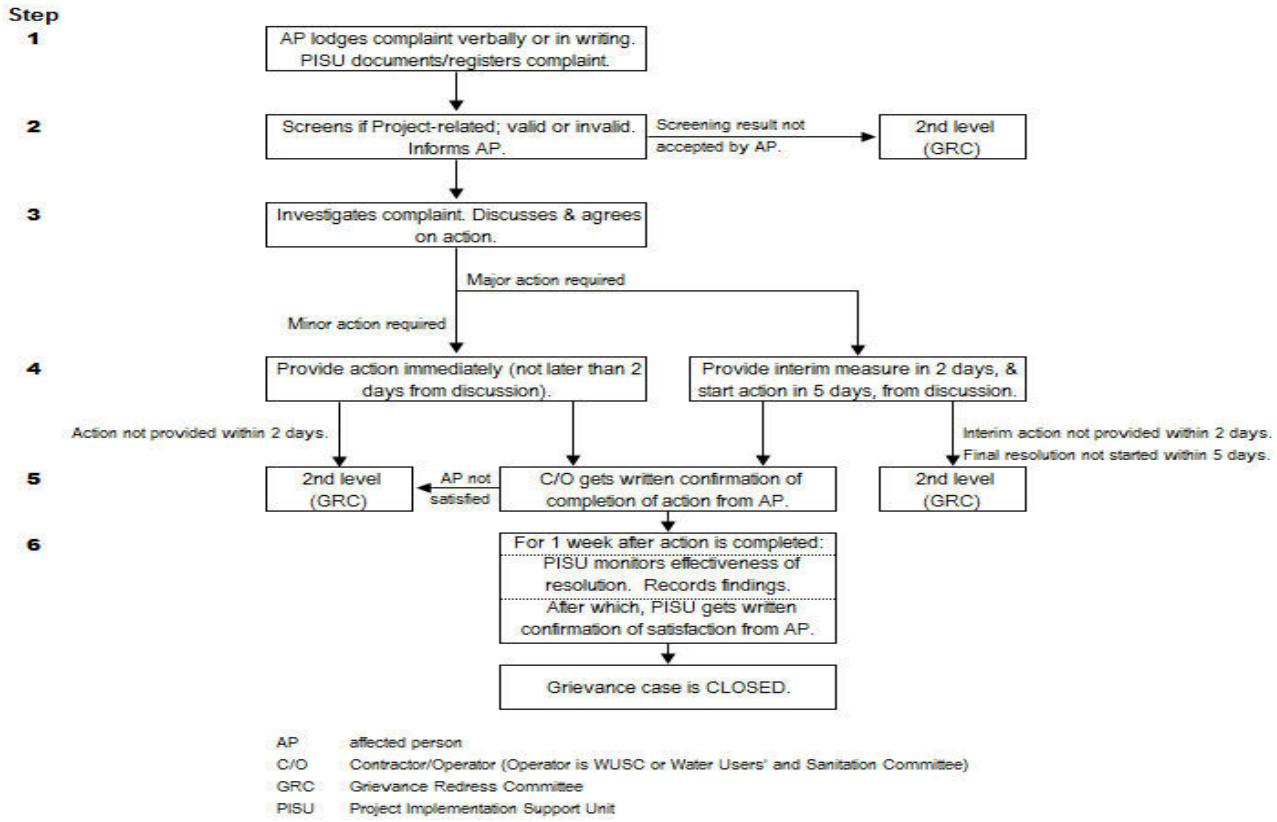


Figure 8.2: GRM First Level

IX. ENVIRONMENTAL MANAGEMENT PLAN

236. 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.

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

A. Institutional Arrangement

238. The Ministry of Urban Development (MoUD) will be the executing agency with responsibility of subproject execution agency with responsibility of subproject execution delegated to the Department of Water Supply and Sewerage (DWSS). The Water Supply and Sanitation Division/Sub-division Office (WSSDOs) are the subproject implementing agencies. Water User's and Sanitation Committees of participating towns are the implementing agencies.

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

- The MoUD will deputize a qualified staff to act as the Environmental Safeguard Officer of the Project management office (PMO).
- The MoUD will establish the grievance redress mechanism, including setting up the Grievance Redress Committee.
- The Water Supply and Environmental Division of the MoUD will be responsible for reviewing the EIA Report prior to submission to the Ministry of Science, Technology and Environment (MoSTE) for reviewing and approval.
- The DWSS will review the IEE/EIA Report prepared by the Design and Supervision Consultant's Team's Environmental Safeguard Expert (DSMC-ESE) prior to forwarding this to MoUD.
- The DWSS 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 and Supervision Consultants that will be appointed to prepare the subprojects.

B. Safeguard Implementation Arrangement

8.1.1. Project Management Office (PMO)

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

i. Confirm existing IEEs/EMPs are updated based on detailed designs and that new IEEs/EMPs are prepared in accordance with the EARF and government rules;
ii. Confirm whether EMPs are included in bidding documents and civil works contracts;
iii. Provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by regional project management offices (Eastern RPMO and Western RPMO) and contractors;
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 RPMOs to properly carry out the environmental monitoring and assessments as per the EARF;
vii. Review, monitor and evaluate the effectiveness with which the EMPs are implemented, and recommended necessary corrective actions to be taken as necessary;
viii. Consolidate monthly environmental monitoring reports from RPMOs and submit semi-annual monitoring reports to ADB;
ix. Ensure timely disclosure of final IEEs/EMPs 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 IEEs.

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

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

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

8.1.3. Civil Works Contracts and Contractors

241. EMPs are to be included in bidding and contract documents and verified by the PMO and RPMOSs. The contractor will be required to designate an environment supervisor to ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their 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, on (b) equal pay for equal work of equal value regardless of gender, ethnicity or caste, and on (c) elimination of forced labor; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/AIDS to employees and local communities surrounding the project site. Contractors will only starts the civil works activities in communities surrounding the project site. Contractors will only starts the civil works activities in the section/subproject sites that has IR/IPP impacts upon the completion of RP/IPP implementation and after receiving clearance from the WUSC and endorsed by RPMO's SDO.

8.1.4. Capacity Building

242. The PMC safeguards experts (environmental and social) will be responsible for training the; (i) PMO's safeguards officers (environmental and social); (ii) RPMOs' engineers and social development officers. Training modules will need to cover safeguards awareness and management 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 IEEs and integration into the project detailed design;
iv. Improved coordination within nodal departments; and

v. Monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites.

8.1.5. Water Users and Sanitation Committees (WUSCs)

243. WUSCs are the eventual operators of the completed subprojects. The key tasks and responsibilities of the WUSCs 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/EIA/
- 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/EIA Reports.
- Facilitate public consultations, 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.

8.1.6. Licensed and accredited laboratory

244. 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.

Table 9.1: Environmental Management Plan (EMP) Matrix

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
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, RPMOS,& DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract	N/A
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 activities. 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 spoils management plan (see Annex E)for outline.	DSMC, RPMOS	List of affected utilities and operators; Bid document to include requirement for a contingency plan for service interruptions (example provision of water if disruption is more than 24 hours), spoil management plan (see Annex E for outline).	During detailed design phase Review of spoils management plan: Twice (once after first draft and once before final approval)	
Drinking water supply	Extraction of unsatisfactory raw water quality Delivery of unsafe water to the	During the detailed engineering design stage, water samples from deep tube well & shallow well were tested. Tests revealed iron content and coliforms as beyond standards limits. This information has guided design of water treatment plant. Design proposes basic treatment using lime dosing, pressure filter and disinfection using	OMO, RPMOS & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	distribution system Inadequate protection of intake well Health Hazards arising from inadequate design of facilities for receiving, storing and handling of Cl & other hazardous chemicals	$Ca(ClO)_2$ and provisions for lab unit and kits. This IEE proposes "hands on" training by a licensed & accredited laboratory for the first few years of operation under the Water Safety Plan included in the subproject design & continuing training thereafter. Intake well has adequate land for perimeter fencing to keep animals away from grazing nearby. Appropriate casing of tube wells including the installation of screens. Intake well to be located at leastv30m upstream from sanitation facilities. Where this cannot be maintained; (i) septic tanks will need to be sealed (water tight) and emptied as per the design requirements; (ii) tube wells to be cased appropriately and installation of a screen; and (iii) a test pit should be established and water quality monitoring should be conducted regularly (at least once every quarter). Disinfection of the tube well should be conducted prior to commissioning and after repairs Design has included a "housed" dosing unit with appropriate ventilation, bunding and training for staff in handling as per material, safety data sheets (MSDS).				
Sanitation (Toilets and septage disposal)	Contamination of drinking water source and other environmental	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	PMO, RPMOS, & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	receptors from household and public toilets Risk to public and environmental health due to inappropriate sitting and design of septage disposal pit	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 septage disposal site will ensure no disturbances to nearby Janaki community Forest. The facility will have water tightness, arrangement for inlet-outlet , access ports for inspection and de-sludging. 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.				
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, RPMOS	List of selected sites for construction work camps, stockpile areas, storage areas, and disposal areas. Spoil disposal site identified at the open land of bank of	During detailed design phase	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
				karnali river		
Sources of materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution	Prepare list of approved quarry sites and sources of materials	DSMC, RPMOS	List of approved quarry sites and sources of materials; (ii) Bid document to include requirement for verification of	During detailed design phase, as necessary with discussion with detailed design engineers and PIUs suitability of sources and permit for additional quarry sites if necessary.	N/A
EMP Implementation Training	Irreversible impact to the environment, workers, and community	Project manager and all key workers will be required to undergo EMP implementation including spoils management, standard operating procedures (SOP) for construction works; health & safety (H&S), core labor laws, applicable environmental laws, etc.	PMO, RPMOs and DSMC. Contractor's Environmental Supervisor	Proof of completion (safeguards Compliance Orientation) Posting of proof of completion at worksites Posting of EMP at worksites	During detailed design phase prior to mobilization of workers to site	Training is the responsibility of the PMO & RPMOS.
2. During Construction Activities						
A. Physical Characteristics						
Topography landforms, geology and soils and/or river morphology and hydrology	Significant amount of sand, gravel or crushed stone will be required for this subproject. Extraction of natural aggregate materials may cause localized changes in topography and	Contractor's should be required to first utilize readily available sources with environmental clearance and license to and that still have a high ratio of extraction capacity over loss of natural state. Borrow areas and quarries (if these are being opened up exclusively for the subproject) must comply with environmental requirements, as applicable. No activity will be allowed until formal	Contractor	Records of sources of materials	Monthly by RPMOS	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	landforms (if on land) or river morphology and hydrology (if on river). The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures	agreement is signed between PIU, landowner and contractor. Coordinate with MoSTE, DDC, and local authorities regarding restrictions in quarrying from rivers. As much as possible, alternative source should be identified.				
Water quality	Trenching and excavation, run-off from stockpiled materials and chemical contamination from fuels and lubricants may result to silt-laden runoff during rainfall which may cause siltation and reduction in the quality of adjacent bodies of water. The impacts are negative but short-term , site-specific within a relatively small area and reversible by mitigation measures	Prepare and implement a spoils management plan (see Appendix for outline). Prioritize re-use of excess spoils and materials in construction activities. If spoils will be disposed, consult with district development committee on designated disposal areas. All earthworks must to 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 minimize the wastage of water in the construction activities 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	Contractor	Areas for stockpiles storage of fuels and lubricants and waste materials; Number of silt traps installed along trenches leading to water bodies; Records of surface water quality inspection; Effectiveness of water management measures; No visible degradation to nearby drainage, water bodies due to construction activities	Visual inspection by RPMOS and DSMC-ESS on weekly basis Frequency and sampling sites to be finalized during detailed design stage and final location of subprojects components	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		bodies. Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low lying areas. While working across or close to any water body, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water of any watercourse and cross drainage channels. Monitor water quality according to the environmental management plan.				
Air quality	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, and hydrocarbons) which will affect people who live and work near the sites. The impacts are negative but short-term, site specific within a small relatively small area and reversible	Confine earthworks that should be part of the working document. Water 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. Hoarding active work sites in populated areas Require trucks delivering aggregates and cement to have tarpaulin cover and maintain a minimum of 2" free board. Limit speed of construction vehicles in access roads and worksites to maximum of 30kph. Arrangements to control dust through provision of water sprinklers.	Construction Contractor	Location of stockpiles; Number of complaints from sensitive receptors; Certification that vehicles are compliant with air quality standards as per NVMES.	Visual inspection by RPMOS & DSMC-ESS on monthly basis Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	by mitigation measures					
Acoustic environment	Construction activities will be on settlements along and near schools, and areas with small-scale businesses. Temporary increase in noise level and vibrations may be caused by excavation equipment, and the transportation of equipment materials, and people. However, the proposed subproject will follow existing ROW alignment and impact is short-term, site specific and within a relatively small area. The impacts are negative but short-term, site specific within a relatively small area and reversible by mitigation measures. The pump stations and RVTs lying	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 (Chief district office), local police/traffic office so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. Restrict noisy activities if possible during the daytime. Overtime work should avoid using noisy/high noise generating equipment. Limit engine idling to maximum 5 minutes. Minimize drop heights when loading and unloading coarse aggregates. Spread out schedule of materials, spoil & waste transport 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	Contractor	Number of complaints from sensitive receptors; Use of silencers in noise –producing equipment and sound barriers; Equivalent day and night time noise levels	Visual inspection by RPMOS & DSMC-ESS on monthly basis Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	close to schools and office buildings should be given extra precautions and care during construction phase.	shall be fitted with exhaust silencers. Use silent type generators (if required) Monitor noise levels. Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10m or more from the vehicle/s.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. Workers in a posted noise hazard area must wear hearing protection. 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.				
Aesthetics	Removal of aesthetics value	Prepare a debris disposal plan. Remove all construction and demolition wastes on a daily basis Coordinate with district development office for beneficial uses for excess excavated soils or immediately dispose to designated areas. Avoid stockpiling of any excess spoils. All vehicles delivering fine materials to the site and carrying debris for disposal shall be covered to avoid spillage. All existing roads used by vehicles of the contractor, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. Lightning on construction sites shall be pointed downwards and away from oncoming traffic and	Contactor	Number of complaints from sensitive receptors; Worksite clear of wastes such as oil/fuel; Worksite clear of any wastes, collected materials from drainages, unutilized materials and debris; Transport route and worksite cleared of any dust/mud.	Visual inspection by RPMOS & DSMC-ESS on monthly basis Frequency and sampling sites to be finalized during detailed design stage and final location of sub project components	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		nearby houses. In areas where the visual environment is particularly important or privacy concerns for surrounding building exist, the site may require screening. This could be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction. The site must be kept clean to minimize the visual impact of the site. Manage solid waste according to the following preference hierarchy; reuse, recycling and disposal to designated areas.				
B. Biological Characteristics						
Biodiversity	Activities being located in WUSC acquired area. There are no protected areas in or around subproject sites.	Check if tree-cutting will be required during detailed design stage. No trees, shrubs, or groundcover may be removed or vegetation. All efforts shall be made to preserve trees by evaluation of minor design adjustments/alternatives (as applicable) to save trees. The alignment in community forest should avoid trees (as far as possible), and in case of tree felling prior coordination and approval from the CFUG should be obtained. Such records should be kept.	Contractor	PIU and PMO to report in writing the number of trees cut and planted if tree-cutting will be required (to be determined during detailed design stage); Number of complaints from sensitive receptors on disturbance of vegetation, poaching fishing, etc.	Visual inspection by RPMOS & DSMC-ESS on monthly basis Frequency and sampling sites to be finalized during detailed design stage and final location of subprojects components.	N/A
C. Socioeconomic Characteristics						
Existing provisions for pedestrians and	Road closure is not anticipated. Hauling of construction	Prepare and implement a traffic management plan	Construction Contractor	Traffic route during construction works including number of	Visual inspection by RPMOS & DSMC-ESS on monthly basis	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
other forms of transport	materials and operation of equipment onsite can cause traffic problems. However, the proposed subproject will follow existing ROW alignment. The impacts are negative but short-term, site specific within a relatively small area and reversible by mitigation measures.	Transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. Maintain safe passage for vehicles and pedestrians throughout the construction period. Schedule truck deliveries of construction materials during periods of low traffic volume. Erect and maintain barricades including signs, markings, flags and flagmen informing, diversions and alternative routes when required. Notify affected sensitive receptors by providing sign boards by providing sign boards informing nature and duration of construction activities and contact numbers for concern/complaints. Leave spaces for access between mounds of soil. Provide walkways and metal sheets where required to maintain access across for people and vehicles. Increase workforce in front of critical areas such as institution, place of worship, business establishment, hospitals, and schools. Consult business and institutions regarding operating hours and factoring this in work schedules. Ensure there is provision of alternate access to businesses and institutions during construction activities, so that there is no closure of these shops or any loss of clientage. Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.		permanent signs, barricades and flagmen on worksite as per Traffic Management plan (see Annex E for sample); Number of complaints from sensitive receptors; Number of signage placed at project location. Number of walkways, signage, and metal sheets placed at project location	Frequency and sampling sites to be finalized during detailed design stage and final location of sub project components.	

