Initial Environmental Examination

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NEP: Urban Water Supply and Sanitation (Sector) Project – Charikot (Dolakha) Water Supply and Sanitation Subproject

Package No. W-01

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CURRENCY EQUIVALENTS

(as of 2 July 2018)

Currency unit	-	Nepalese rupee (NRe)
$1.00	=	NRs109.821
NRe1.00	=	$0.009

ABBREVIATIONS

2ndSTWSSSP	Second Small Towns' Water Supply and Sanitation Sector Project
3R	Reduce, Reuse & Recycle
A.D.	Anno Domini
ADB	Asian Development Bank
AIFC	Average Incremental Financial Cost
AM	Accountability Mechanism
AP	Affected Person
ATP	Ability to Pay
BDS	Bulk Distribution System
BoQ	Bill of Quantities
B.S.	Bikram Sambat
BW	Brick Works
CAPP	Communication and Public Participation Plan
CBO	Community Based Organization
CBS	Central Bureau of Statistics
CDO	Chief District Officer
C-EMP	Contractor's Environmental Management Plan
CGI	Corrugated Galvanized Iron
CITES	Convention on International Trade in Endangered Species of Wild Fauna & Flora
CLBW	Chain Link Boundary Wall
CO	Carbon Monooxide
Coliform P/A	Coliform Presence/Absence
CRO	Complaint Receiving Officer
CSA	Concerned Sector Agency
DC	Distribution Chamber
DCC	District Coordination Committee
DDR	Due Diligence Report
DEDR	Detailed Engineering Design Report
DHM	Department of Hydrology & Meteorology
DI	Ductile Iron
DMA	District Metered Area
DMC	Developing Member Countries
DPC	Damp Proof Course
DPH	Dosing Pump House
DRTAC	Design Review and Technical Audit Consultant
DS	Distribution System
DSMC	Design, Supervision and Management Consultant
DWSSM	Department of Water Supply and Sewerage Management
EA	Environmental Assessment
EARF	Environmental Assessment and Review Framework
e.g.	exempli gratia (For example)
EHS	Environmental Health Safety

EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
ENPHO	Environment and Public Health Organization
EO	Environmental Officer
EOCC	Economic Opportunity Cost of Capital
EPA	Environment Protection Act
EPR	Environment Protection Rules
ES	Environmental Specialist
ESA	Environmental Safeguard Assistant
ESE	Environmental Safeguard Expert
ESO	Environmental Safeguard Officer
et. al.	et alia
etc.	et cetera
FGD	Focus Group Discussion
FIRR	Financial Internal Rate of Return
FRP	Ferro Reinforced Plastic
GH	Guard House
GI	Galvanized Iron
GoN	Government of Nepal
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HDPE	High Density Polyethylene
HHs	Households
HRF	Horizontal Roughening Filter
H_2S	Hydrogen Sulphide
IBAT	Integrated Biodiversity Assessment Tool
IC	Interruption Chamber
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICG	Implementation Core Group
ID	Indirect
IS	International Standard
IUCN	International Union for Conservation of Nature
IEC	Information Environment and Communication
IEE	Initial Environmental Examination
LC	Least Concern
LGs	Local Groups
LT	Long Term
MoFE	Ministry of Forest and Environment
MoFLD	Ministry of Federal Affairs & Local Development
MoUD	Ministry of Urban Development
MoWS	Ministry of Water Supply
MT	Medium Term
MWSS	Manufacturer Waste Scrap Shingles
NAAQS	National Ambient Air Quality Standards
ND	Nominal Diameter
NDWQS	National Drinking Water Quality Standard
NEPAP	National Environment Policy & Action Plan
NGO	Bon Governmental Organization

no.	Number
NO_2	Nitrogen Dioxide
NPR	Nepalese Rupees
NRCS	Nepal Red Cross Society
NRW	Non Revenue Water
NT	Near Threatened
NTFP	Non Timber Forest Products
NVMES	Nepal Vehicles Mass Emission Standards
NWSC	Nepal Water Supply & Sewerage Corporation
OD	Outer Diameter
ODF	Open Defecation Free
OM	Operation Manual
O&M	Operation and Maintenance
PAF	Project Affected Families
Pb	Lead
PE	Polyethylene
PID	Project Information Datasheet
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter 2.5 micrometres
PM_{10}	Particulate Matter 10 micrometres
PMO	Project Management Office
PMQAC	Project Management and Quality Assurance Consultants
PN	Nominal Pressure Rating
PRO	Proposed
PPE	Personal Protective Equipment
PPTA	Project Preparation Technical Appraisal
PSC	Project Steering Committee
RCC	Reinforced Cement Concrete
RDSMC	Regional Design Supervision and Management Consultant
REA	Rapid Environmental Assessment
RL	Relative Level
RoW	Right of Way
RPMO	Regional Project Management Office
RRM	Random Rubble Masonry
RUDP	Regional Urban Development Project
RVT	Reservoir Tank
SB	Sedimentation Basin/Settling Basin
SDG	Sustainable Development Goal
SHG	Self Help Group
SO_2	Sulphur Dioxide
SPS	Safeguard Policy Statement
SS	Site Specific
SSF	Slow Sand Filter
SSO	Social Safeguard Officer
ST	Short Term and Sedimentation Tank
STWSSSP	Small Towns' Water Supply and Sanitation Sector Project
TDF	Town Development Fund
ToR	Terms of Reference
TSP	Total Suspended Solids
TSTWSSSP	Third Small Town Water Supply & Sanitation Sector Project

USD	United States Dollar
UWSSSP	Urban Water Supply and Sanitation (Sector) Project
VDC	Village Development Committee
VU	Vulnerable
WGR	Weighted Growth Rate
WHO	World Health Organization
WN	Ward Number
WOV	Wash Out Valves
WS	Water Supply
WSP	Water Safety Plan
WSSDO	Water Supply and Sanitation Division Office
WtP	Willingness to Pay
WTP	Water Treatment Plant
WUA	Water Users' Association
WUSC	Water Users' and Sanitation Committee
Yr.	Year

WEIGHTS AND MEASURES

amsl	Above mean sea level
cm	centimetre/s
cum	cubic meter
cum/hour	cubic meter per hour
cum/sqm/hr	cubic meter per square meter per hour
dBa	decibel audible
ft^2	square feet
Ha	hectare/s
kg	kilogram
kgf	kilogram force
Kg/sq.cm	Kilogram per square centimetre
km	kilometre/s
kW	Kilowatt/s
Kph	kilometre/s per hour
m	meter/s
kph	kilometre/s per hour
lpcd	liter per capita day
lps	liter per second
m	meter/s
m^3	cubic meter/s
mg/l	milligram/s per litre
mm	millimetre/s
NRs.	Nepalese Rupees
NTU	Nephelometric Turbidity Unit
PPHA	Population Per Hectare
Rs.	Rupees

NOTE

In this report, "$" refers to United States Dollars.

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EXECUTIVE SUMMARY

Introduction

1. Charikot WSSP is one of the projects proposed under UWSSSP which is currently being prepared to support further GoN's continuing efforts to provide water supply and sanitation services to selected urban municipalities of Nepal. In support of GoN's endeavour, the Asian Development Bank (ADB) funded this Urban Water Supply and Sanitation Sector Project (UWSSSP).
2. During field study, it has been identified that there are fifteen major existing water supply systems operated by 17 different WUSCs in the project area. In all these systems, the water supply service is only few hours a day. The supplied water is not sufficient to meet the increasing water demand of the service area. All these existing systems are independent and isolated. However, due to urbanization process in the core Charikot bazaar area and the vicinity of the few systems of Charikot Bazaar are overlapping in same service area. Hence, these fifteen WUSCs has been integrated and single WUSC i.e., Charikot WUSC has been formed to avoid this issue. This newly formed WUSC will take reign of all the former WUSCs and will take the responsibility of the proposed project. It has also been observed that some of these existing major systems used to carry out occasional disinfection. Hence, there is no provision of water treatment system in the existing systems. This proposed project expects to improve the existing water supply condition of the project town.
3. ADB and GoN require all projects to undergo environmental assessments. All projects funded by ADB must comply with the Safeguard Policy Statement (SPS) 2009 which will ensure the following mentioned points:
    - The projects are environmentally sound,
    - The projects are designed to operate in compliance with applicable regulatory requirements,
    - These projects are not likely to cause significant environmental, health, or safety hazards.
4. According to ADB's REA Checklist, the proposed project falls under 'Category B' that requires IEE study only. On the GoN side, the statutory requirement that has to be adhered to is the Environment Protection Act (1997), and Environment Protection Rules (1997) with latest amendments (2017). Based on EPR Schedule 1, the Project falls within the threshold of activities under (H) drinking water sector that indicates that the project requires IEE only. This IEE fulfills the policy requirements of both ADB and GoN.

Policy,Legal and Administrative Framework

5. The IEE study requires study of the concerned Policy, Legal & Administrative Framework to analyze their compliance with the project construction activities. The major environmental act, rules, plan, policies, guidelines that are relevant for IEE study of this project includes;

    a) Major Law, Acts & Rules: i)Constitution of Nepal; ii) Environmental Protection Act (EPA), 2053 B.S. (1997 A.D); iii) Environmental Protection Rules (EPR), 1997 AD, and its amendments in 2017 A.D.

b) Plans, Policies & Strategies: i) National Environmental Policy & Action Plan (NEPAP), 2050 B.S. (1993 A.D.); ii) Water Resources Strategy, 2059 B.S. (2002 A.D.); iii) Rural Water Supply and Sanitation National Policy and Rural Water Supply and Sanitation National Strategy 2060 B.S. (2004 A.D.); iv) Rural Water Supply and Sanitation Sectoral Strategic Action Plan; v) National Water Plan-Nepal 2062 B.S. (2005 B.S.); vi) National Urban Policy, 2063 B.S. (2007 A.D.); vii) National Urban Water Supply & Sanitation Sector Policy, 2065 B.S. (2009 A.D.); viii) Updated 15-yr Development Plan for Small Towns Water Supply and Sanitation Sector, 2066 B.S. (2009 A.D. and Amendments in 2015 A.D.);ix) National Water Supply & Sanitation Policy (Draft) ,2071 B.S. (2014 A.D.); x) National Forest Policy, 2075 B.S. (2019 A.D.); xi) Land Use Policy, 2072 B.S. (2015 A.D.) and xii) National Urban Development Strategy, 2074 B.S. (2017 A.D.)

c) Laws & Acts: i) Essential Goods Protection Act, 2012 B.S. (1955 A.D.; ii) Aquatic Animal Protection Act, 2017 B.S. (1961 A.D.) with Amendments (2055 B.S. (1997 A.D.)); iii) Town Development Act , 2045 B.S. (1988 A.D.); iv) Water Resource Act,2049 B.S. (1992 A.D.); v) Forest Act, 2049 B.S. (1993 A.D.) with amendments 2055 B.S. (1999 AD.); vi) Land Acquisition Act,2049 B.S. (1993 A.D.); vii) Child Labor Prohibition and Regulation Act, 2056 B.S. (2001 A.D.); viii) Water Supply Management Board Act, 2063 B.S. (2006 A.D.); ix) Solid Waste Management Act, 2068 B.S. (2011 A.D.); x) Labour Act, 2074 B.S. (2017 A.D.); xi) Local Government Operation Act, 2074 B.S. (2017 A.D.)

d) Rules & Regulations: i) Solid Waste (Management & Resource Mobilization) Rules, 2044 B.S. (1987 A.D.) & Amendments 2049 B.S. (1992 A.D.); ii) Water Resource Regulations, 2050 B.S. (1993 A.D.); iii) Drinking Water Regulations, 2055 B.S. (1998 A.D.); iv) Solid Waste Management Rules, 2070 B.S. (2013 A.D.); iv) Labor Rules, 2075 B.S. (2018 A.D.)

e) Guidelines & Manuals: i) National EIA Guideline, 2049 B.S. (1993 A.D.); ii) WHO Air Quality Guidelines, Global Update, 2061 B.S. (2005 A.D.); iii) WHO Guidelines for Drinking Water Quality, Fourth Edition 2073 B.S. (2017 A.D.); iv) National Noise Standard Guidelines, 2068 B.S. (2012 A.D.); v) Guidelines for Community Noise by WHO, 2055 B.S. (1999 A.D.) and vi) "working procedure for the use of national forest for national priority projects, 2074"

Approach & Methodologies

6. The basic methodology for the prepartion of IEE as per EPR includes **Literature Review** to collect information on the project area and **Field Study** to collect baseline information on physical, cultural, chemical, biological and social conditions of the project town. On the basis of literature review and field study, the **Impact Area Delineation** is carried out to determine the project area affected by the proposed project activities either as Core Area or Surrounding Area. This is then followed by a 15-days **Public Notice Publication** in any national daily newspaper to seek opinions from the stakeholders. After this, **Public Consultation** is carried out to acknowledge any kind of suggestions from the interested stakeholders regarding public notice. Along with this, **Impact Identification, Prediction & Evaluation** is carried out through simple checklist & questionnaire method and through professional judgement to determine adversity

of the anticipated impacts. The study has followed the procedures outlined in the approved ToR and has covered the issues delineated therein.

Analysis of Alternatives

7. Analysis on the alternatives of the proposed project is another important process of IEE study that will help to assess the feasibility of the project in regard to technical, environmental & social aspects. Primarily, this involves two alternatives that includes "Without Project" or "Do-nothing" Alternative and "With Project" Alternative. The limitation of "Without Project" Alternatives regarding continuous water supply system, treatment system and susceptibility to water borne diseases leads to opt for "With Project" Alternative. With Project Alternative has been analyzed by envisaging the likely benefits of the proposed project. The analysis shows that the proposed project is designed to provide convenient access to reliable, adequate, safe and potable water supply to 22,755 populations as per base year 2018 A.D. This "With Project" Alternative analysis also involves assessment of the most cost-effective, reliable and efficient system that can serve the design population. During this Alternative analysis, it has been identified that there are no other alternatives possible for this proposed project. The alternative analysis shows that the proposed project is a unique system and is the extension of the existing Charikot system.

Description of the Project

8. The proposed project is mainly the extension of the existing Charikot system. The proposed project will extend the distribution system to new areas of Bhimeshwore municipality (partial areas of wards 2, 4 5 & 7) which are not covered by the existing Charikot system. Similarly, five existing intakes will be rehabilitated and used in this proposed project. The field study shows that there is no proper provision of water treatment facility in the existing system. Likewise, the existing system has been providing water supply services only for few hours a day. The existing condition of the existing system will be improved by the proposed project through the provision of continous water supply system along with proper water treatment system.
9. This project has been conceptualized as a totally gravity surface water system. The overall concept has been developed with distribution system comprising of Bulk Distribution System (BDS) and Distribution System (DS). The main system comprises of three sub systems that includes a) Sub System-1 (SS-1), b) Sub System-2 (SS-2) and Sub-system-3 (SS-3). Here, SS-1 comprises five distribution systems that include Deurali System, Tower System, Existing Charikot System, Upper Dolakha System and Lower Dolakha System. Similarly, SS-2 comprises three distribution systems namely Makaibari System, Tindhare System and Charighyang System. Then, SS-3 comprises seven distribution systems namely Upper Matti System, Lower Matti System, Upper Dharamghar System, Lower Dharamghar System, Upper Jillu System, Middle Jillu System and Lower Jillu System.
10. Six existing sources will be used for the proposed project that includes Jhapre Khola, Dund Khola. Gairi Khola, Kagate Khola, Odare 1 & Odare 2. Our study shows that out of these sources, the last two mentioned sources are spring sources while the rest are stream sources.All these existing sources are included in Sub System -1. Apart of these existing sources, four new sources have been

proposed. Out of these four new sources, two sources that includes HC1 (Hattichhahara at the main course of Charnawati River) and HC1 (tributary of Charnawati River) are included in sub system 2. Similarly, the remaining two sources that includes Ghatte Khola & Pani Ghatta are included in sub system 3. In total, the project wil have ten intakes. Among these ten intakes, two spring intakes and two stream intakes of SS-1 will be replaced by new ones while the other two stream intakes will be rehabilitated. Similarly, two stream intakes for both SS-2 & SS-3 have been proposed. According to the detailed design engineering report, the cumulative amount of water that will be used from the sources of SS-1, SS-2 & SS-3 are 10.60 lps, 31 lps & 11 lps respectively. Similarly, seven collection chambers have also been proposed for the proposed project.

11. Five water treatment plants have been proposed for this project. Among these five WTPs, SS-1 comprises three WTPs among which only one SSF (WTP-1) has been proposed for Deurali System while for other systems of SS-1, WTP-2 consisting SB, HRF & SSF has been proposed. Similarly, the third WTP is the existing WTP referred as WTP-E will be rehabilitated to improve its performance. Likewise, WTP-3 has been proposed for SS-2 that comprises SB and SSF only. Along with this, WTP-4 has been proposed for SS-3 that comprises SB, HRF & SSF in different area.

12. There are fifteen service reservoirs proposed for this project. The cumulative capacity for these reservoirs is about 1,650 cubic meters. The total length for the proposed transmission mains is 37.23 km. The total length of the proposed distribution pipeline is 158.849 km. The main project components of the proposed project are Intakes, Collection Chambers, Transmission Mains, Water Treatment Plant, Service Reservoirs, Bulk Distribution Mains, Distribution Mains, House Connections, Appurtenances, Guard Quarter & Boundary Wall. This project also covers construction requirements like Land Requirement, Energy Requirement, Human Resource Requirement, Worker's Camp, and Stockpiling Site etc.

Description of the Environment

13. This IEE study requires information on the existing environment of the project town to identify the susceptibility of the environmental aspects of the project town towards the anticipated environmental impacts of the proposed project. Regarding this, the secondary information of the existing environment was collected through literature review during desk study. However, the secondary information is not sufficient for IEE study. Hence, the field study was carried out to collect primary information on the existing environmental aspects.

14. Regarding this, details on various physical environmental aspects like Landforms & Topography, Land Use Pattern, Geology & Soil, Water Resources, Climate, Air Quality, Acoustic Environment, Landslide Susceptibility etc and biological features like Flora, Fauna, Protected Areas & Community Forest Areas were collected through simple checklist, REA checklist, professional judgement and interaction with the locals & the concerned bodies during field study. No existence of protected areas was observed during the field study. However, some project components were observed to be located within some of the existing community forest areas.

15. Similarly, details on water quality were collected through sampling process followed by water quality tests on approved laboratory. The test result shows that the water samples taken from three sources viz; Hattichhahara, Odare and Jhapre Khola have all the required parameters within the permitted value of NDWQS.

16. During field study, details on the socio-economic environment that includes Demographic Features, Caste/Ethnic Groups, Economic Features, Education & Skills and Community Infrastructures were collected through simple questionnaire method followed by household survey and interaction with the locals. Regarding this, Willingness to Pay for Monthly Tariff, Willingness for Up-front Cash Contribution and Affordability has also been assessed. As per the sampled household survey, 100% of 192 sampled HHs expressed willingness to pay for Monthly tariff and to contribute for up-front cash contribution. This indicates their demand for the proposed project to get rid of their acute water shortage problem. The survey also shows that only 11.37% (437) of 3842 HHs fall under poor category and only 29.30% (1124) of 3842 HHs expend less than Rs. 7,500 per month. Hence, this indicates the affordability of the community in terms of monthly income level and the expenditure level.

Anticipated Environmental Impacts & Mitigation/Augmentation Measures

17. The analysis on the information collected during field study helps to identify and predict the likely environmental impacts that may result from the proposed project. These predicted impacts are then evaluated using Scoring matrix as per National EIA Guidelines, 1993 to determine the nature, extent and magnitude. This evaluation will further help to propose the appropriate mitigation measure for each impact.

18. The anticipated environmental impacts have been mainly categorized into two viz., Beneficial Impacts and Adverse Impacts on the basis of its negative and positive significance. This has been further categorized into four impacts that includes i) Impact on Physical Environment, ii) Impact on Biological Environment, iii) Impact on Chemical Environment and iv) Impact on Socio-economic Environment, based upon the effects on the existing environment. These impacts have been sub divided into three categories based upon the project phase that includes i) Design Phase, ii) Construction Phase and iii) Operation Phase.

19. Here, Beneficial Impacts includes Employment Generation, Skill Enhancement, Local Trade & Business Opportunities, Improved Health & Hygiene, Increased Economic Opportunity and Women Empowerment. Similarly, Adverse Impacts includes Soil Erosion, Noise Pollution, Impacts on Air Quality, Surface Water Quality, Generation of Solid Waste & Waste water from the construction site & worker's camp, Accidental Leakage or Spillage of Stored Fuel/Chemicals, Land Use Pattern, Disruption to Natural Drainage, Haphazard Disposal of Dismantled Debris, Impacts on Water Bodies, Impacts on Flora & Fauna, Impact on Aquatic Life, Forest fire, Forest Encroachment, Impact on Water Quality of nearby rivers, Impact of Quality of water stored in the reservoir, Structural Instability, Workers & Community Health & Safety Hazards, and Damage to the existing Utilities, Traffic Congestion, Disruption to Local Vendor's Business, Occupational Health & Safety Hazards, Delivery of Unsafe Water, Impact of Sustainability of Works etc.

20. The mitigation & augmentation measures for each & every adverse impact mentioned above have been proposed. These measures primarily include Slope Protection Measures, Air Quality Monitoring, Noise Quality Monitoring, Waste Management, Prompt Backfilling, Handling of fuel & chemicals, Awareness regarding Workers & Community Health & Safety Hazards, Monitoring of Water Treatment System, Proper Handling of Chlorine etc. If these proposed mitigation measures are effectively implemented, no such significant environmental problems have to be encountered during the construction & operation period of the proposed project. Likewise, various suitable augmentation measures have also been proposed to maximize the anticipated beneficial impacts.

Environmental Management Plan

21. Preparation and Implementation of the environmental management plan (EMP) is another essential process of the IEE study.The main purpose of EMP is to ensure that the activities are undertaken in a responsible and non-detrimental manner. Similarly, the other objectives of EMP are as follows:

(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 impacts of the project; and
(iv) ensuring that safety recommendations are complied with.

The total estimated local level monitoring and mitigation cost for the project is NRs. 1,800,000.00.

Information Disclosure, Consultation & Participation

22. Stakeholder Consultation and Community Participation is an essential process in project preparation. It is the process of engaging stakeholders and affected people. This process involves Key Informant interviews, On-site discussions with WUSC, and Random Field Interviews of stakeholders. Prior to the stakeholder's consultation, stakeholder analysis and mapping of stakeholders were carried out to identify the potential stakeholders and their roles towards the implementation of the project. The potential stakeholders were then involved in consultation to disseminate information related to the project, to collect their views & suggestions and to prioritize their concerns regarding the project. This will continue throughout the implementation of the projects and operation period. To facilitate the stakeholder consultation, PMO & ICG will maintain good communication and collaboration with WUSC and the Municipality.

Grievance Redress Mechanism

23. The Project-specific grievance redress mechanism (GRM) is also an essential process of the IEE study which is meant for persons seeking satisfactory resolution to their complaints on the social and environmental performance of the projects under UWSSSP. The mechanism, developed in consultation with key stakeholders, will ensure the following mentioned points;

(i) the basic rights and interests of every person adversely affected by the social and environmental performance of a Project are protected; and

(ii) their concerns are effectively and timely addressed

This GRM involves setting up the Grievance Redress Committee (GRC) at the municipality level. The GRC will comprise of the following mentioned members:

(1) WUSC Secretary; (2) RPMO Engineer; (3) RPMO social /environmental (as relevant) officer, (4) representative of affected persons, (5) RDSMC's safeguards specialist (social/environment as relevant), (6) a representative of reputable and relevant CBO/SHG/organization working in the project area as invitee, and (7) contractor's representative.

Monitoring & Reporting

24. PMO & RPMO will be responsible for environmental monitoring & reporting. RPMO will monitor and measure the progress of EMP implementation. RPMO will submit a monthly monitoring and implementation reports to PMO, who will take follow-up actions, if necessary. PMO will submit semi-annual monitoring reports to ADB. ADB will review project performance against the MoWS's commitments as agreed in the legal documents. ADB will monitor projects on an ongoing basis until a project completion report is issued. Ministry of Water Supply (MoWS) under Government of Nepal will also undertake monitoring process through random field visits to review the project performance.

Conclusion

25. In conclusion, the IEE study shows that the proposed project is not an environmentally critical undertaking. The proposed project, 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 (i.e., most likely to occur only during peak construction periods). The proposed project will bring about the following mentioned benefits:

(i) Access to reliable supply of safe and potable water;

(ii) Promotion of good hygiene and sanitation practices and reduced health and safety risks;

(iii) Liberation from the hardship for continuous drinking water supply for years and

(iv) Enhanced community health, improved quality of life and safe communities as outcomes.

26. In conclusion, there are no significant negative impacts of the proposed project, and the classification of the project as Category "B" is confirmed as per ADB and as Schedule -1 is confirmed as per Environment Protection Rules, 2054 (1997) and 2017 (Latest Amendments). No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) and Environment Protection Rules, 2054 (1997) of Nepal.

I. INTRODUCTION

A. Background

1. The Urban Water Supply and Sanitation (Sector) Project (UWSSP) supports the Government of Nepal in expanding access to community-managed water supply and sanitation (WSS) in 20 project municipalities by drawing on experiences and lessons from three earlier projects funded by the Asian Development Bank (ADB). The project finances climate-resilient and inclusive WSS infrastructure in project municipalities and strengthen institutional and community capacity, sustainable service delivery, and project development. Subprojects are demand driven by water users' associations (WUAs) and project municipalities and selected based on transparent criteria including population growth, poverty index, existing WSS infrastructure, community willingness for cost sharing, and long-term operation and maintenance (O&M) contract.

2. The project builds upon the on-going efforts of the Government of Nepal in providing water supply and sanitation (WSS) services in urban areas of Nepal. It helps the country to meet Sustainable Development Goal (SDG)-6 to ensure availability and sustainable management of water and sanitation for all by 2030 and it is aligned with sector objectives laid out by the government's Fourteenth Plan, National Urban Development Strategy, and updated 15-year Development Plan for WSS in Small Towns, which is to improve water supply and sanitation service delivery in urban areas across Nepal.

3. The project has the following impacts: quality of life for urban populations, including the poor and marginalized, improved through the provision of sustainable WSS services. The project has the following outcomes: inclusive and sustainable access to WSS services in project municipalities achieved. The project has two outputs: (i) water supply and sanitation infrastructure in project municipalities improved; and (ii) institutional and community capacities strengthened.

4. The Ministry of Water Supply (MoWS) is responsible for planning, implementation, regulation, and monitoring of WSS. The Department of Water Supply and Sewerage Management (DWSSM) under the MoWS supports the provision of WSS facilities in municipalities where large utilities do not exist, and these are operated by water users' and sanitation committee (WUSCs) or municipalities. Shortage of investment funds, skilled personnel, and inadequate O&M budgets, hinders municipalities from providing adequate, cost-effective services. The Local Government Operation Act, 2017, established municipalities as autonomous government institution with responsibility for WSS services. While municipalities' capacity is being built, the government and residents have been receptive to the decentralized, participatory, and cost-sharing service provision model by water users' associations (WUAs). Development support for municipal WSS has been channelled through a combination of (i) government grants through DWSSM, (ii) loans by the Town Development Fund (TDF), and (iii) contributions from municipalities and beneficiaries. The TDF also supports WUAs in institutional and financial management including the introduction of tariffs.

5. The project is implemented over a five-year period (indicative implementation period is 2018 – 2023) and is supported through ADB financing using a sector lending approach. The MoWS is the executing agency and DWSSM the implementing agency. The Project Management Office (PMO) and Regional Project Management Office (RPMO) is responsible for the overall management, implementation and monitoring of the project. There is regional PMOs (RPMOs) to manage day-to-day project implementation at the subproject/municipality level. After construction including a one-year O&M period by the contractor, subprojects will be operated by the WUSC or municipality.

6. The municipality is served by surface water sources. However, the system does not sufficiently meet the needs of the people, regarding both quantity and quality. The water sample has been collected from the proposed water source and analyzed. The results of the test have shown that chemical and microbial quality of water meets National Drinking Water Quality Guidelines (NDWQG).

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

Name of Proponent

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C. Sub Project Selection Criteria Based on Environmental Assessment and Review Framework

7. This EARF has been prepared in accordance with ADB SPS and Government of Nepal Environment Protection Act (EPA) 1997 and Environment Protection Rules (EPR) 1997, as amended in 1999 and 2007. This EARF will provide guidance on subproject selection, screening and categorization, information disclosure and consultation, assessment, planning, institutional arrangement, and processes to be followed in the formulation and implementation of subprojects during project

implementation. The proposed project has strictly followed the criteria mentioned in EARF. The Table I-1 given below depicts the complaince matrix of the subproject selection criteria as per EARF.

Table I-1: Compliance Matrix on the subproject selection criteria in the EARF

Sub project	Sub project Components	Subproject Selection Criteria	Compliance Status	Remarks
A. General Criteria				
Water Supply	Intake - deep tube wells - borehole well - surface water intake structure	Located at least 30m upstream of any sanitation facilities. Where this cannot be maintained, the design and implementation will ensure that (i) septic tanks will be sealed to make them water tight and emptied as per the design requirements	Complied	There is no human settlements nearby the proposed sources.
		Intake of the source is; (ii) appropriate borehole case and screen are installed; and (iii) a test pit is established, and water quality monitoring is conducted regularly (at least once every quarter)	Complied	Water quality test has been conducted. Refer Appendix 7
	Water reservoirs such as overhead tanks (OHT), ground level service reservoirs (GLSR), etc.	Infrastructure, such as OHT, GLSR, etc. will be located considering high flood level in floodplains	Complied	As per design report, the proposed ground service reservoir has been designed and located considering high flood level in floodplains
	Water pipes	All pipes are designed to be constructed underground.	Complied	All the proposed pipelines have been proposed to be laid underground.
	Water treatment plant (WTP)	No WTP is established in floodplains	Complied	The location of the proposed WTP has no chance of occurrence of flooding events.
B. Specific Environment Safeguard Criteria				
General	All subprojects	not directly affect environmentally protected areas, core zones of biosphere reserves, highly valued cultural property	Complied	Appendix 1-Rapid Environmental Assessment Checklist and No Mitigation Scenario for Charikot WSSP
		not be located in the following ecologically sensitive areas: wildlife/bird sanctuaries, national parks, tiger reserves, elephant reserves, conservation reserves, core zone of biosphere reserves, centrally protected monuments or critical habitat (as defined in ADB Safeguard Policy Statement or SPS);	Complied	Appendix 1-Rapid Environmental Assessment Checklist for Charikot Water Supply & Sanitation Project

Sub project	Sub project Components	Subproject Selection Criteria	Compliance Status	Remarks
		not be deemed highly complex and sensitive in accordance with ADB SPS	Complied	As per Table II-6, no such complexity and sensitivity has been observed.
		not cause damage/destruction, removal, alteration or defacement of adjacent or nearby structures/monuments and sites of international, national and local significance. Subprojects with component activities near (within 50 m from) such sites shall have prior coordination with the Department of Archaeology	Complied	Appendix 1-Rapid Environmental Assessment Checklist for Charikot Water Supply & Sanitation Project
		Only involve activities that follow all applicable government laws, rules and regulations	Complied	The proposed project activities follow the concerned government laws, rules and egulations which has been described briefly in the Table II-1.
		Not include and/or involve any activities listed in ADB's Prohibited Investment Activities List (Appendix 5 of ADB SPS). These activities do not qualify for ADB's financing	Complied	This has already been considered during screening process.
		Reflect inputs from public consultations	Complied	Various decisions regarding the proposed project have been made through some public consultation programs. The minutes of these programs is attached in Appendix 4.
		Corresponding initial environmental examinations (IEEs) prepared in accordance with this environmental assessment and review framework (EARF) and Safeguard Requirements 1 of ADB SPS; identified all the key potential environmental and social impacts and risks; and incorporated effective measures to avoid, minimize, mitigate of compensate for the adverse impacts into an environmental management plan (EMP) and project design.	Complied	IEE has been carried out considering all the ADB requirements as well as GoN requirements. The IEE report has been prepared accordingly.

Sub project	Sub project Components	Subproject Selection Criteria	Compliance Status	Remarks
Water Supply	Water supply system	Construct, operate and maintain the water treatment facility in accordance with national requirements and internationally accepted standards to meet national water quality standards or, in their absence, World Health Organization (WHO) Guidelines for Drinking Water Quality	Complied	The proposed WTP has been designed as per national requirements and internationally accepted standards to meet national water quality standards or, in their absence, World Health Organization (WHO) Guidelines for Drinking Water Quality. Hence, the construction and O & M of WTP must be as per design.
		Ensure road access to water treatment plant, pumping stations and reservoirs/tanks for operations and maintenance activities	Complied	There is provision of road access to each proposed project components however, the cost for the construction of this approach road will be incurred by WUSC itself.
	Intake - deep tube wells - borehole well - surface water intake structure	Tube well sites and/or surface water intake locations will be fenced or have security provided to them	Complied	There is provision of Retaining Wall/Gabion Wall at the proposed intake well site.
		For any tree to be cut, consider replacement of 1:25	Not applicable	No trees exist at the intake area.
	Water reservoirs such as overhead tanks (OHT), ground level service reservoirs (GLSR), etc	For any tree to be cut, consider replacement of 1:25	Not applicable	No trees will be cut except some clearing of bushes
	Water pipes	For any tree to be cut, consider replacement of 1:25	Not applicable	No trees will be cut except some clearing of bushes
		Will not involve use or installation of asbestos cement pipes	Complied	The proposed project involves only DI, PE & GI Pipes.
	Water treatment plant (WTP)	Include sludge management plan	Complied	EMP has considered this aspect.
		Locations will be fenced or have security provided to them	Complied	There is provision of boundary wall and the cost has been included in BoQ.

Sub project	Sub project Components	Subproject Selection Criteria	Compliance Status	Remarks
		Include in the operation and maintenance manual the allowable maximum quantity of chlorine that can be stored on-site at water treatment plants and/or chlorinator facilities.	Complied	EMP has considered this aspect and similarly, Appendix 6 also includes this aspect.
		Avoid noise impact due to pump and diesel generators operations by locating minimum of 50 m away from any premises used by people (house, shops).	Complied	EMP has considered this aspect.
		Store chemicals and fuel in appropriate tanks or containers, and regularly inspect them for wear or damage. Store chemical waste and used chemical products in a secure location, away from the well and dispose any product in an environmentally-friendly manner.	Complied	EMP has considered this aspect.

Source: EARF, 2018 and IEE Study 2018/019

D. Purpose of the IEE

8. The main purpose of IEE is to ensure the environmental sustainability of the project, to integrate environmental considerations into the project preparation process and to manage the environment during project implementation. All projects funded by ADB must comply with its Safeguard Policy Statement (SPS) to ensure that projects are environmentally sound, designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards. Environmental assessment has been conducted for the Charikot (Dolakha) water supply and sanitation subproject selected based on detailed engineering design, and (ii) most likely environmentally sensitive components. The environmental assessment used ADB's rapid environmental assessment (REA) checklist (Appendix 1) and a "no mitigation measures scenario" checklist developed for UWSSP (Appendix 1). The environmental assessment of the Charikot (Dolakha) water supply and sanitation subproject shows it is not likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Potential impacts are unlikely to affect areas larger than the sites or facilities subject to physical works. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed with uncomplicated measures commonly used at construction sites and known to civil works contractors.

9. The IEE report primarily:

(i) provides information on the project and its environmental requirements;
(ii) provides the baseline physical, ecological, cultural and socioeconomic environments and resources in and surrounding the project's area of influence;
(iii) identifies and assesses potential environmental impacts arising from the implementation of the project;
(iv) recommends measures to avoid, mitigate, and compensate the adverse impacts;
(v) presents information on stakeholder consultations and participation during

project preparation;
(vi) recommends a mechanism to address grievances; and
(vii) includes an environmental management plan.

10. The IEE study team conducted a preliminary exercise to solicit information from planners, policy makers, project components, concerned authorities, the user community and affected population. The team reviewed the relevant documents on water supply and sanitation in the country and the feasibility report. Similarly, the team also reviewed the reports on hydrology, meteorology, geology, and others related to the environment.

11. The study team visited the site to identify the potential impacts, both positive and negative, of the project. During the visit, the team met local people and conducted meetings, brainstorming sessions, field examinations, and data gathering. The team also made walkthrough surveys of the project area to assess the baseline environment and potential environmental impacts of the project during the construction and operation phases.

E. Need for the Subproject

12. The municipality is an attraction for internal migration from remote hilly regions. Because of its strategic location, the municipality will tend to grow moderately in the future. The existing water supply system has not been able to meet the growing demand for water from the consumers. The present water supply is intermittent and is limited to only certain parts of the city area. The current systems serve only about 90% of the population. There is a demand from other parts of the municipality for the supply of regular potable water.

13. The water from the existing system is hardly treated. The people are mostly dependent on piped water supply directly from streams/springs, the quality of which is prone to bacteriological contamination specially during the Monsoon season.