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
Socio-economic status	Manpower will be required during the construction stage. This can result to generation of contractual employment and increase in local revenue. Thus potential impact is positive and long term.	Priority hiring of labor force from communities in the vicinity of the site. This will have the added benefit of avoiding social problems that sometimes occur when workers are imported into host communities, and avoiding environmental and social problem from workers housed in poorly serviced camp accommodation. Secure construction materials from local market.	Construction Contractor	Employment records; Records of sources of materials Records of compliance to Nepal Labor Act 1992, district wages	Visual inspection by RPMOS &DSMC-ESS on monthly basis Frequency and sampling sites to be finalized during detailed design stage and final location of subproject components	N/A
Other existing amenities for community welfare	Although construction of subproject components involves quite simple techniques of civil works, the invasive nature of excavation and the subproject sites being in built-up areas of town where there are a variety of human activities, will result to impacts the sensitive receptors such as residents businesses, and the community in general. Excavation may also damage existing infrastructure (such	Obtain details information on location of all existing infrastructure, and plan excavation carefully to avoid any such sites to maximum extent possible; Integrate construction the various infrastructure subprojects to be conducted in town (roads, water supply, etc.) so that different infrastructure is located on opposite sides of the road where feasible and roads and inhabitants are not subjected to repeated disturbance by construction in the same area at different times for different purposes. Consult with local community/district development committee/local administration to inform them of the nature, duration and likely effects of the construction work, and to identify any local concerns so that these can be addressed. Existing infrastructure (such as water distribution pipes, electricity pylons, etc.) shall be relocated before construction starts at the sub project sites.	Construction contractor	Utilities Contingency Plan Number of complaints from sensitive receptors	Visual inspection by RPMOS & DSMC-ESS on monthly basis Frequency and sampling site s to be finalized during detailed design stage and final location of sub project components	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
	as water distribution pipes, electricity pylons, etc.) located alongside the roads. The impacts are negative but short-term, site specific within a relatively small area and reversible by mitigation measures.	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 pre work conditions.				
Community health and safety	Construction works will impede the access of residents and business in limited cases. the impacts are negative but short-term, site specific within a relatively small area and reversible by mitigation measures.	Contractor's activities and movement of staff will be restricted to designated construction areas. Locations of hot –mix plants, batching plants and crushers (if these establishments are being set up exclusively for the sub projects) shall be shall be located at least 100 m away from the nearest dwelling preferably in the downwind direction. Consult with district development committee on the designated areas for stockpiling of soils, gravel, and other construction materials. If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission in writing from the land owners and approval from the DSMC. Use small mechanical excavator to attain faster trenching progress Recycling and the provision of separate waste receptacles for different types of waste shall be encouraged.	Contractor	Number of permanent signs, barricades and flagmen on worksites as per Traffic Management Plan (see Appendix 4 for sample); Number of complaints from sensitive receptors; Number of walkways, signs, and metal sheets placed at project location Agreement between landowner and contractors in case of using private land as work camps storage areas etc.	Visual inspection by RPMOS & DSMC-ESS on weekly basis Frequency and sampling sites to be finalized during detailed design stage and final location of sub project components	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		Construction of temporary toilet facility should be encouraged with proper soak pit A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: (i) no alcohol/drugs on site; (ii) prevent excessive noise; (iii) construction staff are to make use of the facilities provided for team; (iv) no fires permitted on site expect if needed for the construction works; (v) trespassing on private/commercial properties adjoining the site is forbidden; (vi) other than pre-approved security staff , no workers shall be permitted to live on the construction site; and (vii) no worker may be forced to do work that is potentially dangerous or that he/she is not trained to do. Interested and affected parties need to be made aware of the existence of the complaints book and the methods of communication available to them. The contractor must address queries and complaints by: (i) documenting details of such communications; (ii) submitting these for inclusion in complaints register; (iii) bringing issues to the environment management specialist's attention immediately; and (iv) taking remedial action as per environment management specialist's instruction. The contractor shall immediately take the necessary remedial action on any complaint/grievance received by him and forward the details of the grievance along with the action taken to the PIU within 48 hours of receipt of such complaint/grievance.				

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
Workers Health & safety	There is invariably a safety risk when construction works such as excavation and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can arise from working in height and excavation works. Potential impacts are negative and long-term but reversible by mitigation measures.	Comply with requirements of Labor Act 1992 of GoN and standards on workers' health and safety (H&S). Ensure that all site personnel have a basic level of environmental awareness training. If necessary, the environmental management specialist and/or a translator shall be called to the sites to further explain aspects of environmental or social behavior that are unclear. Produce and implement a site H&S plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (vests/cloths with reflectors, footwear, helmets, gloves, goggles and masks) at all times; (iii) providing H&S training for all site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances. Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work camps. Ensure (i) uncontaminated water for drinking, cooking and washing, (ii) clean eating areas where workers are not exposed to hazardous or noxious substances; and (iii) sanitation facilities are available at all times.	Contractor	Site –Specific H&S plan Equipped first-aid stations Medical insurance coverage for workers Number of accidents Records of supply of uncontaminated water Condition of eating areas of workers Record of H&S orientation trainings Use of personal protective equipment % of moving equipment outfitted with audible back-up alarms Permanent sign boards for hazardous areas Signage for storage and disposal areas Condition of	Visual inspection by RPMOS (monthly) and DSMC-ESS on weekly basis. Frequency and sampling sites to be finalized during detailed design stage and final location of sub project components	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		Provide medical insurance coverage for workers; Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective equipment , and preventing injuring to fellow workers; Provide visitor orientation if visitors to the site can gain access to areas where hazardous condition or substances may be present. Ensure also that visitor's do not enter hazard areas unescorted; Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; Ensure moving equipment is outfitted with audible back-up alarms; Mark and provide sign boards for restricted areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors and the general public as appropriate; and Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.		sanitation facilities for workers		
D. Historical, Cultural, and Archaeological Characteristics						
Physical and	There are no	Stop work immediately to allow further	contractor	Records of chance	Visual inspection by	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
cultural heritage	scheduled or unscheduled archaeological, paleontological, or architectural sites of heritage significance listed by local and/ or national authority and/or internationally (UNESCO) within or adjacent to sub project sites.	investigation if any finds are suspected.		finds	RPMOS and DSMC-ESS on Monthly basis. Frequency and sampling sites to be finalized during detailed design stage and final location of sub project components	
E. Others						
Submission of EMP implementation Report	Unsatisfactory compliance to EMP	Appointment of environment supervisor to ensure EMP implementation Timely submission of monitoring reports including pictures.	Contractor	Availability and competency of appointed supervisor Monthly report	Monthly monitoring report to be submitted by RPMOS to PMO PMO to submit semi-annual monitoring report to ADB	N/A
3. Post Construction Activities	Damage due to debris, spoils, excess construction materials	Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and All excavated roads shall be reinstated to original condition. All disrupted utilities restored All affected structures rehabilitated /compensated The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up.	Contractor	RPMOS/PMO report in writing that (i) worksite is restored to original conditions; (ii) camp has been vacated and restored to pre-project conditions; (iii) all construction related structures not relevant to O&M are removed; and (iv) worksite clean-up is satisfactory.	Prior to turn-over of completed works to WUSC	Cost for implementation of mitigation measures responsibility of contractor

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area hall be top soiled and regressed using the guidelines set out in the revegetation specification that forms part of this document. The contractor must arrange the cancellation of all temporary services. Request PMO/PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.				
Environmental legislation compliance	Lack of awareness amongst project managers and WUSC in operating systems as per required legislation and IEE requirements	Capacity strengthening of the WUSC and continuing capacity strengthening of Project staff; and ensuring compliance with NDWQS, applicable conditions in IEE approvals and license for use of water resource.	PMO, RPMOs, DSMC and WUSC	Monitoring reports and checking operations against O&M manuals and permits/clearances	After commissioning of systems and semi annually	N/A
Drinking water supply system	Delivery of unsafe Water	The operations and maintenance plan and training for staff will cover; (i) competent/cautions handling and storage of chemicals and qualified persons to implement/oversee disinfection and treatment; (ii) providing safe storage for chemicals; (iii) ensure capacity of WUSC to implement quick response to hazardous substance/waste spills; (iv) implement SPS-complaint EMP and a water safety plan; and (v) monitor water quality.	PMO, RPMOs, DSMC and WUSC	Water Quality reports WTP records in the log book	During O&M of the system Quarterly monitoring	N/A
	Excessive algal growth in reservoirs.	The water tanks are designed to be closed. In addition; (i) maintenance of chlorine residual in the system at all times including the cleaning of	WUSC	Water quality results	During O&M of the system. Daily maintenance of	N/A

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost and Source of Funds
		reservoirs as per the O&M schedule.			chlorine residual , cleaning.	
Sanitation facilities (toilets and septage disposal site)	Contamination to land or water ways due to overflow of septic tanks and/or uncontrolled dumping of septage	The subproject incorporates a pilot for controlled disposal of septage. This is to reduce the likelihood of uncontrolled septage disposal to land and local water ways (nallas) which is currently practiced. Further septic tanks will be designed to ensure maximum retention is achieved and will be emptied at the required frequency (min every 3 years). Households will be educated on the above to further reduce the likelihood of septic tank overflows and uncontrolled dumping of septage.	WUSC, DSMC, RPMOs and PMO for education campaign	Sanitary inspection reports. Water quality re[orts from test pits near tube well sites	During O&M of the system.	N/A

C. Environmental Monitoring Program

245. Environmental monitoring will be done during construction on three levels:
(i) Monitoring development of project performance indicators by the PMO-ESS;
(ii) Monitoring implementation of mitigation measures by the Contractor; and
(iii) Overall regulatory monitoring of environmental issues by the PMO.

D. Institutional Capacity Development Program

246. 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.

247. WUSC does not have the capacity to monitor the quality of supplied water as prescribed in the NDWQS and its Directives. Albeit monitoring kits and laboratory rooms will be provided, this would not guarantee WUSC can handle monitoring appropriately. DWSS has five regional laboratories; however some are not functioning fully due to lack of manpower. 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 the WUSC actively participating to develop WUSC capacity. The conduct of 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 capacity of the 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 the WUSC. A Water Safety Plan is included in subproject design and will oblige the operator to carry out water quality monitoring accordingly. The amount of NPR 500,000 will be provided annually to implement the Plan. There will be sufficient fund to include training by the licensed and accredited lab, while monitoring water quality.

248. The PMO-ESS will be responsible for trainings on environmental awareness and management in accordance with both ADB and government requirements. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training program along with the frequency of sessions is presented in Table 9.2.

Table 9.2: Training Program for Environmental Management

Items	Pre-construction/prior to construction	Construction	
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 implementation of EMP
Contents	**Module 1:** Orientation ADB Safeguards Policy Statement Government of Nepal Environmental Laws and Regulations	Roles and responsibilities of officials/contractors/consultants towards protection of environment Environmental issues during construction	Experiences on EMP implementation – issues and challenges Best practices followed

Items	Pre-construction/prior to construction	Construction	
	Module 2: Environmental Assessment Process ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements Review of environmental assessment report to comply with ADB requirements Incorporation of EMP into the project design and contracts	Implementation of EMP Monitoring of EMP implementation Reporting requirements	
Duration	1 day	1 day	1 day on a regular period to be determined by PMO, PIUs, and (provide if PMC or DSC)
Participants	Executing and implementing agencies, PMO, and PMO staffs (technical and environmental) involved in the project implementation	PMO PIUs Contractors	PMO PIUs Contractors

E. Staffing Requirement and Budget

249. 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.

250. The infrastructure involved in each scheme is generally straightforward to build. 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.

251. 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.

252. The operation phase mitigation measures are again of good operating practices, which will be the responsibility of the WUSC. All monitoring during the operation and maintenance phase will be conducted by WUSC. The Water Safety Plan, included in each subproject design, will allocate NPR 500,000 annually for operation and maintenance particularly water quality monitoring. If a licensed laboratory will be engaged for the first 2-3 years of operation for training purposes, the cost can be accommodated under the Water Safety Plan.

253. The indicative costs of EMP implementation are shown in Tables 9.3 (by source of funds).

Table 9.3: Indicative Cost of EMP Implementation

	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
A.	**Mitigation Measures**						
1.	Compensatory plantation measures	Construction	Per tree				Civil works contract

	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
B.	**Monitoring Measures**						
1.	Water quality monitoring	- Pre-construction - Construction	Per location			540,000.00	Civil works contract
C	**Capacity Building**						
1.	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguards Policy Statement, Government of Nepal environmental laws and regulations, and environmental assessment process; (ii) induction course contractors, preparing them on EMP implementation and environmental monitoring requirements related to mitigation measures; and taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation; and (iii) lessons learned information sharing	**Module 1** – immediately upon engagement of the (provide if PMC or DSC) environmental specialists **Module 2** – prior to award of civil works contracts (twice a year for 4 years) **Module 3** – prior to start of Phase 2 and upon completion of the project	lump sum	1 8	Module 1 – 300000.00 Module 2 – 100000.00 Module 3 – 200000.00	300,000.00 800,000.00 200,000.00	Covered under PMC or DSC contract
D.	**Manpower Costs**						
1	PMO Environment Safeguards Officer	Construction phase	1	20	65000.00	1300000.00	Budget covered through PMC
2	PISU Environment Safeguard Assistants	Construction phase	2	20	25000.00	1,000,000.00	Budget covered through DSC
3	PMO Environmental Safeguard Specialist	Responsible for environmental safeguards of the project at PMO level	person months (spread over entire project implementation period)	24 person months	350000.00 per person month	8,400,000.00	Remuneration and budget for travel covered in the PMC contract
4	DSC Environmental Safeguard Specialist	Responsible for environmental safeguards of the project at PIU level	person months (spread over entire project implementation period)	20 person months	300000.00 per person-month	6,000,000.00	Remuneration and budget for travel covered in the DSC contract
E.	Administrative Costs						
1.	Legislation, permits,	Permit for excavation,	Lump		XXX	XXX	These

	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
	and agreements	tree-cutting permits, etc	sum				consents are to be obtained by contractor at his own expense.
		Environmental assessment and environmental clearances as per EPA 1996 and EPR, IEE presentation at review committee related expenses	Lump sum	1	50000.00	50000.00	50000.00
F.	Other Costs						
1.	Public consultations and information disclosure	Information disclosure and consultations during preconstruction and construction phase, including public awareness campaign through media	As per requirement	Lump sum		550000.00	Covered under DSC contract
2.	GRM implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination)		Lump sum		200,000.00	PMO cost
3.	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 insurance defect liability period
		TOTAL				**19,340,000.00**	

F. Implementation Schedule

254. Environmental management will be implemented from the detailed design phase through to procurement, construction and operation. Table 9.4 presents the indicative time frame of key EMP activities in relation to subproject implementation schedule.

Table 9.4: Environmental Management Implementation Schedule

Activity		Indicative Time Frame
SUBPROJECT 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
ENVIRONMENTAL MANAGEMENT		
Overall		
1.	Project Management Consultant (PMC)-Engagement of Environmental Specialist	Starting Q4 Y0 (5 yrs of intermittent inputs)
2.	PMO's submission of Environmental Monitoring Report (EMR)	

	Activity	Indicative Time Frame
	Monthly EMR for subproject's Monthly Progress Report	8th day after effective month
	Semi-Annual EMR during construction for submission to ADB	8th day after effective 6-mo. period
	Annual EMR for submission to ADB	8th day after effective year
Prior to Construction Mobilization		
1.	Finalization of EMP, (if applicable) revision of IEE	Q2 Y0
2.	ADB review & approval of revised IEE & EMP.	Q 2 Y0
3.	Obtaining Government's approval of IEE Report	Q2 Y0 – Q3 Y0
4.	Community preparation (including disclosure of Final IEE &it's EMP)	Q4 Y0
5.	Establishment of baseline data (as set out in the EMP)	Q4 Y0 (shall have been done prior to award of contract)
6.	Preparation of C-EMP by selected Contractor, review of C-EMP	Q4 Y0, before Notice to Proceed is
	against SPS-compliant EMP.	Given
Construction Period		
	Mobilization to Demobilization	
1.	Implementation of mitigation measures and conduct of environmental effects monitoring following the C-EMP.	Q4 Y0 – Q4 Y2
2.	Submission of Environmental 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
Operation Period (potentially could start even before DLP is over)		
1.	Implementation of mitigation measures & monitoring activities as specified in the EMP	Starting anytime between Q3 Y3 & Q1 Y4
2.	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

X. MONITORING AND REPORTING

255. 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 EIAs/IEEs for the projects. In addition to recording information on the work and deviation of work components from original scope PMO, PIUs, and (provide if PMC or DSC) will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome.