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

F. Rationale of the Project and IEE

Rationale of the Project

15. The rationale of the project is based on the increasing demand of the reliable project, hardship of people for safe drinking water, willingness to pay, affordability, public health impacts, policy committments and various other aspects.

16. Rationale of the IEE

17. The IEE study for the proposed project is needed to be studied from the environmental point of view as per EPA 1997 A.D. and EPR 1997 A.D., 2054 B.S. (Amendments 1999 A.D., 2007 A.D. and 2017 A.D.). The proposed project is intended to serve drinking water in wards 2 to 4 and 6 to 12. The project is expected to benefit a base year population of about 31,415 populations (2021) & a design year

population of 45,768 (2040) by providing a reliable and adequate supply of safe & potable water and by promoting good hygiene and sanitation practices through provision of construction of public toilets.

18. As per EPR 1997(Amendments 1999, 2007 & 2017 AD), IEE for any project shall be done if the project meets the criteria mentioned in the Schedule 1 (Pertaining to Rule 3) (Clause H) for drinking water projects of EPR 1997(Amendments 1999, 2007 & 2017 AD), only an IEE should be done. The regulation stated in Schedule 1 (H) shall only be applicable if the proposal does not fall under the category "A" through (Clause H) of Schedule 2. Our study shows that the proposed project does not meet the criteria mentioned in Schedule 2 (Clause H) of EPR while the proposed project features meet the criteria mentioned in Schedule 1 (Clause H) of Environmental Protection Regulations 1997 with amendments 2017.

II. Policy, Legal and Administrative Framework

19. The IEE study has followed the necessary policy, legal and adminstrative framework outlined in the approved ToR. However, some of them mentioned in ToR are updated in this IEE study.

A. Nepal's Environmental Policy, Legal & Administrative Framework

Constitution of Nepal

20. The Constitution of Nepal is the fundamental law of Nepal.

- Article 30 (1) of the Constitution of Nepal guarantees a ''clean environment'' as a fundamental right, and elaborates that ''every citizen shall have the right to live in a clean and healthy environment".

- Article 30 (3) of the constitution also encourages the state to formulate necessary legal frameworks to balance environment and development.

21. Beside this, the Government of Nepal has passed a series of environmental laws, policies and implementing regulations and standards. Among these, the basic legislations that provide the framework within which environmental assessment is carried out in Nepal are the:

Environmental Protection Act, 2053 (1997)

- Environmental Protection Act (EPA), 1997, which requires a proponent to undertake IEE or EIA of the proposed project and have the IEE or EIA Report approved by the concerned sector agency, respectively, prior to implementation. This EPA:

(i) sets out the review and approval process of IEE and EIA Reports, that involve informing and consulting stakeholders;

(ii) stipulates that no one is to create pollution that would cause significant adverse impacts on the environment or harm to public life and health, or to generate pollution beyond the prescribed standards;

(iii) specifies for the Ministry in charge of environment (currently the MoFE) to conduct inspection of approved projects to ensure that pollution prevention, control or mitigation is carried out according to the approved IEE or EIA Report;

(iv) provides for the protection of objects and places of national heritage and places with rare plants, wildlife and biological diversity; and

(v) states that any person/party affected by pollution or adverse environmental impact caused by anybody may apply to the prescribed authority for compensation to be recovered from the polluter/pollution generator.

Environmental Protection Rules, 2054(1997)

22. Environmental Protection Rules (EPR), 1997, and its amendments in 1999, 2007 & 2017 defines 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 2017.

23. Other environmental policies, laws, rules, conventions & standards of Nepal that provide general context in the environmental assessment of water supply & sanitation works are presented in Table II-1.

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

Act/ Rule Policy/Law/Guidelines	Year	Relevant Provisions	Remarks
i) Plans, Policies & Strategies			
National Environmental Policy & Action Plan (NEPAP)	2050B.S. (1993 A.D.)	Of its five objectives, most relevant to the Project are to (i) mitigate adverse environmental impacts; and (ii) safeguard national & cultural heritage & preserve biodiversity, within & outside protected areas.	• The subproject will not encroach any physical & cultural heritage areas and will not affect biodiversity. • EMP provides measures to mitigate anticipated adverse impacts.
Water Resources Strategy	2059 B.S. (2002 A.D.)	Among the ten strategic outputs of this strategy, third output focuses on Adequate Supply of and access to potable water and sanitation & hygiene awareness provided.	This provision will strengthen implementation capacity for the proposed project.
Rural Water Supply and Sanitation Sectoral Strategic Action Plan (Unofficial Translation)	2060 B.S. (2004 A.D.)	• This action plan has proposed "Environmental Aspects" as one of its major components. • This underscores the environmental aspects of all levels of plans and their implementation and consolidates them according to rules & policies to ensure the execution of development works.	Though this action plan has main focus on rural areas and the proposed project is for urban area, the IEE study has duly followed this strategic action plan as a reference.
Rural Water Supply and Sanitation National Policy and Rural Water Supply and Sanitation National Strategy	2060 B.S. (2004 A.D.)	Recognizes that all people have a right to access to basic water supply and sanitation services and that these services are necessary for socio economic development and to combat waterborne diseases	The proposed project ensures easy access to safe, reliable & potable water.
National Water Plan	2062 B.S. (2005 A.D.)	• This includes subsector-wise action programmes in water induced disasters, environmental action plan on management of watershed and aquatic ecosystem, water supply, sanitation and hygiene, irrigation for agriculture, hydropower development, industries, tourism, fisheries, and navigational uses, water-related information systems (Decision Support System for River Basin Planning and Management), legal frameworks, and institutional mechanisms • This also includes Environment Management Plan, a strategic document for the implementation of environmental protection measures (including downstream water pollution and groundwater quality,	This has been considered in IEE study

Act/ Rule Policy/Law/Guidelines	Year	Relevant Provisions	Remarks
		erosion/landslide and sedimentation, water pollution and sanitation, effect on aquatic life and wetland ecosystem), monitoring (baseline, impacts, and compliance), environmental auditing and institutional and procedural arrangements.	
National Urban Policy	2063 B.S. (2007 A.D.)	The policy gives importance to environment conservation while carrying out urban development works and natural resource use; thus, supporting the required environmental conservation and protection in donor-assisted development projects.	The IEE study will meet the provisions of this policy.
National Urban Water Supply & Sanitation Sector Policy,	2065 B.S. (2009 A.D.)	The Policy requires the IEE or EIA of proposed WSS projects by the EPA/EPR to (i) incorporate consultations with key stakeholders, including endpoint users; & (ii) specify measures to mitigate environmental impacts before, during construction & operation, as well as corrective measures.	The IEE study will meet the provisions of this policy.
Updated 15-yr Development Plan for Small Towns Water Supply and Sanitation Sector	2066 B.S. (2009 A.D. and Amendments in 2015 A.D	The Plan emphasizes monitoring and evaluation as an important component of a project to determine the overall impact of a project.	EMP prescribes performance monitoring & evaluation to minimize the anticipated environmental impacts.
National Water Supply & Sanitation Policy (Draft)	2071 B.S. (2014 A.D.)	One of the main objectives of this policy is to reduce urban and rural poverty by ensuring equitable socio-economic development, improving health and the quality of life of the people and protection of environment through the provision of sustainable water supply & sanitation service	The proposed project is also committed to provide safe, potable, reliable and adequate water supply service and to provide sanitation service through construction of public toilets.
Land Acquisition, Rehabilitation and Resettlement Policy	2015	• Contribute to overall development of the nation and its citizens by creating a conducive environment for implementation of infrastructure development projects • Facilitate timely execution (completion) of development projects by minimizing adverse impacts on economic, social and cultural aspects of affected families/people and the project area • Improve social and economic status of project-affected families by providing fair and adequate compensation, appropriate resettlement and rehabilitation assistances/ allowances.	There is no issue of any kind of Land Acquisition, Rehabilitation and Resettlement in this project.

Act/ Rule Policy/Law/Guidelines	Year	Relevant Provisions	Remarks
Land Use Policy	2072 B.S. (2015 A.D.)	• The strategy 3 of Policy 2 has taken into account to maintain a balance between physical infrastructure development and environment. • The strategy 3 of Policy 10 focusses on adoption of principle of sustainable development in view of the impact of climate change during any construction and/or development works in order to keep balance between land, environment and development.	The proposed project will maintain balance between construction activities and environmental aspects of the project town.
National Urban Development Strategy	2074 B.S. (2017 A.D.)	• This strategy assesses the existing conditions of infrastructures, environment, economy and governance, establishes benchmarks and desirable standards. • It identifies prioritized strategic initiatives for investment in infrastructure and environment to realize the comparative advantages of urban areas.	The IEE study has duly followed this.
National Forest Policy	2075 B.S. (2019 A.D.)	It guides sub sectoral programmes relating to forests, plant resources, wildlife, biodiversity, medicinal plants, and soil and watershed conservation. It also covers periodic assessment and updating of information on forest resources of the country.	The proposed project does not have to deal with forest related adverse issues.
Fourteenth Plan (FY 2073/74-2075/76)	2073/74-2075/76	This plan has separate provision for water supply & sanitation sector. Regarding this, this plan intends to provide water supply & sanitation service to whole population for which it has its own strategy, working policy and expected positive outcomes through various development works in the field of water supply & sanitation service.	This proposed project falls under the major programmes of this plan. (Chapter 4, Section 3, Sub Section 3.6, Ka-2)
Fifteenth Plan Approach Paper (2076/77-2080/81)	2076/77-2080/81	This plan also has separate provision for water supply & sanitation sector. Regarding this sector, this plan aims to ensure access to safe water supply & sanitation service and to enhance quality service. This plan has also its own strategy, working policy and expected positive outcomes through various development works in the field of water supply & sanitation service.	The successful implementation of the proposed project shall be the expected outcome of this plan.

Act/ Rule Policy/Law/Guidelines	Year	Relevant Provisions	Remarks
ii) Laws & Acts			
Essential Goods Protection Act	2012 B.S. (1955 A.D.)	• Deems drinking water an essential commodity and strictly protects drinking water. • Prohibits any unauthorized use or misuse, stealing, damaging etc. of drinking water.	The proposed project ensures safe, reliable & potable water along with the provision of protection works and metering system to prevent any misuses, stealing and damage problems.
Aquatic Animal Protection Act	2017 B.S. (1961 A.D.) with Amendments (2055 B.S. (1997 A.D.))	This act renders punishment to any party introducing poisonous, noxious or explosive materials into a water source or destroying any dam, bridge or water system with the intent of catching or killing aquatic life. It also emphasizes that GoN empowers to prohibit catching, killing and harming of certain kinds of aquatic animals by notification in Nepal Gazette.	Information of this act will be delivered to the construction workers, as they may get involved in fishing during construction period.
Town Development Act	2045 B.S. (1988 A.D.)	This act has provision of services and facilities like road, transport, electricity, drainage, sanitation and open space based on density of such area.	The proposed project is solely for provision of water supply & sanitation services.
Water Resource Act	2049 B.S. (1992 A.D.)	• The umbrella Act governing water resource management. • Provides for the formation of water user associations and establishes a system of licensing. • Prohibits water pollution	WUSC has been formed for this proposed project as per this act and There is provision of control of water pollution through protection works and strict supervision.
Forest Act	2049 B.S. (1993 A.D.) with Amendments - 2055 B.S. (1999 A.D.)	The Act prohibits the extraction of boulders, rocks, pebbles, sand or soil from national forests, defined as all forests, excluding private forests, whether marked or unmarked with forest boundary, to include waste or uncultivated lands, or unregistered lands surrounded by the forest or situated near adjacent forests as well as paths, streams rivers, lakes, riverine lands within the forest.	No trees will be cut. EMP stipulates no quarrying of natural aggregate materials.
Land Acquisition Act	2049 B.S. (1993 A.D.)	It guides the compulsory acquisition of land. It also describes that GoN can acquire land at any place and in any quantity by giving compensation pursuant to the act for the land acquired for any public purposes or for operation of any development project initiated by GoN.	There is no requirement of land acquisition of private land. All the land required are under the ownership of GoN.

Act/ Rule Policy/Law/Guidelines	Year	Relevant Provisions	Remarks
Child Labor Prohibition and Regulation Act	2056 B.S. (2001 A.D.)	The section 3 of the Act prohibits a child from engaging in work, sub-clause 1 of the clause 3 states "Nobody shall engage in work a child who has not completed fourteen years of age as a labor and sub clause 2 states "Nobody shall engage a child in a risk full occupation or work set forth in the Schedule". The section 4 states "Child not to be engaged in work against his will by temptation or fear or pressure or by any other means.	This provision has been stated in EMP.
Water Supply Management Board Act	2063 B.S. (2006 A.D.)	It guides to prevents the misuse of potable water and prevent pollution of potable water	The proposed project has followed this as it has provision of protection works at the intake site, WTP & RVT sites that will prevent pollution of water.
Solid Waste Management Act	2068 B.S. (2011 A.D.)	Article 4 provides that the management of hazardous, medical, chemical or industrial waste rests upon the generators of such wastes. Management should be as prescribed in the Act. Article 5 provides that individuals and entities must 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	2074 B.S. (2017 A.D.)	• The has provisions for the rights, interest, facilities and safety of workers and employees working in enterprises of various sectors. • The Act emphasizes on occupational health and safety of workers and stipulates provision of necessary safety gears and adopting appropriate precautionary measures against potentially hazardous machine/equipment in the workplace. • It also specifies to arrange such as removal of waste accumulated during production process and prevention of dust, fume, vapor and other waste materials, which adversely affect the health of workers. • It specifies the provision of controlling the communicable diseases at the construction site. It also prohibits mobilization of child as a labor. It emphasizes on the provision of temporary camp, safe drinking water and necessary food supplies to the workers.	These provisions are stated in EMP.

Act/ Rule Policy/Law/Guidelines	Year	Relevant Provisions	Remarks
Local Government Operation Act	2074 B.S. (2017 A.D.)	The Act gives Province Government the functions, duties & powers to: (i) entrust municipalities with responsibility of WSS services, (ii) conserve & protect their local environment & natural resources; (iii) plan, implement &/or operate & maintain WS projects at local level; (iv) implement or arrange for implementation local sanitation/sewerage & drainage projects; (v) protect cultural heritage & religious sites; &/or (vi) monitor project activities within their respective jurisdictions	Provides a basis for Local Government to monitor the environmental performance of the projects EMP provides the responsibilities of LGs in EMP implementation.
iii) Rules & Regulations			
Solid Waste (Management & Resource Mobilization), Rules	2044 B.S. (1987 A.D.) & Amendments 2049 B.S. (1992A.D.)	• This act focuses on the management of solid waste and mobilization of resources related. • These also ensure the health convenience of the common people by controlling the adverse impact on pollution from solid waste.	• This act needs to be reviewed during construction phase. • EMP covers the requirement of this rule for the proposed project.
Water Resource Regulations	2050 B.S. (1993 A.D.)	• This is the umbrella Regulation governing water resource management. • Sets out the procedure to register a Water User Association and to obtain a license • Sets out the rights and obligations of Water User Associations and license holders	The proposed project has followed these provisions.
Forest Regulations	2051 B.S. (1995 A.D.)	• This has separate provision for the protection of Community Forest along with the duties & responsibilities of Community Forest User's Group.	The proposed transmission mains run along the Naule Community Forests. The IEE study has considered this forest regulation assuring the protection of the Naule Community Forest.
Drinking Water Regulations	2055 B.S. (1998 A.D.)	• Regulates the use of drinking water • Provides for the formation of Drinking Water User Associations and sets out the procedure for registration. • Deals with licensing of use drinking water. • Deals with the control of water pollution and maintenance of quality standards for drinking water • Sets out the conditions of service utilization by consumers	The proposed project has followed all these provisions.

Act/ Rule Policy/Law/Guidelines	Year	Relevant Provisions	Remarks
Solid Waste Management Rules	2070 B.S. (2013 A.D.)	• GoN has issued these rules by exercising the power conferred by the section 50 of the Solid Waste Management Act, 2068. • Section 3 of this rule focuses on Segregation & management of solid wastes.	EMP for this proposed project covers this matter focused by this rule.
Labor Rules	2075 B.S. (2018 A.D.)	• GoN has issued these rules by exercising the power conferred to it under the section 184 of the Labor Act, 2074. • Section 7 of these rules deals with Occupational Safety & Health Policy.	EMP for this proposed project covers this matter focused by this rule.
iv) Directives, Guidelines & Manuals			
National EIA Guidelines	2049 B.S. (1993 A.D.)	This guidelines aims to assess the environmental impacts likely to be caused by a project, and promote its positive impacts and mitigate or eliminate adverse impacts by undertaking preventive and other effective measures after integrating the environmental impacts in the planning cycle of all the projects to be initiated in Nepal, prior to their initiation, so as to make the economic benefits from development projects sustainable	This has been followed for evaluation of the anticipated environmental impacts.
WHO Air Quality Guidelines, Global Update	2061 B.S. (2005 A.D.)	It provides basis for global standards in air quality that are designed to offer guidance in reducing the health impacts of air pollution.	During air quality monitoring, this guideline will be followed
WHO Guidelines for Drinking-water Quality, Fourth Edition	2073 B.S. (2017 A.D.	It provides the recommendation of WHO for managing the risk from hazards that may compromise the safety of drinking water.	During water quality monitoring, this guideline will be considered and followed
National Noise Standard Guidelines	2068 B.S. (2012 A.D.)	It provides basis for national standards in noise quality that are designed to offer guidance in reducing the health impacts of noise pollution.	During noise quality monitoring, this guideline will be followed
Guidelines for Community Noise by WHO	2055 B.S. (1999 A.D.)	It provides basis for global standards in noise quality at community level that are designed to offer guidance in reducing the health impacts of noise pollution.	During noise quality monitoring, this guideline will be followed.
Working procedure for the use of national forest for national priority projects, 2074	2074 B.S. (2017 A.D.)	It emphasizes on the management regarding the use of national /community forests for the implementation of national priority project.	During construction activities within the community forest area, this will be followed

Source: IEE Study, 2018/019

B. Environmental Agreements

International Environmental Agreements

24. Nepal is a signatory to many international agreements and conventions related to environmental conservation. However, all of those conventions are not interrelated to the proposed project. The conventions related to the proposed project are as follows:

(i) The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973

(ii) International Covenant on Economic, Social and Cultural Rights (ICESCR), 1976

(iii) Worst Forms of Child Labour Convention, 1999

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

26. The Charikot Water Supply & Sanitation Project does not and will not break or go against Nepal's commitment to these international agreements.

C. Environmental Standards

27. The key environmental quality standards applied in the GoN IEE (as well as in the ADB IEE) are listed below and their details featured as **Appendix 2A**.

- National Ambient Air Quality Standards, for Nepal (NAAQS), 2003 A.D. & Updated in 2012 A.D.
- National Diesel Generator Emission Standard,2012
- Nepal Vehicle Mass Emission Standard, (NVMES), 2069 B.S. (2012 A.D.)
- The relevant environmental quality standards applied in the GoN IEE (as well as in the ADB IEE) are listed in Table II-2 and their details on the acceptable level criteria of these standards are featured in ***Appendix 2A***.

Table II-2: 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 Noise Level Guidelines
Drinking water quality	National Drinking Water Quality Standards, 2005	WHO Guidelines for Drinking-water Quality, Fourth Edition, 2011
Emission standard for diesel generator discharge to ambient Air	National Diesel Generator Emission Standard,2012	

Source: IEE Study, 2018/019

28. As shown in the above table, National Ambient Air Quality Standards, for Nepal, 2003 is enforced by GoN that has set quality standards for seven parameters TSP, PM10, Sulphur Dioxide(SO2), Nitrogen Oxide(NO2), Carbon Mono-oxide (CO), Lead (Pb) and Benzene at national level. Similarly, WHO Air Quality Guidelines, Global Update, 2005 enforced by WHO has set quality standards for four parameters PM10, PM2.5, SO2 and NO2 at international level. Both standards provide guidelines to follow and comply the set standards for the ambient air quality during construction period. The acceptable level criteria for ambient air quality as per both standards are tabulated below:

Table II-3: Standards for Ambient Air Quality

Parameter	Averaging Period	Nepal's Ambient Air Quality Standard ($\mu g/m^3$) *	WHO Air Quality Guidelines ($\mu g/m^3$) **	
			Global Update 2005	Second Edition ^ 2000
TSP	Annual	-	-	-
	24-hour	230	-	-
PM_{10}	Annual	-	20	-
	24-hour	120	50	-
$PM_{2.5}$	1-year	-	10	-
	24-hour	-	25	-
SO_2	Annual	50	-	
	24-hour	70	20	-
	10-minute	-	500	-
NO_2	1-year	40	40	-
	24-hour	80	-	-
	1-hour	-	200	-
CO	8-hour	10,000	-	10,000
	15-minute	100,000	-	100,000
Pb	1-year	0.5	-	0.5
Benzene	1-year	20	-	-

Source:

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

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

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

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

29. Similarly, National Noise Standard Guidelines, 2012 has set the standard noise levels measured in dBA for Industrial area, Commercial Area, Rural Residential Area, Urban Residential Area, Mixed Residential Area and Quiet Area. This also has provision of standard values for the noise level generated by Water Pumps and Diesel Generator also. This is limited within the country only. For international level, WHO Noise Level Guidelines has set the standard noise levels measured in dBA for two areas that includes residential and commercial areas. The standard values for ambient noise quality are given in the table given below:

Table II-4: Standards for Ambient Noise Quality

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

* Guidelines for Community Noise, WHO, 1999.

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

30. National Diesel Generator Emission Standard, 2012 has been introduced by the Government of Nepal in 2012 for new and in use diesel generators with a capacity of 8 kW-560kW (under the 1997 Environment Protection Act). The emissions standards set for new diesel generator imports is equivalent to Bharat Stage III standards and, for in-use diesel generators, is equivalent to Bharat Stage II. The Diesel Power Generation: Inventories and Black Carbon Emissions in Kathmandu Valley, Nepal 60 emissions limits are set for four major pollutants: CO, HC, NOx, and PM. This is given in detail below:

Table II-5: National Diesel Generators Emission Standards, 2012

1. Emissions Limits (g/kWh) for Imports of New Diesel Generators

Category (kW)	CO	$HC+NO_x$	PM
kW< 8	8.00	7.50	0.80
8 = kW <19	6.60	7.50	0.80
19 = kW <37	5.50	7.50	0.60
37 = kW <75	5.00	4.70	0.40
75 = kW <130	5.00	4.00	0.30
130 = kW <560	3.50	4.00	0.20

Note: This standard is equivalent to Bharat III standards.

2. Emissions Limits (g/kWh) for In-use DG Sets

Category (kW)	**CO**	**HC**	**NO_x**	**PM**
kW< 8	8.00	1.30	9.20	1.00
8 = kW <19	6.60	1.30	9.20	0.85
19 = kW <37	6.50	1.30	9.20	0.85
37 = kW <75	6.50	1.30	9.20	0.85
75 = kW <130	5.00	1.30	9.20	0.70
130 = kW <560	5.00	1.30	9.20	0.54

Note: This standard is equivalent to Bharat II standards.

a) Sampling collection point should be located at one-third of the DG set stack height.

*b) kW= Power Factor * kW*

c) Testing Methodology: Should be according to ISO 8178 or equivalent to ISO 8178 standard set by the manufacturing country.

Source: Diesel Power Generation, 2014 by The World Bank

D. Environmental Assessment Requirements

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

i. Environmental Assessment Requirements of ADB

32. All projects funded by the ADB must comply with the Safeguard Policy Statement (SPS) 2009 to ensure that projects funded under ADB loan are environmentally sound, legally compliant, and safe. On the environment, the ADB Operations Manual, Bank Policy (OM Section F1/OP, 2010), underpins the SPS 2009. The policy promotes international good practice as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health, and Safety Guidelines.[1]

33. ADB's Environmental Safeguards policy principles are defined in SPS (2009), Safeguard Requirements as per Table II-6 given below and the IEE is intended to meet these requirements.

Table II-6: SPS 2009 Safeguard Requirements

SPS 2009 - Safeguard Requirements	Remarks
Use a screening process for each proposed project, as early as possible, to determine the extent and type of environmental assessment (EA) so that the studies are undertaken commensurate with the significance of potential impacts and risks.	REA has been undertaken, indicating that the Subproject is **NOT**: (i) environmentally critical; and (ii) adjacent to or within environmentally sensitive/critical area. The extent of adverse impacts is expected to be local, site-specific, confined within main and secondary influence areas. Significant adverse impacts during construction & operation will be temporary & short-term, can be mitigated properly. Hence, IEE is sufficient.
Conduct EA to identify potential direct, indirect, cumulative, & induced impacts and risks to physical, biological, socio-economic (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 trans boundary global impacts, including climate change.	IEE has been undertaken to meet this requirement. (Section VII).
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.	No project alternatives
Avoid, and where avoidance is not possible, minimize, mitigate, &/or offset adverse impacts and enhance positive impacts using environmental planning & management. Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.	An EMP has been prepared to address this requirement. Section VIII
Carry out meaningful consultation with affected people &facilitate their informed participation. Ensure women's participation. Involve stakeholders, including affected people & concerned NGOs, early in the project preparation process & ensure that their views & concerns are made known to & understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to EA. Establish a GRM to receive & facilitate resolution of affected people's concerns & grievances on project's environmental performance.	Key informant and random interviews have been conducted. A grievance redress mechanism for the resolution of valid Project-related social and environmental issues/concerns is presented in Section X.
Disclose a draft EA (including the EMP) promptly, before project appraisal, in an accessible place & a form & language(s) understandable to affected people & other stakeholders. Disclose the final EA, & its updates if any, to affected people & other stakeholders.	This is the final IEE based on the Detailed Engineering Design Report. Copies of both SPS-compliant IEE and GoN-approved IEE will be made available at the offices of the PMO, ICG, and WUSC for public consultation.
Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	EMP implementation, reporting, and disclosure of monitoring reports are in this IEE.

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 trees will be cut. Although in due time, groundcover is expected to naturally grow over the backfilled affected area, EMP recommends seeding of the re-surfaced area to accelerated re-growth.
Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health, and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, 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 marginally applicable to the Subproject regarding waste generation. The Subproject will not involve hazardous materials subject to international bans or 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 the environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	The Subproject will not affect any physical, cultural resource. The EMP recommends the measure/s mitigate the adverse impact on PCRs in the case of the chance find.

Source: ADB-SPS, 2009

ii. Environmental Impact Assessment Requirements of Nepal

34. The Environmental Protection Rules (EPR, 1997) defines the process that should be followed for the preparation, review, and approval of environmental assessment reports. The process applicable to the project is summarized in Table II-7. The key environmental quality standards applied in the GoN IEE (as well as in the ADB IEE) are included in ***Appendix 2A.***

Table II-7: 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 a proposed project requires an IEE, Proponent prepares an IEE schedule of work/ToR using the format prescribed in Schedule 3 of the EPR and submit this to the CSA for approval.	ToR has been prepared, submitted and approved accordingly.
Proponent carries out IEE according to the approved work schedule/ToR and prepares an IEE Report following the format prescribed in EPR Schedule 5 and incorporating stakeholders' feedback applying the consultation procedure specified in the EPR.	The IEE study has been carried out as per approved ToR and submitted accordingly.
Proponent submits 15 copies of the IEE Report along with the project proposal and recommendation of the concerned town or town to the CSA.	15 copies of the IEE Report has been submitted.
CSA conducts review and grants approval of IEE Report.	The IEE report has already been approved by the Ministry of Water Supply (MoWS). Refer Appendix 4.
If the review reveals project implementation to have no substantial adverse impact on the environment, CSA grants approval within 21 days of receipt of the report.	MoWS has already granted approval.
If the review reveals the necessity to carry out an EIA, Proponent conducts an EIA following the prescribed EIA process.	The IEE study concludes that there is no necessity to carry out EIA and It has already been mentioned in Chapter XII of this IEE Report.
Proponent implements approved IEE Report and any terms and conditions given the approval.	As soon as the implementation of the project starts, IEE Report will be followed accordingly.
CSA monitors and evaluates the impact of project implementation. When necessary, issue directives to the Proponent to institute environmental protection measures.	This will be conducted as soon as the implementation of the project starts.
MoPE conducts the environmental audit after two years of project commissioning/operation.	This will be conducted after the successful implementation of the project.

Source: EPR, 1997 with Latest Amendments 2017

III. APPROACH AND METHODOLOGIES

35. The IEE study was carried out in accordance with the requirements of the ADB's Safeguard Policy Statement (SPS 2009) and environmental legal requirements of GoN i.e., EPA (1997) and EPR (1997 with amendments 1999, 2007 & 2017). The IEE study was conducted through preliminary exercise to solicit information from the planners, policy makers, concerned authorities, WUSC and the relevant stakeholders. This involves walkthrough survey, desk study, field visits and impact identification & evaluation. For this, the stepwise process to undertake these activities are as follows:

A. Literature Review/Desk Study

36. Available secondary information in the form of reports and maps; topographic maps, land use maps, aerial photographs, cadastral survey maps, etc. were collected and reviewed. Feasibility Study Report, Detailed Engineering Design Report and Social Safeguard Due Diligence Report of the proposed project were the key documents to determine the nature and scope of activities of the project that influences the environmental conditions of the proposal area. Rainfall & Other Meteorological data of the project town were also collected from the Department of Hydrology & Meteorology. Similarly, published and unpublished reports about environmental policies, laws, rules, standards, Acts, Regulation and other legal provisions were also collected and reviewed. Published and unpublished literature of the project area about biological, social, chemical, physical, and cultural environments in the form of maps, and reports, etc. were collected from various sources and reviewed to get information on the coverage of the studies and fulfill the data gaps.

B. Impact Area Delineation

37. To carry out IEE study, the possible areas where the anticipated impacts have either significant or insignificant effects, need to be delineated. To specify the area that would be covered by the assessment, the geographical boundary of the influence area is delineated on the topographical map. This delineating methodology is called Impact Area Delineation The impact areas have been delineated on the basis of proximity of the construction site to the nearby surrounding areas. The impact areas has been delineated as “Core Project Area”, and “Surrounding Project Area” on the basis of proximity and magnitude of the impacts due to the proposed project activities.

38. Core Area: Here, the Core Area indicates the area required permanently as well as temporarily for the proposed project. This area refers to the service area as well the area where the construction of the project components will be carried out.

39. Surrounding Area: Here, the Surrounding Area indicates the area within the immediate surroundings of the core area of proposed project. It includes the area of the project town which is closely associated with the core area of the project

C. Field Study

40. Field studies were carried out within the project site areas in an extensive manner by a multidisciplinary team comprising a) an Environmental Specialist; b) Water Supply & Sanitation Engineer; c) Sociologist; d) Geo-hydrologist and e) Botanist. During the visit, baseline information on physico-chemical, biological, and socio-economic & cultural conditions of the core area and surrounding areas of the project area were collected through simple checklist method and Survey Questionnaire method. During field study, Rapid Environmental Assessment (REA) Checklist (Refer Appendix 1) as recommended by ADB as per SPS, 2009 were duly followed and filled up. This checklist primarily includes the data regarding physico-chemical, biological, socio-economic & cultural environment. Various approaches and methodological tools that were used for the data collection of various environmental aspects during this field study are described below:

a) Physico-Chemical Environment

41. An extensive physical & chemical environment survey were carried out by delineating the project impact area to collect the baseline information. Topographic and geomorphological features that include Landforms, Geology & Soil, Land use pattern, Landslide susceptibility etc. were observed and documented. The data regarding Climate & Rainfall of the project town were collected from the concerned authority. Similarly, information on air quality and noise quality condition were collected through field observation and expert's judgment. Information on rivers and aquatic ecology were also collected to assess the existing condition. Various consultations programs with the local communities and Interviews with few government officials, schools & representatives of the local bodies were also conducted.

b) Biological Environment

42. The baseline information regarding biological environment were collected through walkthrough survey throughout the core & surrounding areas of the project area by adopting simple checklist method (Refer **Appendix 5**), through professional judgment and local interaction. Under this baseline information in regard to the biological environment, types of vegetation and forests were identified based on the species composition. The protected vegetation (rare, endangered, indigenous, etc.) of the project area as per IUCN Red Book, CITES Appendices, Proximity Report Generated by IBAT and GoN list species were enumerated based on consultation with the local people and the expert judgment.

43. Information on rivers of the project area and aquatic ecology were also collected through the interaction with the locals, the expert judgment and field observation.

44. The data on the existing wildlife/mammals, birds, herpetofauna (Reptiles/Amphibians) were collected through field observation and interaction with the locals. The checklists as given in **Appendix 5** were filled up accordingly. The status of each of these species were identified as either threatened or near threatened or endangered species or least concern as per IUCN Red Book, IBAT Report of ADB, CITES Appendices and GoN list species. This were affirmed by the expert review.

c) Socio-Economic & Cultural Environment

45. Household surveys were conducted through interviews by simple questionnaire method to obtain information on the socio-economic & cultural environment that primarily includes demography, ethnicity, education, health & sanitation, drinking water condition of the project area, irrigation facility, local traditions, religions, land use patterns, incomes & expenditures and to acquire their perception towards the proposed project, etc. Information on Migratory patterns of the local people and the Impact of river on settlements & agriculture were collected. Information on the people residing within the core area of the proposed project town were collected through socio-economic survey. The sample of Household Survey Questionnaire that were filled up during household survey has been included in **Appendix 5**.

46. Focused Group discussions (FGD) were conducted to obtain suggestions and comments from all the potential stakeholders. Direct observation (Transect Walk Method) were conducted to ascertain the existence of the cultural sites, and public institutions such as temples, cremation grounds, historical & archaeological sites, schools, and health posts within the project core areas and to determine the effect on their existence due to project construction activities. The Consultations with the village elites, Meetings and Group discussions were done to assess the current situation of the project area community.

D. Stakeholder & Public Consultation

47. Various consultations with key stakeholders were held during design phase of this proposed project. Here, the key stakeholders include government agencies, local bodies, road users, local beneficiaries etc. These consultation programs disclose information regarding the proposed project to the relevant stakeholders. Along with this, other required information for the project were collected from the concerned stakeholders, which were integrated in the identification of anticipated environmental impacts.

E. Impact Identification, Prediction & Evaluation Methods

48. The information regarding Physico-chemical, Biological and Socio-economic & Cultural aspects as mentioned above were collected to identify the susceptibility of these aspects to be affected by the proposed project activities. This helped to identify the anticipated environmental impacts of the proposed project. For this, Simple Checklist method were adopted for the impact identification. This was carried out by using Rapid Environmental Assessment (REA) Checklist prepared by ADB and by using simple household survey questionnaire (Refer Appendix 5) prepared during the desk study. These checklists explained about the environmental features or factors that need to be addressed while identifying the impacts of projects and activities.

49. Once all the important impacts were identified, their potential characteristic were predicted. The baseline data on physico-chemical, biological, socio-economic and cultural aspects were used to estimate the likely characteristics and parameters of impacts that includes Nature, Magnitude, Extent and Duration.

50. The nature of each predicted impact has been classified into Direct (D) and Indirect (ID). The magnitude of the impact is classified into High (H), Medium (M) and Low

(L). The extent is classified into Site-Specific (SS), Local (L), and Regional (R). Similarly, the duration of impact is classified into Short Term (ST), Medium term (MT), and Long term (LT).

51. Impact predictions is generally made against a baseline established by the existing environment. Hence, during our field study, the baseline data were used as reference point against which the characteristics and parameters of impact related changes were analyzed. Impact predictions were made by considering the future state of the environment. This also requires professional judgment for accuracy.

52. After the impact identification and prediction method, the impacts will be evaluated regarding the significance of the predicted impacts to assess the adversity of adverse impacts and efficiency of beneficial impacts within the project core & surrounding areas. This was done by following the National EIA Guidelines 1993 according to which scoring for each likely parameter of the impacts was carried out and the level of significance has been assessed as recommended by these guidelines. The scoring of Impacts as per National EIA Guidelines 1993 is tabulated below.

Table III-1: Scoring of Impacts

S. No.	Likely Parameters of Impacts	Type	Scoring as per National EIA Guidelines,1993
1.	Nature	Direct	No Scoring Required
		Indirect	
2.	Magnitude	High (H)	60
		Medium/Moderate (M)	20
		Low (L)	10
3.	Extent	Regional (R)	60
		Local (L)	20
		Site Specific (SS)	10
4.	Duration	Long Term (LT)	20
		Medium Term (MT)	10
		Short Term (ST)	5

Source: National EIA Guidelines 1993

53. Then, the significance level of Impact rated will be assessed as per the following table:

Table III-2: Significance of Impacts

S. No.	Scoring as per National EIA Guidelines,1993	Level of Significance as per National EIA Guidelines,1993
1.	Less than 50	Insignificant
2.	50 to 75	Significant
3.	More than 75	Very Significant

Source: National EIA Guidelines 1993

54. This evaluation has been carried out as per the professional judgment by the key expert team involved in the IEE study.