256. 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 G. Subproject budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

257. For subprojects 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

258. ADB will review project performance against the MoUDs 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:

a. Conduct periodic site visits for projects with adverse environmental or social impacts;
b. Conduct supervision missions with detailed review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
c. Review the periodic monitoring reports submitted by EAs to ensure that adverse impacts and risks are mitigated, as planned and as agreed with ADB;
d. 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
e. Prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

XI. CONCLUSION AND RECOMMENDATION

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

- The proposed subproject, its components, are not within or adjacent to environmentally sensitive areas.
- The extent of adverse impacts is expected to be local, confined within the subprojects' main areas of influence, quarry or borrowing sites, waste disposal sites, and the routes to and from these sites. Except during windy days and heavy rainfall, fugitive dust, fine aggregates, sediments and/or wastes would not be the transported beyond the aforementioned sites. With mitigation measures in place and ensuring that the bulk of earthworks are completed prior to the onset of the rainy season, the potential adverse impacts during construction would be highly/more site-specific.
- The few adverse impacts of high magnitude during construction will be temporary and short-term (i.e., most likely to occur only during peak construction period). These will not be sufficient to threaten or weaken the surrounding resources. The preparation and implementation of a Contractor's EMP that would address as minimum the requirements of the SPS-compliant subproject EMP will mitigate the impacts and lower their residual significance to acceptable levels. Simple/uncomplicated mitigation measures, basically integral to socially and environmentally responsible construction practices, are commonly used at construction sites and are known to Contractors. Hence, mitigation measures would not be difficult to design and institute.
- During operation, the potential delivery of unsafe water can be mitigated with good operation and maintenance, prompt action on leaks, and complying with the required quality monitoring of supplied water as prescribed in the National Drinking Water Quality Standards Directives.
- The proposed subproject will bring about: (i) the benefits of access to 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 public health, improved quality of life and safe communities as outcomes.

260. Based on the above findings, the classification of the 3rdSTWSSSP as Category B is confirmed, and no further special study or detailed EIA needs to be undertaken to comply with the Safeguard Policy Statement of the ADB. The Government of Nepal EIA will incorporate the findings and recommendations of this IEE and prescribed environmental management in the EMP.

Table 11.1: Proposed Topics for Capacity Building/Training

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

REFERENCES

1. Environmental Protection Act, 1996
2. Environment Protection Regulations, 1997
3. Environmental Protection Rules, 1997, and as amended in 1999 and 2007
4. Final Feasibility Study of Tikapur Town Water Supply and Sanitation Project
5. Final Detailed Engineering Study of Tikapur Town Water Supply and Sanitation Project
6. The Updated Fifteen-Year Development Plan for Small Towns' Water Supply and Sanitation Sector, 2009

Annex A: Approved Terms of Reference

AnnexB: Rapid Environmental Assessment (REA) Checklist for Tikapur Town Sub projects and Preliminary Climate Risk Screening Checklist for Sample Sub Project Towns

Instructions:

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

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

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

Country/Project Title: NEP: Third Small Towns Water Supply and Sanitation Sector Project

Subproject: Tikapur Town Water Supply and Sanitation Subproject

Screening Questions	Yes	No	Remarks
A.Project Siting : Is the project area			
Densely populated?		√	The distribution pipeline will partially go through RoW of road inTikapur, with moderate population density.
Heavy with development activities?		√	The distribution pipeline will partially go through the RoWin bazaars areas of Tikapur. Development activities are of low moderate intensity.
Adjacent to or within any environmentally sensitive areas?			
Cultural heritage site		√	
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay		√	
B. Potential Environmental Impacts Will the Project cause…			
pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and		√	

Screening Questions	Yes	No	Remarks
soil erosion runoff?			
impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	
hazard of land subsidence caused by excessive ground water pumping?		√	High cost involved in pumping will constrain over pumping. EMP recommends the monitoring of pumping & maintaining of records to control pumping to design limit.
social conflicts arising from displacement of communities ?		√	
conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		√	
unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?	√		Basic water treatment is proposed under the Subproject. EMP recommends water quality monitoring as prescribed in the NDWQS & its Directives.
delivery of unsafe water to distribution system?	√		Design proposes monitoring kits, a lab room. EMP recommends continuing training of WUSC in water quality monitoring, as prescribed in the NDWQS Directives.
inadequate protection of intake works or wells, leading to pollution of water supply?	√		Design proposes housing for intake wells, as well as perimeter fencing of the entire land area of the intake wells & associated facilities.
over pumping of ground water, leading to salinization and ground subsidence?		√	High cost involved in pumping will constrain over pumping. EMP recommends monitoring pumping & maintaining record to control pumping to design limit.
excessive algal growth in storage reservoir?	√		EMP provides mitigation measures.
increase in production of sewage beyond capabilities of community facilities?	√		Most of the communities have septic tanks leading to soak pits. EMP provides mitigation measures.
inadequate disposal of sludge from water treatment plants?	√		Minimal sludge expected. EMP provides mitigation measures.
inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		√	
impairments associated with transmission lines and access roads?	√		No water transmission or distribution lines will be affected. Power transmission lines crossing the proposed water transmission &distribution lines will not be

Screening Questions	Yes	No	Remarks
			affected. EMP provides measures to mitigate impacts on power supply poles in the bazaar that are immediately adjacent to, or onto, road carriageways. Associated access roads in bazaars are narrow but paved; elsewhere these are unpaved. Outside bazaars, associated access roads are unpaved, in poor conditions. Impaired access roads will be repaired, as appropriate.
health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.	√		$Ca(ClO)_2$, commonly used in basic water treatment, will be used. EMP provides measures to mitigate health and safety impacts from improper handling, potential accidents &/or human error in dosing.
health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?	√		$Ca(ClO)_2$, commonly used in basic water treatment, will be used. EMP provides measures to mitigate health and safety impacts from improper handling, potential accidents &/or human error in dosing.
dislocation or involuntary resettlement of people?		√	
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	
noise and dust from construction activities?	√		EMP provides mitigation measures.
increased road traffic due to interference of construction activities?	√		EMP provides mitigation measures.
continuing soil erosion/silt runoff from construction operations?		√	
delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?	√		EMP incorporates monitoring of distributed water according to the Directives for the NDWQS.
delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?	√		Concern for corrosion of G.I. pipes caused by the chlorine content in treated water is low. EMP provides mitigation measures.
accidental leakage of chlorine gas?		√	
excessive abstraction of water affecting downstream water users?		√	Water irrigation in the vicinity comes from existing wells near the river.
competing uses of water?		√	
increased sewage flow due to increased water supply	√		Most of the communities have

Screening Questions	Yes	No	Remarks
			septic tanks leading to soak pits. EMP provides mitigation measures.
increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	√		Sullage is currently led to drains or to the backyard to percolate/seep through the ground. There is no wastewater collection & treatment system. EMP provides mitigation measures.
large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	
social conflicts if workers from other regions or countries are hired?	√		Expected as low concern. Priority will be given to local workers.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?	√		EMP provides mitigation measures.
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	√		EMP provides mitigation measures.

Preliminary Climate Risk Screening Checklist for Sample Sub Project Towns

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

	of project outputs (i.e construction materials)		
Performance of Project Outputs	Would climate/weather conditions and related extreme events likely to affect the performance throughout their design life time?	0	Climate conditions will unlikely affect water quantity and quality of water supply system. Ground water for the water supply system will be sourced from the deep aquifers where yield is demonstrated to be sufficient to meet the demand. The water supply schemes will be designed to meet the current and future demand. Further water supply system will be operated and maintained efficiently to reduce system losses. Water safety plans will be implemented to ensure water supplied is safe and potable at all times.

Options for answers and corresponding scores are given below.

Response	Score
Not Likely	0
Likely	1
Very Likely	2

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

Result of Initial Screening (Low, Medium, High): Low

Other comments: None

Annex C: Water Quality Standards

B.3 National Drinking Water Quality Standards, 2006

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

* Health-based guideline values

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

^ These standards indicate the maximum and minimum limits.

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

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

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

Annex D: 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 E: Spoil Management Plan

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

Objectives of SMP: The objectives of SMP are:

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

Structure of SMP:

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

Aspects and Potential Impacts

The key aspects of potential impacts in relation to SMP are listed in table below

Aspects	Potential Impacts
Air Quality	Potential for high winds generating airborne dust from the stock piles
Sedimentation	Potential for sediment laden site runoff from spoil stockpiles and potential for spillage of spoil from truck on roads
Surface and Groundwater	Contamination of 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, mud mix materials, reusable materials

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

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

Identification of possible safe disposal sites for spoil: Those spoils which can't be reuse shall be properly disposed in designated areas, such disposal areas should be identified in project locations. Such disposal areas should be safe from environmental aspects 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 DSC for their review and approval.

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

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

Appendixes

F Photos

G Summary of consultations

H Copies of environmental clearances and permits

I Sample of environmental site inspection Report

J Others

Annex F: Sample Semi-Annual EnvironmentalMonitoring Report Template

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

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

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

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS

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

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

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

COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

a. Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
b. There should be Reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual Report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
c. What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
d. If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;
e. adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;

f. Are their designated areas for concrete works, and refueling;
g. Are their spill kits on site and if there are site procedure for handling emergencies;
h. Is there any chemical stored on site and what is the storage condition?
i. Is there any dewatering activities if yes, where is the water being discharged;
j. How are the stockpiles being managed;
k. How is solid and liquid waste being handled on site;
l. Review of the complaint management system;
m. Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary Monitoring Table

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

Overall Compliance with CEMP/EMP

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

APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

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

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

a. Brief discussion on the basis for monitoring
b. Indicate type and location of environmental parameters to be monitored
c. Indicate the method of monitoring and equipment to be used
d. 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)

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)

Noise Quality Results

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

Annex G:Sample Environmental Site Inspection Report

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION:_____GROUP: _____

WEATHER CONDITION:

_____

INITIAL SITE CONDITION:

_____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory_____ Incident_____ Resolved _____Unresolved _____

INCIDENT:
Nature of incident:

_____

Intervention Steps:

_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

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

Signature

_____

Sign off

_____ _____

Name Name
Position Position

Annex H: Public Notice, Muchulka, Recommendation Letter

खानेपानी तथा ढल निकास विभाग
तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना
टिकापुर खानेपानी तथा सरसफाई आयोजना
प्रारम्भिक वातावरणीय परिक्षणका लागि राय सुझाव पेश गर्ने सम्बन्धमा

सार्वजनिक सूचना

एसियाली विकास बैंकको आर्थिक सहयोगमा कैलाली जिल्लाको टिकापुर नगरपालिका अन्तर्गत वडा नं ३, ४, ६, ७, ८, ९ मा निर्माण हुन लागेको टिकापुर साना शहरी खानेपानी तथा सरसफाई आयोजनाको प्रारम्भिक वातावरणीय परीक्षण (Initial Environmental Examination) को प्रतिवेदन तयार गर्नु पर्ने भएकाले सो आयोजनाबाट भौतिक, जैविक, सामाजिक, आर्थिक एवं सांस्कृतिक प्रणालीहरुमा के कस्ता असरहरु पर्न सक्छन् सो बारे लिखित राय सुझाव सहित १५ (पन्ध्र) दिन भित्र आइपुग्ने गरी निम्न ठेगानामा पठाइ दिनु हुन वातावरण संरक्षण नियमावली २०५४ को नियम ७ (२) अनुसार सम्बन्धित सबैको जानकारीका लागि यो सूचना प्रकाशित गरिएको छ । साथै लिखित राय सुझावको प्रतिलिपी शहरी विकास मन्त्रालय, सिंहदरबार, काठमाडौं र खानेपानी तथा ढल निकास विभाग, पानीपोखरी, काठमाडौंमा उपलब्ध गराइ दिनुहुन समेत अनुरोध गरिन्छ ।

राय सुझाव पठाउने ठेगाना

खानेपानी तथा सरसफाई डिभिजन कार्यालय, कैलाली, टिकापुर फोन नं.: ०९१-५६५२६५ फ्याक्स : ०९१-५६११३८ खानेपानी तथा सरसफाई उपभोक्ता समिति, टिकापुर, कैलाली सम्पर्क नं : ९८५११५१४६७	टेक कन्सल्ट प्रा.लि./आइकन कन्सल्टेन्ट नेपाल प्रा.लि. जे.भी. शंखमूल, काठमाडौं, नेपाल फोन नं.: ४७८१४४६, ४४७०२३३ फ्याक्स : ४७८१४४७, ४४९९८९७	तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना आयोजना व्यवस्थापन कार्यालय पानीपोखरी, काठमाडौं फोन नं.: ९७७-०१-४४२३८६ फ्याक्स : ९७७-०१-४४१३२८७ आयोजना व्यवस्थापन क्षेत्रिय कार्यालय, सुर्खेत रोड नेपालगञ्ज सम्पर्क नं : ९८४१२८३५४८

गोरखापत्र
मिति - २०69 साल फागुन १४ गते बिहीबार

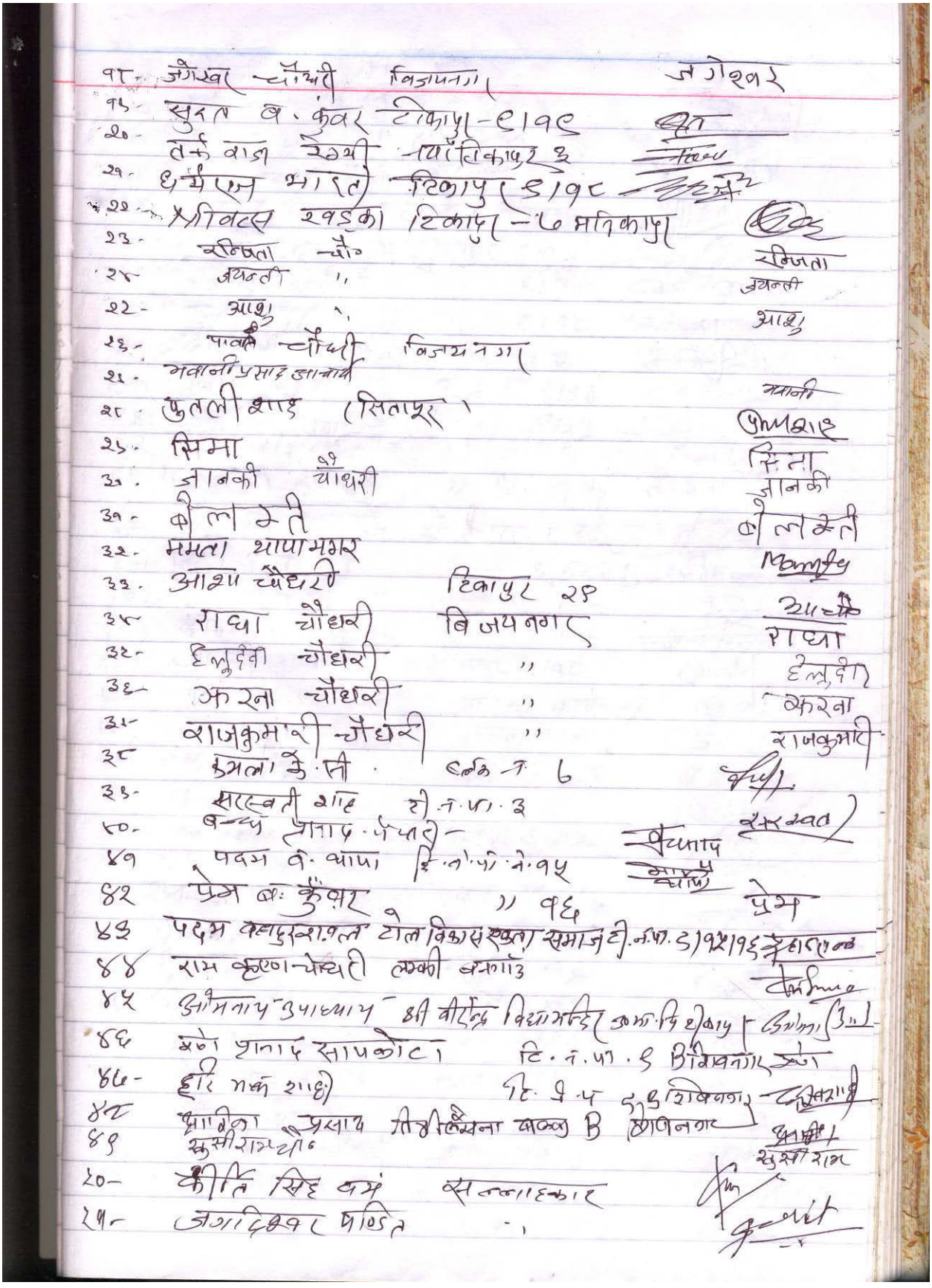
आज मिति २०७२ साल वैशाख २ गतेका दिन यस टीकापुर साना शहरी खानेपानी तथा सरसफाई नगर आयोजना सम्बन्धमा छलफल तथा आयोजनाको प्रस्तुतिकरण भेला टीकापुर सा.श.खा.पा.उ. तथा स.सं. का अध्यक्ष श्री नवराज रावलको अध्यक्षतामा तपसिल बमोजिम को उपस्थितिमा यसी निर्णयहरु गरियो।

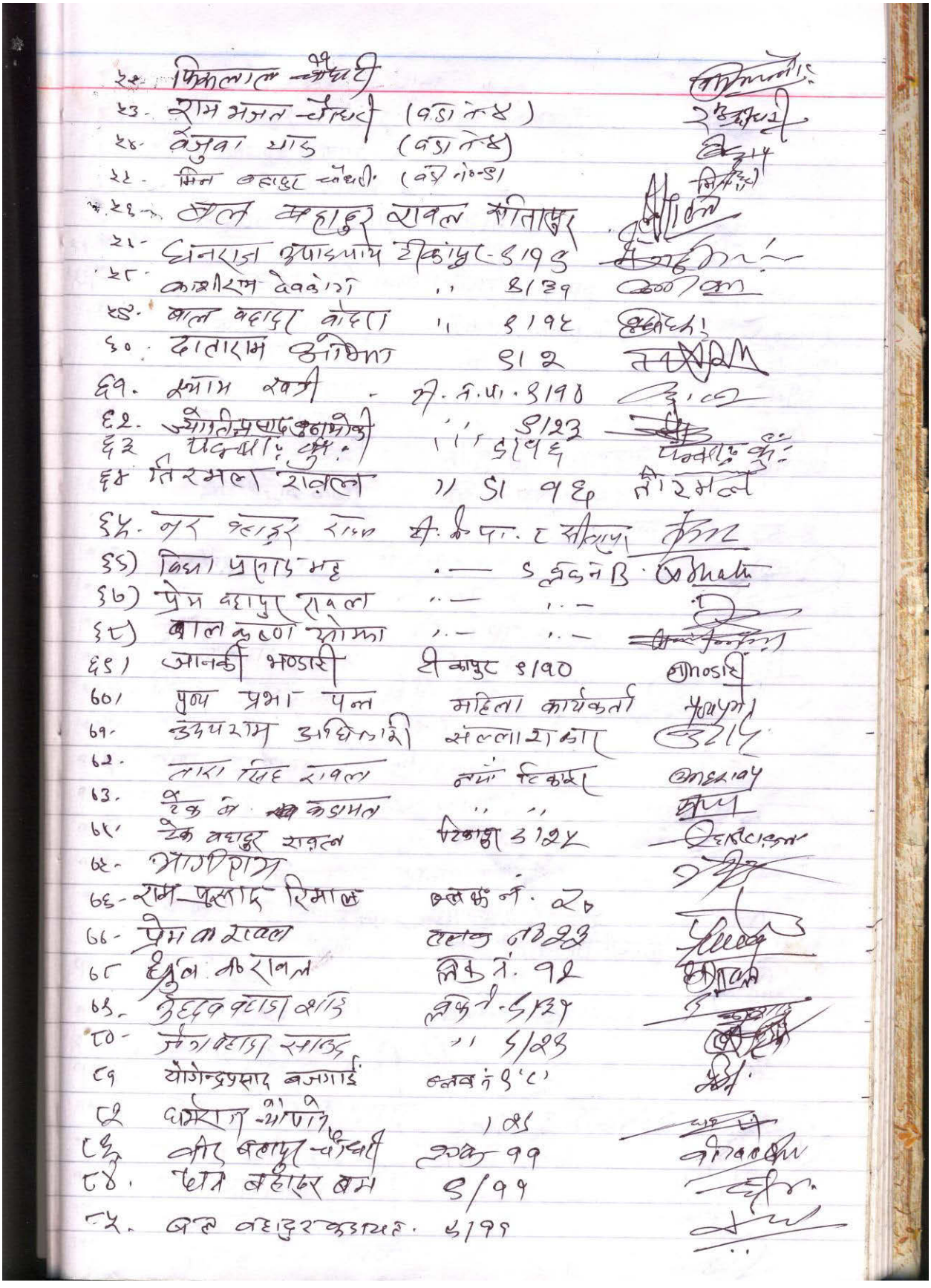
उपस्थिति

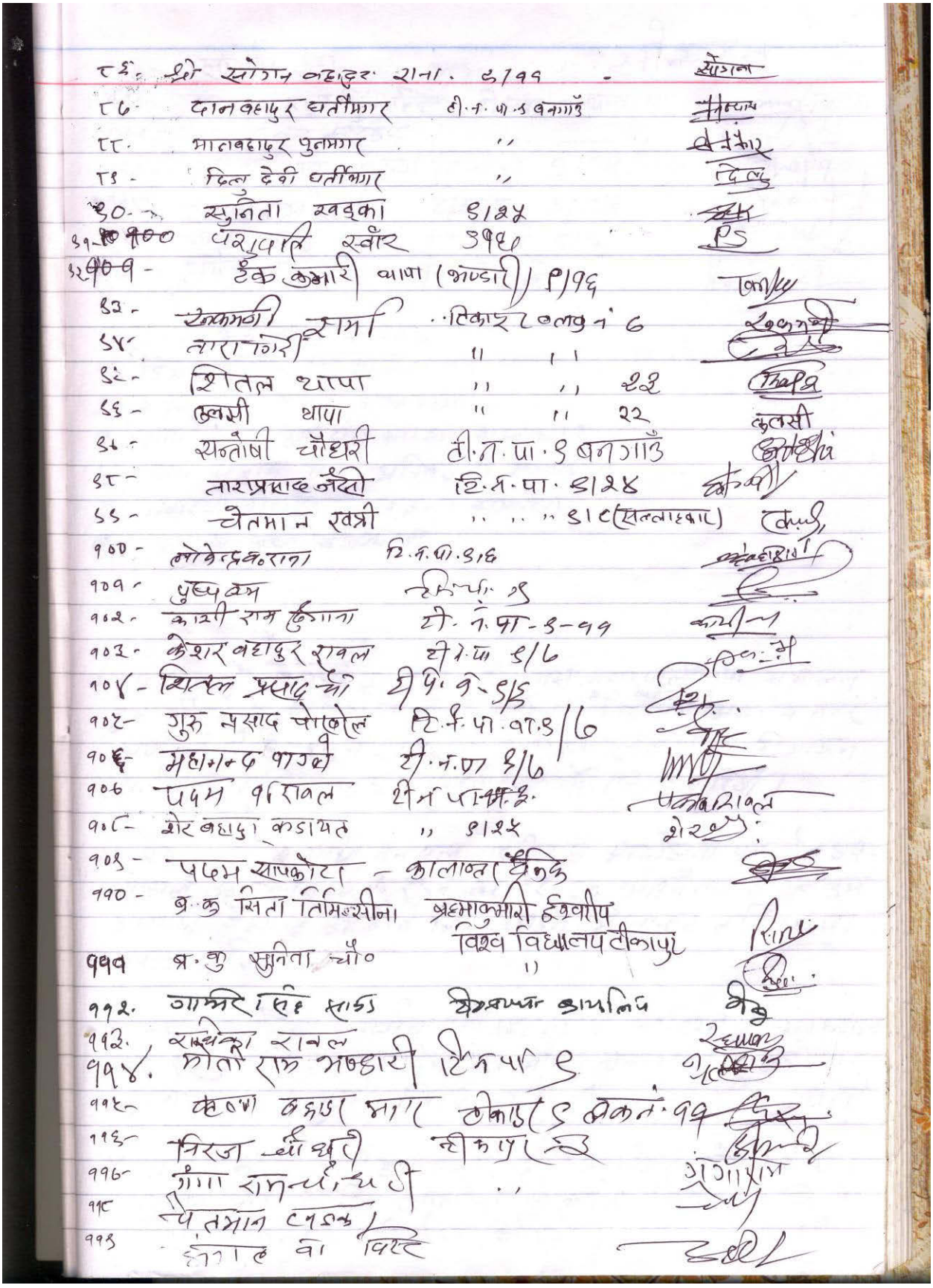
१. श्री नवराज रावल, अध्यक्ष टी.सा.श.खा.पा.उ.स.सं.
२. श्री कमला केसी उपाध्यक्ष ,,
३. श्री भैरव रावल, सचिव ,,
४. श्री प्रेम सिंह विश्वकर्मा, कोषाध्यक्ष ,, — अनुपस्थित
५. श्री नरेश कुमार खत्री, सदस्य ,,
६. श्री प्रकाश बहादुर बुढाथोकी ,, ,, — अनुपस्थित
७. श्री शिवलाल चौधरी ,, ,,
८. श्री दयाराम संज्याल ,, ,, (अनुपस्थित)
९. श्री उषा केसी ,, ,,
१०. श्री केशरी खड्का ,, ,, (अनुपस्थित)

विशेष उपस्थिति

१ दीवाकर प्रसाद ढकाल (अ.कु.) साना शहरी खा.पा. तथा स.आ.
२. भोज विक्रम थापा (वि.आ.प्र.) तेस्रो साना शहरी आयोजना, ने.गं.
३. सुनिल ढकाल (कम्प्युटर) ,, ,, ,,
४. ओमनाथ विष्ट — ,, ,, — ,,
५. कृष्ण ब. वालिया कार्यकर्ता
६. आनन्द मोहन कालिदास, टीम लिडर, आरकन
७.
८. नृप बहादुर खड्का, समाजसेवी टीकापुर-९/१४
९. अमर सिंह रावल, समाजसेवी टीकापुर-९/१४
१०. विष्णु प्र. कोइराला टिकापुर ब्लक १५
११. तेज बहादुर चौधरी टीकापुर - ९ बीच बनगाउँ
१२. पदारथ लाल चौधरी ,, ,, ,,
१३. कुंज लाल चौधरी ,, ,, ,,
१४. जंग ब. चौधरी ,, ,, ,,
१५. राम ब. ,, ,, ,, ,,
१६. चित्र बहादुर केसी ब्लक नं. १०
१७. हरि ब. सुनार ब्लक नं. १२
१८. भक्त तिरुवा ब्लक नं. ३







१२० – सौभाग कुँवर वडा – नं. ११ सोयान

१२१ – झनक राज तिमिल्सिना गैरहुड ३ व्यवसाय

१२२ – लाल ब० खड्का " — "

१२३ – सरिता रावल थापा टिकापुर ३/१५ Thapa

१२४ – गणेश राज रेग्मी टीकापुर ३/३३

१२५ – झलक मान कुँवर टीकापुर ३/६ Jhalak

१२६. तपेन्द्र रावल टीकापुर ३/३

मेलाका प्रस्तावहरु

१. डिजाइन अनुमोदन सम्बन्धमा
२. ५% रकम उठाउने सम्बन्धमा
३. आयोजनाको कार्यक्षेत्र थपघट सम्बन्धमा
४. थप सुझाव तथा प्रतिबद्धता सम्बन्धमा
५. नगरपालिकाको प्रतिबद्धता सम्बन्धमा
~~६. [illegible]~~

निर्णयहरु

१. प्रस्ताव नं. १ माथी छलफल गर्दा यस नगरपालिकामा संचालन हुन गैरहेको तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना अन्तर्गत नगर आयोजनाको आइकन (ICON) द्वारा तयार गरिएको डिजाइन सार्वजनिक गरिए अनुसार अनुमोदन गर्ने निर्णय गरियो ।

२. प्रस्ताव नं. २ माथी छलफल गर्दा यस आयोजना अन्तर्गत उपभोक्ताले उठाउनुपर्ने ५% रकम बराबर हुन आउने लागत रकम आगामी वैशाख २५ गते भित्र उठाउने भेलाबाट प्रतिबद्धता व्यक्त गरियो ।

३. यस आयोजना अन्तर्गत सर्वेक्षण भएको एरिया (क्षेत्र) घटाउन वा थपनु पर्ने भएमा ३ दिन भित्र आयोजना व्यवस्थापन इकाईको कार्यालयमा सम्पर्क गरी निर्णय गरी पठाउने निर्णय गरियो

४. प्रस्ताव नं. ४ माथी छलफल गर्दा आयोजना संग कुनै थप सुझाव भए ३ दिन भित्र उपभोक्ता समितिले वडाहरु निर्णय गरी पठाउनुपर्ने निर्णय गरियो ।

(५) प्रस्ताव नं. ५ माथि छलफल गर्दा यस आयोजना अन्तर्गत स्थानीय निकायको रुपमा रहेको शीडापुर नपा ले पनि ~~प्रस्तावेहला~~ आफ्नो दायित्व पुरा गर्नुपर्ने भएकोले सो सम्बन्धी प्रतिबद्धता ५ दिन भित्र मुखी पठाउने अनुरोध गर्ने निर्णय गरियो ।

(६)

आज मिति २०६४ साल वैशाख ५ गतेका दिन यस [illegible] सानो शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्थाका पद अन्तर्गत गठित उपसमितिहरूको बैठक संस्थाका अध्यक्ष नवराज रावलको अध्यक्षता तथा तपसिल बमोजिमको उपस्थितिमा बसी निम्न निर्णयहरू गरियो।

१ श्री नवराज रावल - अध्यक्ष
२. श्री कमला कुँ० क्षेत्री - उपाध्यक्ष
३. श्री भैरब रावल - सचिव (अनुपस्थित)
४. श्री प्रेमसिंह विश्वकर्मा - कोषाध्यक्ष
५. श्री प्रकाश बहादुर बुढाथोकी - सदस्य (अनुपस्थित)
६. श्री नरेश कुमार खत्री - सदस्य
७. श्री उपमा कुँ० क्षेत्री - सदस्य
८. श्री पृथ्वीलाल चौधरी - सदस्य
९. श्री केसरी भण्डारी - सदस्य (अनुपस्थित)
१०. श्री दयाराम संज्याल - सदस्य (अनुपस्थित)

आमन्त्रित

१. श्री धतराज उपाध्याय - सल्लाहकार
२. श्री ताराप्रसाद संज्याल - सल्लाहकार
३. श्री शम्भुराज भट्टराई - सल्लाहकार
४. श्री नरबहादुर रावल - सल्लाहकार
५. श्री जगदिश्वर पाण्डे - सल्लाहकार
६. श्री किर्तिसिंह बम - सल्लाहकार
७. श्री उदयराम अधिकारी - सल्लाहकार
८. श्री लाल बहादुर चौधरी - सल्लाहकार
९. श्री गम्भिर सिंह साउद - प्राविधिक, डी.डी.सी. अफिस
१०. श्री चेतमान खत्री - सल्लाहकार
११. श्री तपेन्द्र रावल - सल्लाहकार
१२. श्री विष्णु देवी रावल -
१३. श्री निरंजना चोरस्रेल -
१४. श्री महेन्द्र रावल -
१५. श्री कुलबमान बुढा -
१६. श्री अर्जुन रावल -
१७. श्री कृष्णबहादुर नेपाली -
१८ श्री सूर्य चंद्र विष्ट -

१९. श्री जित बहादुर चौधरी, संयोजक – विजयनगर
२०. श्री सुरत बहादुर कुँवर, ,, ९६,९८,९९९२०-
२१. श्री कैलुवा थारु ,, बाधमारा
२२. तेज बहादुर चौधरी, बिच बनगाउँ
२३. राम कृष्ण चौधरी संयोजक लक्ष्मी टोल विकास / दलित बुलवा
२४. प्रेम ब. रावल संयोजक ब्लक ३. प्रेम.ब.रावल
२५. विद्या भट्ट सचिव –,,– [illegible]
२६. सुशील कोइराला, सदस्य – ब्लक ४.
२७. जिप बहादुर वि.क. सदस्य, शंकरपुर
२८. ज्योति बहादुर चौधरी संयोजक बनगाउँ हलाबुलवा
२९. खगेन्द्र कार्की मगर संयोजक बनगाउँ (मगर टोल)
३०) गणेश राज रेग्मी (टी.न.पा.–५/३४)
३१) काशीराम देवकोटा संयोजक गणेशपाटी –
३२ गुलाब बलायर ,, पशुपतिटोल ६
३३. देवी प्रसाद आचार्य, टीकापुर नगरपालिका कार्यालय
३४. मान बहादुर पुन मगर बनगाउँ (मगरटोल) सचिव
३५ चमन चौधरी बनगाउँ (उत्तरपुर) सचिव
३६ – सौगन बहादुर शाही – ब्लक नं ११–५
३७ – मणिराम शर्मा ,, ब्ल. ३-४
३८ हरि नन्द शाही
३९ भवानीप्रसाद आचार्य

३०. जग बहादुर कडायत टीकापुर ६/११
३१. जानकी भण्डारी टिकापुर ९/१०
३२ आशा देवकोटा टिकापुर ८
३३. पुतली शाह टिकापुर ९.
३४ तर्क राज रेग्मी नेपाँ टिकापुर ४
३५. बाल बहादुर बोहरा ब्लक नं. १६, १९. सचिव
३६. कालीराम कुमाल ब्लक नं. ११ सदस्य
३७ हरि बहादुर सुनार ,, १२
३८ खुशीराम चौधरी संयोजक (दलित पुरवा) बनगाउँ
३९. इन्द्रसिंह रावल टीकापुर ९/१० इन्द्र सिंह रावल
३९ निरज चौधरी ,, ४ नयाँ टीकापुर
४० मित बं. चौधरी ,, ९ बनगाउँ

४१) अनिल चौधरी वर्दीया पुरुवा बनगाउँ (सामुदायिक...)
४२) कृष्ण भक्त थिताल ,, ब्लक नं. २४
४३) नवराज आचार्य ,, ...

प्रस्तावहरु

१. जिम्मेवारी बाँडफाँड सम्बन्धमा
२. आयोजनाको क्षेत्र थप घट गर्ने सम्बन्धमा
३. शौचालय थप गर्ने सम्बन्धमा
४. ...