IV. ANALYSIS OF ALTERNATIVES

A. With- and Without-Project Alternatives

55. Analysis of the alternatives of the proposed project is another important process of IEE study that helps to assess the feasibility of the project in regard to technical, environmental & social aspects. Primarily, this involves two alternatives that includes "Without Project" or "Do-nothing" Alternative and "With Project" Alternative.

i. Without-project' or 'do-nothing' alternative

56. "Without Project" or "Do-nothing" Alternative carried out study on the existing water supply system to analyze the condition of the project town in the absence of the proposed project.

57. The study shows that the residents of the project area are consuming either untreated or partially treated water from the existing water supply system.Though there are not any evidence of impacts of untreated water on the lives of local people at present situation, there is possibility of incidence of water-borne diseases in the future due to continous consumption of unsafe and untreated water. This will result in the health hazards in the project area that will in turn expose the surroundings to environmental problems.

58. The existing water supply system in the project area is intermittent and is not able to meet the increasing demands of the increasing population of the project area. Insufficient water supply compels them to control the use of water for various purposes even for sanitation practices. Lack of water in the sanitation practices like flushing of water after use of latrine, bathing, washing clothes etc. demotes the domestic hygiene of the project area. This may pose outbreak of diseases like Typhoid, Cholera, Dysentry etc. This may in turn result in various environmental problems.

59. 'Without Subproject' or 'Do-Nothing' alternative toughens the chance of the occurrence of the abovementioned threats to the environment of the project area. Without subproject, people of the project area will continue to consume the partially treated or untreated water from the existing water supply system. This may increase the risk of bacterial infection resulting health issues that obviously have impact on public health, animal health and the health of the ecosystems. Similarly, 'Do-Nothing' alternative constrains the locals to be content with the intermittent water supply service.

60. This would further impede (i) further social and economic development of the municipality, (ii) fundamental right related to health as guaranteed in Constitution of Nepal (Article 35) that says that "Every citizen shall have the right of access to clean drinking water and sanitation", (iii) Goal of National Urban Water Supply & Sanitation Sector Policy,2009 (Final Draft) to ensure the socio-economic development, improved health status and quality of life of urban populations, including the poor and marginalised, through the provision of sustainable water supply and sanitation services and protection of the environment and (iv) Nepal's delivery of its commitment to SDG 6th to increase the proportion of the population with sustainable access to safe drinking water and basic sanitation.

61. Beside this, ‘Do-Nothing’ alternative has one positive aspect as it may prevent the service area of the project town from the susceptibility towards the anticipated environmental impacts of this proposed project. However, for this only positive aspect, it is irrational to ignore the hardship that locals of this project town are facing for safe,reliable and potable water. Hence, ‘Do-Nothing’ alternative cannot be better option to be followed in order to get rid of the anticipated environmental impacts as these environmental impacts can either be avoided or minimized by suitable mitigation measures.

ii. With Project alternative

62. With Project Alternative was also analyzed by envisaging the likely benefits of the proposed project. The analysis shows that the proposed project is designed to provide convenient access to reliable, adequate, safe and potable water supply to 22,755 populations as per base year 2018 A.D. There is provision of water treatment system in this project which will ensure the balanced health condition of the people of the project area through consumption of well-treated drinking water. Similarly, the adequate supply of water will encourage people to use water generously for sanitation practice ensuring good hygiene of the people Hence, in overall, the ‘with subproject alternative’ results in the improved public health and living environment that will contribute to improved quality of life in the project municipality.

63. Hence, the ‘with project’ alternative contributes towards the realization of the Updated 15-Yr Development Plan for Small Towns Water Supply & Sanitation Sector, compliance with the fundamental right related to health as guaranteed in Constitution of Nepal (Article 35), fulfillment of Goal of National Urban Water Supply & Sanitation Sector Policy, 2009 (Final Draft) and the delivery of Nepal’s commitment to SDG 6.

64. Along with this, the limitation of "Without Project" Alternatives regarding continuous water supply system, treatment system and susceptibility to water borne diseases leads to opt for "With Project" Alternative. The proposed sub project is the best alternative to overcome the aforementioned threats that is likely to occur in the absence of this subproject.This "With Project" Alternative also involves analysis of alternatives to assess the most cost-effective, reliable and efficient system that can serve the design population. The alternatives regarding "With Project" Alternative is described in detail in the following section.

With No Forest Option

65. As it has already been metioned in Table 29 that some of the project components need to be constructed within various community forest areas. During alternative analysis, 'With No Forest' option has also been considered so that occupying of forest area could be avoided for the construction of this proposed project. But, the technical study shows that there are no other possible options for the proposed project. This project is conceptualized as a unique system. Hence, this 'With No Forest' option seems inappropriate for the proposed project.

B. Alternatives Relative to Planning and Design

66. As per Feasibility Study Report, there are no such alternatives proposed for this project. The proposed project is a unique system and is the extension of mainly existing Charikot system.

67. Hence, there is no requirement of considering system layout, alternative technology, alternative materials and alternative sources in terms of technical, social and environmental aspects for the proposed project.

V. DESCRIPTION OF THE SUBPROJECT

A. Proposed Service Area

68. The subproject is located in Bhimeshwore Municipality, which is situated in Dolakha district in Province 3 of Nepal. It lies between 27º37' 58" N to 27º44' 42" N latitude to 85º5' 12" E to 85º 59' 31" E longitude. The municipality is in a hilly region with an altitude ranging between 950 to 2,560 m above mean sea level with an average altitude of 1554 meters.

69. Discussion was held with WUSC for the delineation of service area of the proposed project. Regarding this, the initial discussion was carried out with users committee on various dates. The service area of the Charikot (Dolakha) water supply and sanitation subproject comprises complete areas of wards 3 & 7 and partial areas of ward numbers 2, 4 & 5 of Bhimeshwore Municipality.

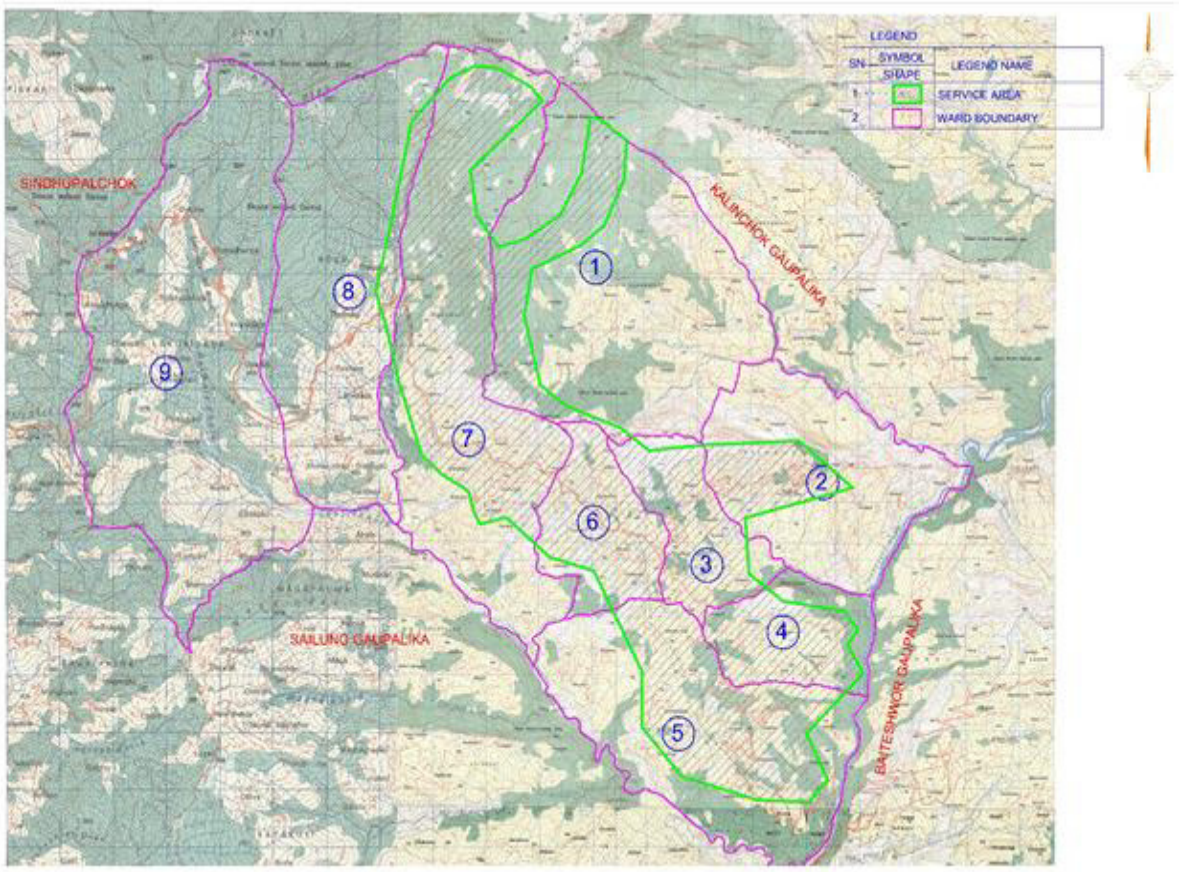


Figure V-1: Proposed Service Area

B. Project Components

70. Sources/Intake: Altogether, there are ten intakes. The first sub-system, SS-1 or OLD system comprises of six intakes and the other two sub-systems, SS-2 and SS-3, each comprises of two-stream intakes.

71. Out of these six intakes of the old system, two are spring intakes, and four are stream intakes. As they are drawing water from these sources since the past with a

cumulative safe yield of 11 liters per second (lps), the safe yield of the transmission system of this sub-system has been adopted as 10.6 lps. The water collected from the two streams will be collected in a collection chamber. Intakes are located in an altitude ranging from 2,669 m to 2,964 m.

72. In sub-systems (SS-2) two streams intake have been proposed. One intake has been proposed at the main course of Charnawati River and other intake is from its tributary. Both of these intakes are about 400 m u/s from the Tallo Dovan of Hattichahara. As the tributary of Charnawati River flows in very steep gradient at intake area of SS-2 Sub-system, temporary type of weir by Rip-Rap has been recommended (TYP-3). A single orifice type intake with minimal sill height has been provided to divert river water to intake filter chamber in a main river.

73. However, simple bottom trash rack has been proposed (TYP-5) on the hard bedrock at the Hattichahara (Charnawati River near waterfall). The bed is of hard rock as stilling basin in this waterfall area. An appropriate simple Bottom Rack Intake has been proposed in this river. A gravel trap at the end the bottom rack, in the form of chamber, has been provided to trap the heavy sediment, which enter from the bottom rack and rolled in the gallery. The gravel trap shall be cleaned occasionally by manual means. Diverted water from two streams will be collected at collection chamber. In totality cumulative discharge of about 31 lps have been proposed. Relative Level (RL) of these intakes is around 2318 m amsl.

74. As the main course of Charnawati River flows in very steep gradient at intake area of SS-3 Sub-system, temporary type of weir by Rip-Rap has been recommended. A single orifice type intake with minimal sill height has been provided to divert river water to intake filter chamber in the main river. As rigid structure like concrete or masonry weir is not found suitable for the river of mid hill with wider river width. A temporary weir formed by heaping of Rip-Rap for 0.5 to 1 m high across 20m wide river has been provided for the diversion structure of this system. Moreover, such flexible structure is easy for operation and maintenance. A single orifice type of intake has been provided to capture the design flow even during the lean season. To make simple design and simple operation, no gates and scour sluice at intake are provided. To control heavy discharge in the canal during flood time in the river, a control orifice is provided immediately after the gravel trap.

75. A simple RCC chamber intake (TYP-4) has been proposed to divert water from the tailrace of the watermill (Ghatta) in Sub-system (SS-3). This place of existing Ghatta is very close to Lamosangu - Jiri Road. The Ghatta is drawing water from the tributary of the Charnawati near Highway. Relative Level (RL) of this intake is around 1889 m amsl. This tributary have safe yield of 6 lps. In totality cumulative discharge of 11 lps have been proposed from these two branch (SS-3).

76. **Collection Chambers/Collection Tanks:** Altogether, seven collection chambers have been proposed. The sub system-1 comprises five collection chambers, the sub system -2 comprises one collection chamber and SS-3 comprises one collection chamber.

77. In sub system-1, the first collection chamber (CT1) will collect water tapped from sources S1 & S2. Along with the water tapped from the source S3, the water collected at CT1 will be collected at second collection chamber (CT2). Similarly, the

water tapped from the sources S4, S5 & S6 will be collected at the third collection chamber (CT3). The water collected at CT3 will further be collected at the fourth collection chamber (CT4) where the water from CT2 will also be collected. Then, the water from CT4 will be conveyed to two distribution systems i.e., Deurali & Tower System. In case of tower system, apart of Tower RVT, water from water tretament plant (WTP-2) will also be transported to collection chamber (CT7) where water from the existing WTP will also be collected. The water from CT7 will be conveyed to three distribution systems viz., Existing Charikot System, Upper Dolakha System and Lower Dolakha System.

78. In sub-system-2, the water tapped from two proposed sources viz; HC1 & HC2 will be collected at the the collection chamber CT-5. Likewise, in sub-system-3, the water tapped from Ghatte Khola & Pani Ghatta will be collected at the collection chamber CT-6.

79. **Transmission Main.** There are three different transmissions for different sub-system. The total length of transmission main of Old System (SS-1) is about 13.300 km. This Transmission System transfer water to WTP-2 of SS-2 at Tower area. As the pipe used in existing transmission line is of sub standard in terms of pressure rating, it is not recommended to incorporate in the proposed transmission system.

80. The transmission length of the Hattichahara Transmission system (SS-2) is about 9.941 km. The valley crossing and pipeline along river gorge in steep terrain are the main reason to provide DI pipe. In one stretches (about a 1500m wide) of transmission line at valley the pressure on this transmission line exceed 160 m and below 250m. Therefore, a higher PN rating fittings including flanged pipe has been recommended. Similarly, transmission line of Ghatta Transmission system (SS-3) is about 13.990 Km. The brief details of the proposed transmission system are tabulated below:

Table V-1: Details of Transmission Pipes Subsystem Wise

Sub-System	Length (m)	Pipes Details
Existing System (SS-1)	13,300	PE (50-140mm)
Hattichahara System (SS-2)	9,941	DI(150 -200mm) PE(125-200mm)
Ghatta System (SS-3)	13,990	PE(110-200mm)

Source: Detailed Engineering Design Report, 2018

81. **Thrust Blocks, Saddle Blocks and Thrust Beams.** Thrust blocks has been proposed for DI pipes (both transmission and distribution mains) from being moved by forces exerted within the pipe arising from the internal pressure of the pipeline or the flow of water hitting bends, tapers and closed or partially closed valves. Typical Thrust Blocks for horizontal bend, vertical bend, tee has been designed for the pressure of 30 kg/sq. cm and 20 kg/sq. cm for transmission and distribution line, respectively.

82. Similarly, Thrust Beam and Saddle Blocks are proposed for DI Pipes laid up in the sloppy area and unburied portion. All saddle block are proposed to be anchored with concrete at the center of each pipe to prevent movement. This type of support in the initial stretches of Hattichahara Transmission system. Provision of RCC Support for the stretches of buried and unburied DI pipeline, which are laid-up in the sloppy area, has been made to prevent pipe movement.

83. A special thrust block and beams for 25 PN rating has been designed and recommended in 1500 m long stretches of the valley crossing in Hattichahara Transmission system (SS-2).

84. **River and Stream Crossing.** There are several river crossings in all the three-transmission systems. There are two major crossings, one is in SS- 1, and another is in SS-2. MS truss pipe crossing for a span of 25 m and span of 20 m have been proposed in the Transmission line of SS-2 and SS-3, respectively. These truss crossings are triangular in shape comprising of tuber mild steel sections and braced by welded tubular sections to form a composite light section which is economical than the traditional angle and channel section.

85. A simple crossing by providing SP-4 type concrete saddle block is recommended for small crossings for ductile iron pipes. This type of crossing is used only when the span of crossing is less than 6 m. There are about five crossings in the three-transmission systems. There is provision of pipe clamps for the crossing near existing bridge and culvert.

86. **Water Treatment Plants.**The study shows that in most of the existing systems, water is supplied directly from the sources without the treatment. Only few WUSCs carry out occasional disinfection with bleaching powder during wet season. This indicates the need of provision of water treatment system for the proposed project. To ensure this requirement, water sampling from the three point sources has been conducted which includes one major source i.e., Hattichhahara and two minor sources i.e., Odare and Jhapre Khola. The water quality test reports (Refer ***Appendix 7***) of the proposed sources for physical & chemical parameters show that the water sample collected from all three sources has the value for the turbidity,hardness and iron within the prescribed NDWQS (Turbidity: 5-10 NTU, Hardness: 500mg/L and Iron: 0.30-3mg/L).This does not constrain the provision of water treatment plant. However, there is no surety that these sources' quality will remain same in the future as the project town is leading towards urbanization. Similarly, the on site bacteriological test carried out during field study shows that the proposed water source is contaminated with bacteria. In regard to this, five water treatment plants have been proposed for this project.

87. As the DMA-1 (Deurali System) is drawing water from the existing sources, a small WTP-1 comprises of the only slow sand filter (SSF) with a filtration rate of 0.25 m/hour has been proposed. This service area is at a higher elevation than the proposed big water treatment plant WTP-2 at Tower. This Deurali area is introduced during detail engineering design, and this area is presently served directly by the existing Charikot transmission system. Therefore, separate WTP has been proposed for this SS-1. The capacity of the SSF is 0. 3 lps. Two circular RCC unit of SSF with 1.8 m diameter and height of 3.4m have been proposed.

88. Excluding one separate slow sand filter in WTP-1 for DMA-1, the Charikot water supply system will have major four number of water treatment plants.Out of four major water treatment plants, one water treatment plant is existing treatment plant referred as WTP-E, which will be rehabilitated to improve its performance. The design capacity of existing WTP worked out to be 6.6 lps. As the elevation allows for the Hattichahara Transmission System (SS-2), discharge of 6.6 lps has been diverted from this Transmission System. This WTP will be referred as WTP-E from

now on. The elevation of this area is about 2222 m. This WTP-E comprises of SSF only.

89. The proposed water treatment plant near the tower referred as WTP-2 for old transmission system (SS-1), has been proposed at elevated area to treat 10.3 lps water. This location has been identified as a command location for the reservoir to serve elevated settlement along old transmission line, which is presently receiving water from the transmission mains. Elevation of this WTP area is about 2326 m.

90. Similarly, another water treatment plant has been proposed for the partial treatment of (23.9 lps) discharge from Hattichahara Transmission system ((SS-2). It is situated at 2220 m and referred as WTP-3. This consists of Settling Basin/Sedimentation Tank and SSF.

91. The fourth water treatment plant (WTP-4) has been proposed for Ghatta Transmission system to treat 10.3 lps water. Sedimentation Tank has been proposed near the intake as pre treatmnet unit while WTP-4 comprises Horizontal Roughing filters and Slow sand filter right after this sedimentation tank.

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

93. All setting basin are rectangular settling basin with a longitudinal flow. A Setting basin with two identical chambers of the size of 2.6 m x 9 m has been adopted for 10.3 lps with a design load of 0.8 cum/sq. m /hour. In case of 23.9 lps design discharge, the two identical chamber of tentative size 4 m x 14 m has been adopted with same design load.

94. Horizontal roughing filters have been proposed in WTP-2 and WTP-4 before corresponding SSF. The filtration rate of 2.0 cum/sq.m/hr has been adopted for design. Inlet and outlet chambers each of 90 cm wide has been provided in the unit. Each unit comprises of three chamber for fill filter material in graduation fashion (coarse to fine). The HRF provides superior treatment to basic sedimentation methods for suspension with particulates. Moreover, it is primarily used to separate water from fine solids that are only partly retained, or not at all, by sedimentation tanks. In addition to this, it partly improve bacteriological water quality and to minor extent, it improves some water quality parameters like Color and Dissolved Organic Matters.

95. Both roughing filters for WTP2 and WTP-4 have been designed for a discharge capacity of 10.3 lps. The required number of chamber in a unit is four. The flow width of each unit is 4m and height of the unit is 1.7

96. Slow Sand Filter as main filtration unit has been proposed in every major treatment plant. The filtration rate of 0.2 cum/sq.m/hr has been adopted for design. All SSF will have a depth of 2.8 m including free board of 50 cm. Three chambers each 6 m x 12 m has been proposed to filter design discharge of 10.2 to 11 lps capacity as a unit. Similarly, the same size of two units has been proposed to filter design discharge of 23.9 lps. This SSF will improve the water quality by removing water borne parasites,

bacteria and suspended solids that are not effectively removed by the preceding treatment units.

97. The brief details on the proposed water treatment plants is given in the following table:

Table V-2: Water Treatment Plant in Various Sub-systems

Description	WTP-1(P)	WTP-E (Existing)	WTP-2 (Proposed)	WTP-3 (Proposed)	WTP-4 (Proposed)
T. Sub-system	SS-1 (Old)	SS-2 (Hattichahara)	SS-1 (Old)	SS-2 (Hattichahara)	SS-3 (Ghatta)
Design Discharge	0.3 lps	6.8 lps	10.3 lps	23.9 lps	10.3 lps
Units	SSF	SB+HRF+SSF	SB+HRF+SSF	SB+SSF	SB+HRF+SSF

Source: Detailed Engineering Design Report, 2018

98. All the WTPs have dosing system before distributing water to the service reservoirs. The dosing system comprises of electronic dosing pump with FRP tank and stirring device. As the pump is automatic dosing pump of the electronic type, close housing is recommended.

99. The dosing system at each WTP comprises of electronic dosing pump with FRP tank and stirring device. As the pump is automatic dosing pump of the electronic type, close housing has been recommended. This will effectively remove bacteriological content that are only partly removed by SSF.

100. The environmental audit of the proposed WTP is also carried out, the result of which is tabulated below:

Table V-3: Result of the environmental audit of the proposed WTPs

Subproject name	Details of the WTPs to be rehabilitated	Required environmental clearances per Government of Nepal laws and regulations	Status of monitoring of raw and treated water (per Government of Nepal and WHO guideline values)	Sludge management (if sludge is being generated)	Management of backwash and/or filter media washings	Operation and maintenance (roles and responsibilities, availability of O&M manual, environmental monitoring being conducted)
Charikot Water Supply Project	The existing WTP to be rehabilitated is referred as WTP-E. Its design capacity is 6.6 lps. It includes Settling Basin and Slow Sand Filter. It is located in the land owned by the concerned WUSC within the community	Site Management and Clearance for demolishing boundary wall of WTP and clearing of all the grasses in its premises.	Raw water taken from the concerned sources and the tap water meets both NDWQS and WHO guidelines. However, currently, tap water is not treated as the existing WTP is not functioning.	No Sludge is generated.	The existing WTP is not functioning. Hence, there is no filter media washings carried out by the concerned authority. The rehabilitation of this existing WTP involves clearing of all filter media (sand) from SSF and disposal at a	Charikot WUSC is the operator of the existing system. The WUSC has assigned three water supply technicians for managing water distribution, maintenance and meter reading of the whole system. Two staffs are also deployed.

Subproject name	Details of the WTPs to be rehabilitated	Required environmental clearances per Government of Nepal laws and regulations	Status of monitoring of raw and treated water (per Government of Nepal and WHO guideline values)	Sludge management (if sludge is being generated)	Management of backwash and/or filter media washings	Operation and maintenance (roles and responsibilities, availability of O&M manual, environmental monitoring being conducted)
	forest.				suitable place.	
		No Objection Letter (Document) provided by the concerned community forest to the concerned WUSC.				·The WUSC does not maintain a separate account for operation of water supply system making it difficult to conduct financial analysis;
		Compliance with EPA, EPR, NEPAP, Forest Act, Local Self Governance Act, Labour Act etc.				• The WUSC 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.
						IEE field visit shows that there is no environmental monitoring done during operation and maintenance as the existing WTP is not functioning at all.

Source: IEE Study, 2018

101. Service Reservoir. Altogether, there are fifteen service reservoirs proposed for this project. The cumulative capacity of all fifteen reservoirs proposed in the Charikot water supply sub-project is about 1,650 cubic meters. A minimum of 50 cum capacity have been provided for all reservoirs. An existing tank of 250 cum capacity has been incorporated from the existing system. The table given below gives details on the capacity & status of the reservoirs of this proposed project.

Table V-4:Details of Service Reservoirs

TL SS	DMAs	Reservoir	
		Capacity (lit)	Status
SS-1	Deurali	50,000	Proposed
	Tower Area	50,000	Proposed
	Existing Charikot Bazaar	250,000	Existing
	Upper Dolakha	150,000	Proposed
	Lower Dolakha	150,000	Proposed
SS-2	Charighyang	250,000	Proposed
	Tindhare	150,000	Proposed
	Makaibari	150,000	Proposed

TL SS	DMAs	Reservoir	
		Capacity (lit)	Status
SS-3	Upper Jillu	50,000	Proposed
	Middle Jillu	150,000	Proposed
	Lower Jillu	50,000	Proposed
SS-3	Upper Matti	50,000	Proposed
	Lower Matti	50,000	Proposed
	Upper Dharmaghar	50,000	Proposed
	Lower Dharmaghar	50,000	Proposed
	TOTAL	1,650,000	

Source: Detailed Engineering Design Report,2018

102. **Bulk Distribution Mains.** All of the storage reservoir of the Sub-system will get required water from the corresponding water treatment plants. The total cumulative length of BDS is about 22,046 km. All three types of pipe, PE pipe (50- 140 mm OD), GI pipe (65 mm ND) and DI pipe 125 mm ND, have been used in BDS system. All three series pipes, 6 PN, 10 PN and 16 PN, have been used in PE pipes

103. **Distribution Mains.** The distribution system comprises of a pipe network, which is looped in certain cases and branched in other. The network has been analyzed using EPANET, a design analytical software tool. The entire system has been designed using Polyethylene (PE), Ductile Iron (DI) and Galvanized Iron (GI) pipes. The size of DI pipes is 200 mm and 150 mm. To proper saddle arrangement at the household connection in distribution pipe, the minimum diameter of distribution pipe has been adopted as 50mm.

104. Three types of pipes have been used in the distribution network; Ductile Iron (DI), Galvanized Iron Pipe and PE pipes. However, the uses of GI pipes have been limited. The total pipe length of various diameters is given in the table above. The total pipe length of the proposed distribution system works out to 158.849 km. The details are briefly given below:

Table V-5:Details of Pipes Used in Distribution System (in meters)

A	PE Pipes	Length of PN 6 Pipe (m)	Length of PN 6 Pipe (m)	Length of PN 16 Pipe (m)
	50 OD PE Pipe		54,969	43,885
	63 OD PE Pipe		18,434	4,808
	75 OD PE Pipe	5,218	5,896	1,489
	90 OD PE Pipe	7,247	1,190	1,740
	110 OD PE Pipe	3,142	1,696	3,738
	125 OD PE Pipe	1,228	189	335
	140 OD PE Pipe	1,226	925	22
	160 OD PE Pipe	507	119	
	Sub Total	**18,568**	**83,418**	**56,017**
B	**METTALIC PIPE**	**Length of GI Pipe**	**Length of DI Pipe (m)**	
	50 ND	-		
	65 ND	-		
	80 ND	-	26	

A	PE Pipes	Length of PN 6 Pipe (m)	Length of PN 6 Pipe (m)	Length of PN 16 Pipe (m)
	100 ND	-	18	
	125 ND	-	12	
	150 ND	-	111	
	200 ND	-	679	
	Sub Total	**-**	**846**	
	Total	**158,849**		

Source: Detailed Engineering Design Report,2018

105. The pipelines will be laid along both sides of the wider roads and paved roads to avoid the pavement demolition and long house connection.

106. House Connections. There are about 499 numbers of household connections through GI mains from distribution chambers in core Bazaar area. Similarly, there about 3303 number of house connections from PE pipes out of which about 576 HHs connections require drain-crossing provision. Provision of 38 numbers of household connections has been allocated from DI pipe. This will make the total household connections of 3,843 in the project area. All of the connection will be private.

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

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

109. Appurtenances.

(i) **Line or Sectional Valves.** Line or sectional valves are gate valves used to isolate sections of a pipeline in an emergency or for maintenance and repair. It should be noted that gate valves are suitable for isolation of a pipeline in either "fully open" or "fully closed" positions, but not for frequent open/close operation and flow regulation. All valves shall be with nominal pressure rating PN16 unless in special circumstances where a higher-pressure rating is required.

(ii) **Pressure reducing valves.** Pressure reducing valves (PRVs) are recommended to maintain a preset, reduced, generally constant outlet (downstream) pressure for a range of flow rates and inlet (upstream) pressure in the distribution system. The bypass arrangement has been provided in PRV arrangements to maintain the system during breakdown of PRV and maintenance of the valves. All PRV valves shall be with nominal pressure rating PN 16 unless in special circumstances where a higher-pressure rating is required.

(iii) **Air (Release) Valves.** Air valves will be installed at all high points of the pipeline, in sections, which form a peak on the hydraulic gradient and on the downhill side of line valves. Air valves shall be of combined type with a larger and smaller venting orifice, which permits passage of large volumes of air for vacuum breaking, and venting on starting up and closing down operation and a small venting cross section for the

release of small volumes of air under full internal operation pressure. All air valves shall be Double Orifice Air Valves and shall be with nominal pressure rating PN 16 unless in special circumstances where a higher-pressure rating is required.

(iv) **Washout valves.** Washout valves (WOVs), formed by gate valves, have been proposed to allow sediment to be flushed out and to enable the pipeline to be drained for maintenance and repair work. At least one washout valve has been proposed at the lowest point between two sectional valves on the pipeline and the dead end of a pipeline. Double valves should be provided for washouts for trunk mains and primary distribution mains to suit operational needs. The upstream valve should be opened while the downstream valve should be closed so that the washout pipe on the upstream side of the downstream valve is fully charged with water. Care should be taken to position the discharge points of the washout pipes to avoid water in stream course seeping through the washout pipes into the water mains.

(v) **Flow Meters.** A flow meter has been installed at the at the inlet and outlet mains of a service reservoir, within the treatment works to measure the quantity of water flow for a supply zone. For a DMA, a flow meter has been installed at the inlet of DMA to monitor continuously the quantity of water flowing into or out of DMA. The flow meter for DMA is the typical Waltman type flow meter which has been recommended.

(vi) **Fire Hydrant.** Fire hydrants are provided at major road junctions. These fire hydrants shall also be used for extinguishing fire in emergencies and flushing of the system as required. Fire hydrants, namely, stand post type, conforming to IS 908 is recommended.

(vii) **Chambers.** Two types of chambers have been proposed in the subproject. A chamber with brick masonry walls has been provided in non-vehicular and rural areas. In other vehicular carriageway and city area chambers constructed with RCC have been provided.

110. Guard Quarter, Other Buildings and Boundary Wall.In order to safeguard storage tanks and RVT from vandalism as well as contamination, Chain-link boundary (CLBW) wall and barbed wire fencing (BWF) has been proposed. A galvanized chain link fencing over 450 mm high parapet wall has been proposed from aesthetic and economic consideration for boundary wall. Barbed wire with concrete post has been proposed for fencing in fringe area of town and rural area of the municipality.

111. A two bay two storeyed building for office (OFF-1) is proposed at Charighyang Area. The building comprises of big meeting hall, water quality laboratory, administrative rooms, store for household meter and other small gadgets in addition to the guardroom, kitchen and bathroom for a guard.

112. Three numbers of single storeyed Guard House (GH-1) are proposed at three WTP locations (WTP-2, WTP-3, and WTP-4). The Guard House building comprises of residence facilities for guard and a room for tools for repair and maintenance.

113. Similarly, four numbers of small Guard House (GH-3) are proposed at three reservoir locations. The Guard House comprises of two rooms. As the location is very nearby village, only guardroom is proposed. Another room has been proposed as a tool room.

114. To add bleaching solution in distribution, each RVT sub-system has its dosing system. The Dosing Pump House (DPH) with two compartments has been proposed.

The one compartment house dosing pump and other compartment is recommended for the chemical store. Altogether nine numbers of Dosing Pump House have been proposed.

115. As the system comprises of many RVTs and other structures to be protected and operated, different size of building structures and different type of boundary has been discussed with the WUSC and proposed in the project. The table given below summarizes the details of the above mentioned components :

Table V-6:Proposed Buildingsand Boundary Type

Location	Component	Building	Boundary Type
Charighyang	Main Office	OFF-1	GI Chain link with B/W
Deurali	WTP-1+ RVT #1	DPH	Fencing by Barbed Wire
Tower	WTP-2+ RVT #2	GH-2 + DPH	GI Chain link with B/W
WTP-E (Existing)	Existing WTP	DPH	Exist
Bisuna (Ex. Charikot)	RVT- #3 + Existing Office	DPH	Exist
Upper Dolkha	RVT #4	GH3	GI Chain link with B/W
Lower Dolkha	RVT #5	GH3	GI Chain link with B/W
Bhutpokhari	WTP-3 + RVT- #6 (Makaibari)	GH-2 + DPH	GI Chain link with B/W
Tindhare	RVT # 7	GH-3	GI Chain link with B/W
Simpani	RVT # 8 (Charighyang)	GH-3	GI Chain link with B/W
Ghatta	SB of WTP-4		Fencing by Barbed Wire
Upper Matti	WTP-2 (HRF+SSF) + RVT # 10	GH-2 + DPH	GI Chain link with B/W
Lower Matti	RVT # 9		Fencing by Barbed Wire
Upper Dharamghar	RVT # 11		Fencing by Barbed Wire
Lower Dharamghar	RVT # 12		Fencing by Barbed Wire
Upper JIllu	RVT # 13		Fencing by Barbed Wire
Middle JIllu	RVT # 14	GH-2	GI Chain link with B/W
Lower JIllu	RVT # 15		Fencing by Barbed Wire
Various Locations	Intakes, IC, CC and BPTs		Fencing by Barbed Wire

Source: Detailed Engineering Design Report, 2018

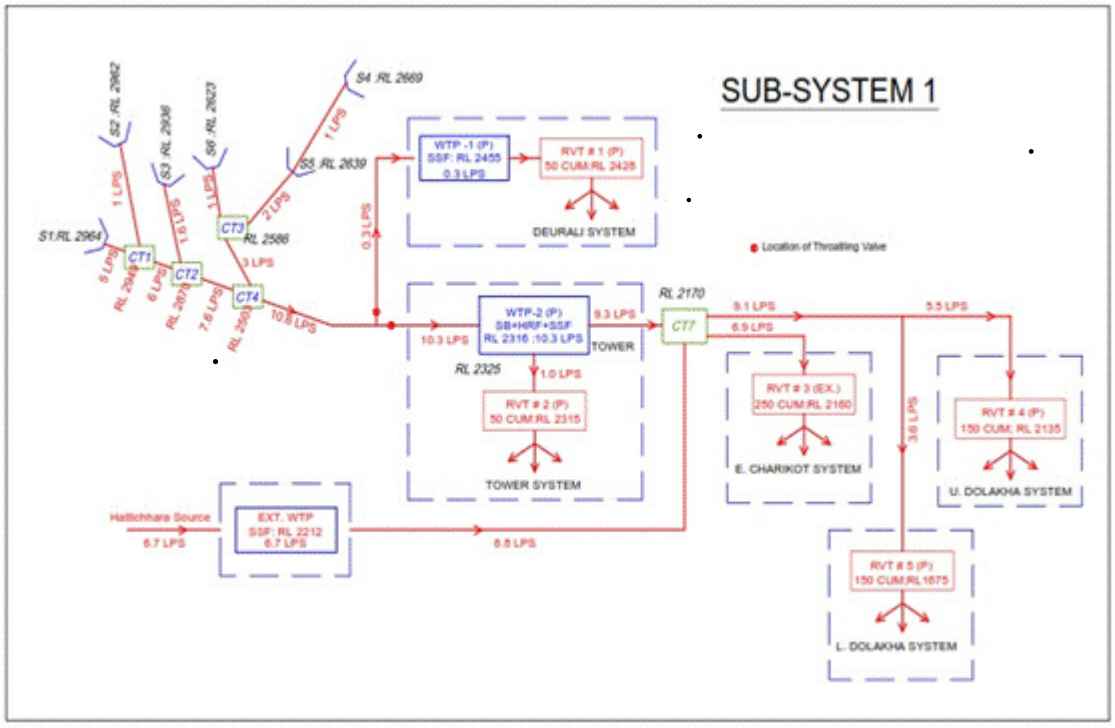
116. **Miscellaneous Works.** There is also provison of miscellaneous works for this proposed project that includes Construction of Approach Road, Construction of RRM, Gabion Wall Construction, Surface Drain (RRM, BW), Footpaths, Hume Pipe, Manhole, Landscapingetc. for the protection of Intake, Treatment Sites,Office Buildings and RCC Pier Supports, Thrust Blocks and Dismantling Works for the distribution system.