निर्णयहरु

१. यस आयोजनालाई सफल बनाउन तपसिल बमोजिमको जिम्मेवारी बाँडफाँड गर्ने निर्णय गरियो।

तपसिल

१. नरेश स्वत्री - ब्लक नं. ९, १० र व्यवसायक्षेत्र
२. प्रकाश बुढा - विजयनगर, माथिल्लो राजिपुर
३. शिवलाल चौधरी - जमिदारी, बनगाँउ
४. नरबहादुर रावल - ब्लक नं. १०, १५, १६ र निरंकारी मिशन
५. धनराज उपाध्याय - १६, १८, १३ र २०
६. तपेन्द्र बहादुर रावल - ब्लक नं. ३, २२ र २३
७. लाल बहादुर चौधरी - शीतपा - २, ४ र ७
८. शम्भुराज भट्टराई - ब्लक नं. ६, ७ र ब्लक नं. ७
९. ताराप्रसाद जोशी - ब्लक नं. ८, २४, २५, २६, २७ र २८
१०. जगदीश्वर पाण्डे - ब्लक नं. ४, ५ र जमिदारी
११. चेतमान स्वत्री - ~~जमिदारी~~
१२. कीर्ति सिंह थप - जमिदारी

२. प्रस्ताव नं. २ माथि छलफल गर्दा यस आयोजना अन्तर्गत विगतमा सर्वेक्षण हुन बाँकी रहेको टीकापुर न.पा. वडा नं. ७ को मनिकापुर कुलमठ रहेको स्थानसम्म क्षेत्र विस्तार गर्ने निर्णय गरियो।

३. प्रस्ताव नं. ३ माथि छलफल गर्दा टीकापुर नगरपालिका वार्ड नं. ९ मा रहेको ब्रह्मा कुमारी ईश्वरीय विश्वविद्यालय, राजयोग प्रशिक्षण केन्द्रले स्नान गृह सहितको शौचालय र सन्त निरंकारी मण्डलले आफ्नो सत्संग भवन रहेको टीकापुर-९/९ मा शौचालय निर्माण गरिदिनको लागि यस उपभोक्ता संस्थाको कार्यालयमा निवेदन दिएकाले सो निर्माणको लागि सम्बन्धित निकायमा अनुरोध गर्ने निर्णय गरियो।

फो.नं. ५६०११८
५६०८१६
टेलिफ्याक्स ५६०४९९

टीकापुर नगरपालिकाको कार्यालय

टीकापुर, कैलाली

प.सं. : २०७१/०७२ (२ भा.)
च.नं. : ६८६९

मिति : २०७२/०२/१४

विषय :- हस्तान्तरण सम्बन्धमा ।

श्री टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था,
टीकापुर, कैलाली ।

उपरोक्त सम्बन्धमा त्यस संस्थाको मिति २०७१।११।१८ गतेको प.स.०७१।७२, च.नं. ५४ को पत्रानुसार टीकापुर नगरपालिका कार्यालय मार्फत सञ्चालन हुदै आएको खानेपानी सेवा शहरी खानेपानी उपभोक्ता तथा सरसफाइ संस्था टीकापुर-१ लाई हस्तान्तरण गर्ने सम्बन्धमा मिति २०७१।११।२९ गते नगरपालिकामा बसेको सर्वदलिय बैठकको तपसिल बमोजिमको निर्णयानुसार हुने गरी स्वामित्व हस्तान्तरण गरिएको व्यहोरा अनुरोध छ ।

तपसिल :

१. टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्थालाई हाल नगरपालिकाको स्वामित्वमा रहेको संरचना हस्तान्तरण गर्ने ।
२. न.पा.बाट हाल सञ्चालन भई रहेको खानेपानी संचालन व्यवस्थापनको जिम्मेवारी १ (एक) वर्ष सम्म न.पा.मा नै रहने र तत् पश्चात उपभोक्ता समिति स्थापित भई संचालन/व्यवस्थापनको जिम्मेवारी हस्तान्तरण गर्ने ।

....
(तुलसी प्रसाद आचार्य)
कार्यकारी अधिकृत
कार्यकारी अधिकृत

टीकापुर नगरपालिका कार्यालय
टीकापुर, कैलाली

च.नं. : ६८६०

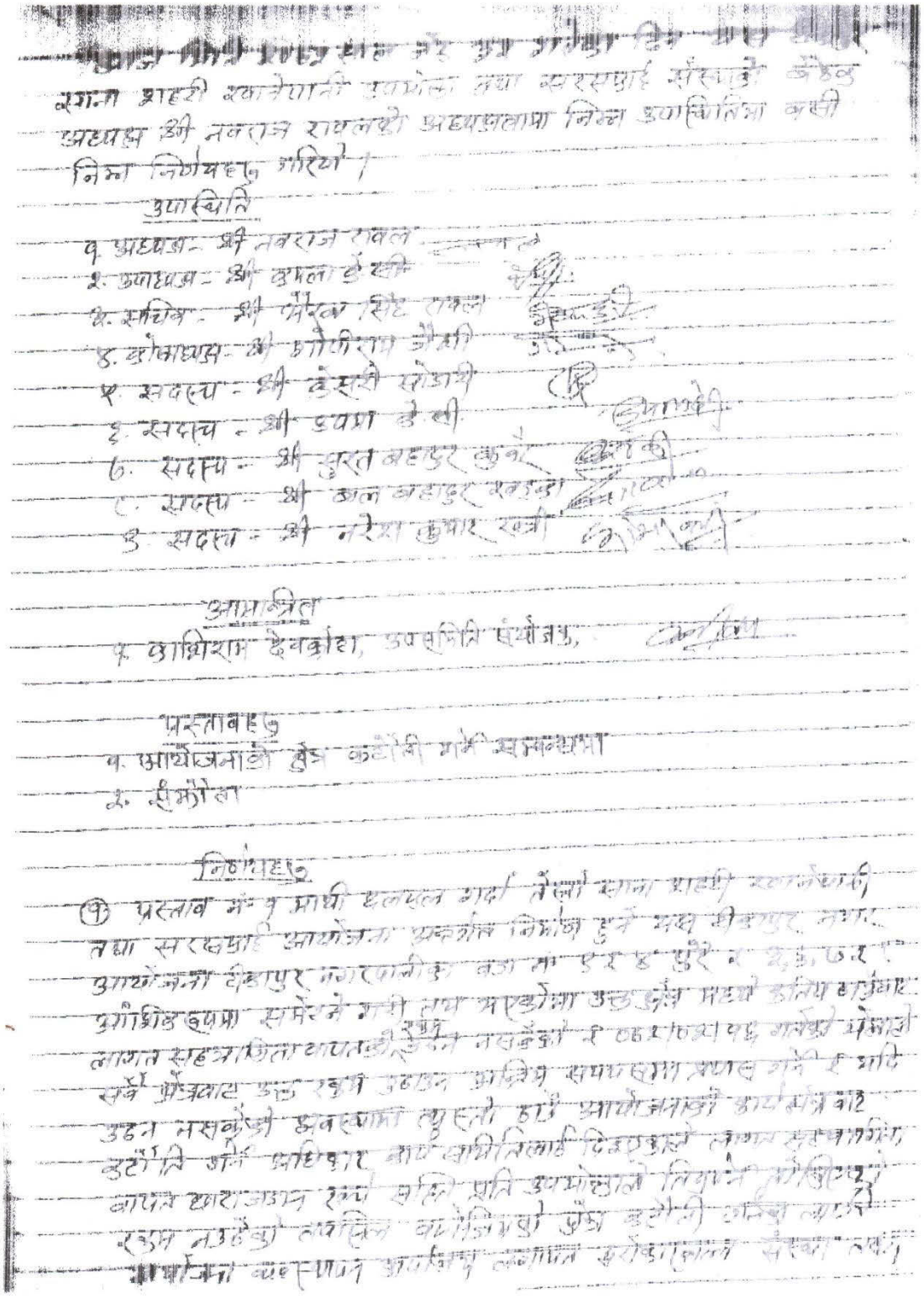
मिति : २०७२/०२/१४

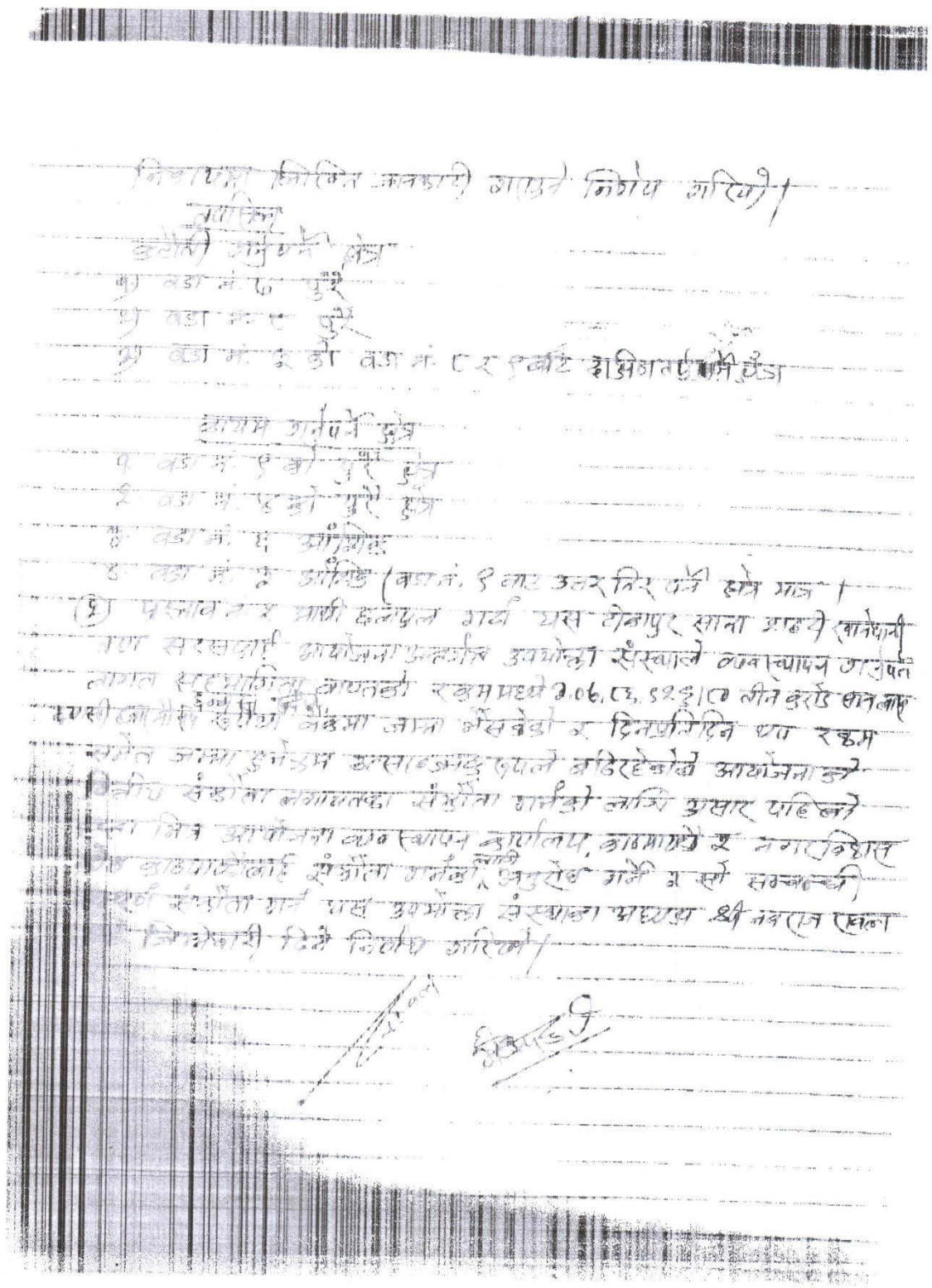
विषय :- जग्गा उपभोग सम्बन्धमा ।

श्री टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था,
टीकापुर, कैलाली ।

उपरोक्त सम्बन्धमा त्यस संस्थाको मिति २०७२।०२।१५ गतेको प.स.०७१।७२, च.नं.११० को पत्रानुसार तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना अन्तर्गत टीकापुर नगरपालिकामा संचालन हुन गईरहेको उक्त आयोजना अन्तर्गत बन्ने भौतिक संरचनाहरुका लागि न.पा.को स्वामित्वमा रहेको जग्गा भोगाधिकारका लागि माग भए बमोजिम मिति २०७२।०२।१२ गते नगरपालिकाको बसेको सर्वदलिय बैठकको निर्णयानुसार उक्त न.पा.को स्वामित्वमा रहेको वडा नं.१ कित्ता नं. ५१ मा रहेको खानेपानीका लागि छुट्याईएको जग्गा पी-६, क्षेत्रफल ०२३७.० वर्ग मिटर (०-७-०.५) र कित्ता नं. २८ मा खानेपानीका लागि छुट्याईएको जग्गा १८ र १९ क्षेत्रफल ०१६५४.० व.मि. (०-४-०) जग्गा उक्त आयोजनालाई जग्गा उपभोगका लागि उपलब्ध गराईएको व्यहोरा अनुरोध छ ।

सुवर्णी प्रसाद आचार्य
कार्यकारी अधिकृत
कार्यकारी अधिकृत





टीकापुर नगर विकास समिति

वि.सं.२०५४

टीकापुर, कैलाली

प.सं.०७१/०७२

च.नं..१९४

मितिः- २०७२/२/२०

विषयः- जग्गाको उपयोग सम्बन्धमा।

श्री टीकापुर साना सहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था
टीकापुर, कैलाली।

उपर्युक्त सम्बन्धमा तहाँ कार्यालयको प.सं.०७१/०७२ च.नं.१११ को पत्रानुसार तपाईं साना सहरी खानेपानी तथा सरसफाई आयोजना अन्तर्गत टीकापुरमा सञ्चालन हुन गै रहेको नगर आयोजनाको ओभर हेड ट्याङ्की सहित को संरचना निर्माण र हाल सञ्चालनमा रहेको टीकापुर ६ ब्लक नं. सी को खानेपानी ट्याङ्की को लागी बोरिङ्ग र जेनेटर हाउस निर्माण गर्न सो संस्थाले जग्गा माग गरकोमा बोरिङ्ग र जेनेटर हाउस को लागी ब्लक नं सि को ओपन स्पेस जग्गामा (कि.नं २४२ मध्यबाट) दिईने। ओभर हेड टंकी र बोरिङ्ग आसपासको लागी नगर विकास समिति को परिसर भित्रको जग्गा त्यस संस्था लाई संरचना निर्माण गर्न (टीकापुर ६/६ कित्ता ३ मध्यबाट) टी.न.वि.स को मिति २०७२/२/१८ गतेको निर्णय नं. ४ अनुसार सहरी विकास मन्त्रालयको स्वकृति अनुसार भोगाधिकार गर्न दिईने व्यहोरा जानकारी गरिन्छ।

(रामचन्द्र शर्मा)
अध्यक्ष
अध्यक्ष

Annex I:Survey Questionnaire

तेस्रो साना शहरी खानेपानी तथा सरसफाई क्षेत्रगत आयोजना
घरधुरी सर्वेक्षण प्रश्नावली

जिल्ला..... नगरपालिका/गा.वि.स..... वडा नं.....
नगर आयोजना: ..... घर नं. .....
अन्तरवार्ता लिनेको नाम : ..... अन्तरवार्ता मिति : .....
सुपरिवेक्षकको नाम : .....