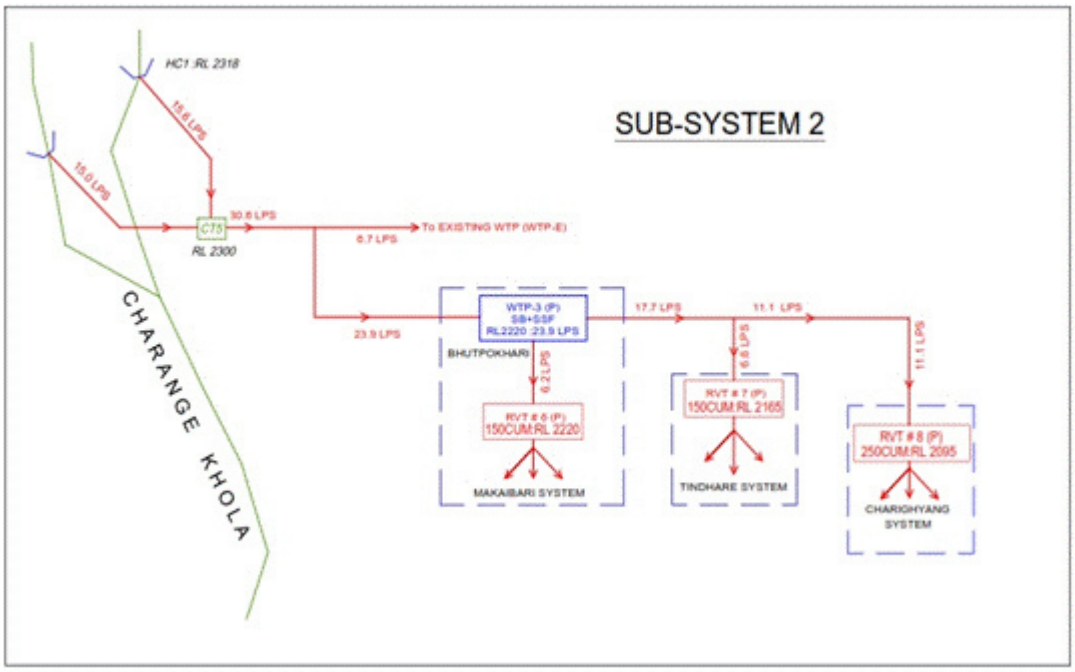
117. **DMA Establishment.** One increasingly common principle of managing a large water network is to sub-divide it into some areas, typically of between 500 and 3000 connections, each established area having a defined and permanent geographical and/or hydraulic boundary. Such an area is known as a District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

so that the leakage location activity is always directed to the worst parts of the network.

118. An important factor in lowering and subsequently maintaining a low level of leakage in a water network is pressure control. The division of the network into DMAs facilitates the creation of a permanent pressure control system, thus enabling pressure reduction in DMAs, which reduces the level of background leakage, the rate of flow of individual bursts and the rate of the annual burst frequency. To manage NRW in the proposed system, the total system has been divided into 6 DMA according to the serving reservoir.

119. The schematic diagram of the proposed project is presented sub-system wise in the figure given below:





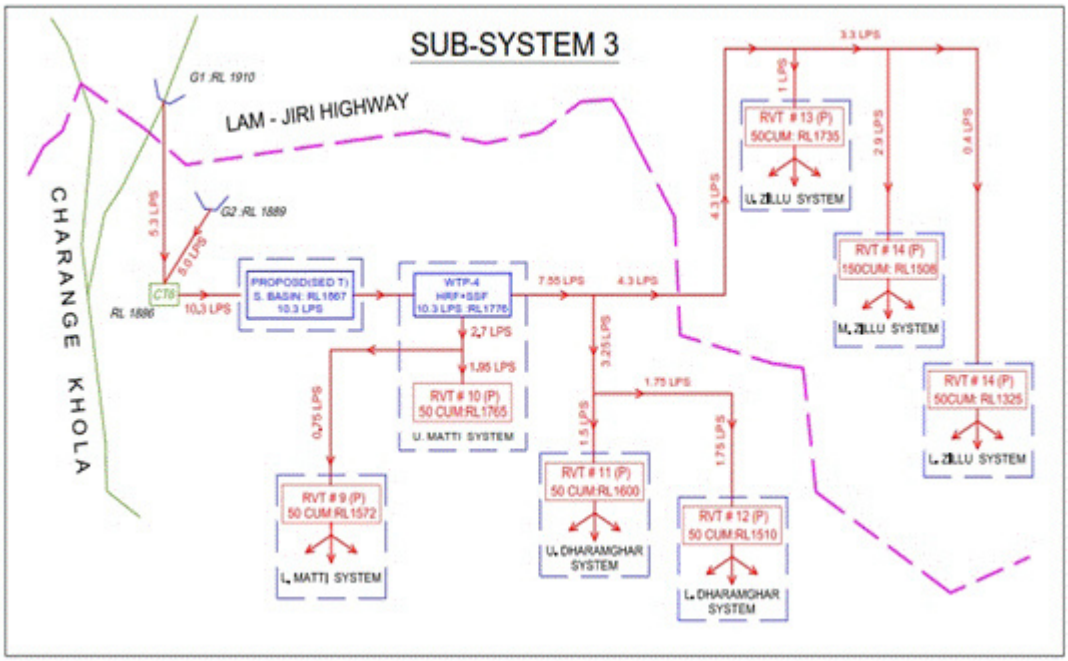


Figure V-2: The Schematic Layout of the Project

C. Salient Feature of the Proposed Project

120. The salient features of the proposed project are presented in the table given below:

Table V-7: Salient Feature of the Subproject

SN.	Items	Description
1	Name of Project	Charikot Water Supply and Sanitation Project
2	Type	Gravity
3	Study Level	Detailed Engineering Design
4	Location Area	
	Province	3
	District	Dolakha
	Rural Municipality/Municipality	Bhimeshwor Municipality
	Ward	Complete area of Ward 3 & 7 and partial areas of wards No. 2, 4 & 5
5	Available Facilities	
	Road	Lamoshanghu- Jiri Highway
	Supply Water System	17 Major Systems
	Electricity	Available
	Communication	Available le
	Health Services	Available
	Banking Facilities	Available
6	Social Status	
	Present HHs Numbers (2016)	3842
	Present Population (2016)	21,909
	Base Year Population (2018)	22,755
	Design Year Population (2038)	34,610 34,610
	Average HHS size	5.7
	Weighted Growth Rate % (WGR)	2.1
	Projected HHs in Design Year (based on WGR)	~ 6070
7	Water Demand (MLD)	
	Base Year (2018)	2.878
	Design Year (2038)	4.378
8	Source Characteristics	
	Source Name	a) SS-1: S1 (Jhapre Khola),S2 (Dund Khola),S3(Gairi Khola),S4(Kagate), S5 (Odare 1) & S6 (Odare 2) b) SS-2: HC1 (Hattichhahara Source) & HC2 (Hattichhahara Source-Nigale Khola) c) SS-3: Ghatte Khola & Pani Ghatta
	Source Type	a) SS-1:S1, S2, S3 & S6: Stream Sources S5 & S6: Spring Sources b) SS-2:HC1 & HC2: Stream Sources c) SS-3:G1 & G2: Stream Sources
	Source Location	a) SS-1: S1-WN 7 , S2-WN 7, S3-WN 7, S4-WN 1, S5-WN 1 & S6-WN 1 b) SS-2: HC1: WN 7 & HC2: WN 8 c) SS-3: Ghatte Khola (G1)- WN 7 & Pani Ghatta (G2)- WN 8
	Safe Yield	a) SS-1: Cumulative -10.6lps b) SS-2: Cumulative -31lps c) SS-3: Cumulative -11lps

SN.	Items	Description
9	Type of Structures	
	Proposed intakes	Total: 10 nos. SS-1: 2 nos (New) and 4nos.(Rehabilitated) SS-2: 2 nos.(New) SS-3: 2 nos. (New)
	Collection Chambers/Collection Tanks	SS-1: 5 nos. SS-2: 1 no. SS-3: 1 no.
	Water treatment plant	WTP-1: SSF-0.3lps WTP-2: SB+HRF+SSF-10.3 lps WTP-E: SSF-6.7 lps WTP-3: SB+SSF-23.9 lps WTP-4: SB +HRF+SSF-10.3lps
	Ground Reservoir (No and Capacity in CUM)	a) SS-1 i) Deurali RVT -50cum ii) Tower RVT-50cum iii) Existing Charikot RVT-250cum iv) Upper Dolakha RVT-150cum v) Lower Dolakha-150cum b) SS-2 i) Makaibari RVT-150cum ii) Tindhare RVT-150cum iii) Charighyang RVT-250cum c) SS-3 i) Upper Matti RVT-50cum ii) Lower Matii RVT-50cum iii) Upper Dharamghar RVT-50cum iv) Lower Dharamghar RVT-50cum v) Upper Jillu RVT-50cum vi) MIddle Jillu RVT-150cum vii) Lower Jillu RVT-50cum
	Valve Chamber (Bricks/RCC)	Bricks: 70 nos. RCC: 25 nos.
	Office Cum GH (O1) /Guard House (G1) / Small Guard House (G2) /Dosing Pump House (DPH)	1-O1 / 3-G1 / 3-G2 / 9- DPH
	Household Connection	3,842
	Fire Hydrant	14 set
	Protection Works	• Barbed Wire Fencing-60 m & 180m (Deurali RVT), 266m (Makaibari System), 180m (Upper & Lower Dharamghar), 160m (Upper & Lower Jillu System), 216m (Intakes, IC,CC & BPT) • P encing by galvanized chain link-288 m^2(Tower System), 154 m^2(Upper Dolakha System), 140 m^2(Lower Dolakha System), 127 m^2(Charighyang System), 167 m^2(Tindhare System), 288 m^2(Upper Matti System), 127 m^2(Lower Matti System), 154 m^2(Middle Jillu System), 181 m^2(Proposed Office Premises) and 261 m^2(Existing Charikot System)
	Approach Roads (Gravel)	200m
	Approach Roads (PCC)	100 m^2
	Reinstatement of PCC/RCC pavements	2000 m^2
	Re-sealing of Blacktopped Roads	2000 m^2
	Re-sealing of Gravel Roads	5000 m^2
	Total Length of pipe in transmission and Bulk	44,674 m (with 1351 m of BDS)

SN.	Items	Description
	Distribution	
	Total Length of pipe in Distribution	143,321 m
10	Total Cost of WS Component (Inclusive of all) NRs.	972,446,154.80
11	Cost Sharing Arrangement	
	GON Component (75 %)	724,461,491.33
	TDF Loan (25 %)	241,487,163.78
12	WUSC's Commitment for O&M as upfront (Cash)	19,318,973.10
13	Tariff	
	Up to 6 cum/monthly (NRs)	210
	7 to 10 cum/monthly (NRs)	53
	11 to 20 cum/monthly (NRs)	79
14	EIRR (Base case) %	31.05
15	Per Capita Cost for W/S component	
	Per Capita Cost (for base year pop.)	42,736
	Per Capita Cost (for design year pop.)	28,098
16	Environment	
	ADB Category	B, Only IEE necessary
	IEE finding	No significant adverse impact.

Source: Detailed Engineering Design Report, 2018

VI. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment and Resources

121. **Landforms and topography.** The municipality is in a hilly region with an altitude ranging between 950 to 2560 m above mean sea level with an average altitude of 1554 meters.The project area comprises of extensive terraces and steep gorges. Gorges occur where the Seti flows close to the outliers or cuts across buried hills. Terraces are the result of the lateral erosion of gravels by the meandering Seti.

122. **Geology and Soils.** Dolakha District is characterized by Ulleri and Seti formations of the Midland Group. In the subproject area, rocks of the Ulleri Formation are represented by augen gneiss and feldspathic schists whereas the rocks of the Seti Formation are mainly composed of grey to greenish-grey phyllites and quartzites. Colluvial deposits and rocks are predominantly found on the surface. The subproject area also has weathered rocks of phyllite to gneiss and colluvium to alluvium deposits. The thickness of the colluvial range 2 to 5 m and alluvial deposits of more than 5 m.

123. **Climate.** The Municipality has a subtropical to a temperate climate and is heavily influenced by the monsoon (June-September) with an average annual rainfall of about 1710 mm.

124. The average temperature in Charikot, Dolakha ranges from 7.5 degree celsius during January (the coldest month of a year) and 19.3 degree celsius during July (the hottest month of a year). Similarly, the average rainfall in Charikot, Dolakha ranges from the most dry month of January with 10mm to the most wet month of July with 543 mm.

125. **Land Use Pattern.** The municipality covers 58.59 sq. km out of which most of the land is coverd by forest & agricultural land. About 53% of land is covered by forest while 40% of land is covered by agricultural land. The land in this project town is in moderate to very steep slope. More than 50% of land in the municipality is steepr than 30º. The land use pattern is determined by topography, climate and soils. Generally, lands with gentle slopes are used for settlements.

126. Water Quality.During the survey, the respondents were asked about the existing water quality in the project area. The survey revealed that out of 3842 respondents, about 21.21% (815) of respondents referred to as Good quality where as large numbers 77.90% (2993) referred to as Satisfactory or Moderate in terms of water quality. Likewise, only 0.88% (34) of the respondents referred to as Bad in terms of water quality. Their response is categorized as good, satisafactory or bad in terms of their sensitivity to the taste, colour, visibility (turbidity) and incidence of water borne diseases.

127. During field survey,water samples collected from the proposed sources that includes Hattichhahara, Odare and Jhapre Khola were tested for various physical and chemical parameters. The test reports show that all parameters of water quality of the sample collected are within the permitted value of NDWQS. These water quality test reports are included in **Appendix 7**.

128. Similarly, during field study, simple bacteriological tests (Coliform P/A Test Vial) which has been developed by ENPHO to determine the presence of Coliform bacteria at the water source was carried out. This on-site bacteriological test is based on the principle developed by Manja et. al in 1982. The test is based on the readily observable formation of black precipitate iron sulfide in the test bottle, as a result of the reaction of H_2S with iron.The results of the Coliform P/A Test Vial shows that the samples collected are contaminated with bacteria.

129. **Air Quality.** During the field study, field observation shows that Air pollution is generally caused by fugitive dust from the vehicle movements e.g. old and over smoky buses, tractor, heavy and overloaded trucks, old jeeps particularly over unpaved roads, construction activities, and wind action on unpaved exposed surfaces.Air emissions also come from household cooking, open burning, and moving vehicles. Emissions from these sources are scattered regarding both locations and timing. However, the magnitude of air quality problems in the project town is not that severe.

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

B. Ecology, Environment and Resources

131. **Flora and Fauna.** There are no critical habitats in and around the subproject sites. Dolakha District is blessed with natural beauty of floral diversity. The site specific vegetation types are decribed below.The major plant life forms available in the project area are given in Table V-2.

Table VI-1: Major Plant Life Forms of the Project Area

S.No.	Scientific Name	Local Name	Species
1	*Rubus ellipticus*	Ainselu	Shrub
2	*Emblica offficinalis*	Amala	Tree
3	*Pieris ovalifolia*	Angeri	Shrub
4	*Lagerstroemia reginae*	Ashare phul	Shrub
5	*Adhatoda vasica*	Asuro	Shrub
6	*Melia azedarach*	Bakaino	Tree
7	*Ficus bengalensis*	Bar	Tree
8	*Terminalia bellirica*	Barro	Tree
9	*Aegle marmelos*	Bel	Tree
10	*Rhus wallichii*	Bhalayo	Tree
11	*Populus ciliate*	Bhote Pipal	Tree
12	*Lagerstroemia parviflora*	Bot Dhayaro	Tree
13	*Schima wallichii*	Chilaune	Tree
14	*Bassia butyracea*	Chyuri	Tree
15	Berberis aristata	Chutro	Shrub
16	*Debregeasia salicifolia*	Daar	Shrub/Small Tree
17	*Garuga pinnata*	Dabdabe	Tree
18	*Mussaenda macrophylla*	Dhobeni	Tree
19	*Colebrookea oppositifolia*	Dhusure	Shrub
20	*Dioscorea bulbifera* L.	Githa	Vine
21	*Callicarpa macrophylla*	Guyanlo	Shrub
22	*Lannea coromandelica.*	Hallunde	Tree
23	*Terminalia chebula*	Harro	Tree

S.No.	Scientific Name	Local Name	Species
24	*Syzygium cumini*	Jamun	Tree
25	*Phoebe lanceolata*	Jhankri syaula	Tree
26	*Ficus lacor*	Kabro	Tree
27	*Anthocephalus chinensis*	Kadam	Tree
28	*Myrica esculenta*	Kafal	Tree
29	*Adina cordifolia*	Karam	Tree
30	*Acacia catechu*	Khayar	Tree
31	*Ficus semicordata*	Khanayo	Tree
32	*Sapium insigne*	Khirro	Tree
33	*Morus alba*	Kimbu	Tree
34	*Litsea monopelata*	Kutmiro	Tree
35	*Duabanga grandiflora*	Laampate	Tree
36	*Engelhardtia spicata*	Mauwa	Tree
37	*Erythrina stricta*	Phaledo	Tree
38	*Ficus religiosa*	Pipal	Tree
39	*Pinus roxiburghii*	Sallo	Tree
40	*Terminalia tomentosa*	Saj	Tree
41	*Bombax ceiba*	Simal	Tree
42	*Vitex negundo*	Simali	Tree
43	*Mallotus philippensis*	Sindure	Tree
44	*Albizia chinensis*	Siris	Tree
45	*Dalbergia sisoo*	Sisoo	Tree
46	*Bauhinia vareigata*	Tanki	Tree
47	*Cedrealla toona*	Tuni	Tree
48	*Alnus nepalensis*	Uttis	Tree

Source: IEE Field Visit Survey, 2015

132. Some species of mammals available in the project area is given in the table given below. The status of these mammals are as per IUCN & IBAT reports.

Table VI-2: Mammals in the Subproject Area

S. No.	Scientific Name	English Name	Local Name	Status
1	*Felis Chaus/Prionailurus Bengalensis*	Jungle cat	Ban Dhade	LC
2	*Macaca Assamensis*	Assam Macaque	Bandar	NT*
3	*Hipposideros cineraceus*	Least Leaf Nosed Bat	Chamero	LC
4	*Panthera Pardus*	Common Leopard	Chituwa	VU*
5	*Hystrix Hodgsoni (Brachyura)*	Malayan Porcupine	Dumsi	LC
6	*Vulpes Bengalensis*	Bengal Fox	Fyauro	LC
7	*Funambulus Pennantii*	Five Stripped Palm Squirrel	Paanch Dharke Lokharke	LC
8	*Semnopithecus schistaceus*	Nepal Grey Langur	Dhedu	LC
9	*Martes Flavigula*	Yellow Throated Marten	Malsapro	LC
10	*Mos hosmour*	Hill Mouse	Musa	LC
11	*Gangetica Canis Aureus*	Golden Jackal	Syaal	LC

Source: IEE Field Visit Survey, 2015

Note: Though 'Common Leopard' falls under VU category, the subproject activities will not affect the habitat of this species.

133. Some of the birds reported in the forest areas are listed in the table given below. The status of these birds are as per IUCN & IBAT reports.

Table VI-3: List of Birds in the Subproject Area

S. No.	Scientific Name	English Name	Local Name	Status
1	*Tyto alba*	Common Barn Owl	Gothe Latokosero	LC
2	*Ictinaetus malaiensis*	Black Eagle	Dronak Chil	LC
3	*Psilopogon asiaticus*	Blue Throated Barbet	Basanta	LC
4	*Eudynamys scolopaceus*	Common Koel	Koili	LC
5	*Arborophila torqueola*	Common Hill Patridge	Piura	LC
6	*Acridotheres tristis*	Common Myna	Dangre Rupi	LC
7	*Coturnix coturnix*	Common Quail	Battai	LC
8	*Streptopelia sp*	Dove	Dhukur	LC
9	*Bubo bubo*	Eurasian Eagle Owl	Hapsilo	LC
10	*Psilopogon (Megalaima) Virens*	Great Barbet	Nyauli	LC
11	*Cuculus micropterus*	Indian Cuckoo	Kafal Pakyo	LC
12	*Corvus Macrorhynchos*	Large Billed Crow	Kaalo Kaag	LC
13	*Caprimulgus macrurus*	Large Tailed Night Jar	Lapuchhre Chaite Chara	LC
14	*Psittacula cyanocephala*	Plum Headed Parakeet	Tuisi Suga	LC
15	*Passer domesticus*	Sparrow	Bhangera	LC
16	*Bubo nipalensis*	Spot Bellied Eagle Owl	Mahakaushik	LC
17	*Lophura Leucomelanos*	Kalij Pheasant	Kalij	LC
18	*Pellorneum ruficeps*	Puff Throated Babbler	Thople Bhyakur	LC

Note: Though 'Asian Wollyneck' falls under VU category, the subproject activities will not affect the habitat of this species.

Source: IEE Field Visit Survey, 2016.

134. The commonly found reptiles and amphibians observed in the project area are presented in Table VI-4. The status of these reptiles & amphibians are as per IUCN & IBAT reports.

Table VI-4: List of Reptiles & Amphibians Found in the Subproject Area

S. No.	Scientific Name	English Name	Local Name	Status
1	*Calotes versicular*	Garden lizard	Chheparo	LC
2	*T. albolabris*	Green Pit Viper	Haryau	LC
3	*Hemidactylus brookii*	Common lizard	Mausuli	LC
4	*Bufo melanostictus/ Duttaphrynus Himalayanus*	Common toad	Bhyaguto	LC
5	*Ovophis monticola*	Mountain Pit Snake	A(a)ndho Sarpa/ Gurube/ Chhirbire Sarpa	LC
6	*Ptyas mucosus*	Rat Snake	Dhaman	
7	*Rana cyanophylectis*	Stream Frog	Bhyaguto	LC*

Source: IEE Field Visit Survey, 2015

135. Similarly, the commonly found fishes in the project area are given in Table VI-7. These species are found in the nearby water bodies of the project area that includes Chharange Khola, Hattichhahara Khola and Other minor water bodies like Odare,Jhapre Khola, Dund Khola etc.The status of these fishes are as per IUCN & IBAT reports.

Table VI-5: List of Fishes Found in the Subproject Area

S. No.	Scientific Name	English Name	Local Name	Status
1	*Schizothoraichthys sp*	Trout	Asala	LC
2	*Garra* annandalei	Annandale Garra	Chuche Buduna	LC
3	*Barilius vagra*	Vagra Baril	Faketa	LC
4	*Neolissocheilus hexagonolepis*	Copper mahseer	Katle	LC
5	*Glyptothorax* Indicus	Catfish	Mungri	LC
6	*Heteropneustes fossilis*	Stinging Catfish	Singhi	LC
7	*Nemacheilidae(Schistura Multifasciata)*	Stone Loach	Gadela	LC
8	*Psilorhynchus pseudecheneis*	Stone Carp	Tite	LC
9	*Channa gachua*	Dwarf Sankehead	Hile	LC
10	*Tor tor*	Tor Mahseer/Tor barb	Sahar	Not Known

Source: IEE Field Visit Survey, 2015

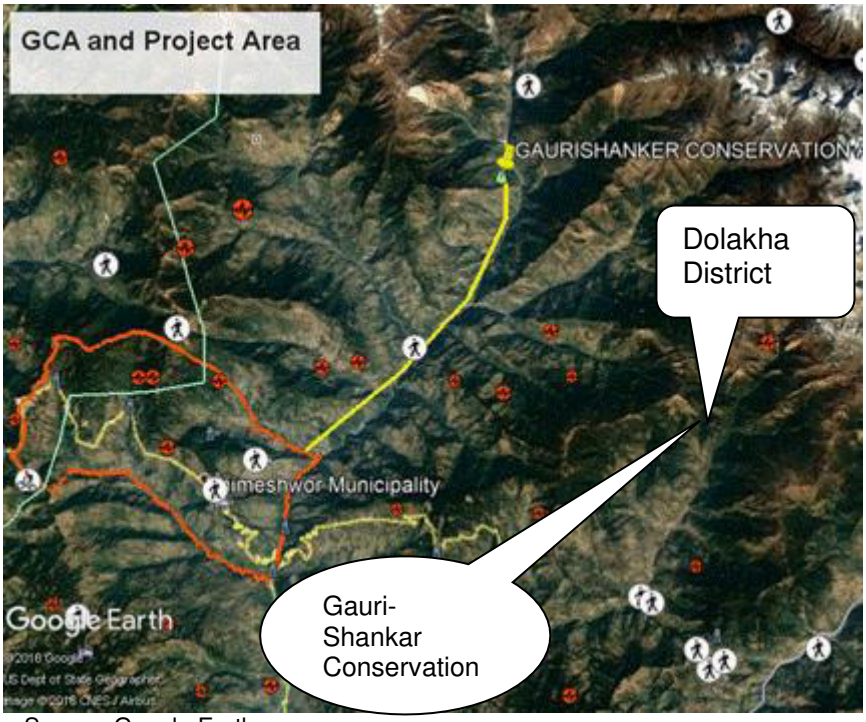
136. Protected Area. The list of protected area in Nepal as specified by IUCN is given below to identify the presence of protected areas within the subproject areas, if any.

Table VI-6: List of Protected Areas in Nepal

S. No.	Type of Protected Areas	Name of the Protected Areas
1	National Parks	Chitwan National Park
		Sagarmatha National Park
		Langtang National Park
		Rara National Park
		Khaptad National Park
		Shey Phoksundo National Park
		Bardiya National Park
		Makalu Barun National Park
		Shivapuri Nagarjun National Park
		Banke National Park
		Shuklaphanta National Park
		Parsa National Park
2	Wildlife Reserves	Koshi Tappu Wildlife Reserve
3	Conservation Areas	Annapurna Conservation Area
		Kanchenjunga Conservation Area
		Manaslu Conservation Area
		Blackbuck Conservation Area
		Api Nampa Conservation Area
		Gauri-Shankar Conservation Area
4	Hunting Reserves	Dhorpatan Hunting Reserves
5	Ramsar Sites	Bishazari Tal
		Ghodaghodi Tal
		Gokyo Lake Complex
		Gosainkunda
		Jagadishpur Reservoir
		Koshi Tappu Wildlife Reserve
		Mai Pokhari
		Phoksundo Lake
		Rara Lake
		Lake Cluster of Pokhara Valley

137. With reference to the above given table, Gauri-Shankar Conservation Area that falls under IUCN Category V-VI is located in the district of the subproject area. Apart of this, no other ecologically sensitive areas is located in the subproject area. The location of this conservation area is shown in **Figure VI-1**.

Figure VI-1: Google Earth Map showing Location of Subproject and Gauri-Shankar Conservation Area



Source: Google Earth.

138. The location of Gauri-Shankar Conservation Area does not indicate that the protected area will be affected by the proposed subproject. Its distance from the subproject area confirms its vulnerability. The proximity report generated by the Integrated Biodiversity Assessment Tool report shows that this conservation area lies within 10 km from the Charikot town. However, the analysis on google earth shows that the subproject municipality is about 20.3 km far from the conservation area. It is illustrated in the above given Figure V-1. Similarly, the subproject site is downstream of the protected area. Hence, this confirms that the proposed subproject activities will not affect the protected area.

139. **Community Forest.** The community forests within and nearby of the proposed subproject are Bichaur Community Forest, Barkhedanda Community Forest, Budhabhimsen Community Forest, Shree Chandrawati Community Forest and Shree Thangsa Deurali Community Forest. These community forests are not protected forests of the country. They are managed by the communities for their own use. Some of the subproject components are located within the community forest area. However, the construction activities will not affect the community forest features, except for the clearing of small bushes. Those community forests are mentioned below along with the details of proposed water supply components.

Table VI-7: Project Components within Community Forests

SN	Project Components	Community Forests
1	Matti System (RVT-250, GH,WTP)	Bichaur Community Forests
2	Barkhedanda (RVT-250,WTP,GH)	Barkhedanda Community Forests
3	Budhabhimsen System	Budhbhimsen Community Forests
4	Transmission Mains	Shree Chandrawati Community Forests
5	Transmission Mains	Shree Thangsa Deurali Community Forests

Source: IEE Field Visit Survey, 2015

140. Regarding this, consent letter has been secured from the concerned community forest committee copy is in **Appendix 4**.

C. Socioeconomic and Cultural Environment

141. **Settlement Pattern.** Our field observation shows that the spatial distribution pattern of settlements in Bhimeshwor Municipality is found to be scattered in the agricultural village areas and agglomerated in the accessible commercial areas, tended to be clustered in the main road area. There is a dense linear settlement in the main Charikot Bazaar. The rural area of the project area is gradually shifting towards the urban area with emerging market along the main roads and settlements, however such urban growth has been hindered by limited population growth and steep terrain of the area. Most of the government and non-government offices are located in wards 9 & 10, which is the most densely populated area of the service area. Nevertheless, the settlement pattern of the other wards is scattered.

142. **Population and Demographic Characteristics.** As the all of the service area lies in the former municipality boundary, total population of historical time of former municipality had been used for the population assessments of the area.

Table VI-8: Population of the former BHimeshwore Municipality

Year	Population
1981	16,761
1991	19,261
2001	21,916
2011	22,537

Source: DEDR, 2018

143. However, the Municipality has increased it judiciary boundary more than double folds during March 2017 by incorporating adjoining former VDCs. The formation of the new municipality has been described in earlier (section 1.2). Therefore, the present population assessment of newly formed municipality has been carried out by summing up neighboring VDCs' population data. The ward wise population of the project town according to the census, 2001 and 2011 has been presented below:

Table VI-9: Population of the Concerned Wards of the Subproject Town

Ward	W. Area	Census 2001			Census 2011			Growth
	Ha	HHs	Pop	P. Densities (PPHA)	HHs	Pop	P. Densities (PPHA)	Rate
1	2,178	746	3547	1.63	864	3437	1.58	-0.31
2	1,189	1123	4672	3.93	984	3571	3.00	-2.65
3	499	662	3036	6.08	1134	4330	8.68	3.61
4	501	397	1861	3.71	644	2448	4.89	2.78
5	1,629	925	4216	2.59	1140	4198	2.58	-0.04
6	533	854	3559	6.68	1312	4626	8.68	2.66
7	2,157	948	4572	2.12	862	3364	1.56	-3.02
8	1,793	772	3706	2.07	775	2793	1.56	-2.79
9	2,771	830	4508	1.63	924	3713	1.34	-1.92
Total	**13,250**	**7257**	**33677**	**2.54**	**8639**	**32480**	**2.81**	**-0.36**

Source: CBS 2001 and 2011.

144. The above given table shows that the total population of Bhimeshwor Municipality as per the census of 2011 is 32,480. The population of the municipality in 2001 was 33,677. The analysis of the census population shows that the overall annual growth rate of the municipality is declining by 0.36%. Most of the wards have had declining population growth rate in last decade. The declining population growth rate attributed to the Maoist insurgency during early 2000 AD.

145. However, Ward no 3, 4 and 6 of the municipality (former ward no 1, 5, 7 and 12 of Bhimeshwor Municipality or main Charikot area) have positive growth rate. The population densities of these wards are comparatively high.

146. As the social surveys have been carried out before the formation of present Bhimeshwor Municipality, all the social information has been collected and presented in terms of former wards. The service area of the proposed Charikot Water Supply and Sanitation Subproject comprises partial ward area of former ward nos. 2, 3, 4, 5, 6, 8, 9, 12 and 13 and complete area of former ward nos. 1, 7 and 10 of the former Bhimeshwor municipality. The project area has been delineated in consultation with WUSC and the local community. The consultants conducted a socio economic survey in 2016 of the proposed service area. The survey shows that the total population of the service area is 21,909. The wardwise household number and population of the service area is given in the table given below:

Table VI-10: Beneficiaries Households

Former Ward	Present Ward Number of Bhimeshwor Municipality	HHS	Total Population
1	Complete Area of WN 3	937	6,214
2	Partial Area of WN 2	211	938
3		72	303
4		68	393
5	Partial Area of WN 4	220	1,056
6	Partial Area of WN 5	344	1,570
7	Partial Area of WN 4	305	1,408
8	Partial Area of WN 5	241	1,043
9		32	136
10	Complete Area of WN 3	843	5,984
12	Complete Area of WN 7	287	1,607
13		282	1,257
Total		**3842**	**21,909**

Source: Socio-economic survey 2016.

147. **Ethnicity and Caste.** The composition of the community by caste/ethnic is heterogeneous. Therefore, the diversity of cultures, customs, traditions, norms, and values exists in the project area. The household survey of the subproject area also reflects the cross-section of major ethnic groups of the country.

148. The survey revealed that Brahmin/Chhetri are the major caste group of the project area comprising about 48.59% (1867) of the total 3842 households whereas the Janajati comprises about 41.25% (1585). Similarly, the Dalits and other caste groups (Mushalman and Madheshi etc.) are 9.94% (382) and 0.21% (8) respectively.

149. **Education.** The institutional data shows that there are 12 educational institutions including including two Multiple Campus one Nursing campus, eight higher secondary level schools as well as one children home was recorded in service area with 5363 people including students, staffs and teachers. The study also shows that most of the educational institutions are depending on both tap and springs water source.

150. The survey also revealed that about 9.27% (356) of households head are illiterate. Whereas, just literate ratio is 33.78% (1298) and only 6.77% have graduated or reached above graduate level.

151. **Health.** Medical facilities for diagnosis and treatments are available in the service area. There are seven medical institutions including three hospitals, four Health post and polyclinic with 49 bed capacities was recorded.. Similarly, there is also facility of some polyclinics, pharmaceutical stores and medical shops in the project town.

152. The survey revealed that cases of waterborne diseases such as diarrhea, dysentery, stomach aches and skin disease etc. are found to be very few. Similarly, cases of mortality by water related diseases are nil. The information realted to water borne and communicable disease was crossed checked by visiting hospital and health posts within the service area. According to the survey, there is record of 4.87% (889) people that suffered from diarrhea and 4% (735) that suffered from dysentery. Similarly, about 2.58% (472) people were known to be suffered from other diseases such as skin diseases, stomach pains, fever etc

153. **Economic Activities.** The economy of the municipality is extensively agrarian although most of the households in the subproject area depend on more than one occupation. During the course of the household survey of the subproject area, detailed information has been collected about the major occupation and economic activities of all the household head. The social survey shows that, highest number of population ie about 35.92% engaged in Agriculture, whereas 26.68% are service holders, about 23.97% depend on business about 6.98% are engaged in foreign employment, 2.86% are labor and 0.10% are dependents.

154. There are more than 10 hotels/lodges with a 104 bed capacity and managed by 14 staff in the subproject area. Now, there are a few industries and businesses in Charikot. The survey shows that there are 4 industries operating in the subproject area. The type of industries operating in the municipality are rice mills, cotton, grill and carpet mill etc.

155. There are four public and private banks proving banking services to the people of the municipality. Similarly some cooperatives are also in operation in the service area.

156. Monthly Income Details. The survey revealed that main sources of household income of the service area are agriculture, service, remittance and wage labour, respectively. Among the total households 11.37% have monthly income less than NRs7500 which is considered as poor household. About 12.05% of households have monthly income ranges of NRs 7501 to NRs 10875. Similarly, 38.44% of households have income range of NRs 10,875 to NRs 20,000, 32.3% of household have income range of NRs 20001 to NRs 50,000 and about 5.83% of households have income ranges above than NRs 50,000 in a month (Table VI-11). Similarly, the survey shows that only 11.37% of total population fall under the poor category as per the implementation guidelines (Income less than Rs. 7500 per month).

Table VI-11: Distribution of Mean Monthly Household Income

Income Range (NRs)	Ward												Grand Total	%
	1	2	3	4	5	6	7	8	9	10	12	13		
<7500	47	82	18	23	16	81	31	57	0	48	14	20	437	11.37
7501-10875	40	34	18	15	24	95	54	62	0	73	16	32	463	12.05
10876-20000	319	50	18	24	73	103	123	83	11	342	164	167	1477	38.44
20001- 50000	468	25	13	5	95	56	79	32	21	304	84	59	1241	32.30
> 50000	63	20	5	1	12	9	18	7	0	76	9	4	224	5.83
Grand Total	937	211	72	68	220	344	305	241	32	843	287	282	3842	100

Source: Socio-economic survey 2015

157. **Monthly Expenditure Details.** The survey team has collected basic data information of expenditure level of household by monthly basis.The survey shows that among the total 3842 households, 21.50 % (826) have monthly income of more than Rs. 7,501-10,875, about 33.10% (1271) of total households have monthly income in the range of Rs. 10,875-20,000 whereas 14.50% (556) households have monthly inome with the range Rs. 20,001-50,000. Likewise, only 1.7% (65) households are earning more than Rs. 50,000 per month. About 29.30% (1124) households falls under poor category as thery are only earning less than Rs 7,500 per month. The monthly expenditure level of HHs in the service area is given in the table below.