१. सामाजिक-आर्थिक विवरण

(उपयुक्त कोठामा (√) यो चिन्ह लगाउनु होस्)

१.१ अन्तरवार्ता दिनेको नाम :
१.२ घरमुलिको नाम ..... लिङ्ग : पुरुष ☐ महिला ☐ ☐
१.३ यस परिवारमा अपाङ्गता भएको कुनै सदस्य हुनु हुन्छ: छ ☐ छैन
१.४ जातजातिमध्ये कुन हो? क) आदिवासी जनजाति ☐ ख) दलित ☐ ग) अल्पसंख्यक ☐ घ) अन्य ☐
(अन्तर्वाता लिनेले थरको आधारमा उपयुक्त वर्गमा चिन्ह लगाउने)
१.५ अन्तरवार्ता दिने व्यक्तिको नाता: .....
१.६ यस परिवारका सदस्यहरुको विवरण दिनुस्

क्र.सं.	घरमुलिसितको नाता/नाम	उमेर	लिङ्ग	शिक्षा स्तर	पेशा
१					
२					
३					
४					
५					
६					
७					
८					
९					

नोट: पेशा : १. कृषि २. व्यापार ३. नोकरी ४. उद्योगधन्दा
५. रेमिटेन्स (वैदेशिक रोजगार) ६. ज्याला ७. अन्य
शिक्षा : १. निरक्षर २. साक्षर ३. प्राथमिकसम्म ४. माध्यमिकसम्म ५. एस.एल.सी. उतिर्ण
६. आई.ए. ७. वि.ए. ८. एम. ए. ९. अन्य
१.७ यस परिवारमा बसोबास गर्ने अन्य सदस्यहरुको सहयोगी डेराबाल कुल संख्या
१.८ यस नगर/शहरमा कहिले देखि बस्दै आउनु भएको छ ? वर्ष
स्वबासी बसाइ सरेको बसाई सरी आएको भए कुन जिल्लाबाट .....?
१.९ बसाई सर्नुको कारण: प्राकृतिक प्रकोप व्यापार/व्यवसाय शिक्षा द्वन्द जिविकोपार्जन सामाजिक विलयन
१.१० कहिले देखि यस घरमा बस्दै आउनु भएको हो ? साल/वर्ष
१.११ यो घर आफ्नै हो ? हो होइन यदि हो भने हालको मुल्य कति होला अनुमानित रु.
ख) भाडामा बसेको हो होइन हो भने मासिक घर भाँडा कति तिर्नुहुन्छ ? रु.
ग) सुकुम्बासी हो होइन
१.१२ यस घरमा भान्छा कोठा बाहेक अन्य कति वटा कोठाहरु छन् ?
१ कोठा २ कोठा ३ कोठा ४ कोठा वा सो भन्दा बढि
१.१३ घरको अवलोकन गरी घरको किसिम लेख्ने । पक्की अर्ध पक्की कच्ची
*(**पक्की** : छत ढलान, **अर्ध पक्की** : ढुङ्गा इट्टाको गाह्रो, टीनको छाना/ढुङ्गा/ स्लेट,झिगटी/ टायल आदि, **कच्ची** : माटो गाह्रो र खर/टायलले छाएको)*
१.१४ यस परिवारसंग जग्गा जमीन छ ? छ छैन
यदि छ भने ५ रोपनी (०.२५ हेक्टर) भन्दा बढि वा ५ रोपनी भन्दा कम
१.१५ यहाँको जग्गाको किसिम: क) खेत वा बारी /असिंचित जग्गा (.....विघा/रोपनी)
ख) खेत वा बारी /सिंचित जग्गा (.....विघा/रोपनी)
१.१६ यहाँले गाई/भैसी पाल्नु भएकोछ ? छ छैन , छ भने कतिवटा ? एउटा दुईवटा वा बढि
१.१७ तपाईको परिवारमा तल उल्लेखित कुन कुन सामान छन् ? (भएको सामानको संख्या लेख्ने)

क्र.सं.	सम्पत्ती	संख्या	कैफियत
१	साइकल/रिक्सा		
२	मोटरसाईकल		
३	बैलगाडा		
४	कार/जिप		
५	मिनीबस/बस		
६	ट्रयाक्टर/ट्रक		
७	रेडियो/क्यासेट		
८	टेलिभिजन/भिडियोसेट		

९	स्टोभ/ग्यास चुलो		
१०	रेफ्रिजेटर		
११	वासिङ्ग मेशिन		
१२	वाटर फिल्टर		
१३	कम्प्युटर		
१४	इमेल/इन्टरनेटको पहुँच		
१५	अन्य भए उल्लेख गर्ने ।		

१.१८ यदि मुल पेशा कृषि भए कति महिना खान पुग्छ? ३ महिना ☐ ६ महिना ☐ १२ महिना ☐ यदि नपुग भएमा कसरी धान्नु हुन्छ ?
पसल/घरभाडा ☐ तलब ☐ पेन्सन ☐ अन्य ☐

१.१९ तपाईको परिवारको औसत मासिक खर्च कति छ उल्लेख गर्नुहोस ।

खर्चको शिर्षक र किसिम	मासिक खर्च रु.	कैफियत
(क) कृषि तर्फ		
रसायनिक मल, बिउ, किटनाशक आदी खरिद गर्न		
माटोको तैयारी, रोप्ने, गोड्ने, बाली काट्ने, भित्राउने, ढुवानी र बिक्री गर्दा हुने खर्च		
अन्य भए (उल्लेख गर्नुस्)		
(क) को जम्मा		
(ख) गैह्र कृषि तर्फ		
खाद्यान्न (अन्न र दैनिक उपभोग्य वस्तु)		
कपडा		
शिक्षा		
घर भाडा/घर मर्मत		
यातायात/संचार		
विद्युत		
पानी पोत /मर्मत सम्भार		
औषधि/उपचार (पानीबाट हुने रोग)		..... वार्षिक खर्च
औषधि/उपचार (अन्य रोग)		..... वार्षिक खर्च
अन्य: चाडपर्व कर्मकाण्ड संस्कार आदि उल्लेख गर्ने		..... वार्षिक खर्च
(ख) को जम्मा		
क+ख को कुल जम्मा		

१.२० तपाईको परिवारको औसत मासिक आय कति छ ? उल्लेख गर्नुहोस ।

आयस्रोत	संलग्न परिवार		प्राप्त हुने आय (रु. मासिक)	कैफियत
	पुरुष	महिला		
(क) कृषि तर्फ				
कृषि उत्पादनको बिक्रीबाट आय (मकै, गहुँ, धान, तरकारी, फलफूल)				
पशुजन्य उत्पादन (दुध, दही, घ्यू, बाखा, कुखुरा आदि)				
(क) को जम्मा				
(ख) गैह्र कृषि तर्फ				
नोकरी / जागिर				
ज्याला मजदुरी				
पेन्सन/उपदान आदी				
वैदेशीक रोजगार (रेमिटेन्स)				
पसल/व्यापार				
उद्योग				
पसल/घर भाडा				
गाडी/ढुवानी व्यवसाय				
अन्य भए उल्लेख गर्ने				
(ख) को जम्मा				
क+ख कुल जम्मा				

१.२१ यहाँको परिवारले कुनै ठुलो ऋण बोक्नु परेको छ ? छ ☐ छैन ☐

२. खानेपानी तथा सरसफाई व्यवस्थापन

२.१ तपाईको परिवारको लागी खान, खाना पकाउन, नुहाउन, भाँडावर्तन तथा लुगा धुनका लागी प्रयोग गरिने पानीको श्रोत एउटै हो ?
हो ☐ होइन ☐

२.२ तपाईकनपानीको श्रोत कहाँ छ ? घर कम्पाउण्ड भित्रै ☐ सार्वजनिक स्थलमा ☐

२.३ तपाईको परिवारले पिउन, खाना पकाउनको लागी प्रयोग गर्ने पानीको श्रोत कुन हो ? दैनिक कति लिटर पानी खर्चनु हुन्छ ? कृपया तलको कोठामा(✓) चिन्ह लगाउनुहोस् ।

क्र.सं.	वर्षायाममा	✓	लिटर/ दैनिक	सुख्खा याममा	✓	लिटर/ दैनिक
१.	इनार/कुवा (खुल्ला)	Á		इनार/कुवा (खुल्ला)	Á	
२.	इनार/कुवा (ढक्कन भएको)	Á		इनार/कुवा ढक्कन भएको)	Á	
३.	ट्यूबेल/हयाण्डपम्प	Á		ट्यूबेल हयाण्डपम्प	Á	
४.	डिप ट्यूबेल	Á		डिप ट्यूबेल	Á	
५.	इनार/कुवा मेसीनले तान्ने	Á		इनार/कुवा मेसीनले तान्ने	Á	
६.	सार्वजनिक धारा	Á		सार्वजनिक धारा	Á	
७.	निजी धारा	Á		निजी धारा	Á	
८.	मूल, खोला, नदी, पोखरी	Á		मूल खोला, नदी, पोखरी	Á	
९.	बिक्रेतासँग पानी किनेर	Á		बिक्रेतासँग पानी किनेर	Á	
१०.	वर्षातको पानी संकलन गरेर	Á		वर्षातको पानी संकलन गरेर	Á	
११.	अन्य	Á		अन्य	Á	
१२.	थाहा छैन	Á		थाहा छैन	Á	

२.४ दैनिक खानेपानी आवश्यक पूर्ति पानी संकलनबारे निम्न विस्तृत विवरण दिनुहोस् ।

क्र.सं.	विवरण	वर्षा याममा				सुख्खा याममा			
		पुरुष	महिला	बालिका	बालक	पुरुष	महिला	बालिका	बालक
१.	कति खेप/पटक								
२.	लिटर/खेप								
३.	कुल परिमाण								
४.	पानी ल्याउन लाग्ने समय (मिनेट)/खेप								
	• पानीको मुहान सम्म पुग्न								
	• मुहानमा पर्खनु पर्ने समय								
	• फर्कदा लाग्ने समय								
५.	प्रति खेप लाग्ने समय								

नोट : *अन्तरवार्ता लिने व्यक्तिले पानीको भाँडो हेरी सोको क्षमता यकिन गरि उल्लेख गर्ने ।*

२.५ भाँडा माझ्न, नुहाउन र लुगा धुन तथा अन्य कामको लागी कुन श्रोतको पानी प्रयोग गर्नुहुन्छ ? कति पानी खपत गर्नुहुन्छ? कृपया ☑चिन्ह लगाउनुहोस् ।

क्र.सं.	वर्षायाममा	✓	लिटर/ दैनिक	सुख्खा याममा	✓	लिटर/ दैनिक
१.	इनार/कुवा (खुल्ला)	Á		इनार/कुवा (खुल्ला)	Á	
२.	इनार/कुवा ढक्कन सहित	Á		इनार/कुवा ढक्कन सहित	Á	
३.	ट्यूबेल हयाण्डपम्प सहित	Á		ट्यूबेल हयाण्डपम्प सहित	Á	
४.	डिप ट्यूबेल	Á		डिप ट्यूबेल	Á	
५.	इनार/कुवा मेसीनबाट तान्ने	Á		इनार/कुवा मेसीनबाट तान्ने	Á	
६.	सार्वजनिक धारा	Á		सार्वजनिक धारा	Á	

७.	घरकै निजी धारा	Á		घरकै निजी धारा	Á	
८.	मूल,खोला, नदी, पोखरी	Á		मूल खोला, नदी, पोखरी	Á	
९.	पानी बिक्रेतासँग किनेर	Á		पानी बिक्रेतासँग किनेर	Á	
१०.	आकासे पानी संकलन गरेर	Á		आकासे पानी संकलन गरेर	Á	
११.	अन्य	Á		अन्य	Á	
१२.	थहा छैन	Á		थहा छैन	Á	

२.६ लुगा धुन र नुहाउन घरबाट पानीको मुहान सम्म जान कति समय लाग्दछ । (यदि श्रोत/मुहान छुट्टाछुट्टै भएमा समय (मिनेटमा) उल्लेख गर्ने)

क) लुगा धुन जाने ☐ नुहाउन ☐ भाँडा माझ्न ☐

ख) वर्षायाममा लाग्ने समय ☐ मिनेट सुख्खा याममा लाग्ने समय ☐ ट

२.७ यदि धाराको पानी यहाँको आवश्यकता परिपूर्तिगर्न पर्याप्त छैन भने कसरी आपूर्ति गर्नु हुन्छ?

पानीको श्रोत	परिमाण लिटर	खर्चनु पर्ने समय (घण्टा) दैनिक	थप खर्च मासिक
कुवा इनार			
आकासे पानी संकलन			
निजी टैंकरबाट पानी किन्ने			
हण्ड् पम्प,ट्युवबेल			
मिनलर वाटर जार			
अन्य			

२.८ गाईबस्तुको लागि चाहिने पानी कुन श्रोतबाट कति मात्रामा उपभोग गर्नुहुन्छ ।

क) प्रयोग भएको स्रोत.....

ख) परिमाण (लिटर/दैनिक) .....

ग) श्रोतसम्म जान आउन लाग्ने समय (मिनेट).....

३. निजी धारा जडान

३.१ के तपाईले घरमा पाइप धारा जडान गर्नु भएको छ ? छ ☐ छैन ☐ यदि छ भने कति खर्च लाग्यो? रु.

३.२ के तपाई आफ्नो घरमा धारा जोड्न चाहनु हुन्छ ? चाहन्छु ☐ चाहन्न ☐ चाहनु हुन्छ भने कस्तो प्र☐ा जडान गर्न इच्छा राख्नु हुन्छ ?

क) घरभित्र निजी धारा ☐

ख) कम्पाउण्डभित्र निजी धारा

ग) सामुदायिक धारा ☐ ☐

३.३ यदि तपाइको घरमा निजी धारा जडान भएको छैन भने, किन जडान नगरेको ?

क) खर्च गर्ने क्षमता नभएकोले ☐

ख) जडान शुल्क धेरै पर्ने भएकोले ☐

ग) मासिक पानी बिल धेरै आउने भएकोले ☐

घ) पानीको मात्रा पर्याप्त नभएकोले ☐

ङ) पानीको आपूर्ति नियमित नभएकोले ☐

च) यस क्षेत्रमा पाइपलाइन जडान गर्ने व्यवस्था उपलब्ध नभएकोले ☐

छ) पानीको गुणस्तर राम्रो नभएकोले ☐

ज) अन्य कारण उल्लेख गर्ने ☐

झ) थाहा छैन

३.४ हाल तपाईले पानजी धारा बापत गएको महिनामा पानीको महशुल कति तिर्नु भयो ? रु ☐

३.५ गएको महिनामा तिरेको बिल देखाउन सक्नु हुन्छ ? (बिल उपलब्ध भए सोको विवरण भर्ने) ☐

क) तिरेको रकम रु ☐ ख) खपत भएको पानीको मात्रा ☐ लिटर

३.६ पानीको बिल क☐ा तिर्नुहुन्छ ? ☑ चिन्ह लगाउनुहोस् । ☐

क) मासिक निश्चित तोकिएको रकम ☐

ख) मिटर रिडिङ्ग बमोजिम ☐

ग) खानेपानी कार्यालयले भने जति ☐

घ) तिर्नु पर्दैन ☐

ङ) अन्य ☐

च) थाहा छैन ☐

३.७ तपाईलाई पानीको बिल तिर्न कुन तरिका मन पर्छ ? ☐

क) निश्चित तोकिएको मासिक शुल्क

ख) मिटर रिडिङ्ग बिल अनुसार

३.८ घरको धारामा पानी नआउँदा पनि पानी महशुल तिर्नु पर्छ ? पर्छ ☐

३.९ निजी धाराको पानी बाहेक तपाईले कहिले थप पानी किन्नु पर्ने भएको ☐ ☐ ☐

वर्षायाममा लिटर ☐ सुखायाममा लिटर ☐ पर्दैन

३.१० निजीस्तरक ☐ कैताबाट किन्दा कति पर्‍ ☐ घरमा पानी किन्नु भएको छ?

लिटर ☐ ☐ /प्रति लिटरको दर रु. ☐

३.११ तपाइका घरका धारा कति भरपदा छ ?

क) पानी निरन्तर आउछ ☐

ख) पानी कहिले आउँछ र कहिले आउदैन ☐

ग) पानी एक दिन बिराएर आउँछ ☐

घ) पानी प्रत्येक दिन केही घण्टा आउँछ ☐

३.१२ खानेपानी वितरण प्रणाली अवरुद्ध हुदा मर्मत सम्भार गर्दा लाग्ने खर्च व्यहोर्ने जिम्मा कसको हो ?

क) नेपाल सरकार ☐

ख) खानेपानी उपभोक्ता सरसफाइ समिति ☐

ग) समुदाय / छर छिमेकी ☐

घ) अन्य उल्लेख गर्ने .....

३.१३ खानेपानीको पाइप/धारा मर्मत सुधारको लागि वार्षिक कति रकम खर्च गर्नुहुन्छ ? गर्छु ☐ गर्दिन ☐

३.१४ सार्वजनिक धारा प्रयोग गरे वापत पानी पोत तिर्नु पर्छ?

पर्दैन ☐ , ☐ भने कति ? रकम ☐ मासिक/वार्षिक

३.१५ पानीको गुणस्तर: तपाईले प्रयोग गर्ने पानीको गुणस्तरबाट सन्तुष्ट हुनुहुन्छ? छु ☐ छैन ☐

यदि छैन भने, पानीको गुणस्तर सम्बन्धि समस्या कस्ता छन ?

अ) पानी गन्हाउँछ ☐

आ) स्वाद नराम्रो छ ☐

इ) पानी प्रदूषित/धमिलो छ ☐

ई) अन्य केहि समस्या भए उल्लेख गर्ने .....

३.१६ यसरी प्रयोग गर्ने पानीको गुणस्तर कायम गर्न के गर्नु हुन्छ

पानीको प्रशोधनका घरेलु विधि	थप खर्च मासिक
उमाल्ने	
फिल्टर गर्ने	
छान्ने	
क्लोरिन (पियुस), आलम, पोटास	
युरो गार्ड	
सोडिस	

सह-लगानी अवधारणा सम्बन्धी प्राथमिकता

४.१ यदि तपाईको नगरपालिका/गा.वि.स. मा विभिन्न योजना सञ्चालन गर्न रकम उपलब्ध छ भने निम्नलिखित मध्ये कुन कुन २ योजनालाई पहिलो प्राथमिकता दिनुहुन्छ ?

क) सडक बत्ती ☐

ख) कालोपत्रे सडक ☐

ग) विद्यालय ☐

घ) अस्पताल ☐

ङ) व्यवस्थित खानेपानी प्रणाली ☐

च) पैदलयात्री सडक ☐

छ) विद्युत ☐

ज) संचार ☐

झ) सरसफाई/सुविधा ☐

ञ) सिचाई ☐

ट) पाटीपौवा धर्मशाला ☐

ठ) अन्य .....

४.२ यदि तपाई व्यवस्थित खानेपानी वितरण प्रणालीलाई महत्वपूर्ण ठान्नु हुन्छ भने, कस्तो किसिमको खानेपानी वितरण प्रणालीको चाहना गर्नु भएको छ ?