Table VI-12: Monthly Expenditure Level ofHouseholdsby Ward

Expenditure Range	Ward												Grand Total	%
	1	2	3	4	5	6	7	8	9	10	12	13		
<Rs.7500	129	138	56	53	28	240	59	177	0	93	50	101	1124	29.3
Rs.7501-Rs.10875	194	37	7	8	25	36	61	41	3	217	93	104	826	21.5
Rs.10875-Rs.20000	430	15	3	4	75	30	106	15	27	361	132	73	1271	33.1
Rs.20001-Rs.50000	165	18	5	2	87	38	70	8	2	153	6	2	556	14.5
>Rs.50000	19	3	1	1	5	0	9	0	0	19	6	2	65	1.7
Grand Total	937	211	72	68	220	344	305	241	32	843	287	282	3842	100

Source: Socio-economic survey, 2015

158. **Willingness to Pay**. **a) Monthly Water Tariff:**The sampled survey during detailed socioeconomic survey was carried out to observe the response of the community revealed towards the willingness to pay for monthly water tariff. As per the findings, more than 41.67% (80) of total 192 sampled households prefer to pay monthly water tariff in the range from Rs. 151 to 200 whereas about 3.65% (7) of 192 households prefer to pay in the tariff range from Rs. 201-300. Similarly, 7.29% (14) of households are willing to pay between Rs. 301-350 per month and 10.94% (21) of households prefer to pay monthly water tariff in the range from Rs. 351 to 400. Likewise, about 18.75% (36) and 10.94% (21) of households are willing to pay in the range from Rs. (401 to 450) and from Rs. (451 to 500) respectively. Only 6.77% (13) of 192 sampled

households prefer to pay for monthly water tariffs for more than Rs.500. This data indicates that the positive response towards the willingness to pay for monthly water tariff.

b) Up-front Cash Contribution. As per the survey, 97.24% (3736) of total 3842 households have shown willingness to pay 5% up-front cash contribution for the proposed project whereas, only 2.76% (106) households were not ready for upfront cash contribution.

The above givent table 28 in the section 5.3.3.2 shows that the poverty household within the project area is about 11.37% (437) HHs and it is observed that almost all of the poor households has shown interest toward the program and willingness to pay for upfront cash contribution eventhough there is provision of free tap connection to poor households. This indicates enthusiasm of people residing within the project town for the proposed project.

c) Affordability.The study has also assessed affordability of community in terms of monthly income level for expense on water supply & sanitation service. Hence, assessing the income level of households, more than 89% of households can afford monthly water tariff and contribute for up front cash. Hence, afffordability of the community has been obseved as encouraging and positive towards the program.

159. **Existing Water Supply.** There are several piped water supply systems constructed under various programmes by different agencies in different years. There are about 17 major systems operated by 17 different WUSCs. The detail of each system with regard of name of source, number of taps and storage tanks are shown in Table VI-13.

Table VI-13: Name List of WUSC and Details

SN	Name of WUSC	Source	No. of Taps	No. x Cum of RVT
1	Charikot WUSC BNP	Dund Khola, Gairi Khola, Arupate in WN 13, Odare 1 , 2 , 3 WN 9, Jhule Khola WN 10 and Suspa WN 6 all are in BNP	707	1-200, 2-95, 3-130,1-100
2	Chothang WUSC BNP -10	Jhule Khola	60-65	1
3	Maidane WUSC BNP-10	Beesauna	40-50	NA
4	Khole WUSC BNP-12	Local spring	20	
5	Taknagi WUSC BNP-10	Tagnagi	60	No
6	Ramkot WUSC BNP-10	Ramkot spring	75	No
7	Gauri Swora Thapa Group BNP-10	Mulkharka	95	3x10
8	Purano Bazar WUSC BNP-1	Darfe ko Jungle Tundikhel	125	1x100
9	Dolakha WUSC BNP 2 and 3	Gautam Tole,	500	1x20, 2x50, and 1x90
10	Hatti Chara Charighang Manedanda BNP	Hattichara,		18
11	Jilu Bhatmase BNP 7	Jhulekhola	80	1x200
12	Upper Marti WUSC BNP 8	Thulo Dharo, Sano& Thulo Pokhari	125	3x10
13	Middle Marti WUSC BNP 8	Banpale and Trishul Muhan	200	1x10, 3x20 and 1-25
14	Junge Chanse WUSC BNP6	Chanse Muhan	200	
15	Jilu WUSC BNP 5&7		200	
16	Khanepani WUSC(Dolakha)	Darfe Jungle	155 PVT.+35 P	2x20, 1x50 and 1x90
17	Dolakha WUSC	Teekhatal and Chakthali	110 PVT & 3 P	1x20 and 1x40

Source: DEDR, 2018

160. **Sanitary Facilities.** The overall sanitary condition of the Municipality is found to be reasonably satisfactory. In the core area, almost all households have private toilets whereas in isolated/semi-urban areas some people still practice open defecation. The socio-economic survey (2016) reported that 3.85% households still practice open defecation in the subproject area and the majority of households i.e. 58% have either water-sealed private toilets or improved pit latrines (Table VI-14).

Table VI-14: Toilet Coverage **(HH)**

Type of Toilet	Service Area												Grand Total	%
	1	2	3	4	5	6	7	8	9	10	12	13		
No toilet	36	31	10	11	4	5	4	6	0	22	12	7	148	3.85
Pit Latrine	76	21	10	9	214	338	299	232	0	21	175	79	1474	38.37
V. Pit	462	156	50	48	2	1	2	1	32	270	100	196	1320	34.36
Pour flush	357	3	2	0	0	0	0	2	0	527	0	0	891	23.19
Cistern flush	6	0	0	0	0	0	0	0	0	3	0	0	9	0.23
Grand Total	937	211	72	68	220	344	305	241	32	843	287	282	3842	00.00

Source: Socio-economic survey, 2016

161. 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.

162. **Drainage Facilities.** There is no proper drainage system for storm water as well as for domestic sewage in Bhimeshwore Municipality. The core area of the city along the highway has about 1 km of open surface drains on each side in ward 1 and other few stretches of surface drains to avoid local pondage. As the terrain is mostly steep, there will be no issues of drainage and the study also shows that no drainage problems have been encountered till date and hence, people are less concerned about the storm water drainage facility. Detailed information regarding this issue were not collected as this does not fall under the scope of the project.

163. **Wastewater Management Practices.** There is no sewerage system in the subproject area. Wastewater from individual households is managed inside the house. The socio-economic survey conducted in 2016 shows that 96% households have their own toilet. Some of them have constructed septic tanks and some have directly connected the waste with surface drains. The municipality is planning to construct a separate unit for septage and solid waste management. This issue is addressed by UWSSP with the inclusion of a separate sewer network and DEWAT subproject, which will aim to collect sewage from households through as sewage collection network and directed for treatment to DEWAT facilities prior to disposal. The survey shows that 99% of the sampled households showed an interest in improving the septage management system and are interested to pay for it. However, this issue does not fall under the scope of the proposed project. Hence, this will not be considered in the design of the proposed project.

164. **Solid Waste.** The major sources of waste generation in Bhimeshwor Municipality are households, hotels, hospitals, vegetable and fruits market, meat stores, groceries, clothing/ fancy stores/tailors etc. There has been no study about types and volume of solid wastes. The municipality does not have an integrated solid waste management infrastructures in place yet. Nonetheless, the municipality implements

measures to minimize generation of wastes, such as the adoption of the reduce-reuse-recycle scheme.

D. Existing Institutional Situation

165. **Existing Institutions involved in Water Supply and Sanitation Field.** The main institutions involved in water supply and sanitation sector in the subproject area are Bhimeshwore Municipality, Water Supply and Sanitation Division Office (WSSDO), Charikot water users' and sanitation committee, other WUSC Committees and some NGOs. WSSDO, Dolkha has been actively supporting most of the WUSCs in operating the existing water supply system and carry out different WASH activities in the subproject area. It has been providing both financial and technical support for large-scale maintenance and providing pipes, bleaching powder and human resources as and when needed.

166. DWSSM through WSSDO, Dolkha constructed and then rehabilitated the water supply systems. WUSCs have been managing the existing systems.

167. **Water Supply and Sanitation User's Association.** The Integrated Charikot Water Supply and Sanitation Committee consist of eight members representing various WUSCs and clusters within the service area. The executive committee consists of six males and two female members and Three male members are in the key positions of chairperson, vice chairperson and secretary where as one female member is working as the treasurer. According to the caste/ethnicity status of WUSC body, six members are from Brahmans/Chhetris and 2 women members are from Janajatis (Newar Community) groups respectively in Charikot WUSC.

168. **Registration of WUSC in Water Resource Committee.** Charikot was registered in 1997 A.D. as per the Water Resource Act 1991 and Water Resource Rule 1992 and involved in the management and improvement of the water supply system in Dolkha Bazaar. Similarly, renewal of WUSC and annual general meetings are carried out regularly. The namelist and position of the existing WUSC member are given in Table VI-15.

Table VI-15: Members of Charikot STWS Users and Sanitation Committee

S.N.	Name	Position
1	Mr. Ram Krishna K.C	Chairperson
2	Mr. Krishna Bahadur Khadka	Vice Chairperson
3	Mr. Dhurba Bashnet	Secretary
4	Ms. Anita Shrestha	Treasurer
5	Mr. Moti Prasad Chaulagai	Members
6	Mr. Ram Saran Thapa	Members
7	Ms. Kamala Maharjan	Members
8	Mr. Ram Sharan Thapa	Members

Source: Socio-economic survey, 2015

169. It is intended that WUSC will assist PMO to implement the proposed subproject and it will operate and maintain the Charikot water supply system to provide regular and quality drinking water to the consumers.

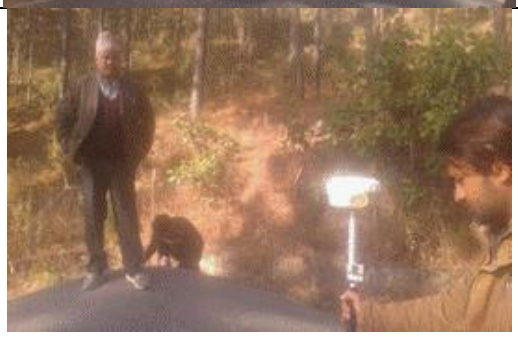
170. **Organization Structure of operators of the Existing System.** Charikot WUSC is the operator of the existing largest system. WUSC has assigned three water supply technicians for managing water distribution, maintenance and meter reading of the whole system. Two staffs are also deployed for office management.

E. Site-Specific Environmental Conditions

171. Table VI-16 summarizes site-specific conditions of the component locations/ sites/ alignments.

Table VI-16: Site-specific Environmental Conditions

Site	Description	Photograph
Source Hattichhahara fed by Charnawati River	This source is Hattichhahara fed by the Charnawati river. Simple bottom trash rack has been proposed (TYP-5) on the hard bedrock at the Hattichahara (Charnawati River near waterfall). The bed is of hard rock as stilling basin in this waterfall area. An appropriate simple Bottom Rack Intake has been proposed in this river. A gravel trap at the end the bottom rack, in the form of chamber, has been provided to trap the heavy sediment, which enter from the bottom rack and rolled in the gallery. The gravel trap shall be cleaned occasionally by manual means. Diverted water from two streams will be collected at collection chamber. In totality cumulative discharge of about 31 lps have been proposed. Relative Level (RL) of these intakes is around 2318 m amsl.	
Ghatte Khola Source fed by Charnamwati River	This place of existing Ghatta (Water Mill) is very close to Lamosangu - Jiri Road. The Ghatta is drawing water from the tributary of the Charnawati River near Highway. Relative Level (RL) of this intake is around 1889 m amsl. This tributary have safe yield of 6 lps. A simple RCC chamber intake (TYP-4) has been proposed to divert water from the tailrace of the watermill (Ghatta) in Sub-system (SS-3).	
Charnawati River is a tributary of Tama Koshi River which ultimately drain into river Sunkoshi. Although the source river, Charnawati, is medium sized river, most of the river stretches are in steep gradient.The Charnawati originates from the Middle Mountain region also known as the Mahabharat range.The Charnawati is perennial fed through springs. The river flow rates during low season is 98.08 lps(Hattichhahara) and181.94 (Ghatta) while during high seasons they are 2000lps (Hattichhahara) and 3880 lps (Ghatta). All the six local sources are fed by Charnawati River. Similarly, other four sources i.e. Hattichhahara 1 & 2 and Ghatte Khola 1 & 2 are also the tributaries of Charnawati River.		

Site	Description	Photograph
Existing RVT: Pani Tank	It is surrounded by scattered settlements.	
Proposed Matti RVT	It is located at at Bichaur Community Forest. This site has been finalized under the consent of the concerned community forest committee. It has suffiecient barren land to construct the proposed RVT.	
Existing RVT at Dharamghar	It is located at the right hand side of Kathmandu-Jiri Highway which is 200m away from the highway. It has slightly steep topography. It is 2 km far fom Charikot Bazaar. It has no settlements in the surroundings.	
Existing and Proposed RVT at Barsedanda	It is also located at the right hand side of Kathmandu-Jiri Highway. Its location is within the Barsedanda Community Forest. There is no interference from the concerend forest committee for the construction of the propsoed RVT.There is no settlements around this area.	

172. Altogether the proposed system will be divided into three sub systems namely, Old sub-system, Hattichahara Sub- system and Ghatta Sub-system. All the three sub-system will draw water from local sources and Charnawati (called Charange Khola). These local sources are also tributary of Charnawati. An old sub-system is drawing water from these sources in the past with a cumulative safe yield of about 11 lps, the safe yield for the transmission system of this sub-system has been adopted as 10.6 lps. However, the other two sub-systems are drawing comparatively larger discharge water from the same river (River Charnawati) at different location. Therefore, hydrological analyses of River Charnawati have been done in detail in two locations i.e. Hattichahara and Ghatta.

173. There are no hydrological stations in Charnawati River and so the exact data on flow characteristic of the river is not available. As the water are abstracting from two location (Hattichahara and Ghatta), hydrological analysis of the river in two locations has been carried out with the help of discharge measurements at these location. The observed flow in Charnawati River during the survey time in March has been measured as 106 lps and 182 lps in Hattichahara (SS-2) and Ghatta (SS-3), respectively.

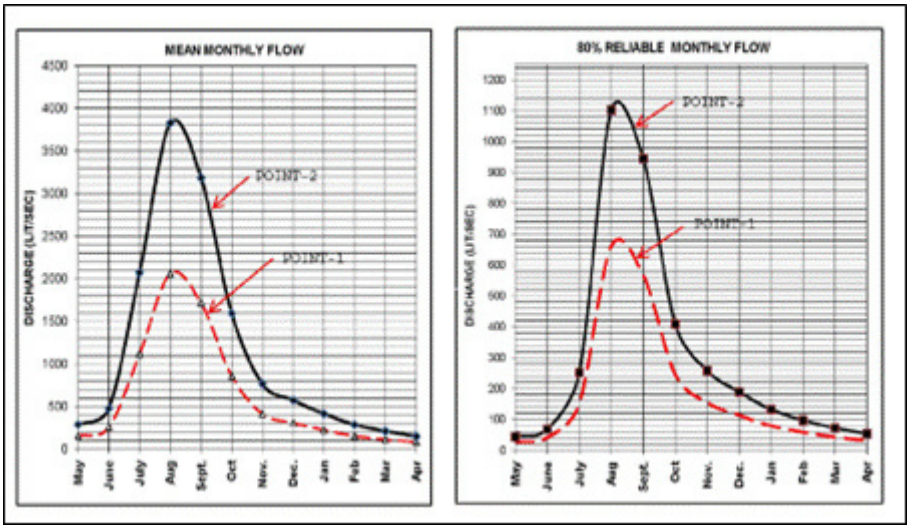
174. The catchment area of Charnawati River at the proposed head work site of Sub-system 2 (Abstraction point 1 at Hattichahara) and Sub-system 3 (Abstraction point 2 at Ghatta) have been calculated using the recent topographic map (based upon 1:50,000 and 1:25,000 scale topographic map with MUTM Projection). Total catchment areas of the river at Hattichahara and Ghatta are about 7.48 and 15.47 km^2.

175. About 46% of the total catchment area is above 3,000 m amsl for abstraction point at Hattichahara. Similarly, about 33% of the total catchment area is above 3,000m amsl for abstraction point at Ghatta.

176. The mean monthly flows over the river at two abstraction points have been estimated according to the regional hydrograph prepared for Region 3 in the PDSP manual. The anticipated low flows during end week of March are 98.08 lps and 181.94 lps at abstraction point 1 and abstraction point 2, respectively.

177. The predicted value of specific discharges has been compared with the regional specific discharge value for all months and found quite comparable. The predicted specific discharges for all months are slightly more than the given regional specific discharge. This may be due to good vegetation cover and altitude of catchment area. In addition to that, this region (region 3) all tributaries of Sunkoshi show higher specific discharge in comparison to other rivers in that region. Hence, no adjustment has been made to the regional hydrograph.

178. Figure V-2 below presents the predicted mean monthly flows and predicted 80% reliable flow at proposed Hattichahara abstraction points (Points 1) and Ghatta abstraction point (Point 2).



Source: Project Office, Third Small Towns Nepal: Third Small Towns Water Supply and Sanitation Sector Project.

179. It is clear that 80% reliable discharges in the river have been estimated about 33 lps and 53 lps at Hattichahara and Ghatta abstraction points, respectively. Therefore, drawing water of about 31 lps at Hattichahara's intake site and 11 lps at Ghatta's intake is possible without any technical point of view.

VII. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

180. The anticipated environmental impacts are mainly categorized into two viz., Beneficial Impacts and Adverse Impacts on tha basis of its negative and positive significance. This is then further categorized into four impacts that includes i) Impact on Physical Environment, ii) Impact on Biological Environment, iii) Impact on Chemical Environment and iv) Impact on Socio-economic Environment, based upon the effects on the existing environment. These impacts are sub divided into three categories based upon the project phase that includes i) Design Phase, ii) Construction Phase and iii) Post Construction (Operation & Maintenance) Phase. These impacts are discussed below in detail .

A. Beneficial Impacts

181. Availability of clean and adequate drinking water is the basic human need. The development of drinking water supply facilities has numerous beneficial impacts to individuals and communities. There will be significant improvement in the quality of life of the subproject area through provision of safe and potable drinking water. Some of the major beneficial impacts of this proposed water supply subproject are described below along with suggestions for achieving optimal benefits.

i. Impact on Socio-economic Environment

a) Construction Phase

182. **Employment Generation.** The project generates direct employment opportunities to the local people of the project area. The construction activities of the proposed project can offer the locals a grand opportunity to be engaged in the proposed project activities as either skilled or non-skilled workers in terms of their proficiency. The main target group for this benefit is People relying on daily wages. The socioeconomic survey shows that 2.86% of total households have to rely on labour/daily wages. Hence, this project will be beneficial to this 2.86% of total households. The amount of money earned by the local people may somehow increase the local economy thereby reducing the chances of seasonal migration of the local people depending upon daily wages works to survive.

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

184. The augmentation measures can be as follows;

- Recommend contractor to employ local people by giving high priority to women and under privileged group as far as possible.
- Ensure equity in provision of wages to both male as well as female labors.

185. **Skill Enhancement.** The construction of the project does not only provide direct employment opportunities but also ensure the transfer of skills and technical proficiency to the local workforce. The project activities such as construction of treatment plant, valve chambers, buildings etc. provides transferable skills. In future, these skills can be a plus point for the locals in any relevant work as such. Hence,

this benefit is targetted to the local people relying on daily wages and those to be involved in labor works of this proposed project.

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

187. The augmentation measures can be as follows;

- Making a proper work plan and code of conduct during the construction period.
- Provision of regular hands on training to the workers during the project construction period

188. **Local Trade and Business Opportunity.** The proposed project directly adds in building business opportunity within the area. As construction work involves a lot of human resources, some grocery stores and, agriculture and livestock product may gain a momentum in the vicinity of the construction site. This can boost the local trade and business sector. Similarly, procurement of locally available construction materials also helps to improve the local trade and business opportunity. The main target group for this beneficial impact is local people involved in local business sector. The socioeconomic survey shows that about 23.97% (921) and only 1.48% (57) of total 3842 households are involved in business & industry sector respectively. Though the target group quantity is not so significant, the enhancement of local trade & business opportunity will be fruitful to these people.

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

190. The augmentation measures can be as follows;

- Recommend contractor to give priority to the local products during procurement of construction of materials.
- Priority also will be given to local services like grocery stores, tea shops, hotel & restaurants etc. during the entire construction period.
- Provision of regular hands on training to the workers during the project construction period

b) Operation Phase

191. **Improved Health and Hygiene.** Deteriorating water quality and unsanitary conditions are often the causes of waterborne communicable diseases. The socioeconomic survey revealed that the cases of waterborne diseases such as diarrhoea, dysentery, stomach ache and skin disease etc. are found very few in numbers. Similarly, cases of mortality by water related diseases are nil. However, it is not certain that this condition will be well maintained in the future too. The provision of water treatment plant under the proposed project components provide solution to this uncertainty. After the implementation of the project, easy access to safe & potable water will maintain the health & hygiene of the local people. This also helps to reduce the chance of occurrence of water-borne communicable diseases within the project area in the future. This also helps them in bringing a decrease in medical expenses that may require to be incurred if any incidence of water borne diseases is observed. To enhance such benefits, the regular maintenance of the water supply

and sanitation components should be done so that the project operates smoothly and the benefits are intact. As this proposed project aims to provide safe, reliable & potable drinking water to the proposed service area of the project town, the main target group of this beneficial impact can be beneficiaries or people residing in the service area of this proposed project.

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

193. The augmentation measures can be as follows;

- Regular maintenance of the water supply components should be done so that the project operates smoothly and the benefits are intact.

194. **Increased Economic Opportunity**. After the completion of the project there is a possibility of migration of people from rural areas towards the town due to easy access to reliable water supply facilities and transcend opportunities. The increased economic level adds great value to the land thereby uplifting their economic status. The main target group for this beneficial impact is people of the service area involved in business & industry.

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

196. The augmentation measures can be as follows;

- Ensuring regular maintenance of the water supply components
- Promoting land development activities in the area.

197. **Social Empowerment.** Social Empowerment refers to the process of self empowerment enabling to overcome the sense of powerlessness in the society. This covers Gender Equity, Women's Participation and Social Inclusion. The proposed project is able to enhance this social empowerment through easy access to safe & potable water and through various capacity building programs. Gender Inequality that is still prevailing within the project town is expected to be eliminated through the implementation of the proposed project.

198. As per the sampled household survey carried out in 2016, 70% of female are observed to be involved in water fetching & storage while only 30% of male are said to be involved in this activity. This indicates that women are highly responsible for fetching water in comparison to the men. As the proposed project aims to provide water supply service to each household through private connection, easy access to safe & potable water through the implementation of this proposed project will contribute towards their betterment. It is because the time that may be spent for fetching water can be saved and utilized in various other activities. The improved water supply system contributes towards their better health and hygiene through the provision of safe & potable water. This in turn ensures the maintenance of health & hygiene of other family members as the sampled survey also shows that 69% of female are involved in taking care of family members especially children and senior citizens.

199. The proposed project also encourages women participation in the project related activities by enforcing at least two women in water user's committee. As per the

Table VI-15 given above, two female members are appointed as members of Charikot Water Supply Users and Sanitation Committee among which one is appointed as Treasurer and one as a general member.Their involvement in WUSC provides them the opportunity to actively participate in meetings, discussions and many other decision making level processes. The socioeconomic survey revealed that in comparison to men, women have much more work load regarding household activities though the gender inequality is gradually decreasing in urban areas like Bhimeshwore Municipality. Hence, women of the project area are mostly entangled within the household activities. The involvement of women members in WUSC can be the exemplary effort to encourage other women to come out of the cocoon within which they have been entwined by household activities for decades and isolated from the scoiety. The proposed project also gives emphasis on various activities like stakeholder consultations, meetings etc. to persuade women to actively partipate in project related activities.

200. The proposed project also expects to enhance the condition of underprivileged people (Dalits & Poor People). There is no provision of water supply service to each household in the existing water supply system. Hence, Dalits & poor people are deprived of water supply service. But, the proposed project has included each and every household of the proposed service area. Hence, this proposed project has also prioritized Social Inclusion.

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

202. The augmentation measures can be as follows;

- Priority to be given to vulnerable groups in WUSC along with female groups.
- Involving underprivileged group of people especially women and poor people in various capacity building programs and project related community meetings

203. 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. The summary of impact matrix of beneficial issues of the project is given in Table VII-1.

Table VII-1: Summary of Impact Matrix of Beneficial Issues of the project

Beneficial Impacts	Impact Rating				
	Nature	Magnitude	Extent	Duration	Rating
Construction Phase					
Employment Generation	D	H (60)	L (20)	ST (5)	Very Significant (85)
Skill Enhancement	ID	M (20)	L (20)	LT (20)	Very Significant (80)
Local Trade and Business Opportunity	D	M (20)	L (20)	LT (20)	Very Significant (80)
Operation Phase					
Improved Health and Hygiene	D	H (60)	L (20)	LT (20)	Very Significant (100)
Increase Economic Opportunity	ID	M (20)	L (20)	LT (20)	Very Significant (80)
Social Empowerment	ID	H (60)	L (20)	LT (20)	Very Significant (100)

Note: Scoring is done based on following;

Nature of Impact: D = Direct; IN = Indirect;

Magnitude, H = High (60); M = Medium/Moderate (20) ; and L = Low (10)

Extent, R = Regional (60), L = Local (20); and S = Site-specific (10)

Duration, LT = Long-term (20), MT = Medium-term (10); and ST = Short-term (5)

The points/scoring are taken from the National EIA Guidelines, 1993

Significance of Impact

Total Score: More than 75 : Very Significant

50-75 : Significant

Less than 50 : Insignificant

B. Assessment of Potential Impacts

204. The nature of the subproject and scope of the civil works will generate impacts, issues and concerns prior to construction, during construction and during operation. The potential impacts, issues and concerns from assessed sample subprojects and future subprojects using ADB REA checklist for water supply (**Appendix 1**) and "no mitigation measures scenario" checklist developed for UWSSP (**Appendix 1**) are presented in Table VII-2 below.

Table VII-2: Water Supply and Sanitation Subproject Potential Environmental Impacts, Issues and Concerns (No Mitigation Measures Scenario)

Design	Construction	O&M
• pollution of raw water supply from upstream wastewater discharge • hazard of land subsidence caused by excessive groundwater pumping • excessive abstraction of water affecting downstream water users • competing uses of water • social conflicts arising from displacement of communities • conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters • inadequate protection of intake works or wells, leading to pollution of water supply • inadequate buffer zone around treatment plants	• noise • dust • traffic • impairments associated with transmission lines and access roads • health and safety hazards to workers • continuing soil erosion/ silt runoff • population influx 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 • risks to community health and safety due to transport, and use and/or disposal of materials such as explosives, fuel and other chemicals • community safety risks due to both accidental and natural hazards, especially where structural elements or components of the subproject are	• unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents) • delivery of unsafe water to distribution system • excessive algal growth in storage reservoir • health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards • delivery of unsafe water due to poor O&M treatment processes (especially mows accumulations in filters) • inadequate chlorination due to lack of adequate monitoring of chlorine supply • delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals • accidental leakage/spillage of chlorine • increased volume of sullage (wastewater from cooking and washing) and sludge from

Design	Construction	O&M
• health hazards arising from inadequate design of facilities for receiving, storing and handling of chlorine and other hazardous chemicals • increased sewage flow due to increased water supply • dislocation or involuntary resettlement of people • disproportionate impacts on the poor, women and children, indigenous peoples or other vulnerable groups • permanent or temporary change in land use or topography including increases in intensity of land use	accessible to the members of the affected community or where failure could result in injury to the community • clearance of existing land, vegetation or building • pre-construction investigations (boreholes, soil testing, etc.) • construction works • demolition works • temporary sites used for construction works or housing of construction workers • cut and fill or excavations • working in stream crossings • use of resources (materials, water, energy, etc.) • changes in occurrence of disease or affect disease vectors (e.g. insect or water-borne disease) due to worker's camp • solid wastes such as spoils, overburden, etc. • solid wastes from worker's camp • emission from burning of waste in open air (e.g. worker's camp, slash materials, construction debris)	wastewater treatment plant • population influx 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 • risks to community health and safety due to transport, and use and/or disposal of materials such as explosives, fuel and other chemicals • community safety risks due to both accidental and natural hazards, especially where structural elements or components of the subproject are accessible to the members of the affected community or where failure could result in injury to the community • use of resources (materials, water, energy, etc.) • WTP sludge • positive impacts - employment to local people; safe and easy access to improved water supply which will enhance people's health, and boost economic conditions of municipalities

205. **Location and Design.** The impacts, issues, concerns and mitigation measures during the design phase are given in Table VII-3. As subproject locations/sites are screened during selection process, environmental impacts due to location are not anticipated in Charikot (Dolakha) water supply and sanitation subproject. The environmental assessment of the subproject shows that it is not likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Potential impacts are unlikely to affect areas larger than the sites or facilities subject to physical works. These impacts are site-specific and few if any of them are irreversible.

206. Planning principles, subproject selection criteria, and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the subproject design or location were not significant. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. These were discussed with specialists responsible for the engineering aspects, and as a result significant measures have already been included in the subproject designs.

207. In most cases mitigation measures can be designed with uncomplicated measures commonly used at construction sites and known to civil works contractors. Once the subprojects are operating, the facilities will operate with routine maintenance, which shall not affect the environment. Improved system operation will comply with the operation and maintenance manual and standard operating procedures to be developed for all the subprojects.

Table VII-3: Impacts and Mitigation Measures during Design Phase

Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Responsibility
Detailed Design			
Incorporation of sloped areas in project design	Soil erosion and slope instability	• Incorporate measures and sites for handling excessive spoil materials • Incorporate drainage plan in final design	Project management office (PMO), regional project management office (RPMO) and design, supervision and management consultant (DSMC)
Manual preparation	Health and safety of community and workers	• Prepare training manuals in Nepali with sketches on community health and safety and potential occupational health and safety	PMO, RPMO and DSMC
Location of pipes and photographs of sites and utilities before construction, particularly in heritage areas	False claims from people; water quality changes due to construction. Interference with other utilities and photo of heritage areas to avoid impacts to heritage structures during construction	• Place water pipes away from utilities during design • Provide budget for restoration/replacement of damaged utilities • Avoid placing alignment near heritage buildings • Photograph all sites within heritage areas to enable before and after comparison (note: all roads are to be reinstated to original character especially in heritage areas) • Ensure compliance with any Department of Archaeology (DOA) rules during design including preparation of Archaeological Impact Assessment, or other agreed document by DOA if required.	PMO, RPMO and DSMC/Contractor
Inadequate protection of intake structures	The water from intake will flow and may cause soil erosion.	Intake well has adequate land for perimeter fencing	PMO, RPMO and DSMC
Sludge disposal	Inadequate disposal of sludge from reservoirs and treatment plant will cause nuisances to affected properties.	The design of sludge disposal sites will be made at designated sites approved by the municipalities.	PMO, RPMO and DSMC

C. Adverse Impacts

i. Impact on Physical Environment

a) Design Phase

208. Soil Erosion & Slope Instability. During design phase, there is possibility of incorporation of sloped areas due to which construction activities in such area may result in soil erosion and slope instability.

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

210. The mitigation measures can be as follows;

- Incorporate measures and sites for handling excessive spoil materials
- Incorporate drainage plan in final design

211. PMO,RPMO& DSMC are the main responsible bodies to carry out the above mentioned mitigation measures.

b) Construction Phase

212. **Soil Erosion & Land Surface Disturbances.** 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 as the service area is hilly area.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 can be a discomfort to the road users and inhabitants.

213. Similarly, the construction of Internal Access Roads results in Slope Instability and Landslides due to site clearance and earthwork excavation works. However, its impact is not significant as minimal length i.e., 200m length of this approach road has been proposed.

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

215. During construction, precautionary measures is taken, proper & prompt backfilling trenches is done, and the excavated soil is protected against erosion. The key elements to proper backfilling include:

- Protecting the foundation from damage during backfilling
- Using the right backfill materials
- Compacting the backfill
- Final finishing the subgrade to ensure that water drains away from the foundation

216. **Spoil Disposal.** Inappropriate disposal of spoils from the construction activities may result in gullying and erosion of spoil tips especially when it is combined with unmanaged surface water runoff. This leads to destruction of vegetations, damage to agricultural lands and destruction to property at downhill through direct deposition. This affects the people possessing those agricutural lands as well as the anticipated properties.

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

218. Spoils should be safely disposed by adopting the following mitigation measures:

- Follow Spoil Management Plan as included in ***Appendix 2D***.
- Use of excess Spoil or Soil for filling depressed areas or borrow pits wherever possible.

- Appropriate disposal of Spoil at the designated places.
- Spoils should not be disposed on natural drainage paths, canals and other infrastructures.
- Provision of toe walls and retaining walls to protect the erosion of disposed spoils.
- Provision of proper drainage, vegetation and adequate protection against erosion at the Spoil Disposal Site

219. **Air Pollution.** There is greater impact on air quality from the inadequately managed or haphazard project activities that includes: (i) earthworks such as clearing, grubbing, excavations, and drilling especially during dry seasons; (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; (v) on-site rock crushing and concrete mixing; (vi) burning of firewoods for cooking & heating in work and labour camps and (vii) open burning of solid waste by workers.

220. These activities may increase dust, carbon, monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons in the air. This affects the construction workers, people residing in this area and the passers by.

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

222. The measures to mitigate the impacts on air quality include: (i) confining earthworks according to an Excavation Segmentation Plan that should be part of EMP; (ii) watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; (iii) if re-surfacing of disturbed roads cannot be done immediately, spreading of crushed gravel over backfilled surfaces; (iv) during demolition, watering of exterior surfaces, unpaved ground in the immediate vicinity and demolition debris; (v) signage at active work sites in populated areas; (vi) requiring trucks delivering aggregates and cement to have tarpaulin cover;(vii) limiting speed of construction vehicles in access roads and work sites to a maximum of 30 kph; (viii) Strict Prohibition of open burning of solid waste by the workers; (ix) Use of Vehicles complying with NVMES, 2069, (x) Use of equipments/machinery that comply with applicable emission standards of GoN i.e.,NAAQS,2012, (xi) Use of Diesel Generators complying with National Diesel Generator Emission Standard,2012 and (x) Supply of clean cooking fuel to workers instead of allowing them to use firewood for cooking by the concerned contractor.

223. **Noise Pollution.** Noise-emitting construction activities include earthworks, rock crushing, concrete mixing, demolition works, movement and operation of construction vehicles and equipment, and loading & unloading of coarse aggregates. The significance of noise impact is high in areas where noise-sensitive institutions such as healthcare and educational facilities are situated. This affects the construction workers, people residing in this area and the passers by.

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

225. The measures to mitigate the noise pollution include: (i) using equipment that emits the least noise, well-maintained and with efficient mufflers; (ii) restricting noisy

activities to daytime and overtime work to avoid using noisy equipment; (iii) limit engine idling to a maximum of 5 minutes; (iv) spread out the schedule of material, spoil and waste transport; (v) minimizing drop heights when loading and unloading coarse aggregates; (vi) Use of Vehicles complying with NVMES,2069 B.S.; (vii) Use of equipments/machinery that comply with applicable emission standards of GoN i.e., National Noise Standard Guidelines, 2012; and (viii) Use of Diesel Generators complying with National Diesel Generator Emission Standard,2012

226. **Generation of solid waste & waste water from construction sites and worker's camp.** During construction phase, generation of solid waste & waste water from the construction sites and workers camp are likely to create nuisance in the surroundings. Soil runoff from the construction site may lead to off-site contamination (particularly during rainy season). Similarly, Improper disposal of construction debris may lead to off-site contamination of water resources. Unmanaged solid waste & effluent from workers camp may contaminate the surroundings.It is not possible to avoid this impact, however, it is not impossible too if provisions are envisioned with regular & proper monitoring activities. This may affect the construction workers, people residing in this predicted area and the passers by.

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

228. The mitigation measures for this impact is briefly described below:

Construction Wastes:

- Adopt 3R (Reduce, Reuse & Recycle) concept
- Ensure storage areas are secure, safe and weather proof.
- Management of Reusable Wastes
- Sale of Recyclable wastes to Scrap Dealer
- Avoid over ordering of construction materials to the extent possible. This will be challenging as it requires strong coordination with the concerned contractors as it cannot be made mandatory. However, it is not impossible too to coordinate with the contractors in this regard.
- Use standard size & quantity of construction materials.
- Construct garland drains to reduce the runoff from the stockpiles.

Solid Wastes & Effluent from Worker's Camp:

- Adopt Segregation of Solid Waste (3R Concept) on the basis of being biodegradable or non-biodegradable. It is because non-biodegradable wastes cannot be broken down by decomposers and their disposal poses a big problem.
- Management of biodegradable wastes that includes food waste, paper waste, biodegradable plastic, etc. by any suitable processes that include Composting & Incineration. If these two processes are not possible then, the wastes shall be either managed by handing over these wastes to the municipality waste collectors who will finally dispose those wastes to the

landfill sites of the project town or by disposing those wastes to the burial pits at suitable place.