क) घर/ कम्पाउण्डभित्रै व्यक्तिगत/निजी धारा जडान ☐

ग) शुल्क सहितको सामुदायिक धारा जडान ☐

घ) सुधारिएको कुवा, हयाण्डपम्प जडित ☐

ङ) सुधारिएको कुवा, विद्युतीय यन्त्र जडित ☐

च) हाल उपलब्ध सेवामा सुधार आवश्यक छैन ☐

छ) अन्य (उल्लेख गर्नुहोस्)..... ☐

४.३ यदि तपाईको घरमा धारा छैन र निजी धारा राख्न इच्छुक हुनुहुन्छ भने, कति रकम सह-लगानी गर्न सक्नुहुन्छ ? कृपया तल दिईएको तालिकामा निजि धारा राख्न कति रकम सम्म लगानी गर्नुहुन्छ लगानीको रकमको सीमामा ☑चिन्ह लगाउनुहोस ।

क्र.सं.	लगानीको विवरण	☑ चिन्ह लगाउने

१.	१५००० भन्दा माथी	☐
२.	९००१ देखि १५००० सम्म	☐
३.	६००१ देखि ९००० सम्म	☐
४.	३००१ देखि ६००० सम्म	☐
५.	१५०१ देखि ३००० सम्म	☐
६.	१५०० भन्दा कम	☐

४.४ निजी धारा जडान बापत लाग्ने शुल्क व्यहोर्नु पर्नेछ? मन्जुर छ ☐मन्जुर छैन ☐

४.५ नयाँ खानेपानी योजना शुरु भएमा र सो योजनाबाट चौविसै घण्टा पर्याप्त मात्रामा गुणस्तरयुक्त पानी उपलब्ध भएको खण्डमा के तपाईले आफ्नो घरमा धारा जडान गर्न इच्छुक हुनु हुन्छ? छु छैन

यदि इच्छुक भए नयाँ नियमानुसार मासिक पानी महशुल तिर्नु बुझाउनु हुन्छ? ☐

छु ☐ छैन ☐ यदि इच्छुक हुनु हुन्छ भने तल दिईएको तालिकामा पानी महशुलको सीमामा ☑ चिन्ह लगाएर आफ्नो ईच्छा व्यक्त गर्नुहोस्।

क्र.सं.	मासिक पानी महशुल	☑ चिन्ह लगाउने
१.	रु ५०० भन्दा माथी	☐
२.	रु ४५१ देखि ५००	☐
३.	रु ४०१ देखि ४५०	☐
४.	रु ३५१ देखि ४००	☐
५.	रु ३०१ देखि ३५०	☐
६.	रु २५१ देखि ३००	☐
६.	रु २०१ देखि २५०	☐
७.	रु १५१ देखि २००	☐

४.६ नयाँ खानेपानी वितरण प्रणालीको व्यवस्था हुन तपाईको परिवारबाट पनि प्रतिवद्धता स्वरुप अग्रिम रकम योगदान गर्नु पर्ने हुन्छ, यहाँको विचारमा कति प्रतिशत योगदान हुन सक्छ?

लागतको ५% ☐ १०% ☐ १५% ☐

४.७ नयाँ सरसफाई सुविधा (सामुदायिक शौचालय तथा सतही ढल) निर्माणको लागि सह लगानी स्वरुप १५% स्थानीय निकाय र उपभोक्ताले सहलगानी गर्न इच्छुक हुनुहुन्छ? छु छैन

यदि चाहनुहुन्छ भने, कति सम्म? ☐ ☐

४.८ यहाँलाई नभइ नहुने तथा भए राम्रो हुने प्राथमिक आवश्यकता कुन हो?

निजी धारा जडान ☐ निजी चर्पी निर्माण ☐ दुवै ☐

५.लैङ्गिक दृष्टिकोणबाट महिला सहभागिता

(आयोजनाको विभिन्न चरणमा महिला सहभागिता सम्बन्धि जानकारी संकलन गर्न प्रत्येक घरदैलोमा, लक्षित समुह छलफलबाट र छुट्टै महिला समुहसँग मात्र सोधिने प्रश्नहरु)

क) महिलाहरुको उपस्थिति र सहभागीता

५.१ आयोजनाकोबारेमा छलफल गर्न कुनै बैठक बोलाईएको थियो ?

थियो ☐ थिएन ☐

५.२ के आयोजनाको छनौट गर्न बैठकमा महिला उपभोक्ताहरुको उपस्थिती थियो ?

थियो ☐ थिएन ☐

यदि थियो भने महिला उपभोक्ताहरुको भुमिका कस्तो थियो ?

सुन्ने मात्र अन्तर्कियात्मक निर्णायक

५.३ आर्थ ☐ को क्रियाकलापहरुको रेखदे ☐ र्ख के खानेपानी उपभो ☐ तथा सरसफाई समिति/संस्था गठन भएको छ ? छ ☐ छैन ☐

५.४ खा.पा.उ.स.समितिका सदस्यहरु मध्ये कति महिला सदस्यहरु छन्? (अन्तर्वार्ता लिने व्यक्तिले खा.पा.उ.स.सित समितिको पदाधिकारी तथा सदस्यहरुको नामावली तथा तलबि कर्मचारीको विवरण मागी राखी उपलब्ध गराउने)

ख) लैङ्गिकताका आधारमा कार्य विभाजन

५.५ तलको तालिकामा दिइएको कामहरु अक्सर कस्ले गर्ने गर्दछ? ९√०चिन्ह लगाउनुस्

दैनिक घण्टामा

क्र.सं	घरायसि क्रियाकलापहरु	पुरुष	महिला	कुल समय
१	खानेपानी भर्ने, बोक्ने, भण्डारण र प्रयोग गर्ने			
२	भान्छा तयार गर्ने, भाडाँ माझुन			
३	बालबालिका र वृद्धवृद्धाको स्याहार			
४	लुगा धुने घर सफा गर्ने			
५	खाद्यान्न भण्डारण तथा तयारी			
६	अन्य			

ग) **पारिवारिक व्यवस्थापन, आय श्रोत र अन्य विषयमा महिलाहरुको नियन्त्रण र पहुँच**

५.६ तलको तालिकामा उल्लेखित पारिवारीक विषय वा क्षेत्रहरुमा निर्णय गर्दा यहाँको घर परिवारमा महिला/पुरुषको भनाईको सुनुवाई हुन्छ ? उपयुक्त कोठामा ९√०चिन्ह लगाउनुस्

क.सं	विषय वा कार्यक्षेत्रहरु	हुन्छ ९√०	हुदैन ९√०
१	आर्थिक सरोकारका कुराहरु		
२	केटाकेटीको शिक्षा दिक्षा		
३	केटाकेटी र वृद्धवृद्धाको स्वास्थ्य र स्याहार		
४	अचल सम्पति किनवेच (घर जग्गा)		
५	दैनिक क्रियाकलापहरु		
६	सामाजिक विधि व्यवहार, विवाह, वर्तवन्ध, चाडपर्व तथा सामाजिक/पारिवारीक सुसम्वन्धन आदि		
७	अन्य		

५.७ यहाँको परिवारमा पारिवारीक सम्पतिका निम्न विषयमा महिलाको पहुँच र स्वामित्व रहेको छ छैन तलको तालिकामा उपयुक्त कोठामा ९√०चिन्ह लगाउनुस्

क सं	विवरण	पहुँच	स्वामित्व
१	जग्गा जमिन		
२	घर तथा अन्य संरचनाहरु		
३	चल सम्पति/सचित पैसा		
४	दैनिक क्रियाकलापहरु		
५	अन्य		

घ) **खा.पा.उ.स.स. तथा समुदायमा महिलाको स्तर (हैसियत)** (निम्न बुँदाहरु अन्तरवार्ता लिने व्यक्तिले गरेको अवलोकनका आधार हुनेछ ।)

क्रसं	विषय	उच्च	मध्यम	निम्न
१	आत्मसम्मानबोध			
२	आत्मविश्वास नेतृत्व शीप			
३	दायित्वबोध र क्षमता			
४	ल्याकत, तर्क संगत, धैर्य र मेहनत			
५	अन्य			

६. सम विकासमा पहुँचका आधारमा सामाजिक समावेशी सहभागिता

(आयोजनाको विभिन्न चरणमा गैरलाभान्वित विपन्न वर्गको, आदिवासी जनजाति, दलित तथा पछाडि परेका वर्गको समावेशी सहभागिता सम्वन्धि जानकारी संकलन गर्न प्रत्येक घरदैलोमा, लक्षित समुह छलफलबाट र छुट्टै महिला समुहसँग छलफल गर्दा सोध्ने प्रश्नहरु)

क) **आयोजना क्रियाकलापमा गैरलाभान्वित विपन्न वर्गहरु, जातजाति, दलित, अपाङ्गता भएको व्यक्तिको उपस्थिति**

६.१ आयोजनाकोबारेमा छलफल गर्ने कुनै भेला/बैठकमा समावेशी तवरले बोलाईएको थियो ?

थियो ☐ थिएन ☐

६.२ के आयोजनाको छनौट गर्न बैठकमा समावेशीताको आधारमा सहभागीहरुको उपस्थिती थियो? थियो ☐ थिएन ☐

६.३ के खा.पा.उ.स.स.को गठनमा समावेशीता अंगीकार भएको थियो? थियो ☐ थिएन ☐

ख) **निर्णय प्रक्रियामा समावेशी प्रकृया अपनाएको थियो ?**

६.४ आयोजना छनौट गर्न जातजातिहरुको कस्तो भूमिका कस्तो थियो ?

उच्च ☐ मध्यम ☐ निम्न ☐

६.५ साना सहरी खानेपानी आयोजना कार्यान्वयन गर्न सामाजिक समावेशी आधारमा उपभोक्ताहरुको परिचालन गर्न भएको प्रयास कस्तो थियो?

राम्रो ☐ मध्यम ☐ निम्न ☐

७. स्वास्थ्य र सरसफाइ

क. **खानेपानी**

१तपाईको विचारमा पानीको गुणस्तर नराम्रो (खराब) भएमा के समस्याहरु देखिन सक्छ ?

(एक भन्दा बढी उत्तर आउन सक्ने)

१.१ दुर्गन्ध आउने / नमिठो स्वाद ☐

१.२ दाँत बिग्रिने/रंगीने
१.३ बिरामी बनाउने
१.४ अन्य (उल्लेख गर्ने) .....

२. के तपाईंलाई पानी भर्ने र राख्ने भाँडो पानी भर्नु र भण्डार गर्नु पूर्व सफा थाहा छ ? छ छैन

यदि छ भने, पानी राख्ने भाँडो कसरी सफा गर्नु हुन्छ ?
खाली पानी मात्रले खरानी पानीले भुस/पिठो र पानीले
साबुन पानीले अन्य (उल्लेख गर्नुस्) .....

३. तपाई घरमा पानी कसरी राख्नु हुन्छ ?
(एक भन्दा बढी उत्तर आउन सक्ने)
३.१ पानी भर्नु पहिले भाँडा सफा गर्ने
३.२ बासी पानी फ्याँक्ने
३.३ पानी राख्ने भाँडो राम्रोसँग ढाकेर/छोपेर राख्ने
३.४ अन्य (उल्लेख गर्ने).....

४. तपाई गाग्रो वा घैंटोबाट पानी कसरी निकाल्नुहुन्छ ?
४.१ पानी सार्नु अघि अम्खोरा, लौटा, करुवा, मग धोएर
४.२ गिलास, मग, कप गाग्रीमा डुबाएर
४.३ गाग्रोबाट लोटा, अंम्खोरा, करुवा, गिलासमा पानी सारेर
४.४. अन्य (उल्लेख गर्ने) .....

ख. चर्पी

१. चर्पी प्रयोगका फाईदाहरु के के छन् ? (एकभन्दा बढी उत्तर आउन सक्ने)
१.१ बुढा, बालक तथा बिरामीलाई सुविधा
१.२ घर तथा वातावरण सफा हुने
१.३ गोप्यता हुने
१.४ रोगबाट बचावट हुने
१.५ अन्य (उल्लेख गर्ने).....

२. के तपाईंलाई दिसाबाट रोग सर्छ भन्ने लाग्छ ? लाग्छ लाग्दैन
यदि लाग्छ भने, मानिसको दिसाबाट सर्ने रोगहरुको नाम भन्नुहोस् ? .....

३. के तपाईंको घरमा चर्पी छ ? छ छैन
३.१ यदि छ भने, कस्तो प्रकारको चर्पी छ ?
१ खाल्डे चर्पी
२ भेन्टिलेटेड खाल्डे चर्पी
३ वाटर सिल/पोर फ्लस
४ सिस्टर्न फ्लस
५ अन्य .....

.२ यदि छ भने, तपाईंको घरमा चर्पी कसकसले प्रयोग गर्नुहुन्छ ?
(१. सबैले, २. बच्चा बाहेक सबैले ३. वयस्क र प्रौढले मात्रै ४. बिरामी मात्रैले)

३.३ यदि छैन भने, किन चर्पी नबनाउनु भएको हो ?
(क. बनाउने तरिका थाहा नभएर, ख. लगानी गर्न नसकेर, ग. खुल्ला मैदानमा दिसा गर्ने बानी भएर, घ. जग्गाको अभावले ङ अन्य (उल्लेख गर्ने).....)

३.४ यदि छैन भने, दिसा गर्न कहाँ जानुहुन्छ ?
(क. खोला/जङ्गल/किनार ख. खुल्ला मैदान/ठाउँ ग. घर/सडक छेउ घ. जहाँ सजिलो हुन्छ)

३.५ यदि छैन भने, चर्पी बनाउन कति लगानी गर्न सक्नु हुन्छ ? रु.

ग. खानेकुराको सरसफाइ

१. खाद्यपदार्थ दूषित हुनबाट कसरी बचाउनुहुन्छ ? (एक भन्दा बढी उत्तर आउनसक्ने)
१.१ पकाएको खाना छोपेर/ढाकेर राख्ने
१.२ बासी बच्ने गरी धेरै नपकाएर
१.३ काँचै खाइने खानेकुरा राम्रोसँग पखालेर धोएर मात्र खाने
१.४ हात गोडा सफा गरेर मात्र भान्सामा पस्ने
१.५ सफा हातले खाना पस्कने
१.६ डाबु पन्यु, थाल/भाँडाकुँडा सफा गरेर मात्र खाना पस्कने/खाने
१.७ चुलो चौकी पकाउने भाडा, ढकनहरु सफा राख्ने
१.८ धेरै बासी वा सडे गलेका फलफुल तरकारी नखाने

२. के तपाई खानेकुरा छोपेर/ढाकेर राख्नुहुन्छ ? राख्छु राख्दिन
यदि राख्नुहुन्छ भने, त्यसबाट के के फाइदाहरु छन् ? (एक भन्दा बढी उत्तर आउन सक्ने)
२.१ धुलो मैलो, झिंगा, साइला, किरा, तथा घरपालुवा पशुपन्छीबाट बचाबट
२.२ मूसा/छुचुन्द्री/माउसुलि/बिरालोबाट बचन
२.३ खाद्य प्रदुषणबाट हुने रोगबाट बचन

२.४ अन्य (उल्लेख गर्ने).....

जीवनजल बनाउने तरिका थाहा छ छैन सोध्ने, यदि थाहा भएमा सहि तरिकाले जीवनजल बनाउने । जीवनजल बनाउने सहि तरिका निम्नअनुसारको छ ।

१. पहिला साबुन पानिले हात सफा गर्ने, २. चिया गिलासको ६ गिलास (एक लिटर) पानी एउटा सफा भाँडोमा हाल्ने (यदि पानी उमालेको भएमा सेलाउन दिने), ३.जीवनजलको एक प्याकेटभित्र भएको धुलो पूरै पानीमा हाली पानीलाई रामरी चलाएर धुलोलाई घुल्न दिने ।

घ. व्यक्तिगत सरसफाइ

१. तपाई र परिवारका अन्य सदस्यले कहिले र के गरेपछि हात धुनुहुन्छ ? धुने भए यस्तो (✓) चिन्ह लगाउनुहोस् र नधुने भए यस्तो (×) चिन्ह लगाउनुहोस । (एक भन्दा बढी उत्तर आउन सक्ने)

क्र. सं.	क्रियाकलाप	५ वर्ष मुनिका बालबालिका		महिला		पुरुष	
		धुने (✓)	नधुने (×)	धुने (✓)	नधुने (×)	धुने (✓)	नधुने (×)
१	खाना खानु अघि						
२	खाना खाएपछि						
३	दिसा गएपछि						
४	फोहर मैला छोएपछि						
५	कामबाट फर्केपछि						
६	केटाकेटीलाई दिसा पिसाब गराइ सकेपछि						
७	अन्य (उल्लेख गर्ने)						

२. तपाई र परिवारका अन्य सदस्यले के ले हात धुनुहुन्छ ? धुनेमा यस्तो (✓) चिन्ह लगाउनुहोस् र नधुनेमा यस्तो (×) चिन्ह लगाउनुहोस ।

क्र. सं.	क्रियाकलाप	५ वर्ष मुनिका बालबालिका		महिला		पुरुष	
		धुने (✓)	नधुने (×)	धुने (✓)	नधुने (×)	धुने (✓)	नधुने (×)
१.	पानी मात्रै						
२.	खरानी पानी						
३.	भुस/पिठो पानी						
४.	साबुन पानी						
५.	अन्य (उल्लेख गर्ने)						
जम्मा							

३. तपाई र परिवारका अन्य सदस्यले कहिले कहिले नुहाउनुहुन्छ ?