- Non-biodegradable wastes like glass, plastics & metals shall be managed by reusing them for site use or selling them to scrap dealers instead of disposing them.
- Strict Prohibition on open incineration of solid wastes & Strict Prohibition on use of plastic materials to minimize the quantity of plastic wastes as much as possible.
- Construct the temporary latrines with temporary soak pits & septic tanks within the camp site for proper disposal of sewage.
- Provide temporary but proper drainage system for proper outlet of waste water generated from cooking practices adopted by the workers.
- Employ local people from nearby villages to maximum extent possible. It will minimize the number of workers residing at worker's camp. Lesser the number of people, lesser is the solid waste & effluent generated. However, it cannot be made mandatory because availability of local people with required skills will not be ensured at the time of construction.

229. **Accidental Leakage or Spillage of Stored Fuel/Chemicals.** During construction phase, there is requirement of storage of fuel/chemicals. During the process of storage and handling process, there is possibility of accidental leakage or spillage of stored fuel/chemicals. If not removed quickly, the spilled chemicals/fuel may be absorbed by the floor.This may lead towards the contamination of soil & water. This affects the community living around this area.

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

231. The mitigation measures for this impact is briefly described below:

- Provision of well managed storage site.
- Organize awareness programs for the workers responsible for handling fuel/chemicals prior to the construction works.
- Supervise workers to handle fuel/chemicals properly during transportation as well as storage.
- Use of spill kit materials to block flow and prevent discharge to nearby water bodies
- Scatter the Sawdust, sand or dry soil over the area of spill and leave for few minutes to soak up the fuel/chemical to avoid water as well as soil contamination. So, availability of saw dust, sand or dry soil should be ensured in the store.
- Regular Inspection Visit to the storage site to inspect the leakage of the stored container of fuel/chemical.

232. **Impact on Land Use Pattern.** The construction of the proposed project components occupies significant area of the land within the core area. This affects the current land use pattern as the land to be used for the construction of these components could be used for other purposes like agricultural, residential etc. This effect is direct in nature.

233. As the construction works of the proposed water supply project start, there is possibility of influx of people from the nearby areas of the project town to this project

town. This in turn increases the population of the project area which may lead towards change in land use pattern but in haphazard manner. Arable land may be converted to settlement areas. Unstable land may also be used for planned areas. Hapazard cutting of sloped areas may be done to increase settlement areas. The unmanageable land is the main reason behind the destruction of the environment.The effect is indirect in nature.

234. This is affecting the people residing within the core area of the project.

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

236. The mitigation measures for this impact are as follows:

- Selection of barren and public land only for the construction of project components.
- Avoid the acquisition of private and agricultural land for the construction of project components.
- Monitoring on the haphazard land use & planning by the concerned authority.

237. **Disruption to Natural Drainage.** The pipe laying works along ROW of the public road within the service area of the proposed project may disrupt the existing natural drainage system as the natural drainage flow may be interfered by the construction activities that includes earthworks, backfilling,stockpiling etc.This can have significant consequences like Localised Flooding, Channel Erosion, Landslides etc affecting the residents of that area.

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

239. The mitigation measures for this impact are as follows:

- Avoid the natural drainage pathways for pipe laying works.
- Stockpile the excavated materials at safe but nearby place.
- Restore natural drainage system if the drainage system during construction is blocked.

240. **Haphazard Disposal of Dismantled Debris.** The proposed project also involves dismantling activities for rehabilitation of existing intakes, for pipe laying works and other miscellaneous works. This results in the generation of dismantled debris.

241. Similarly, after the completion of construction works, the temporary facilities like labour camps, stockpiling sites, temporary toilets etc. needs to be dismantled immediately. The dismantled properties in the form of debris if not properly and instantly disposed off, may create nuisance in the surroundings. This may degrade the environmental quality. This affects the people living nearby the haphazardly disposed places and even the construction workers also.

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

243. The mitigation measures for this impact are as follows:

- Immediate Response on handling of dismantled debris.
- Segregation of Dismantled Debris

- Adopt 3R (Reduce, Reuse& Recycle) concept to minimize the quantity of dismantled debris.
- Sale of Recyclable Wastes to Scrap Dealer

ii. Impact on Biological Environment

a) Construction Phase

244. **Impacts on Flora & Fauna.** Some of the project components like RVTs, WTP and Guard House need to be constructed within the community forest areas that includes Barkhe Danda CF, Budhabhimsen CFs, Khorthali CFs and Shree Thangsa Deurali CFs. Similarly, some portions of Transmission Mains pass through the community forest areas. Hence, during construction works of these components, there is high chance of flora & fauna being susceptible to risk. However, there is no requirement of cutting trees except clearing of some bushes and shrubs. Similarly, during pipe laying works, some of the top soil may be lost.

245. Similarly, the construction works within these community forests may induce noise that will create discomfort to the faunas exisiting in those areas.The construction of Internal Access Road can have impact on flora through certain loss of vegetation due to clearing activities.

246. Haphazard site clearing, parking, movement of construction vehicles, use of various equipments, stockpiling, illegal harvesting of forest resources as fuel (NTFP) for cooking by workers and hunting of animals by workers results in unnecessary loss of vegetation & fauna beyond Project footprints.

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

248. The mitigation measures for this impact include:

    (i) Replace the excavated top soil to its original position after the completion of pipe laying works

    (ii) Re-vegetating disturbed slopes and grounds, as applicable

    (iii) Awareness programs regarding conservation of existing flora & fauna, to the workers and the community;

    (iv) Adopt the suitable mitigation measures proposed to minimize noise pollution as mentioned above in *8.1.1 d).*

    (v) Regular Monitoring by DSMC & PMO

    (vi) The forest area will be used as per Section 68 (1) of Forest Act 2049 (1993) which has also been mentioned in Section 2.4.14.

249. **Impacts on Aquatic Life.** During construction phase, nearby water bodies may be used by the workers for their daily activities like waste disposal, sanitation activities which may pollute the river quality which in turn lead the habitat of aquatic life towards risk.

250. Similarly, the construction works for the proposed Intakes and the rehabilitation works of the existing intakes may also contaminate the quality of exisitng & proposed sources affecting the aquatic habitat.

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

252. The mitigation measures for this impact include: i) Strict Monitoring on the daily activities of workers; ii) Provision of temporary but well equipped toilets; iii) Restriction to workers from fishing; iv) Adopt measures mentioned above

253. **Forest Fire.** It has already been mentioned that some of the project components have to be constructed within the community forest area. Due to this, during construction works within the community forest areas, there is greater possibility of accidental forest fire that may be due to carelessness of workers or sudden accidental causes. This forest fire in turn results in various consequences that includes impact on flora & fauna, destroying of nutrients by the ashes, soil erosion etc.

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

255. The mitigation measures for this impact include: (i) Prohibition on burning dry grass or debris ; (ii) Prohibition on camp fires & smoking within the forest area to the workers;(iii) Keeping fire fighting equipment stand by within the construction sites; (iv) Provision of safety trainings regarding forest fire to the construction workers prior to construction

256. **Forest Encroachment.** Due to construction activities, there is regular inflow & outflow of the people to the forest area. This may result in possibility of encroachment of forest area. This has direct impact on flora & fauna as their habitat may be disturbed by the forest encroachment. This discourages the ability of the forest vegetation to recover. Workers involved in the construction activities may use firewood of the forest areas which is illegal in actual.

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

258. The mitigation measures for this impact include: (i)Strict & Regular Monitoring during the entry of workers for the construction workers, (ii) Mobilization of the concerned community forest groups, (iii) Legal Provision along with imposing fines as punishment for those responsible for forest encroachment & (iv) Provision of trainings to the construction workers to provide support in controlling encroachment

b) Operation Phase

259. **Impacts on Aquatic Life.** The effluent produced from the filter backwashing, if discharged directly into the nearby water bodies, may pollute the water bodies endangering the existence of aquatic lives . This impact is more troublesome during dry season when the flow and self cleansing capacity of the river becomes less.

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

261. The mitigation measures for this impact are as follows:

- Strict monitoring to the operators involved to discourage Direct discharge of the effluent to the water bodies.

- Proper Implementation of Water Safety Plan (WSP).

iii. Impact on Chemical Environment

a) Construction Phase

262. **Impacts on Water Quality of the nearby rivers.** During construction phase, there is high possibility of nearby rivers like Hattichhara Khola, Chharange Khola, Charnawati River, Ghatte Khola and various other rivulets to be polluted due to the chance of disposal of solid wastes by the workers and poor sanitation behavior of the workers. This lowers the water quality of those water bodies.Polluted water bodies is detrimental to aquatic life as well as to the health of people relying mainly on the river and streams as sources of water for drinking and other domestic uses.

263. Similalrly, some sections of the distribution pipeline cross small water bodies, exposing these resources to risks of pollution caused by poorly managed construction sediments, wastes and hazardous substances.

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

265. Mitigation measures should be implemented before the construction stage to prevent the contamination of drinking water source and other environmental receptors from worker camps and construction site toilets septage. The mitigation measures includes;

- Appropriate design of septage disposal minimizes the risks to public health. The appropriate design of toilets includes septic tanks that are designed as per national standards and codes to allow for maximum retention of septage. This includes ensuring septic tanks are sealed and watertight. Septage disposal pit is designed and constructed in accordance with international best practice and acceptable standards. This includes, locating disposal pits at least 300 m away from the nearest dwelling and 30 m downstream of the drinking water source, the pits are installed on relatively flat land with no more than 8 % slope and sites selected for locating of pits will not be where food crops are grown. The sanitation condition is maintained to deter flies, mosquito breeding, free from odor. The septage disposal site ensures no disturbances to nearby community forests.

266. In additional to this, other mitigation measures include

- disposing of spoils or excess soils as free filling materials as soon as possible;
- locating temporary storage areas on flat grounds and away from main surface drainage routes;
- shielding temporary storage areas with sandbags
- adopt measures mentioned above in the section 8.1.2 (e) for the solid waste management
- implementing eco-friendly solid and hazardous waste management, disposing them promptly;
- providing adequate water supply and sanitation facilities at work sites.

- Strict supervision on the behaviour of workers for the waste management as well as sanitation behaviour and monitoring the workers to manage the wastes properly.

267. The contractor,RPMO& DSMC are the main responsible bodies to carry out the above mentioned mitigation measures.

b) Operation Phase

268. **Impacts on Quality of Water Stored in Reservoir.** Irregularity in the supervision of the operation of distribution system may lead to excessive algae growth in service reservoir which may produce toxins reducing the water quality within the reservoir and this may cause serious illness in humans consuming water. The algal growth may also impart earthy taste & odor.

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

270. The mitigation measures for this impact are as follows:

- Proper Implementation of Water Safety Plan (WSP).
- Removing of Algae grown within the reservoir at regular intervals by the O&M team deployed by the WUSC.

271. **Impacts on Water Bodies.** The sedimentation tank requires periodic cleaning through periodic removal of sediments settled down (Raw Sludge) at the bottom of the tank. The removed sediments or sludge from sedimentation tank needs to be properly disposed. But, there is high chance of disposal of sludge directly into the nearby water bodies. This will degrade the water quality of the river. This impact is more troublesome during dry season when the flow and self cleansing capacity of the river becomes less**..**

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

273. The mitigation measures for this impact are as follows:

- Disposal of raw sludge to the appropriate landfill sites of the proposed project town
- Use of raw sludge for agricultural land.
- Avoid direct discharge of the raw sludge to the water bodies through strict monitoring to the operators involved.
- Proper Implementation of Water Safety Plan (WSP).

iv. Impact on Socio-economic Environment

a) Design Phase

274. **Structural Instability.** This Bhimeshwore municipality is also seismic prone zone area as it was also highly affected by the massive earthquake that shook various parts of Nepal in April 25, 2015. If certain seismic activity again occurs in the future, this may result in Cracking of structure that leads to facility failure and public discomfort. Though this impact will be experienced during operation phase, this should be considered during design phase so that such possibility of structural failure

can be reduced to greater extent through safe design of earthquake resistant structures.

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

276. This impact can be mitigated through proper design of earthquake resistant structures as per standard and code of practice.

277. PMO, RPMO & DSMC are the main responsible bodies for the adoption of this mitigation measure.

278. **Health & Safety of Community & Workers.** During design phase, if the project components are designed without focusing on the health & safety of community & workers, it will have greater impact on socio-economic environment.

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

280. The mitigation measure for this impact involves;

- Preparation of training manuals in Nepali with sketches on community health and safety and potential occupational health and safety.

281. PMO, RPMO& DSMC are the main responsible bodies to carry out the above-mentioned mitigation measures.

282. **Damage to the existing utilities.** During construction phase, if the proposed pipelines interfere any of the existing utilities, there is greater possibility of those utilites getting damaged. This creates discomfort to the people getting facilities from those damaged utilities. Similarly, there is also possibility of some fraud people to take advantage of this impact and may make false claims for damaged utilities. Though this problem appears during construction phase, its mitigation measure should be considered during design phase. Hence, this impact is categorized for design phase.

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

284. The mitigation measures for this impact includes;

- Coordinate with the concerned agencies to finalize the pipe network layout to avoid damage to the existing utilities.
- Design & Locate pipelines away from existing utilities during design as far as possible.
- Provide budget for restoration/replacement of damaged utilities.
- Photographs of construction sites before and after the construction to avoid the false claims.
- Provision of Prompt Reinstatement of paved as well as unpaved roads after completion of excavation of pipeline works.

285. PMO,RPMO & DSMC/Contractor are the main responsible bodies to carry out the above mentioned mitigation measures.

b) Construction Phase

286. **Community Health & Safety hazards.** Overall, communities are 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; service disruptions, etc. Communicable and transmittable diseases may potentially be brought into the community by construction workers.

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

288. The mitigation measures for this impact include: (i) Contractor's implementation of EMP; (ii) adequate lighting, temporary fence, reflecting barriers and signage at active work sites; (iii) Contractor's preparedness in emergency response; and (iv) adequate dissemination of GRM and Contractor's observance/implementation of GRM.

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

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

291. The mitigation measures for this impact include:

    (i) Comply Labor Act (2017) of GoN; (ii) Train all site personnel on environmental health and safety; (iii) Provide Personal Protective Equipment (PPEs)to workers that includes protective clothing, helmets, goggles and other equipments designed to protect the wearer's body from injury or infection and ensure their effective usage; (iv) Require workers to wear high visibility clothes; (v) Exclude public from worksites; (vi) Maintain accident reports and records; (vii) Make first aid kits readily available; (viii) Maintain hygienic accommodation in work camps; (ix) Ensure uncontaminated water for drinking, cooking, and washing; (x) Assure clean eating areas; (xi) Make sure sanitation facilities are readily available, Provide medical insurance coverage for workers; (xii) Provide adequate space and light to the camp site; (xiii) Adequate supply of potable water to the camps and good sanitation within camps; (xiv) Provide medical insurance coverage for workers; (xv) Provide orientation for guest visitors; (xvi) Ensure that visitors do not enter hazard areas unescorted; (xvii) Ensure moving equipment is outfitted with audible backup alarms; (xviii) Hearing protection equipment enforced in noisy environment and (xix) Chemical and material storage areas need to be marked clearly.

292. **Traffic Congestion.** The core Charikot bazaar area may be susceptible to traffic congestion during pipeline laying works as the road of this area is a bit narrower that may provide discomfort to the passer-by & shopkeepers and may obstruct the daily activities of the people living in that area .

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

294. This impact cannot be avoided because the structure of the bazaar area is very congested. However, this impact can be mitigated as follows;

- The trench for pipeline should not be abandoned and the contractor should be recommended to backfill the trench immediately followed by compaction right after completion of pipe laying works.
- The contractor will be accountable to provide signage at appropriate locations indicating available alternate access routes to minimize traffic disruptions.
- The contractor will have to ensure access to shops and residences using simple wooden walkways.
- The contractor shall follow the Traffic Management Plan especially at Charikot Bazaar Area and along Lamosanghu to Jiri Highway, the sample of which has been attached in ***Appendix 2C***.

295. The contractor and DSMC are the main responsible bodies to mitigate this impact

296. **Disruption to Local Vendor's Business.** The construction works during pipe laying activities may disrupt local vendor's business as the construction activities may obstruct their customers to have easy & direct access to their shops. This may hamper their daily business activities.

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

298. The mitigation measures for this impact includes;

- Avoid delay in construction works and Prompt Backfilling accompanied by compaction right after completion of pipe laying works without delay.
- Provision of temporary access to the shops through provision of planks.
- Pre-notify the vendors regarding the construction works that may hinder their daily activities and Coordinate with them properly.

299. **Mobilization of Child Labour.** During construction period, there is possibility of mobilization of child labor by the contractors which is against the Child Labor Prohibition Act,2000 as child labor deprives children off their childhood and their right to education,health, safety and moral development.

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

301. The mitigation measures for this impact includes;

- As the Child Labor Prohibition Act, 2000 states that “No Child having not attained the age of 14 years shall be engaged in works as a laborer” during mobilization, provision for the requirement of submission of the citizenship certificate of each labor,should be made.
- During contract agreement, the agreement by the contractor to follow Child Labor Prohibition Act, 2000 and Child Labour Prohibition Rules & Regulations,2006, should be made.

302. **Impact on Sustainability of Works.** Nepal is a seismic prone country. It is the geographical location of Nepal that makes it extremely susceptible to seismic activity from the nearby Indian and Tibetan plates. Historically, Nepal has been prone to significant disasters resulting in mass destruction and claiming thousands of lives. Most recently, on 25 April 2015, a 7.8 magnitude earthquake struck in Gorkha district that resulted in the loss of life of thousands of people. As per *Nepal Disaster Management Reference Handbook (2017).Center for Excellence in Disaster Management and Humanitarian Assistance,*this devastating earthquake affected over 50 districts in Nepal. Dolakha, the project district could not remain untouched from this disaster. Nepal is still experiencing repeated but random tremors of various magnitude. Hence, we cannot ignore the fact that there is high possibility of occurrence of such seismic events in the future that will be experienced in the project town also. If this occurs during the construction period of the proposed project, this may cause damage to the unsettled/unfinished/uncured and/or completed structures affecting their structural integrity.

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

304. After every seismic event, the contractor must conduct engineering investigation of built structures and implement the necessary corrective actions immediately as a mitigation measure for this impact.

305. **Damage to the existing facilities.** During the construction phase, while excavating the earth, there is possibility of the existing water supply distribution pipelines getting damaged in a few places particularly in the market area. Similarly, the existing paved as well as unpaved road will also get damaged. This obviously creates discomfort to the people and people will be deprived of regular facilities they are getting from the existing utilities.

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

307. If during construction phase, the problem regarding damage to the exisitng facilities arises, then it is the fault of the people involved in construction works as this problem is considered during design phase. This problem arises only if no carefulness is adopted by the workers and if the pipeline layout drawings prepared during design phase is not strictly followed. Hence, the mitigation measure for this impact is to monitor construction workers to adopt carefulness and to strictly follow the layout drawings.

308. Similarly, during excavation works, damage to the existing paved as well as unpaved roads can be mitigated through reinstatement works. The proposed project has provision for this reinstatement works and the cost estimate has been included in the the detailed design cost estimate of this proposed project.

c) Operation Phase

309. **Occupational Health & Safety Hazards.** Worker's exposure to, and/or mishandling of chemicals and other hazardous substances pose health and safety hazards.

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

311. The mitigation measures for this impactinclude; (i) installation of clear, visible signage in premises onsafety measures; and (ii) setting up amechanism for the quick response to spills of chemical and hazardous substances.

312. **Delivery of Unsafe Water.** Unsafe water delivered due to any one or combinations of the following has 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 upgrading the water treatment process.

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

314. The mitigation measures for this impactinclude;(i) ensuring the correct operation of water treatment plant to meet satisfactory water quality; (ii) providing safe storage for chemicals; (iii) ventilation of Housed dosing unit for chlorine and (iv) train operators for handling chlorine for which Chlorine Use Guidelines as included in ***Appendix 6*** will be followed.

315. **Impact on Consumer's Health.** Irregularity in the supervision of the operation of distribution system may lead to excessive algae growth in service reservoir which may produce toxins causing serious illness in humans consuming water. The algal growth may also impart earthy taste & odor which may create dismay to the consumers and this may result in customer complaints that may lead to protests also.

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

317. The mitigation measures for this impact are as follows:

- Regular Monitoring by the WUSC
- Removing of Algae grown within the reservoir at regular intervals by the operating team deployed by the WUSC.
- Monitoring & Proper Implementation of WSP.

318. **Non-sustainability of Services or Completed Works.** This issue arises and results in disruption in smooth operation of water supply service with the Operator's disregard of the impacts of the following during operation: (i) climate change-induced drought; (ii) seismic events; (iii) Lack of Sense of ownership & affordability; (iv) Lack of institutional capacity & policy compliance and (v) Ineffectiveness in O & M.

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

320. The following mitigation measures to avoid non-sustainability of services or completed works are as follows:

- WUSC should monitor yield closely especially in the dry season and during a climate-change-induced drought.
- After every seismic event, WUSC should conduct engineering investigations of completed works and implement the necessary corrective actions without delay. This shall involve preparation of Emergency Preparedness & Response Plan and Immediate Implementation of this plan after any seismic event.

- Strengthening Institutional Capacity and Policy Compliance through various project related capacity building programs
- Carrying out regular O&M with effectiveness through proper management of WUSC.

321. The summary of impact matrix of adverse issues of the project is given in Table VII-4:

Table VII-4:Summary of Impact Matrix of Adverse Issues of the Proposed Project

Adverse Issues	Impact Rating				
	Nature	Magnitude	Extent	Duration	Rating
A) Impacts on Physical Environment					
i) Design Phase					
Soil Erosion & Slope Instability	D	M (20)	L (20)	ST (5)	Insignificant (45)
ii) Construction Phase					
Soil Erosion & Land Surface Disturbance	D	M (20)	L (20)	ST (5)	Insignificant (45)
Spoil Disposal	D	M (20)	L (20)	ST (5)	Insignificant (45)
Air Pollution	ID	M (20)	R (60)	ST (5)	Very Significant (85)
Noise Pollution	D	H (60)	L (20)	ST (5)	Very Significant (85)
Generation of Solid Waste & Wastewater from the construction site & worker's camp	D	M (20)	L (20)	LT (20)	Significant (60)
Accidental Leakage or Spillage of Stored Fuel/Chemicals	D	M (20)	L (20)	LT (20)	Significant (60)
Impact on Land Use Pattern	D & ID	M (20)	L (20)	LT (20)	Significant (60)
Disruption to Natural Drainage	D	M (20)	L (20)	LT (20)	Significant (60)
Haphazard Disposal of Dismantled Debris	D	M (20)	L (20)	LT (20)	Significant (60)
B) Impacts on Biological Environment					
i) Construction Phase					
Impacts on Flora and Fauna	D	M (20)	L (20)	ST (5)	Insignificant (45)
Impacts on Aquatic Life	D	M (20)	L (20)	ST (5)	Insignificant (45)
Forest Fire	D	M (20)	L (20)	ST (5)	Insignificant (45)
Forest Encroachment	ID	M (20)	L (20)	LT (20)	Significant (60)
ii) Operation Phase					
Impacts on Aquatic Life	D	M (20)	L (20)	LT (20)	Significant (60)
C) Impacts on Chemical Environment					
i) Construction Phase					
Impacts on Water Quality of the nearby rivers	D	M (20)	R (60)	ST (5)	Very Significant (85)
ii) Operation Phase					
Impacts on Quality of Water Stored in the reservoir	D	M (20)	L (20)	ST (5)	Insignificant (45)
Impact on Water Bodies	D	M (20)	L (20)	LT (20)	Significant (60)
D) Impacts on Socio-economic Environment					
i) Design Phase					
Structural Instability	ID	M (20)	L (20)	LT (20)	Significant (60)
Health & Safety of Community & Workers	ID	M (20)	L (20)	LT (20)	Significant (60)
Damage to the existing facilities & False Claims by	D	M (20)	L (20)	ST (5)	Insignificant (45)

Adverse Issues	Impact Rating				
	Nature	Magnitude	Extent	Duration	Rating
the people					
ii) Construction Phase					
Community Health and Safety Hazards	ID	M (20)	L (20)	ST (5)	Insignificant (45)
Workers' Health and Safety Hazards	ID	M (20)	L (20)	ST (5)	Insignificant (45)
Traffic Congestion	D	M (20)	L (20)	ST (5)	Insignificant (45)
Disruption to local vendor's business	D	M (20)	L (20)	ST (5)	Insignificant (45)
Mobilization of Child Labor	ID	M (20)	L (20)	LT (20)	Significant (60)
Impacts on the sustainability of works	D	H (60)	L (20)	ST (5)	Very significant (85)
Damage to the existing facilities	D	M (20)	L (20)	ST (5)	Insignificant (45)
iii) Operation Phase					
Occupation Health and Safety Hazards	ID	M (20)	L (20)	LT (20)	Significant (60)
Delivery of Unsafe Water	D	M (20)	L (20)	LT (20)	Significant (60)
Impacts on Consumer's Health	D	M (20)	L (20)	ST (5)	Insignificant (45)
Non Sustainability of Services or Completed Works	ID	M (20)	L (20)	LT (20)	Significant (60)

Source: IEE Field Study,2016

Note: Scoring is done based on following;

Nature of Impact: D = Direct; IN = Indirect;

Magnitude, H = High (60); M = Medium/Moderate (20) ; and L = Low (10)

Extent, R = Regional (60), L = Local (20); and S = Site-specific (10)

Duration, LT = Long-term (20), MT = Medium-term (10); and ST = Short-term (5)

The points/scoring are taken from the **National EIA Guidelines, 1993.**

Significance of Impact

Total Score: More than 75 : Very Significant

50-75 : Significant

Less than 50 : Insignificant

322. The above given table shows that *Air Pollution*, *Noise Pollution, Impacts on Water Quality of nearby rivers and Impact on Sustainability of Works* are evaluated as "Very Significant". However, if the mitigation measures for these impacts are properly adopted, these impacts would not be problematic for the project implementation. Apart of this, the Table 39 also shows that some impacts are insignificant & some are significant. The best way to avoid these impacts is to follow the appropriate mitigation measures and to implement them effectively. The proposed mitigation measures of each of the above mentioned adverse impacts are discussed in detail in the Chapter 8.

D. Significance of Impact Rating

323. The significance of impact rating as shown in the above table is that it helps to determine the severity of each anticipated adverse impact. This will help to recommend suitable mitigation measures for each impact on the basis of its severity.

This will help to allocate budget required for the implementation of the proposed mitigation measures. As per the severity, the impact rating shall act as a means of making policy and legislations more rational, predictable and scientific. This will also help to establish close and routine monitoring requirement or criteria for mitigating impacts. This will also help to recommend the needs of adopting special checklists, if required. Moreover, this will assist to advance towards the environmental auditing during construction and operation phase, as one of the most important environmental management tools. This auditing enables to assess the actual environmental impacts, accuracy of prediction, effectiveness of environmental mitigation measures adopted and functioning of monitoring mechanism.

324. Hence, the main significance of impact rating is that it reflects the authenticity of impact assessment in which the significance is interpreted in terms of acceptability of impacts that can be either in terms of legal requirements or public/stakeholders' satisfaction

E. Indirect, Induced and Cumulative Impacts

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

326. Cumulative Impacts. There is a Dolakha- Singati Road project ongoing in Charikot that connects Charikot with the rural area of Singati. The road also serves as the access road for one of the national priority projects, the Upper Tamakoshi Hydroelectric Project. This road is one of the three priority roads in the recent earthquake affected districts considered for upgrading by ADB. The total length of the road is 35 km, which passes through various settlements, agricultural lands, and forests in Dolakha District. Out of the total 35 kilometers length of the roads, only a few kilometers lie within the Charikot area. Therefore, a cumulative impact is not expected in a magnitude that negatively affects the local environment.

327. The cumulative impacts will arise mainly from the construction of the main subproject components and associated facilities. The subproject's "main area of influence covers component sites, i.e. footprints and areas within 200 m from their edges, considering the potential reach of noise, dust and socio-economic impacts; "Point works" refer to such main components as pumps, RVTs, treatment units/ancillaries, public markets; "Horizontal works" refer to the transmission main and distribution pipes; the "Construction period" (excluding O&M) for horizontal works is estimated to be 1 year, and 6 months for the collection chamber and water treatment plant and RVT and DTW unit/ancillaries is six months.

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

329. The potential moderate and high cumulative impacts would be dust, noise, road space limitation leading to slow mobility, access blocking, disruption of social services and economic activities, community and workers’ health and safety hazards, generation of solid wastes and spoils. To reduce the cumulative impacts down to acceptable levels:

(i) civil works must be well planned, strategized and completed promptly;
(ii) the contractor should implement SEMP fully, and key institutions should act their roles in EMP implementation effectively;
(iii) there must be adequate consultations with stakeholders, including vehicle operators, and local authorities and coordination, particularly regarding expected cumulative impacts. vehicle operations should temporarily adjust to the circumstances to relieve some road space limitations and for public safety and convenience; and
(iv) the GRM should be disclosed (through public meetings, display at strategic places and media) to the communities affected by the cumulative impacts.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

A. Introduction

330. 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 impacts of the project and in enhancing beneficial impacts;; and (iv) ensuring that safety recommendations are complied with.

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

B. Institutional Arrangement

i. Executing and Implementing Agencies

332. The Ministry of Water Supply (MoWS) is the executing agency with the responsibility of project execution delegated to the Department of Water Supply and Sewerage Management (DWSSM). Water User' s and Sanitation Committees of the proposed towns are the implementing agencies.

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

a) ***Prior to construction:***

- MoWS deputizes a qualified staff to act as the Environmental Safeguard Officer of the Project management office (PMO).
- MoWS establishes the grievance redress mechanism, including setting up the Grievance Redress Committee.
- The Water Supply and Environmental Division of the MoWS is responsible for reviewing and approval of the IEE Report.
- DWSSM reviews the IEE Report prepared by the Design, Supervision and Management Consultant Team's Environmental Safeguard Expert (DSMC-ESE) before forwarding this to MoWS.
- DWSSM prepares the ToRs for the Environmental Safeguard Specialist that engages to support PMO and for the Environmental Safeguard Specialists of the two Design, Supervision and Management Consultants that are appointed to prepare the projects.

ii. Safeguard Implementation Arrangement

a) During construction and operation:

334. Safeguard Implementation Arrangement. The figure given below illustrates the Safeguard Implementation Arrangement;

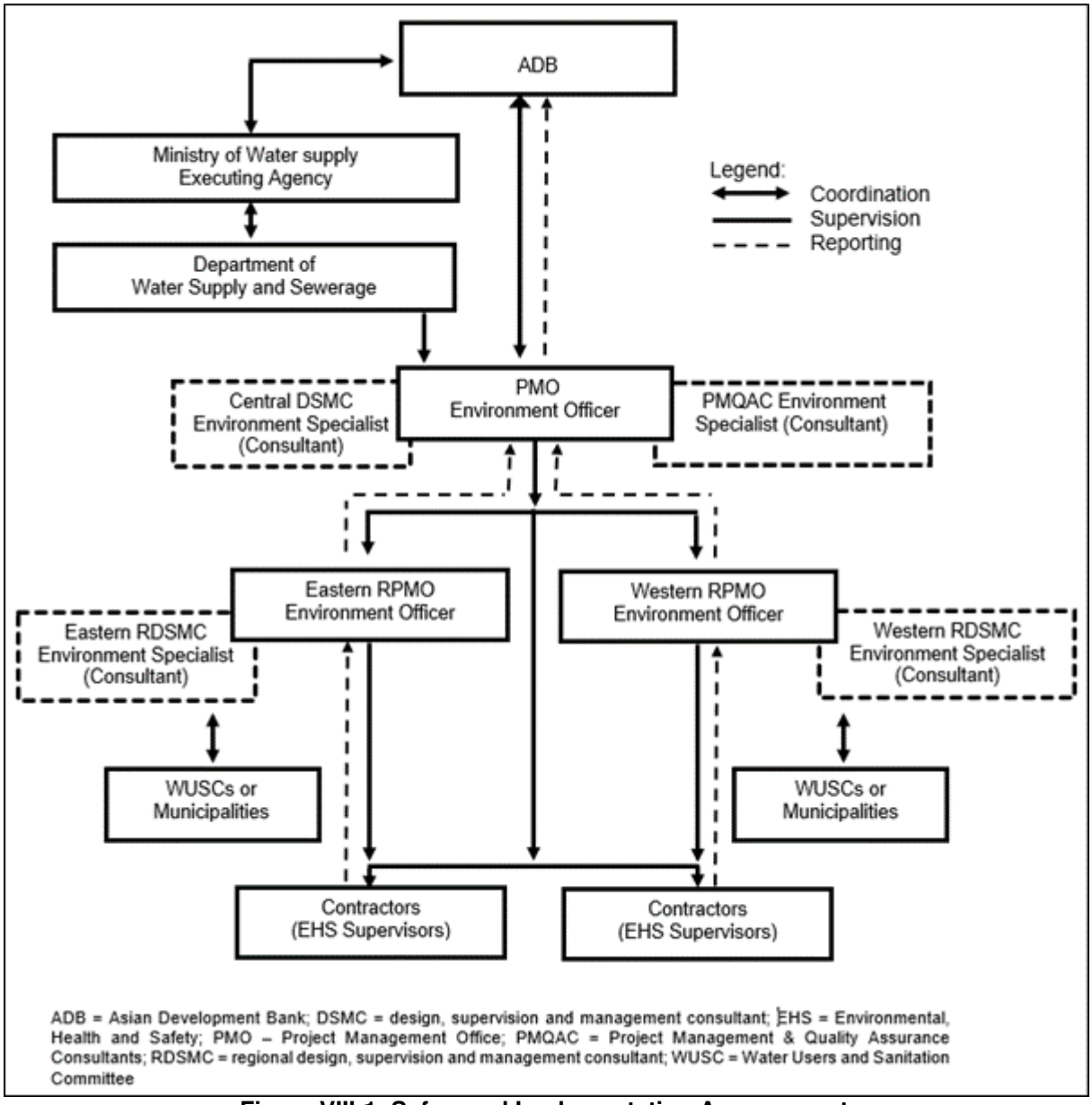


Figure VIII-1: Safeguard Implementation Arrangement

335. **Project Management Office (PMO):**A project officer (Environment) is engaged in PMO to ensure implementation of environmental safeguards. He/ she is provided with necessary consultant support, and capacity development and training. The responsibilities of the Environment Officer are:

(i) review and confirm existing IEEs and EMPs are updated based on detailed designs, that new IEEs/EMPs prepared by DSMCs comply to exclusion criteria and project selection guidelines as stipulated in the EARF and government rules; and recommend for approval to PMO;

(ii) approve subproject environmental category;

(iii) ensure that EMPs are included in bidding documents and civil works contracts;

(iv) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by RPMOs and contractors;

(v) establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the EMP;

(vi) facilitate and confirm overall compliance with all Government rules and regulations regarding site and environmental clearances as well as any other environmental requirements as relevant;

(vii) supervise and provide guidance to the RPMOs to properly carry out the environmental monitoring and assessments as per the EARF;

(viii) review, monitor and evaluate effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken;

(ix) consolidate monthly environmental monitoring reports from RPMOs and submit semi-annual monitoring reports to ADB;

(x) ensure timely disclosure of final IEEs/EMPs in project locations and in a form accessible to the public;

(xi) address any grievances brought about through the Grievance Redress Mechanism (GRM) in a timely manner as per the IEEs;

(xii) undertake regular review of safeguards-related loan covenants, and the compliance during program implementation; and

(xiii) organize periodic capacity building and training programs on safeguards for project stakeholders, PMO, RPMOs, and WUAs.

336. **Regional Project Management Offices (Eastern and Western RPMOs):**The environmental officer assigned by DWSSM to the RPMOs receives support from (i) the PMO environmental officer, (ii) environmental specialist from PMQAC; and (iii) the environmental specialist and EMP monitors of the regional DSMCs to carry out the following:

(i) prepare new IEEs and EMPs in accordance with the EARF and government rules;

(ii) include EMPs in bidding documents and civil works contracts;

(iii) comply with all government rules and regulations;

(iv) take necessary action for obtaining rights of way;

(v) oversee implementation of EMPs including environmental monitoring by contractors;

(vi) take corrective actions when necessary to ensure no environmental impacts;

(vii) submit monthly environmental monitoring reports to PMO; and

(viii) address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs.

337. **PMQAC:** The Project Management and Quality Assurance Consultants (PMQAC) provides support to the PMO in the following areas:

(i) ensure that the quality of the designs and construction of all water supply and sanitation components implemented under the project are to the required standards; and

(ii) assist the PMO with the overall planning, implementation and monitoring of the project during all stages of implementation including adherence to all environmental and social safeguards' requirements.

338. **Regional DSMCs:**The RDSMCs provides support to the RPMOs in the following areas:

(i) prepare quality feasibility studies, detailed engineering designs, safeguards documents and bid documents

(ii) provide effective construction supervision and contract management of all water supply and sanitation components implemented under the project in its region

(iii) assist the RPMOs with the overall planning, implementation and monitoring of each subproject during all stages of implementation including adherence to all environmental and social safeguards requirements

(iv) work closely with the Water User and Sanitation Committees (WUSCs), respective project municipalities and communities to ensure that the citizens are aware of project benefits and their responsibilities

(v) ensure that poor and vulnerable groups will benefit equally from the project.