नुहाउने भए यस्तो (✓) चिन्ह लगाउनुहोस् र ननुहाउने भए यस्तो (×) चिन्ह लगाउनुहोस ।

क्र.सं.	प्रक्रियाकलाप	बालबालिका	महिला	पुरुष
		(✓) (×)	(✓) (×)	(✓) (×)
१.	प्रत्येक दिन			
२.	एक दिन बिराएर			
३.	हप्तामा २ पटक			
४.	हप्तामा १ पटक			
५.	२ हप्तामा १ पटक			
६.	महिनामा एक पटक			
जम्मा				

ङ. फोहर मैला व्यवस्थापन

१. तपाईको घरबाट निस्कने ठोस फोहर मैला कहाँ विसर्जन गर्नुहुन्छ ?

१.१ घर नजिक खाल्डोमा

१.२ निजी फोहर संकलनकर्तालाई दिने

१.३ गा.वि.स./नगरपालिकाले व्यवस्था गरेको खाल्डो वा क्यानमा

१.४ अन्य (उल्लेख गर्ने) .....

२. ठोस तथा तरल फोहर वस्तुलाई अव्यवस्थित तरिकाले विसर्जन गर्नाले हुने नराम्रा असरहरु के के हुन् ? (एक भन्दा बढी उत्तर आउनस क्ने)

२.१ फोहोर वातावरणमा वृद्धि

२.२ लामखुट्टे, झिंगा, किराहरुको वृद्धि

२.३ रोग सर्नेमा वृद्धि
२.४ अन्य (उल्लेख गर्ने) .....

३. तपाईको घरबाट निस्कने फोहोर पानी कहाँ विसर्जन गर्नुहुन्छ ?
३.१ खाल्डोमा९क्यबप उष्त०
३.२ तरकारी बारीमा/करेसा बारीमा
३.३ सार्वजनिक ढलमा
३.४ अन्य (उल्लेख गर्ने) .....

च. वस्तुभाउको फोहर व्यवस्थापन

१. के तपाईले वस्तुभाउ पाल्नु भएको छ ? छ छैन
(यदि छैन भने पानी जन्य सरुवा रोगमा जाने)

यदि छ भने कुन कुन प्रकारका छन् र तिनीहरुलाई कहाँ राख्नु हुन्छ ?

क्र. सं.	वस्तुभाउको प्रकार	घरभित्रै राख्ने	बाहिर छुट्टै गोठमा राख्ने
१	गाई/भैंसी		
२	बंगुर/संगुर		
३	बाख्रा		
४	कुखुरा/हाँस		
५	अन्य		

२. वस्तुभाउबाट निस्कने फोहोर कहाँ र कसरी विसर्जन गर्नुहुन्छ ?
२.१ मलखादमा
२.२ आगो बाल्ने/गुईंठा बनाउने
२.३ गोबर ग्यास प्लान्टमा प्रयोग गर्ने
२.४ अन्य (उल्लेख गर्ने) .....

३. वस्तुभाउको फोहोर मैलाको जथाभावि अव्यवस्थित तवरले विसर्जन गर्दा हुने खराब असरहरु के के हुन् ? (एक भन्दा बढी उत्तर आउन सक्ने)
३.१ वातावरणी फोहोरमा वृद्धि हुने
३.२ लामखुट्टे, झिंगा, किराहरुको वृद्धि हुने
३.३ रोगव्याधि बढ्ने तथा सर्ने
३.४ गाँउ, छरछिमेक तथा नगर अशोभनिय देखिने
३.५ अन्य (उल्लेख गर्ने) .....

छ. पानीजन्य सरुवा रोगहरु

१. पानीजन्य सरुवा रोगको कारणहरु के के हुन् ? (एक भन्दा बढी उत्तर आउन सक्ने)
१.१ दूषित पानी प्रयोग गर्दा
१.२ दूषित खाना खाँदा
१.३ घर तथा सार्वजनिक स्थलमा फोहर बढ्नाले
१.४ मानिसको मलमूत्र जथाभावी फयाक्ने गर्दा
१.५ फोहोर मैला जथाभावी फ्याँक्ने गर्दा
१.६ स्वास्थ्य शिक्षा तथा स्वस्थ बानीको अभाव
१.७ सरसफाई र स्वास्थ्य सम्बन्धी ज्ञान र चेतनाको अभावले
१.८ अन्य .....

२. तपाईको परिवारमा कोही बिरामी परेमा के गर्नुहुन्छ ?(प्राथमिकता अनुसार नम्बर लेख्ने)
२.१ घरायसी उपचार गर्ने
२.२ धामी, झाँक्री, पुजारी कहाँ लाने
२.३ औषधि पसलमा जाने
२.४ स्वस्थ्य चौकि वा अस्पतालमा जाने
२.५ अन्य (उल्लेख गर्ने)

३. यदि परिवारमा कसैलाई झाडापखाला लागेमा के गर्नुहुन्छ ? (प्राथमिकता अनुसार नम्बर लेख्ने)
३.१ जीवनजल खुवाउने
३.२ घरायसी उपचार गर्ने
३.३ धामी, झाँक्री वा पुजारी कहाँ जाने
३.४ औषधि पसलमा जाने
३.५ स्वास्थ्य चौकि वा अस्पतालमा जाने
३.६ अन्य (उल्लेख गर्ने).....

४. गत एक वर्षभित्र परिवारका सदस्यहरु तलका रोगहरु मध्ये कुन कुन रोगबाट बिरामी भए? (मोर्बिडिटि को स्थिति)

५. तपाईको परिवारमा पानीजन्य निम्नलिखित सरुवा रोगबाट कोहि बिरामी परेको थियो? तलको तालिकामा संख्या उल्लेख गर्नुस् ।

क्र. सं.	रोग	५ वर्ष मुनिका बालबालिका	महिला	पुरुष	वार्षिक खर्च रु.
१	झाडापखाला				
२	आउँ				
३	जुका				
४	टाईफाईड				
५	हैजा				
६	छाला सम्बन्धी रोग				
७	औलोरोग (मलेरिया)				
८	कमलपित्त (जण्डीस)				
९	अन्य				
	जम्मा				

६. गत एक वर्षभित्र तपाईका परिवारमा कोही झाडा पखाला तथा पानीजन्य अन्य सरुवा रोगहरुबाट मृत्यु भएको छ ? (मृत्यु अवस्था)

रोग	५ वर्ष मुनिका बालबालिका	महिला	पुरुष
झाडा पखाला			
आउँ			
पानीजन्य अन्य सरुवा रोगहरु			
जम्मा			

७. गत एक वर्षभित्र तपाईको परिवारका सदस्यलाई झाडापखाला र पानीजन्य अन्य सरुवा रोगहरुको उपचारमा कति रकम खर्च गर्नु भयो ?

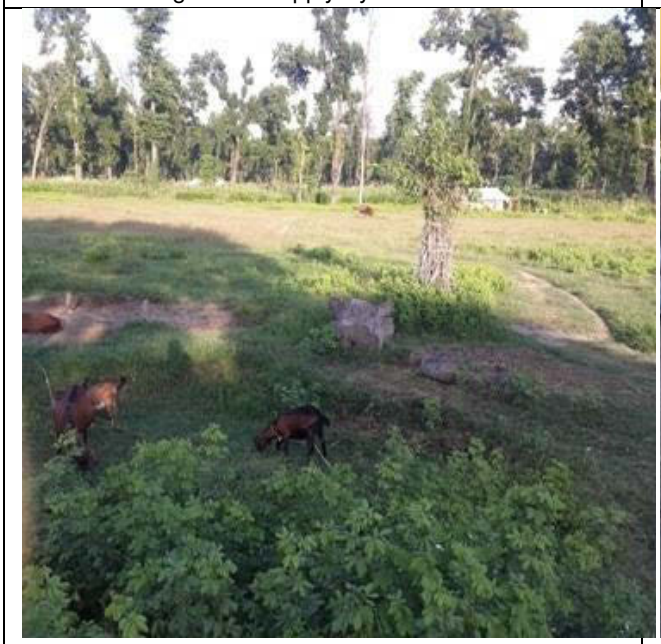
रोग	खर्च रकम (रु.मा)			
	२००० सम्म	२००१–३०००	३००१–५०००	५००० भन्दा माथि
झाडापखाला				
पानीजन्य अन्य सरुवा रोगहरु				
जम्मा				

सहयोगका लागी धन्यवाद ।

Annex J:Photographs

OHT of Existing Water Supply System

Proposed site for boring and OHT at ShantinagarTole

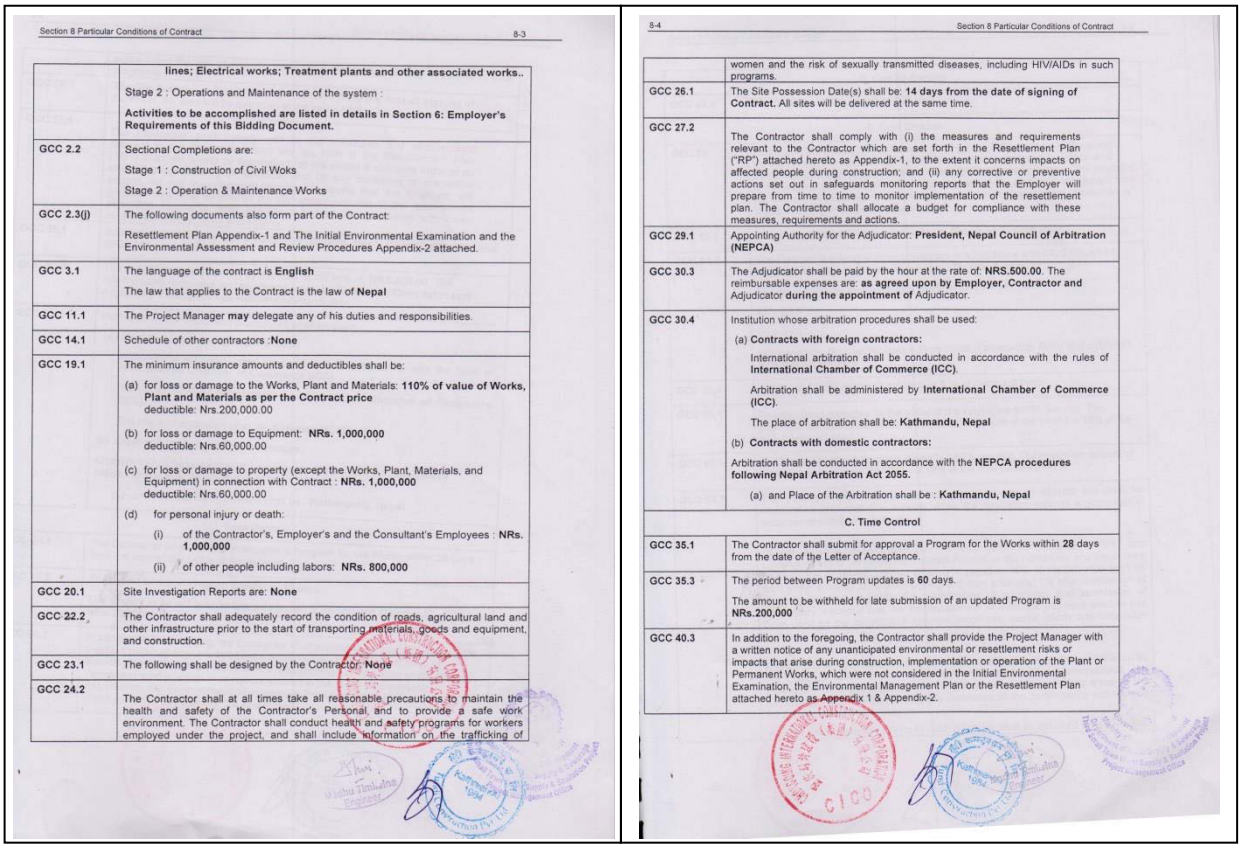


Site for OHT, New Tikapur Land of TMC

Public consultations at New Tikapur

	
Consultations with women's group at LamkiTole	Glimpse of public consultations
	
	Proposed site for toilet construciton

Annex K : IEE Provision in Bid Document



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	lines; Electrical works; Treatment plants and other associated works..
	Stage 2 : Operations and Maintenance of the system : **Activities to be accomplished are listed in details in Section 6: Employer's Requirements of this Bidding Document.**
GCC 2.2	Sectional Completions are: Stage 1 : Construction of Civil Woks Stage 2 : Operation & Maintenance Works
GCC 2.3(j)	The following documents also form part of the Contract: Resettlement Plan Appendix-1 and The Initial Environmental Examination and the Environmental Assessment and Review Procedures Appendix-2 attached.
GCC 3.1	The language of the contract is **English** The law that applies to the Contract is the law of **Nepal**
GCC 11.1	The Project Manager **may** delegate any of his duties and responsibilities.
GCC 14.1	Schedule of other contractors :**None**
GCC 19.1	The minimum insurance amounts and deductibles shall be: (a) for loss or damage to the Works, Plant and Materials: **110% of value of Works, Plant and Materials as per the Contract price** deductible: Nrs.200,000.00 (b) for loss or damage to Equipment: **NRs. 1,000,000** deductible: Nrs.60,000.00 (c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract : **NRs. 1,000,000** deductible: Nrs.60,000.00 (d) for personal injury or death: (i) of the Contractor's, Employer's and the Consultant's Employees : **NRs. 1,000,000** (ii) of other people including labors: **NRs. 800,000**
GCC 20.1	Site Investigation Reports are: **None**
GCC 22.2	The Contractor shall adequately record the condition of roads, agricultural land and other infrastructure prior to the start of transporting materials, goods and equipment, and construction.
GCC 23.1	The following shall be designed by the Contractor: **None**
GCC 24.2	The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personal, and to provide a safe work environment. The Contractor shall conduct health and safety programs for workers employed under the project, and shall include information on the trafficking of

8-4 Section 8 Particular Conditions of Contract

	women and the risk of sexually transmitted diseases, including HIV/AIDs in such programs.
GCC 26.1	The Site Possession Date(s) shall be: **14 days from the date of signing of Contract.** All sites will be delivered at the same time.
GCC 27.2	The Contractor shall comply with (i) the measures and requirements relevant to the Contractor which are set forth in the Resettlement Plan ("RP") attached hereto as Appendix-1, to the extent it concerns impacts on affected people during construction; and (ii) any corrective or preventive actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor implementation of the resettlement plan. The Contractor shall allocate a budget for compliance with these measures, requirements and actions.
GCC 29.1	Appointing Authority for the Adjudicator: **President, Nepal Council of Arbitration (NEPCA)**
GCC 30.3	The Adjudicator shall be paid by the hour at the rate of: **NRS.500.00**. The reimbursable expenses are: **as agreed upon by Employer, Contractor and** Adjudicator **during the appointment of** Adjudicator.
GCC 30.4	Institution whose arbitration procedures shall be used: (a) **Contracts with foreign contractors:** International arbitration shall be conducted in accordance with the rules of **International Chamber of Commerce (ICC).** Arbitration shall be administered by **International Chamber of Commerce (ICC).** The place of arbitration shall be: **Kathmandu, Nepal** (b) **Contracts with domestic contractors:** Arbitration shall be conducted in accordance with the **NEPCA procedures following Nepal Arbitration Act 2055.** (a) and Place of the Arbitration shall be : **Kathmandu, Nepal**
	C. Time Control
GCC 35.1	The Contractor shall submit for approval a Program for the Works within **28** days from the date of the Letter of Acceptance.
GCC 35.3	The period between Program updates is **60** days. The amount to be withheld for late submission of an updated Program is **NRs.200,000**
GCC 40.3	In addition to the foregoing, the Contractor shall provide the Project Manager with a written notice of any unanticipated environmental or resettlement risks or impacts that arise during construction, implementation or operation of the Plant or Permanent Works, which were not considered in the Initial Environmental Examination, the Environmental Management Plan or the Resettlement Plan attached hereto as Appendix 1 & Appendix-2.

Comments-Response Matrix of Tikapur

S:N:	Comments	Response	Incorporation
1.	Executive summary in Nepali - pdf version	Already made in IEE Report	Executive Summary; Page No: viii, ix, x, xi and xii
2.	Clear maps with GPS coordinates (or superimposed on Google maps) showing the locations and alignments of each component (i.e., separate maps for water supply and sanitation; can be separate maps for A, B, C1 and C2 areas)	Maps are superimposed on Google maps showing the locations and alignment of each component.	Page no. 9, 10, 11, 12 and 13
3.	Photographs of all sites	Few photographs are inserted in Google map and few photographs are in Annex - J	Annex-J
4.	Chainage-wise photographs of pipe alignments	There is 192.,347 km distribution pipe line alignment in the project area. Chainage could not be mentioned in distribution pipe line alignment like road.	It is very difficult to include chainage wise photographs of 192 km long pipeline network. Photographs of OHTs and public toilets are attached in Annex J.
5.	Confirmation that asbestos cement pipes are not present in the area.	There is no Asbestos Cement Pipes present in project area.	
6.	Provide status of environmental permits and clearances.	ToR of IEE is approved by Ministry of Environment and final report is under review. Public Notice, Muchulka, Recommendation Letter are attached in Annex H	Annex-H
7.	Clearer map for Figure 4.1	Already made in IEE Report.	Page 25
8.	Confirmation that the draft IEE has been included in the bid documents.	As per clause noGCC 2.3 (j) and 27.2, IEE and EMP are an integral part of the bid documents. EMP has been included in the bid documents.	Attached in Annex K