339. **Civil Works Contracts and Contractors**: The contractor is required to designate an Environment, Health and Safety (EHS) officer immediately to ensure implementation of EMP during civil works. It should be ensured that no works are undertaken unless the contractor has appointed its EHS officer. In regard to this, Mr. Deepak Aryal has been appointed as EHS officer by the contractor. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract. The contractor is required to submit to RPMO, for review and approval, a site-specific environmental management plan (SEMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per EMP; and (iv) budget for SEMP implementation. No works can commence prior to approval of SEMP. The contractor is required to undertake day to day monitoring and report to the respective RPMO and DSMC.

340. A copy of the EMP or approved SEMP is kept on site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP or SEMP constitutes a failure in compliance and requires corrective actions.

The EARF and IEEs specify responsibilities in EMP implementation during design, construction and O&M phases.

341. The PMO and RPMOs ensures that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the subproject sites."

342. **Capacity Building**: The PMQAC safeguards experts (environmental and social) is responsible for training the (i) PMO's safeguards officers (environmental and social); (ii) RPMOs' engineers and social development officers. Training modules needs to cover safeguards awareness and management in accordance with both ADB and government requirements as specified below:

(i) Environmental Safeguards
   (a) sensitization on ADB's policies and guidelines on environment;
   (b) introduction to environment and environmental considerations in water supply and wastewater projects;
   (c) review of IEEs and integration into the project detailed design;
   (d) improved coordination within nodal departments; and
   (e) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites.

(ii) Social Safeguards
   (a) sensitization on ADB's policies on Involuntary Resettlement and Indigenous People;
   (b) introduction to social safeguards assessment and document requirements;
   (c) Consultation and participations requirements;
   (d) Project GRM and ADB's Accountability Mechanism (AM); and
   (e) monitoring and reporting system.

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

Before construction

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

During construction

- Assist in the observance of the grievance redress mechanism.

- Actively participate in the monitoring of Contractor's compliance with IEE and its EMP and the conditions set out with Government's approval of the IEE Reports.
- Facilitate public consultations, as necessary.

During operation

- Implement 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.

344. **Licensed and accredited laboratory:** It is recommended that a licensed and accredited laboratory be engaged to conduct water quality monitoring in the first few years of operation and to train the WUSC on the same. The laboratory ensures 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.

C. Environmental Management Plan

345. The table given below gives brief details on the Environmental Management plan (EMP) matrix that is to be implemented for the project implementation.

Table VIII-1: Environmental Management Plan

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
A. Adverse Impacts					
1. Impacts on Physical Environment					
a) Design Phase					
Topography/Geology	Soil Erosion & Slope Instability	• Incorporate measures and sites for handling excessive spoil materials • Incorporate drainage plan in final design	PMO, RPMO,& DSMC	• Spoil Management Plan • Final Design Documents	Before award of contract, During Detailed Design Phase
b) Construction Phase					
Topography/Geology	Erosion & Land Surface Disturbance	○ Protecting the foundation from damage during backfilling ○ Using the right backfill materials ○ Compacting the backfill ○ Final finishing the subgrade to ensure that water drains away from the foundation ○ During construction of Internal Access Road, Soil Erosion & Land Surface Disturbances will be mitigated through appropriate slope protection measures like Gabion Wall Construction, Retaining Wall Construction and Construction of Drainage Structures	Contractor	• Contractor's Work Log Book • Field Photographs	Weekly Basis During Construction Phase
Spoil Management	Inappropriate disposal of spoils from the construction activities may result in gullying and erosion of spoil tips especially when it is combined with unmanaged surface water runoff.	• Follow Spoil Management Plan as included in Appendix 2D. • Use of excess Spoil or Soil for filling depressed areas or borrow pits wherever possible. • Appropriate disposal of Spoil at the designated places. • Spoils should not be disposed on natural drainage paths, canals and other infrastructures. • Provision of toe walls and retaining walls to protect the erosion of disposed spoils. • Provision of proper drainage, vegetation and adequate protection against erosion at the Spoil Disposal Site.	Contractor	• Spoil Management Plan • Photographs • Location of Spoil Disposal Site	During Construction Phase
Air Quality	Air Pollution	• Strict Prohibition of open burning of solid	Contractor	Written Notice/Code of Conduct	During award of contract

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		waste		Visible Emission	Weekly Basis During Construction
				Number of complaints from sensitive receptors	
		• Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary;	Contractor	Number of water Tank/s	Weekly Basis During Construction
				Capacity of Water Tank/s	
				Daily/Weekly Frequency/Timing of water spraying	
				Locations of water spraying	
		• if re-surfacing of disturbed roads cannot be done immediately, spreading of crushed gravel over backfilled surfaces;	Contractor	• Contractors Log Book of Materials to ensure the use of crushed gravel • Photographs	Weekly Basis During Construction
Air Quality	Air Pollution	• Use of Construction/ Transportation Vehicles complying with NVMES,2069	Contractor	Number and types of vehicles in use	During Construction
				Certified documents for each vehicle	
		○ Regular inspection & maintenance of construction/transportation vehicles	Consultant & Contractor	Contractor's/Consultant's log book of vehicle inspection & maintenance	Daily Basis/During Construction
		○ Supply of clean cooking fuel to workers instead of allowing them to use firewood for cooking.	Contractor	Written Notice/Code of Conduct	Prior to construction
				Type of fuel supplied to camps	Weekly Basis during construction
				Quantity of fuel supplied to camps	Weekly Basis during construction
Acoustic Environment	Noise Pollution	○ Restricting noisy activities to daytime and overtime work to avoid using noisy equipment;	Contractor	Written Notice	Prior to construction
		○ Prohibit the use of pressure horn by transportation vehiles	Contractor	Written Notice/Code of Conduct	Daily Basis
				Number of vehicles fitted with pressure	

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
				horns Maximum Sound Level of Pressure Horn	
		○ Regular inspection & maintenance of construction/transportation vehicles to ensure the use of Vehicles complying with NVMES,2069 B.S.	Contractor	Contractor's/Consultant's log book of vehicle inspection & maintenance	Daily Basis
		○ Regular inspection & maintenance to ensure the use of equipments/machinery that comply with applicable emission standards of GoN i.e., National Noise Standard Guidelines, 2012	Contractor	Contractor's/Consultant's log book of equipment/machinery inspection & maintenance	Daily Basis
		○ Regular inspection & maintenance to ensure the use of Diesel Generators complying with National Diesel Generator Emission Standard,2012	Contractor	Contractor's/Consultant's log book of equipment/machinery inspection & maintenance	Daily basis
Solid Waste	Haphazard Disposal of Wastes	**a) Construction Wastes**			
		○ Adopt 3R (Reduce, Reuse & Recycle) concept	Contractor	○ Daily/Weekly quantity/volume of reusable/recyclable SW collected	Daily basis
		○ Ensure storage areas are secure, safe & weatherproof.	Contractor	○ Locations of stockpiling sites	Daily basis
		○ Management of reusable wastes	Contractor	○ Number of cases of onsite reuses	Daily basis
		○ Sale of Recyclable wastes to scrap dealer	Contractor	○ Daily/Weekly quantity/volume of such wastes sold to or given to scrap vendors ○ Frequency of sale to scrap vendors	Daily basis
		○ Final Disposal of Bio degradable soild wastes	Contractor	○ Number/size of burial pits for final disposal of bio-degradable solid waste ○ Location of burial sites	Daily basis

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
				○ Frequency of burials	
		○ Avoid over ordering of construction materials to the extent possible. This will be challenging as it requires strong coordination with the concerned contractors as it cannot be made mandatory. However, it is not impossible too to coordinate with the contractors in this regard. ○ Use standard size & quantity of construction materials.	Contractor	○ Contractor's log book of construction materials	Daily basis
		○ Construct garland drains to reduce the runoff from the stockpiles.	Contractor	○ Location of construction sites	Daily basis
Solid Waste	Haphazard Disposal of Wastes	**b) Solid Wastes, Wastewater and Sewage from labour camp**			
		○ Adopt Segregation of Solid Waste (3R Concept) on the basis of being biodegradable or non-biodegradable. It is because non-biodegradable wastes cannot be broken down by decomposers and their disposal poses a big problem.	Contractor	○ Number of coloured Bins to segregate wastes into biodegradable & non-biodegradable wastes	Daily basis during construction
		○ Management of biodegradable wastes that includes food waste, paper waste, biodegradable plastic, etc. by any suitable processes that include Composting & Incineration. If these two processes are not possible then, the wastes shall be either managed by handing over these wastes to the municipality waste collectors who will finally dispose those wastes to the landfill sites of the project town or by disposing those wastes to the burial pits at suitable place.	Contractor	○ Daily/Weekly quantity/Volume of Biodegradable solid waste collected ○ Site Photographs ○ Contractor' Log Book	Daily basis during construction
		○ Non-biodegradable wastes like glass, plastics & metals shall be managed by reusing them for site use or selling them to scrap dealers instead of disposing them	Contractor	○ Daily/Weekly quantity/volume of such wastes sold to or given to scrap vendors ○ Frequency of sale to scrap vendors/dealers	Daily basis during construction
		○ Strict Prohibition on open incineration of	Contractor	○ Written Notice	Prior to Construction &

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		solid wastes & use of plastic materials to minimize the quantity of plastic wastes.			During Construction
		○ Construction of the temporary latrines with temporary soak pits & septic tanks within the camp site for proper disposal of sewage.	Contractor	○ Field Photographs ○ Contractor's Monthly Progress Report	Daily basis
		○ Provide temporary but proper drainage system for proper outlet of waste water generated from cooking practices adopted by the workers	Contractor	○ Field Photographs ○ Contractor's Monthly Progress Report	Daily basis
		• Employ local people from nearby villages to maximum extent possible. It will minimize the number of workers residing at worker's camp. Lesser the number of people, lesser will be the solid waste & effluent generated. However, it cannot be made mandatory because availability of local people with required skills will not be ensured at the time of construction.	Contractor	○ Contractor's Workers Log Book	Prior to the construction
Handling of Fuels/Chemicals	Accidental Leakage or Spillage of Stored Fuel/Chemicals	• Provision of well managed storage site	Contractor	○ Location of storage site	Weekly Basis during construction
		• Organize awareness programs for the workers responsible for handling fuel/chemicals	DSMC & Contractor	○ Records of awareness programs in the form of minutes, photographs	Prior to the construction
		• Supervise workers to handle fuel/chemicals properly	DSMC & Supervisor of Contractor	○ Records of any accidental spillage/leakage	Daily Basis During Construction
		• Use of spill kit materials to block flow and prevent discharge to nearby water bodies	Contractor	○ Contractor's log book of materials procured for construction	Weekly Basis During Construction
		• Scatter the Sawdust, sand or dry soil over the area of spill and leave for few minutes to soak up the fuel/chemical. So, availability of saw dust, sand or dry soil should be ensured in the store	Contractor	○ Frequency of use of saw dust, sand or dry soil	Weekly Basis During Construction
		• Regular Inspection Visit to the storage site to inspect the leakage of the stored container	DSMC & Contractor	○ Number of Site Visits ○ Complaints of	Weekly Basis During Construction

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		of fuel/chemical		Leakage	
Land Use Pattern	Change in land use pattern in haphazard manner	• Selection of barren and public land only for the construction of project components • Avoid the acquisition of private and agricultural land for the construction of project components. • Monitoring on the haphazard land use & planning by the concerned authority.	PMO & DSMC	○ Details of land ownership ○ Monitoring Reports on Haphazard Land Use	During Detailed Design Phase
Drainage	Disruption to Natural Drainage	• Avoid the natural drainage pathways for pipe laying works.	DSMC & Contractor	Pipe Layout plan	During Construction
Drainage	Disruption to Natural Drainage	• Stockpile the excavated materials at safe but nearby place.	DSMC & Contractor	Location of Spoil Disposal	Daily Basis During Construction
		• Restore natural drainage system if the drainage system during construction is blocked.	Contractor	Photographs of before and after restoration	Daily Basis During Construction
Dismantled Debris	Haphazard Disposal of Dismantled Debris	• Immediate Response on handling of dismantled debris	Contractor	Number of complaints from the sensitive receptors	Daily Basis After Construction and Prior to Operation
		• Segregation of Dismantled Debris • Adopt 3R (Reduce, Reuse& Recycle) concept	Contractor	• Number of Coloured Bins • Contractor's Work Log Book	Daily Basis
		• Sale of Recyclable Wastes to Scrap Vendors/Dealers	Contractor	• Quantity/Volume of such wastes sold to or given away to scrap vendors • Frequency of sale to scrap vendors	Daily Basis
2. Impacts on Biological Environment					
a) Construction Phase					
Flora & Fauna	Loss of vegetation, Loss of habitat of faunas	• Replace the excavated top soil to its original position after the completion of pipe laying work	Contractor	• Photographs of before and after the replacement of top soil • Contractor's Work Log Book	Daily Basis During Construction

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		• Re-vegetating disturbed slopes and grounds, as applicable;	Contractor	• Photographs of revegetation of disturbed slopes and grounds • Contractor's Work Log Book	Weekly Basis During Construction
Flora & Fauna	Loss of vegetation, Loss of habitat of faunas	• Awareness programs regarding conservation of existing flora & fauna, to the workers and the community	PMO,DSMC & Contractor	Minutes & Photographs of Awareness Programs	Prior to Construction
		• Adopt the suitable mitigation measures proposed to minimize noise pollution as mentioned earlier	Contractor	○ Written Notice ○ Contractor's Work Schedule	As mentioned earlier
		• Regular Monitoring	DSMC & RPMO	○ Contractor's Log Book ○ Number of Monitoring Visits	Daily Basis During Construction
		• The forest area will be used as per Section 68 (1) of Forest Act 2049 (1993)which has also been mentioned in Section 2.4.14.	Contractor, DSMC & RPMO	Forest Act,2049 (1993)	At the start of the construction
Aquatic Life	Loss of habitat of aquatic life	• Strict Monitoring on the daily activities of workers	Contractor & DSMC	○ Location of Labor Camp Site ○ Photographs ○ Number of Complaints from the sensitive receptors ○ Number of Monitoring Visits ○ Monitoring Reports	Weekly Basis
		• Provision of temporary but well equipped toilets	Contractor & DSMC	○ Location of these temporary facilities ○ Photographs of toilets constructed	Weekly Basis
		• Restriction to workers from fishing	Contractor & DSMC	○ Written Notice ○ Number of complaints from the sensitive receptor	Daily Basis During Construction
		• Adopt measures mentioned above for the solid waste management	Contractor & DSMC	○ Number of Coloured Bins to segregate wastes ○ Daily/Weekly	Daily Basis During Construction

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
				quantity/Volume of Biodegradable solid waste collected	
Forest Fire	Impact on Flora & Fauna, Destruction of nutrients by the ashes, soil erosion	• Prohibition on burning dry grass or debris • Prohibition on camp fires & smoking within the forest area to the workers • Keeping fire fighting equipment stand by within the construction sites; • Provision of safety trainings regarding forest fire to the construction workers prior to construction	Contractor & DSMC	○ Written Notice right before the construction ○ Contractor's Log Book ○ Photographs of Safety Trainings	Daily Basis During Construction
Forest Encroachment	Impact on Flora & Fauna	• Strict & Regular Monitoring during the entry of workers for the construction workers, • Mobilization of the concerned community forest groups, • Legal Provision along with imposing fines as punishment for those responsible for forest encroachment & • Provision of trainings to the construction workers to provide support in controlling encroachment.	Contractor & DSMC	○ Written Notice right before the construction ○ List of Records of ingoing & outgoing people from the community forest ○ Training Photographs	Daily Basis During Construction
b) Operation Phase					
Aquatic Life	Pollution of water bodies endangering aquatic lives	• Strict monitoring to the operators involved to discourage Direct discharge of the effluent to the water bodies	WUSC	Number of complaints from the sensitive receptors	Weekly Basis
		• Proper Implementation of Water Safety Plan (WSP)	WUSC, DSMC & PMO	○ WUSC Monitoring Reports ○ Water Safety Plan	Monthly Basis
3. Impacts on Chemical Environment					
a)Construction Stage					
Water Quality	Pollution on surface water sources by crossing of pipelines over water bodies, poorly managed construction sediments and other wastes, poor sanitation practices by	• Appropriate Design of Septage Disposal through design of toilets with septic tanks	Contractor, DSMC	• Semi Annual Environmental Monitoring Report • Photographs of toilets constructed	Prior to Construction as well as During Construction

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	workers				
		• Disposing of spoils or excess soils as free filling materials as soon as possible	Contractor	• Spoil Management Plan • Location of Spoil Disposal Site	During Construction
		• Locating temporary storage areas on flat grounds and away from main surface drainage routes; • Shielding temporary storage areas with sandbags	Contractor	Photographs of temporary storage areas	Monthly Basis
		• Adopt measures mentioned above for the solid waste management	Contractor	○ Number of Coloured Bins to segregate wastes ○ Daily/Weekly quantity/Volume of Biodegradable solid waste collected	Daily Basis
		• providing adequate water supply and sanitation facilities at work sites.	Contractor	○ Number of Complaints received from the workers ○ Number of Water Supplies to the workers	Weekly Basis
		• Strict supervision on the behaviour of workers for the waste management as well as sanitation behaviour and monitoring the workers to manage the wastes properly.	Contractor	○ Number of supervisions ○ Reports on Supervision	Weekly Basis
b) Operation Stage					
Water Quality	Degradation of Quality of water stored within the reservoir	• Proper Implementation of Water Safety Plan (WSP).	WUSC O & M Team	Water Safety Plan of WUSC	Monthly Basis
		• Removing of Algae grown within the reservoir at regular intervals by the O & M team deployed by the WUSC.	WUSC O & M Team	○ Photographs ○ WUSC Monthly Reports	Monthly Basis
Water Quality	Impact on Water Bodies	• Disposal of raw sludge to the appropriate landfill or burial sites of the proposed project town	WUSC O & M Team	• Frequency of Burials • Location of Burial Sites	During Cleaning of sedimentation tank
		• Use of raw sludge for agricultural land	WUSC O & M Team	• Quantity/Volume of Raw Sludge Scraped from sedimentation	During Cleaning of sedimentation tank

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
				tank	
		• Avoid direct discharge of the raw sludge to the water bodies through strict monitoring to the operators involved	WUSC O & M Team	• Written Notice	During Cleaning of sedimentation tank
		• Proper Implementation of Water Safety Plan (WSP)	WUSC O & M Team	WUSC Monitoring Reports	During entire operation phase, Monthly Basis
4.Impact on Socio-economic Environment					
a) Design Phase					
Structural Instability	Cracking of structure leads to facility failure and public discomfort due to construction of water supply components in high earthquake zones	• Proper Design of each & every component as per standard and code of practice.	PMO, RPMO & DSMC	Detailed Design Documents	During detailed design phase
Health & Safety of Community & Workers	Lack of provision will have impact during construction	• Preparation of training manuals in Nepali with sketches on community health and safety and potential occupational health and safety.	PMO, RPMO & DSMC	Photographs & Minutes	During detailed design phase
Existing facilities	Disruption of services & False Claims by the People	• Coordinate with the concerned agencies to finalize the pipe network layout to avoid damage to the existing utilities. • Design & Locate pipelines away from existing utilities during design as far as possible. • Provide budget for restoration/replacement of damaged utilities. • Photographs of construction sites before and after the construction to avoid the false claims.	DSMC, RPMO, PMO, Contractor	• List of affected utilities and operators; • Pipeline Layout Plan • Bid document • Photographs before and after the construction sites	During detailed design phase
b) Construction Phase					
Community Health & Safety	• 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	• Contractor's implementation of EMP	Contractor, RPMO, DSMC	EMP	During Construction Phase, Weekly Basis
		• Adequate lighting, temporary fence, reflecting barriers and signage at active work sites;	Contractor	• Photographs depicting lighting, temporary fencing, reflecting barriers and signage facilities. • Quantity of lighting, temporary fence,	During Construction Phase, Monthly Basis

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	services; service disruptions, etc. • Communicable and transmittable diseases may potentially be brought into the community by construction workers.			reflecting barriers and signage	
		• Contractor's preparedness in emergency response;	Contractor	Emergency Response Plan	During Construction, Weekly Basis
		• Adequate dissemination of GRM and Contractor's observance/implementation of GRM.	Contractor	• Monthly Reports of GRC • Number of Grievance Redress Form received	During Construction, Monthly Basis
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 at height and excavation works.	• Comply Labor Act (1992) of GoN • Train all site personnel on environmental health and safety • Provide **Personal Protective Equipment (PPEs)**to workersthat includes protective clothing, helmets, goggles and other equipments designed to protect the wearer's body from injury or infection and ensure their effective usage • Require workers to wear high visibility clothes	Contractor	• Site –Specific H&S plan • Record of H&S orientation training • Availability of personal protective equipment at construction site • Environmental Site Inspection Report	Visual inspection by RPMO (monthly) and DSMC-ESS on a weekly basis. Frequency and sampling sites to be finalized during detailed design and final location of project components
		• Exclude public from worksites	Contractor	Contractor's Visitors' Log Book	Weekly Basis during construction
		• Maintain accident reports and records.	Contractor	Number of accidents as per site records	Weekly Basis during construction
		• Make first aid kits readily available	Contractor	Contractor's Health & Safety Log Book	Weekly Basis during construction
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	• Maintain hygienic accommodation in work camps • Ensure uncontaminated water for drinking, cooking, and washing, • Assure clean eating areas • Make sure sanitation facilities are readily available • Provide adequate space and light to the camp site	Contractor	• Location of Worker's Camp Site • Number of Monitoring Visits • Number of Complaints from the workers	Monthly Basis during construction
		• Adequate supply of potable water to the	Contractor	• Number of water	Weekly Basis during

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	working at height and excavation works.	camps and good sanitation within camps		supplies • Number of complaints from the workers	construction
		• Provide medical insurance coverage for workers	Contractor	Medical Insurance Documents	Prior to the construction
		• Provide orientation for guest visitors • Ensure that visitors do not enter hazard areas unescorted;	Contractor	• Record of Orientation training (Photographs & Minutes) • Contractor's Visitor's Log Book	Monthly Basis during construction
		• Ensure moving equipment is outfitted with audible backup alarms; • Hearing protection equipment enforced in noisy environment	Contractor	Contractor's Log Book of Machinery & Equipment	Weekly Basis during construction
		• Chemical and Material storage areas need to be marked clearly	Contractor	Signage Board to make aware regarding Chemical Storage and Material Storage Area	Monthly Basis during construction
Traffic Congestion	Interference in the daily activities of people	• The trench for pipeline should not be abandoned and the contractor should be recommended to backfill the trench immediately. • The contractor will be accountable to provide signage at appropriate locations indicating available alternate access routes to minimize traffic disruptions. • The contractor will have to ensure access to shops and residences using simple wooden walkways. • Follow Traffic Management Plan	Contractor	• Number of Site Visit and Photographs of Sites • Traffic Management Plan	Daily Basis
Local Vendor's Business	Discomfort to the customers to get access to the shops	• Avoid delay in construction works and Prompt Backfilling rifght after completion of pipe laying works.	Contractor	• Field Visits • Contractor's Work Schedule	Weekly Basis
		• Provision of temporary access to the shops through provision of planks	Contractor	Photographs	Weekly Basis

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		• Pre-notify the vendors regarding the construction works that may hinder their daily activities and Coordinate with them properly	Contractor	Written Notice or Making (Verbal Notice)	Prior to the construction
Deployment of Child Labor	Deprivation of Children's right to education, health, safety and moral development is deprived	• As the Child Labor Prohibition Act, 2000 states that "No Child having not attained the age of 14 years shall be engaged in works as a laborer" during mobilization, provision for the requirement of submission of the citizenship certificate of each labor,should be made.	Contractor & PMO	Citizenship Certificate of the workers	Prior to Construction
		• During contract agreement, the agreement by the contractor to follow Child Labor Prohibition Act, 2000 and Child Labour Prohibition Rules & Regulations,2006, should be made.	Contractor & PMO	Contract Document	During award of contract
Sustainability of Works	Damage to unsettled/unfinished/uncured and/or completed structures and affecting their structural integrity by seismic event if any.	• After every seismic event, the contractor must conduct engineering investigation of built structures and implement the necessary corrective actions immediately	Contractor	• Monthly Progress Report • Contractor's Log Book	Construction Phase
Existing Facilities	Damage to the existing utilities creating discomfort to the people	• Monitor construction workers to adopt carefulness and to strictly follow the layout drawings.	Contractor, RPMO,DSMC	• Number of Complaints received at GRC • Pipeline Layout Plan • Contractor's Bill of Quantities • Photographs	During Construction Phase on Daily Basis
c) Operation Phase					
Occupational Health & Safety	Worker's exposure to, and/or mishandling of chemicals and other hazardous substances pose health and safety hazards.	• Installation of clear, visible signage in premises on safety measures	WUSC	• Number of Site Visits • Site Visit Reports • Photographs of location where signage are installed	Weekly Basis

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		• Setting up a mechanism for the quick response to spills of chemical and hazardous substances.	WUSC	• Frequency of use of chemical & hazardous substances • Quantity of chemical/hazardous substances used for the proposed project	Monthly Basis
Drinking water supply	• Extraction of unsatisfactory raw water quality • Delivery of unsafe water to the distribution system • Inadequate protection of intake • Health Hazards arising from inadequate design of facilities for receiving, storing and handling of CI & other chemicals	• Ensure the correct operation of water treatment plant to meet satisfactory water quality	PMO, RPMO& DSMC	WUSC Monitoring Reports	Monthly Basis during operation
		• Provide Safe Storage for chemicals	Contractor	• Location of Chemical Storage • Photographs	Monthly Basis during operation
		• Ventilation of "Housed" dosing unit for chlorine	Contractor, PMO & DSMC	• Detailed Design Drawings • Contractor' Working drawings • Photographs of Dosing Unit Constructed	During Construction
		• Train operators for handling chlorine	RPMO,PMO & WUSC	Minutes & Photographs of Training	Prior to operation right after completion of construction
Consumer's Health	Irregularity in the supervision of the operation of distribution system may lead to excessive algae growth in service reservoir which may produce toxins causing serious illness in humans consuming water.	• Regular Monitoring by the WUSC	WUSC	WUSC Monitoring Reports	Monthly Basis
		• Removing of Algae grown within the reservoir at regular intervals by the operating team deployed by the WUSC.	WUSC	Frequency of Algae Removal	Monthly Basis
		• Monitoring & Proper Implementation of WSP.	WUSC	WUSC Monitoring Reports	Monthly Basis
Non Sustainability of Services or Completed Works	Disruption in water supply service by sudden seismic events	• WUSC should monitor yield closely especially in the dry season and during a climate-change-	WUSC & the local body	• Number of Human Resources Mobilized for monitoring	During Dry Season and Immediate action during climate-change-induced

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	or climate change droughts	induced drought.		Yield Monitoring Reports	drought.
		• After every seismic event, WUSC should conduct engineering investigations of completed works and implement the necessary corrective actions without delay. This shall involve preparation of Emergency Preparedness & Response Plan and Immediate Implementation of this plan after any seismic event.	• WUSC	• WUSC Monitoring Reports	• Immediate after any seismic event
		• Strengthening Institutional Capacity and Policy Compliance through various project related capacity building programs	WUSC	• Photographs of capacity building programs • Minutes of such programs • WUSC Monitoring Report	During project cosntruction and During initial stage of operation phase
		• Carrying out regular O & M with effectiveness through proper management of WUSC.	WUSC	WUSC Monitoring Report	Right after the completion of project construction period
B. Beneficial Impacts					
1.Impact on Socioeconomic Environment					
a) Construction Phase					
Income	Employment Generation	• Recommend contractor to employ local people by giving high priority to women and under privileged group as far as possible. • Ensure equity in provision of wages to both male as well as female labors.	DSMC, Contractor & WUSC	• Contractors Log Book • Number of local labours employed in project • Consultant Monitoring Report	During Project Construction
Personal Skills	Skill Enhancement	• Making a proper work plan and code of conduct during the construction period. • Provision of regular hands on training to the workers during the project construction period	DSMC, Contractor & WUSC	• Contractors Log Book • Hands on training Photographs • WUSC monitoring report	During Project Construction

Field	Impacts	Mitigations /Enhancement Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
Local trade & business opportunity	Enhanced Local trade & business opportunity	• Recommend contractor to give priority to the local products during procurement of construction of materials. • Priority also will be given to local services like grocery stores, tea shops, hotel & restaurants etc. during the entire construction period.	DSMC, Contractor & WUSC	• Contractors Materials Log Book • WUSC monitoring report	During Project Construction
b) Operation Phase					
Health & Hygiene	Improved health & hygiene	• Regular maintenance of the water supply components should be done so that the project operates smoothly and the benefits are intact	WUSC	• Number of Site Inspection Visits • Photographs of Inspection Visits • WUSC monitoring report	During O & M
Economy	Increase Economic Opportunity	• Ensuring regular maintenance of the water supply components • Promoting urbanization through proper land development activities in the area.	• WUSC • Local Authority	• Number of Site Inspection Visits • Photographs	During O & M
Social Status	Social Empowerment	• Priority will also be given to vulnerable groups in WUSC along with female groups. • Involving underprivileged group of people especially women and poor people in various capacity building programs and project related community meetings	• WUSC	• Number of members of WUSC • Photographs of capacity building programs • Minutes of meetings	O & M phase

D. Environmental Monitoring Program

346. Environmental monitoring is done during construction on three levels:

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

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

(iii) Overall regulatory monitoring of environmental issues by PMO.

347. In addition to regular monitoring on-site (at the project level) by ICG and DSMC-ESS on EMP implementation of the mitigation measures, monitoring of key environmental parameters is proposed. Table VIII-2 presents the indicative environmental monitoring program for the project, which includes environmental parameters, with a description of the sampling stations, the frequency of monitoring, applicable standards, and responsible agencies. This is finalized based on site-specific EMP and monitoring program is commensurate to the impacts of the subproject.

Table VIII-2: Environmental Monitoring Program

SN	Field	Stage	Parameters	Location	Frequency	Standards	Responsibility
1.	Air quality	Before construction to establish baseline Construction phase	PM_{10} SO_2 NO_x	Intake and/or worksite locations Along water transmission main 1-km interval from intake locations Construction campsite locations	24-hour monitoring once in a season (except monsoons) during the construction	National Ambient Air Quality Standards, 2003	Contractor
2.	Noise and vibration levels	Before construction to establish baseline Construction phase	Equivalent day and night time noise levels	Intake and/or worksite locations Along water transmission main 1-km interval from intake locations Construction campsite locations	Once in a season (except monsoons) during construction	National Noise Standard Guidelines, 2012	Contractor
3.	Surface Water quality	Before construction to establish baseline Construction phase Operation phase	TDS, TSS, pH, hardness, BOD, total coliform, E-coli, total nitrogen, total phosphorus, heavy metals, temperature, DO, hydrocarbons, mineral oils, phenols, cyanide,	Adjacent to construction sites (to be identified by the DSMC)	Twice a year (pre-monsoon and post-monsoon) during construction	National Drinking Water Quality Standards, 2006	Contractor

SN	Field	Stage	Parameters	Location	Frequency	Standards	Responsibility
			temperature[a]				
4.	Treated Water quality	Operation phase	All NDWQS and WHO standard parameters, and follow whichever is more stringent.[a]	End of WTP line (after final disinfection)	Daily or as often as practicable.	National Drinking Water Quality Standards, 2006	WUSC
5.	Survival rate of landscaping, tree plantation	O&M phase	Survival rate	In the areas where re-plantation/ landscaping is proposed	Twice a year for 2 years	None	WUSC
6.	Community and occupational health and safety	Construction phase O&M phase	Incidence and types of health and safety issues	Work sites	Twice a year	Zero incidence	Contractor – construction phase WUSC or municipality – in the whole period of O&M of the plants.

BOD = Biochemical Oxygen Demand; DO = Dissolved Oxygen; DSMC = design, supervision, and management consultant, km = kilometer; NO_x = nitrogen oxide; O&M = operation and maintenance; PM_{10} = particles equal to or smaller than 10 microns; pH = potential of hydrogen; SO_2 = Sulphur Dioxide; TDS = total dissolved solids; TSS = total suspended solids; WTP = water treatment plant; WUSC = water users' sanitation committee.
[a] Depending on what parameters laboratories in Nepal can test or analyze.

E. Institutional Capacity Development Program

348. 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 consists of hands-on training in implementing the responsibilities in EMP (as well as in EARF) implementation, complemented with a short-term series of lectures or seminars on relevant topics.

349. WUSC does not have the capacity to monitor the quality of the water supplied as prescribed in NDWQS and its Directives. Although monitoring kits and laboratory rooms will be provided, it does not guarantee that WUSC would be able to handle them for effective monitoring. DWSSM has five regional laboratories; however, some are not functioning well due to lack of human resources. For effective monitoring, it is recommended that a licensed and accredited laboratory be engaged in water quality monitoring during the first 2-3 years of operation during when WUSC enhances its capacity by actively participating. After the engagement period and initial phase of "learning by doing", there should be continuing periodic training to sustain WUSC's capacity. The cost of monitoring during operation takes account of a licensed laboratory for water quality monitoring and training WUSC. A Water Safety Plan is included in the project design and obliges the operator to carry out water quality monitoring accordingly. There are sufficient funds to include training by the licensed and accredited laboratory while monitoring water quality.

350. The DRTAC-ESS is responsible for environmental awareness training and management. Specific modules customized for the available skill set is devised after assessing the capabilities of the target participants and the requirements of the project. Typical modules are as follows: (i) sensitization; (ii) introduction to the environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The contractors are required to conduct environmental awareness and orientation of workers before deployment to work sites. The proposed training program along with the frequency of sessions is presented in ***Table VIII-3.***

Table VIII-3: Training Program for Environmental Management

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

F. Staffing Requirement and Budget

351. Costs required for implementing EMP covers 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.

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

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

354. The operation phase for mitigation measures are good operating practices to mitigate the environmental impacts of this phase & the responsibility remains to WUSC. WUSC conducts all monitoring during the operation and maintenance phase. To ensure the delivery of safe drinking water from its catchment to the consumers, there is provision of Water Safety Plan (WSP)for the proposed project. If a licensed laboratory is engaged for the first 2-3 years of operation for training purposes, the cost can be accommodated under the Water Safety Plan. The cost of awareness program & WSP during the contract period is NRs. 500,000.00 under provisional sum.

355. The indicative cost of EMP implementation is shown in Table VIII-4.

Table VIII-4: Indicative Cost of Environmental Management Plan Implementation

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
A.	**Consultants Costs**						
1.	Environmental safeguard specialist (1 person)	Project Implementation Period	person months	3	100,000	300,000.00	Cost covers only remuneration, which together with budget for travel covered in the PMQAC contract
2.	Social Safeguard Specialist	Entire Project Implementation Period	person months	3	100,000	300,000.00	Cost covers only remuneration, which together with budget for travel covered in the DSMC contract
3.	Support Staffs	Entire Project Implementation Period	person months	24	35,000	840,000.00	Cost covers only remuneration, which together with budget for travel covered in the DSMC contract
B.	**Local Level Monitoring & Mitigation Measures**						
a)	Local Level Monitoring Measures						
1.	Air quality monitoring	Pre-construction (baseline) Construction	No. of sampling activities	4	37,500	150,000.00	Civil works contract
2.	Noise levels monitoring	Pre-construction (baseline) Construction	No. of sampling activities	4	18,750	75,000.00	Civil works contract
3.	Water Quality	Pre-construction (baseline) Construction Operation and Maintenance (for water supply and wastewater treatment	No. of sampling activities	4	18,750	75,000.00	Civil works contract

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
		subprojects)					
b)	Mitigation Measures						
I.	Impacts on Physical Environment						
i.	Soil Erosion and Slope Instability	Design Phase					
a)	Incorporate measures and sites for handling excessive spoil materials						No Additional Cost Required
b)	Incorporate drainage plan in final design						No Additional Cost Required
ii.	Soil Erosion and Land Surface Disturbance	Construction Phase					
a)	Proper Backfilling						No additional cost required, separately included under Miscellaneous Items
b)	Slope Protection Measures (Gabion Wall Construction, Retaining Wall etc.)						No additional cost required, separately included in Detailed Cost Estimate
iii.	Spoil Disposal	Construction Phase			30,000.00	30,000.00	
iv.	Air Pollution	Construction Phase					
	Excavation Segmentation Plan						No additional cost required
	Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily				120,000.00	120,000.00	
	Other mitigation measures as mentioned in section 8.1.1.2 c)						No additional cost required
v.	Noise Pollution	Construction Phase					No additional cost required
vi.	Generation of Construction Wastes & Solid Wastes	Construction Phase					
	Waste Management				225,000.00	225,000.00	
vii.	Accidental Leakage or Spillage of Stored Fuel/Chemicals	Construction Phase			70,000.00	70,000.00	
viii.	Impact on Land Use Pattern	Construction Phase					No additional cost required
ix.	Disruption to Natural Drainage	Construction Phase					No additional cost required
x.	Haphazard Disposal of Dismantled	Construction Phase					

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
	Debris						
	Segregation, 3R Concept, Sale to Scrap Dealers						No additional cost required as it has already been mentioned in vi.
II.	Impacts on Biological Environment						
i.	Impacts on Flora & Fauna	Construction Phase					
a)	Awareness programs to the construction workers						No additional cost required
b)	Revegetating disturbed slopes & grounds					70,000.00	
c)	Others as mentioned in Sub Section 8.1.2.1 a)						No additional cost required
ii.	Impacts on Aquatic Life	Construction Phase					
	Provision of temporary but well-equipped toilets at worker's camp					210,000.00	
	Solid Waste Management						No additional cost required as it has already been mentioned above in v.
iii.	Forest Fire	Construction Phase					
	Prohibition on burning dry grass or debris						No Additional Cost Required
	Keeping firefighting equipment stand by within the construction sites						No Additional Cost Required
	Provision of safety trainings regarding forest fire to the construction workers prior to construction						No Additional Cost Required
iv.	Forest Encroachment	Construction Phase					
	Strict & Regular Monitoring during the entry of workers for the construction workers						No Additional Cost Required
	Mobilization of the concerned community forest groups						No Additional Cost Required
	Legal Provision along with imposing fines as punishment for those responsible for forest encroachment						No Additional Cost Required
	Provision of trainings to the construction workers to provide support in controlling						No Additional Cost Required

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
	encroachment.						
v.	Impacts on Aquatic Life	Operation Phase					
	Strict monitoring to the operators involved to discourage direct discharge of the effluent to the water bodies.						No additional cost required, It will be managed by WUSC itself
	Proper Implementation of Water Safety Plan (WSP).						No additional cost required, It will be covered by cost of Water Safety Plan
III.	Impacts on Chemical Environment						
i.	Impacts on Water Quality of nearby rivers	Construction Phase					No Additional Cost Required as it has already been mentioned in
a)	Appropriate design of Septage Disposal with well-equipped temporary toilets						No Additional Cost Required
b)	Disposing of spoils or excess soils as free filling materials as soon as possible					75,000.00	
c)	Locating temporary storage areas on flat grounds and away from main surface drainage routes						No Additional Cost Required
d)	Shielding temporary storage areas with sandbags						No Additional Cost Required as it has already been mentioned above in v.
e)	Implementing eco-friendly solid and hazardous waste management, disposing them promptly						No Additional Cost Required. It has to be managed by the contractor itself.
f)	Providing adequate water supply and sanitation facilities at work sites						No Additional Cost Required
g)	Strict supervision on the behaviour of workers for the waste management as well as sanitation behaviour and monitoring the workers to manage the wastes properly						No Additional Cost Required
ii.	Impacts on Quality of Water Stored in Reservoir	Operation Phase					
a)	Proper Implementation of Water Safety						No Additional Cost

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
	Plan (WSP)						Required
b)	Removing of Algae grown within the reservoir at regular intervals by the operating team deployed by the WUSC.						No Additional Cost Required
iii.	Impact on Water Bodies	Operation Phase					
a)	Disposal of raw sludge to the appropriate landfill sites of the proposed project town						No Additional Cost Required
b)	Use of raw sludge for agricultural land						No Additional Cost Required
c)	Avoid direct discharge of the raw sludge to the water bodies through strict monitoring to the operators involved.						No Additional Cost Required
d)	Proper Implementation of Water Safety Plan (WSP)						No Additional Cost Required
IV.	Impacts on Socio-economic Environment						
i.	Structural Instability	Design Phase					
a)	Proper design of earthquake resistant structures as per standard and code of practice.						No additional cost required
ii.	Health & Safety of Community & Workers	Design Phase					
a)	Training on Community Health & Safety Hazards by DSMC by disseminating information in regard to this through training manuals, photographs & documents related to safety						No additional cost required
iii.	Damage to the existing facilities	Design Phase					No additional cost required
iv.	Community Health & Safety Hazards	Construction Phase					
a)	Contractor's implementation of EMP						No additional cost required
b)	Adequate lighting, temporary fence, reflecting barriers and signage at active work sites					100,000.00	
c)	Contractor's preparedness in emergency response					250,000.00	
d)	Adequate dissemination of GRM and						No additional cost

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
	Contractor's observance/implementation of GRM						required
v.	Worker's Health & Safety Hazards	Construction Phase					
a)	Provision of PPE to workers					150,000.00	
b)	Other Mitigation measures						No Additional Cost Required
vi.	Traffic Congestion	Construction Phase					No Additional Cost Required
vii.	Disruption to Local Vendor's Business	Construction Phase					
a)	Prompt Backfilling						No Additional Cost Required
b)	Provision of Planks to provide access to shops & homes					50,000	
vii.	Mobilization of Child Labor	Construction Phase					No Additional Cost Required
viii.	Impact on Sustainability of Works						
a)	Engineering Investigations after any seismic event, if any	Construction Phase				150,000.00	
b)	Emergency Preparedness Response	Construction Phase					No additional cost required as it has already been mentioned above in xii)
ix.	Damage to the existing facilities						
a)	Monitor construction workers to adopt carefulness and to strictly follow the layout drawings.	Construction Phase					No Additional Cost Required
b)	Reinstatement Works of the damaged existing paved roads if any	Construction Phase					No Additional Cost Required. Its cost is separately included in Cost Estimate.
x.	Occupational Health & Safety Hazards	Operation Phase					
a)	Installation of clear, visible signage						No additional cost required, It will be managed by WUSC itself
b)	Setting up of mechanism for quick response to spills of chemical and hazardous substances.						No additional cost required, It will be managed by WUSC

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
							itself
xi.	Delivery of Unsafe Water	Operation Phase					No additional cost required, It will be managed by WUSC itself
a)	Impact on Consumer's Health						No additional cost required, It will be managed by WUSC itself
b)	Non-sustainability of Services or Completed works						
c)	Yield Monitoring						No additional cost required; it will be managed by WUSC itself
d)	Engineering Investigations after every seismic event if any						No additional cost required; it will be managed by WUSC itself
e)	Strengthening Institutional Capacity and Policy Compliance through various project related capacity building programs						No additional cost required; it will be managed by WUSC itself
f)	Carrying out regular O & M with effectiveness through proper management of WUSC.						No additional cost required; it will be managed by WUSC itself
	Total of Local Level Monitoring & Mitigation Measures					**1,800,000.00**	
C.	**Capacity Building**						
1.	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguard Policy Statement, Government of Nepal environmental laws and regulations, and environmental assessment process;	Module 1- on environmental assessment and review framework (EARF) and EMP implementation to be conducted by PMO-ESS (prior to contract of award for civil works)	Lumpsum			400,000	Covered under Output 2 - Improved Institutional Capacity and Project Implementation Platform

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
		Module 2 – Any time after Module 1					
	(ii)induction course contractors, preparing them on environmental management plan (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						
	Total Capacity Building Costs					**400,000.00**	
D.	**Administrative Costs**						
1.	Legislation, permits, and agreements	Permit for excavation, tree-cutting permits etc.	Lumpsum				These consents are to be obtained by contractor at his own expense.
		Environmental assessment and environmental clearances as per ECA and ECR requirements	Lumpsum	1	500,000.00	500,000.00	Covered under the DSMC contract
	Total Administrative Costs					**500,000.00**	
E.	**Other Costs**						
1.	Public consultations and information disclosure	Information disclosure and consultations during preconstruction and	As per requirement	Lumpsum	350,000	350,000	Covered under PMO budget

No.	Particulars	Stages	Unit	Total Number	Rate (NRs.)	Cost (NRs.)	Cost Covered by
		construction phase, including public awareness campaign through media					
2.	Grievance redress mechanism (GRM) implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/ information dissemination)	As per requirement	Lumpsum	200,000	200,000	Covered under PMO budget
3.	Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and defect liability period		Lumpsum	Contractor's liability	As per insurance requirement	Civil works contract – contractor's insurance
	Total Indicative Cost of EMP Implementation					**4,690,000.00**	

Source: EARF, July 2018 and IEE Study 2018/019

356. The above given table shows that the total indicative cost for EMP implementation in NRs. 4,690,000.00. Out of this total amount, the total estimated cost for Local level Monitoring and Mitigation Measures is 1,800,000.00. This has been included under provisional sum in BoQ that includes necessary environmental mitigation measures for the anticipated impacts during the entire construction period.

G. Implementation Schedule

357. Environmental management is implemented from the detailed design phase through to procurement that continues to construction, and operation phases. Table VIII-5 presents the tentative timeframe of key EMP activities about the subproject implementation schedule. Similarly, Table VIII-6 presents training for capacity building programs for the project.

358. As this IEE is based on the master plan, the given details in the following table are just envisaged and it is finalized during detailed design phase.

Table VIII-5:Environmental Management Implementation Schedule

Activity			Indicative Time Frame
PROJECT IMPLEMENTATION			
	Detailed Design & Bidding Documents		Q2 Y0
	Procurement		Q3 Y0
	Construction		Q4 Y0 – Q4 Y2
	Contractor Operating Period		Q3 Y2 – Q4 Y3
	Handover to WUSC for Operation		Q3 Y3 – Q1 Y4
	Defects Liability Period		Q3 Y2 – Q4 Y4
ENVIRONMENTAL MANAGEMENT			
	Overall		
	1.	Design Review and Technical Audit Consultant (DRTAC)-Engagement of Environmental Specialist	Starting Q4 Y0 (5 yrs of intermittent inputs)
	2.	PMO's submission of Environmental Monitoring Report (EMR)	
		- Monthly EMR for project'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 aneffective year
	Before 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 & its EMP)	Q4 Y0
	5.	Establishment of baseline data (as set out in the EMP)	Q4 Y0 (shall have been done before 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		

Activity			Indicative Time Frame
	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	5th day 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

Source: IEE Study 2018/019

Table VIII-6: Proposed Topics for Capacity Building/Training

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

Source: IEE Study 2018/019

IX. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Stakeholder Consultation & Participation

359. Stakeholder consultation and participation is an essential process in project preparation. It is also a part of information disclsoure. It disseminates as well as collects information regarding the proposed project by involving various stakeholders that includes Key Informant Interviews, Stakeholders Meetings, Focus Group Discussions (FGD), On-site discussions with WUSC and Random Field Interviews. The minutes of various meetings undertaken during field visits are also included in ***Appendix 4.***

360. This stakeholder consultation requires the analysis of stakeholders through the identification of the potential participants and the methods of their involvement. The table given below illustrates the concerned stakeholders of the proposed project that will have either primary or secondary.

Table IX-1: Stakeholder Analysis & Mapping

S.N.	Stakeholders	Primary[2]	Secondary[3]	Stakeholders 'Role or Interest	Level of Influence
1.	Government of Nepal		✓	It is the executive and central body.	High
2.	Ministry of Water Supply (MoWS)		✓	It is the lead executive agency and is responsible for policy coordination, guidance, review of programs, ensuring that all aspects relevant to achieve the objective of the project and for sustaining the improved services to the required level.	High
3.	ADB		✓	It supports government of Nepal in improving and enhancing the existing water supply service.	Medium
4.	Department of Water Supply and Sewerage Management		✓	It is the lead implementing agency and works under MoWS with the responsibility of planning, implementation, operation, repair & maintenance of the proposed project.	High
5.	DWASH-CC		✓	It provides coordination in the preparation of local WASH plans with inputs from WASH sector actors and in the effective implementation of the local plans related to this project.	High
5.	UWSSP, PMO,RPMO & DRTAC		✓	It is responsible in successfully implementing the proposed project activities, establishing coordination with ADB & GoN and managing day to day activities at municipality levels.	High
6.	Town Development Fund (TDF)		✓	TDF will assist the project municipality conducting financial appraisal of the proposed project and advice DWSSM on its outcomes prior to the start of detailed design process.	High
7.	Local Bodies (DCC, Municipality & Ward Offices)		✓	It is responsible for establishing coordination with the implementing agency. Here, the municipality will be also responsible for policy compliance as well as for addressing public protests if any.	High

[2] Primary Stakeholders: people, groups and institutions affected positively (beneficiaries) or negatively (involuntarily resettled) by the proposed program

[3] Secondary Stakeholders: people, groups and institutions that are important intermediaries in the program delivery process

S.N.	Stakeholders	Primary[2]	Secondary[3]	Stakeholders 'Role or Interest	Level of Influence
8.	Community Forest User's Group		✓	It is responsible for establishing coordination with the contractor during construction works within the community forest area.	High
9.	Forest Security Personnel		✓	It is responsible for establishing coordination with the contractor during construction works and for establishing harmony between locals and construction workers within the community forest area.	High
8.	DSMC		✓	It will assist PMO & RPMO in the overall planning, implementation and monitoring of the project activities regarding environmental & social safeguards requirements.	High
9.	WUSC		✓	It is responsible for O & M of the proposed water supply system. It will also facilitate the concerned authorities during planning as well as construction phase.	High
10.	Households (Families & Individuals)	✓		They are the main beneficiaries and are benefitted by the provision of enhanced & improved continuous water supply service.	Low
11.	Contractors, Petty Contractors		✓	It is responsible for bidding for works and involved in the construction of the proposed project.	Low
12.	Local Technicians/Plumbers	✓		This group will be benefitted through the increased work opportunities related to construction works of the proposed project.	Low
13.	Unemployed Locals	✓		This group will be benefitted through the increased work opportunities related to construction works of the proposed project.	Low
14.	Local Vendors	✓		This group will be affected by the pipe laying works for the distribution network of the proposed project at the core Charikot Bazaar area.	Low
15.	Schools & Hospitals	✓		This group will be benefitted by the provision of enhanced and improved continuous water supply service.	Low
16.	Commercial Establishments (Private Enterprises)	✓		This group is benefitted by enhancing their business by supplying items to the construction employees regarding their basic needs.	Low
17.	Scrap Vendors	✓		This group will be benefitted by purchasing the recyclable wastes generated from the construction activities as well as from workers camp.	Low
18.	Local Leaders		✓	This group will facilitate to establish strong coordination between the local people and the project authority.	High

Source: IEE Field Study 2016 and DEDR & DDR, 2018

361. The consultations were carried out on various dates at varous locations within the project town for the discussion of the anticipated environmental impacts that may result from the construction of the proposed Charikot Water Supply & Sanitation Project. The consultations were undertaken with key stakeholders that includes Local Bodies,

Beneficiaries Households, CFUGs, TDF, PMO, RPMO & DRTAC in line with ADB's requirements pertaining to environment and social considerations. The key concerns of the people related to the project that includes Implementation of the safeguard policy framework in field level, Delivering the information regarding safeguard activities to local level, Willingness to pay, Upfront cash collection and People's participation in project implementation were discussed.

B. Major Issues Raised by the Stakeholder

362. The major issues raised by the key stakeholders during stakeholder consultation are as follows:

i. The project town is in need of safe, reliable and potable water.
ii. Water shortage problem is acute in the project town during dry season.
iii. People of the project town are relying on untreated but occasionally disinfected water.
iv. The operating system of the existing water supply system is good but the supply system is intermittent.
v. The proposed project must address the socioeconomic as well as environmental aspects.
vi. Fixation of monthly water tariff must be acceptable to all the stakeholders.
vii. High Priority must be given to the locals of ward no.7 while selecting employees by WUSC.
viii. The existing water supply components located at Ward no.7 must not be interfered by Charikot WUSC.
ix. Being the resident of the ward no.7 where the proposed source is situated, high and especial priority must be given to the locals of ward no.7 in regard to various aspects like Minimum Water Quantity, Source Management Fees, Tap Connection Fees, Emergency Aid by Charikot WUSC during natural calamities, Provision of Water Supply to Ranipokhari etc. Refer *Appendix 4* for details.

363. All the stakeholders present during consultation programs expressed their sincere committment towards the proposed project, committed to collect 5% upfront cash contribution from the beneficiaries and agreed to provide aid during project construction whenever required.

364. The assurance made by the study team regarding the issues raised by the stakeholders are as follows:

i. The proposed project will address the water shortage problem faced by Bhimeshwore municipality.
ii. The proposed project has provision of water treatment system. This will resolve the problems of consumption of either occasional treated or untreated water.
iii. The proposed project has provision of continuous water supply system. This will end the irregular water supply service.
iv. The proposed project with water treatment facility and continuous water supply provision if effectively implemented will address the needs of Bhimeshwore municipality residents regarding safe, reliable and potable water.
v. The socioeconomic and environmental aspects have been addressed through detailed IEE study followed by preparation of IEE Report and DDR Report.

vi. It has been decided to fix the monthly water tariff under the recommendation of TDF and as per the financial & economic analysis of the consultant.
vii. Agreement has been made to prioritize the locals of ward no. 7 while employing staffs by WUSC.
viii. Written Consent is made regarding the interference of existing water supply components at ward no. 7.
ix. Written Consent is made in regard to the issues mentioned by the stakeholders. Refer *Appendix 4*.

365. The project envisages that stakeholder consultations continues during the project period and concerned stakeholders will be invited and encouraged to participate. The PMO and ICG maintains rapport with WUSC and the municipality. PMO, ICG, Contractors, and WUSC is open to the public to discuss concerning the progress of the subprojects, adverse impacts, mitigation measures and environmental monitoring and grievances. The stakeholder consultations in future can be as follows.

i. During construction, if change in design, alignment, and location, the PMO and ICG holds at least one public consultation to solicit perceived impacts, issues, concerns and recommendations from affected communities;

ii. Before construction, the PMO and ICG conducts an information, education and communication (IEC) campaign among the affected communities about the upcoming construction, its anticipated impacts, the grievance redress mechanism, contact details and location of the PMO and ICG, and status of compliance with the Government's environmental safeguard requirements. Billboards about the subproject, implementation schedule and contact details of the executing agency, PMO-ES, ICG-ESA and Contractors will be set up at strategic locations. The grievance redresses procedure and details will be posted at the offices of the ICG, WUSC, and VDC;

iii. During construction, regular random interviews are conducted by the ICG-ESA every month to monitor environmental concerns of subproject communities;

iv. During operation, periodic random interviews are conducted by the ICG and WUSC to monitor the environmental concerns of subproject communities;

v. The public consultations and information disclosure are continuous throughout the project cycle. PMO and ICG is responsible for designing and implementing such aspects on the ground.

366. Several public consultations held at various locations on different dates with key stakeholders as mentioned above are tabulated below:

Table IX-2: Summary of Major Public Consultations carried out by Study Team

S.N	Meeting	Facilitator	Venue & Participation	Topic of Dissemination
1	June 21, 2015	Env. expert/ Social Safe Guard Specialist/Contract Management Expert and Social Mobilizer	WUSC office Charikot, WUSC executive body and advisor team	Information sharing about the Third Small Town Implementation, Role and responsibility of various stake holders, Working modality social & environment impacts and safe guard.
2.	August 21, 2015	Social Mobilizer	Municipality Office, Charikot - WUSC executive body and advisor team and Executive Chairman of Municipality	Dissemination of TSTWSSSP approach, modality, role & responsibility of various stakeholders. Preparation of social and technical survey works
3.	August 22, 2015	Safe Guard Specialist/WS and Sanitation Engineer/ C. Management Specialist and Social Mobilizer	WUSC Office, Charikot -WUSC executive body and advisor team Local leader, beneficiaries, WUSC representative etc.	Dissemination of TSTWSSSP approach, modality, role & responsibility of various stakeholders, delineation of service area
4.	November 30, 2015	Social Safe Guard Specialist/ Social Mobilizer	Different Tole of Municipality and WUSC office -Local leader, beneficiaries, WUSC representative etc.	Information Sharing and discussion of project / roles & responsibilities of various stakeholders and collection of Upfront 5% cash from User.
5	June 17, 2016	Consultant Team, DWSSDO, WUSC members, TDF, Local people of service area	Community Hall, Simpani, Charikot	Presented Feasibility report
6	September 1st, 2017	Design Engineer /Env. Expert GESI Expert and Social Safe Guard Specialist	Meeting Hall of PMO – Mayor, MPs, WUSC Chairman and WUSC members, PMO/DRTEC Team and other stakeholders including TDF	Presented Final report and discussion
7	February 7, 2018	Design Engineer /Env. Expert GESI Expert and Social Safe Guard Specialist	Party Palace at Charighyang, Charikot – Mayor, MPs, WUSC members, Key informant, Consultant Team, DWSSDO, DRTAC, TDF, Consultant Team / Local people of service area	Presented Final Detailed Design report and discussion
8	January 26,2020	Charikot WUSC	WUSC office Charikot, Charikot WUSC Members, Water Supply Struggle Committee, Chairman of Ward no.7, Locals of Ward no.7, Engineers of BDA-JPZ-UDAYA and Mrit Sanjivani Nirman Byabasaya	High Priority to the local users of ward no.7 regarding tap connection fees, source management fees, hiring staffs, emergency aid by Charikot WUSC during event of natural calamities if any etc.

Source: DEDR & DDR, 2018

367. The GoN-approved IEE Report (in English), will be available at the offices of PMO, ICG, and WUSC for the perusal of interested parties. Copies may be made available upon formal request. IEE and environmental monitoring reports will be disclosed on the ADB's and UWSSSP website. This is also as a part of Information Disclosure.

X. GRIEVANCE REDRESS MECHANISM

A. Purpose of the Grievance Redress Mechanism

368. A project-specific grievance redress mechanism (GRM) is established to receive, evaluate and facilitate resolution of affected persons' concerns, complaints, and grievances related to social, environmental and other concerns on the project. The GRM aims to provide a time-bound and transparent mechanism to resolve such concerns. The mechanism, developed in consultation with key stakeholders, ensures that: (i) the basic rights and interests of every person adversely affected by the social and environmental performance of a Project are protected; and (ii) their concerns are effectively and timely addressed.

369. A common GRM is in place for social, environmental or any other grievances related to the project. The GRM provides an accessible forum for receiving and facilitating resolution of affected persons' grievances related to the project. Project publishes the sample grievance registration form on its website, and publish it in local language, at the hoarding board of each of the participating WUA or municipalities' office. Every grievance is registered with careful documentation of process adopted for each of the grievance handled, as explained below. The environmental and social safeguards officer (ESO/SSO) at the project management office (PMO) have the overall responsibility for timely grievance redress on environmental and social safeguards issues. The Social Safeguards Officer at the Regional Project Management Office (RPMO) is the focal person for facilitating the grievance redress at the local level.

370. A municipal-level public awareness campaign is conducted on a regular basis as shown in the Communication & Public Participation Plan (CAPP) of the project to ensure awareness on the project and its GRM. The social and environmental safeguards experts of the PMQAC and RDSMCs supports the WUA or municipalities in conducting municipality-wide awareness campaigns, which ensures that all stakeholders including poor and vulnerable are aware of the GRM and project's entitlements.

B. Purpose of the Grievance Redress Mechanism

371. A grievance redress committee (GRC) is formed at the Municipality level, comprising the Mayor as Chairperson of GRC, and Regional Project Manager RPMO as Secretary. The GRC members comprises of (1) WUSC Secretary; (2) RPMO Engineer; (3) RPMO social /environmental (as relevant) officer, (4) representative of affected persons, (5) RDSMC's safeguards specialist (social/environment as relevant), (6) a representative of reputable and relevant CBO/SHG/organization working in the project area as invitee, and (7) contractor's representative. The secretary of the GRC is responsible for convening timely meetings and maintaining minutes of meetings. The concerned social safeguards expert of RDSMC supports the RPMO safeguard's officer and Project Manager of RPMO to ensure that grievances, including those of the poor and vulnerable are addressed. All GRCs shall have at least two women committee members. Along with representatives of the affected persons, civil society and eminent citizens can be invited as observers in GRC meetings.

372. The functions of the local GRC are as follows: (i) provide support to affected persons on problems arising from environmental or social disruption; asset acquisition (if

necessary); and eligibility for entitlements, compensation and assistance; (ii) record grievances of affected persons, categorize and prioritize them and provide solutions within 15 days of receipt of complaint by WUA or local bodies; and (iii) ensure feedback to the aggrieved parties about developments regarding their grievances and decisions of the GRC. The GRM procedure is depicted in Figure X-1, and is outlined below in detail, with each step having time-bound schedules and responsible persons to address grievances and indicating appropriate persons whose advice is to be sought at each stage, as required. If affected persons are not satisfied with the response they can elevate it to the next level:

(i) **First Level of GRM** (WUA level): The first-level, which is also the most accessible and immediate venue for quick resolution of grievances are the contractors, RDSMC field engineers and RPMO supervision personnel, who immediately informs the WUA. Any person with a grievance related to the project works can contact UWSSP to file a complaint. The municipal-level field office of the RPMO, in WUA's building, documents the complaint within 24 hours of receipt of complaint in the field, and WUA or local bodies immediately addresses and resolve the issue at field-level with the contractor, supervision personnel of RPMO and RDSMC field engineers within 5 days of receipt of a complaint/grievance. The assigned RDSMC's Social Mobilizer is responsible to fully document: (i) name of the person, (ii) date of complaint received, (iii) nature of complaint, (iv) location and (v) how the complaint was resolved as well as to provide feedback to the complainant. If the complaint remains unresolved at the local level within 5 days, the WUA forwards the complaint to the municipality level GRM.

(ii) **Second Level of GRM** (Municipality level): The complainant is notified by the WUA that the grievance is forwarded to the Municipality-level GRC. The Municipality-level GRC is called for a meeting, called and chaired by the Mayor. The GRC recommends corrective measures at the field level and assign clear responsibilities for implementing its decision within 10 days of receipt of complaint by WUA. If the grievance remains unresolved within 10 days of receipt of complaint by WUA, the matter is referred to the third level. The RPMO Engineer is responsible for processing and placing all papers before the GRC, recording decisions, issuing minutes of the meetings, providing feedback to complainants and taking follow up actions so that formal orders are issued and decisions are carried out.

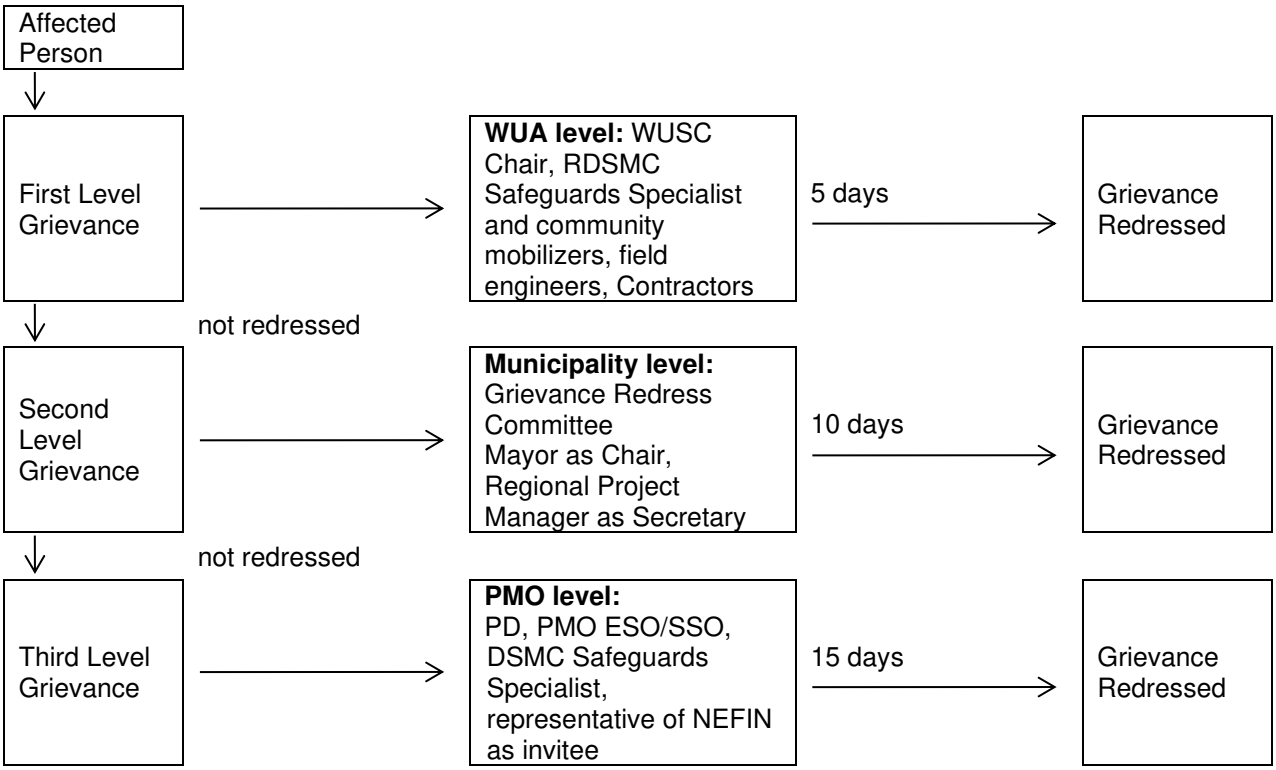
(iii) **Third Level of GRM** (PMO Level)**:** Any unresolved or major issues at Municipality level is referred to the PMO for final solution. A representative of the Nepal Foundation for Indigenous Nationalities (NEFIN) is invited to attend any meetings related to resolution of Indigenous Peoples grievances.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

373. The complainant has to fill up Grievance Redress Form as shown in ***Appendix 2B*** to file the complaint. All paperwork (details of grievances) needs to be completed by the WUA member secretary assisted by RDSMC and circulated to the WUA Chairperson and members. At Municipality level, the RPMO Engineer is responsible for circulation of grievances to the Regional Project Manager, DWSSM, Mayor and other GRC members,

prior to the scheduled meetings. The RPMO's Engineer is responsible for follow-through of all escalated grievances. All decisions taken by the GRC is communicated to the affected persons by the RPMO's SSO.

374. Despite the project GRM, an aggrieved person can have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

375. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use ADB's Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB Nepal Resident Mission. The complaint can be submitted in any of the official languages of ADB's developing member countries (DMCs). The ADB's Accountability Mechanism information is included in UWSSP Information Datasheet (PID), to be published in web and distributed to the affected communities, as part of the project GRM.



DSMC = design, supervision and management consultant; ESO=environmental safeguards officer; NEFIN = Nepal Federation of Indigenous Nationalities; PD = project director; PMO = project management office; RDSMC = regional design, supervision and management consultant; SSO = social safeguards officer; WUA = water users' association; WUSC = water users' and sanitation committee.

Figure X-1Grievance Redress Process

376. **Record Keeping and Disclosure**. Records at the municipal-level is kept by the concerned WUA or local bodies member secretary, assisted by RDSMC, of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date of the incident and final outcome. The number of grievances recorded and resolved, and the outcomes is displayed/disclosed in the PMO office, WUA, and on the web, as well as reported in the safeguards monitoring reports submitted to ADB on a semi-annual basis. For any grievance escalated to RPMO/ Municipality level, the RPMO's Engineer assigned as GRM focal person is responsible for record-keeping, calling of GRC meetings and

timely sharing of information with WUA or municipalities. For grievances escalated to PMO and above, the PMO's SSO is responsible for maintenance of records, sending copies to RPMO and WUA for timely sharing of information with the person filing complaint.

377. **Periodic Review and Documentation of Lessons Learned**. The PMO's SSO periodically reviews the functioning of the GRM at municipality or WUA level and field level and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances. Indicators pertaining to grievance redress (no. of grievances received, no. redressed/resolved to be reported by Member Secretary, WUA to RPMO SDO, and by RPMO to PMO SSO) in monthly and quarterly progress reports.

378. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) at local (field/ward/municipal) level are borne by the concerned focal organizations at each level: WUA at local level, and municipality at municipal level; and PMO at central level. Cost estimates for grievance redress are included in resettlement cost estimates.

XI. MONITORING AND REPORTING

379. RPMO monitors and measures the progress of EMP implementation. The monitoring activities relates to the project's impacts that are identified in IEE. PMO, ICGs will compare the works completed and deviations from the original scope. They also undertakes site inspections and review documents to verify that the project complies with the EMP.

380. RPMO submits monthly monitoring and implementation reports to PMO, who will take follow-up actions, if necessary. PMO submits semi-annual monitoring reports to ADB. Project budgets reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting continues on an annual basis. Monitoring reports are posted at the location accessible to the public.

381. For projects likely to have significant adverse environmental impacts, the PMO retains external experts to verify its monitoring information. PMO-ESS documents monitoring results, identify the necessary corrective actions, reflect them in a corrective action plan, and for each quarter, studies the compliance with the action plan developed in the previous quarter. Compliance with loan covenants is screened by the PMO-ESO, with support from PMO-ESS.

382. ADB reviews the project performance against MoWS's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities is commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards is integrated into the project performance management system. ADB monitors projects on an ongoing basis until a project completion report is issued. ADB carries out the following monitoring actions to supervise project implementation:

(i) conduct periodic visits to projects with adverse environmental or social impacts;
(ii) conduct supervision and review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
(iii) review the periodic monitoring reports submitted by EAS to ensure that adverse impacts and risks are mitigated, as planned and as agreed with ADB;
(iv) work with EAS to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance; and
(v) prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

383. ADB's monitoring and supervision activities are carried out on an on-going basis until a Project Completion Report (PCR) is issued. ADB issues a PCR within 1-2 years after the project is physically completed and in operation.

XII. CONCLUSION

384. The IEE study indicates that:

- The proposed project, its components, are not within or adjacent to environmentally sensitive areas.
- The proposed project fulfills the increasing water demand of the project town regarding the reliable water supply system. It definitely addresses the issues raised by the hardship that people of the project town are facing for safe, reliable & potable water for years.
- The proposed project brings about: (i) the benefits of access to reliable supply of safe and potable water; (ii) promotion of good hygiene and sanitation practices and reduced health and safety risks as positive impacts; and (iii) enhanced community health, improved quality of life and safe communities as outcomes.
- Along with positive outcomes, the proposed project will also have negative impacts as discussed above in Chapter 7. As per our IEE study, four of the adverse impacts that includes *Air Pollution*, *Noise Pollution, Impacts on Water Quality of nearby rivers and Impact on Sustainability of Works* are evaluated as "Very Significant". However, these impacts would not be problematic for the project implementation if the activities that stimulate this impact to occur are properly controlled through the mitigation measures.
- Some of the adverse impacts are also evaluated as *Significant*. However, they are not significant enough to threaten or weaken the surrounding resources. Mitigation measures, integral to socially and environmentally responsible construction practices, are commonly used at construction sites and the contractors are aware about it. Hence, mitigation measures would not be difficult to implement.
- Similarly, Insignificant impacts can either be avoided or simply mitigated through the proposed mitigation measures.
- The environmental management plan (EMP) as mentioned above in Chapter VIII, if duly considered, followed and implemented during project construction activities, then the environmental issues are the issues to be worried about.
- If the responsible body mentioned in the EMP matrix shown in the Table VIII-1 properly takes up the responsibility for the implementation of mitigation measures for the likely impacts resulting from the various activities of the project, then, the environment of the project area can be safe and less affected from the project activities.
- Regular monitoring with good operation & maintenance service including prompt action on leaks and complying of the water supplied as prescribed in the National Drinking Water Quality Standards Directives lessens the risks of the ineffective implementation of the proposed project and sustains the system.
- None of the anticipated environmental impacts is significant enough to go for either detailed EIA study or further especial study.
- As per ADB Categorization, the proposed project falls under "Category B". As per EPR 1997 (Latest Amendments 2017) Schedule H, this IEE study fulfills the requirements of IEE criteria. This IEE thus fulfills the policy requirements of both the

ADB and the GoN. This indicates that IEE study is sufficient for the effective implementation of Charikot Water Supply & Sanitation Project.

385. Based on the above findings, the classification of the Charikot Water Supply and Sanitation Project as "Category B" is confirmed, no further special study or detailed EIA needs to be undertaken and people of Bhimeshwore Municipality will get rid of the hardship of safe, reliable & potable water they have been experiencing for decades.

XIII. LITERATURE REVIEWED

ADB, 2003. Environmental Assessment Guidelines.

Aquatic Animal Protection Act, (1961) with amendments. www.lawcommission.gov.np

Constitution of Nepal. Nepal Law Commission, www.lawcommission.gov.np

Diesel Power Generation (2014). Inventories and Black Carbon Emissions in Kathmandu Valley, Nepal, The World Bank

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

District Health Office, Dolakha 2074/75

Environmental, Health and Safety (EHS) Guidelines (2007). International Finance Corporation, World Bank Group

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

Environment Protection Rules, (1997), Ministry of Science, Technology, and Environment, Kathmandu and Latest Amendments

Environmental Standards and Collection of Concerned Information, (2018). Ministry of Forest & Environment, Government of Nepal, Singhadurbar, Kathmandu

Environment Statistics of Nepal, CBS, 2011

Environmental Impact Assessment Guidelines, (1993). National Conservation Strategy Implementation Project, National Planning Commission, His Majesty's Government, Nepal

Final Feasibility Study of Charikot Water Supply and Sanitation Project, 2017

Detailed Engineering Design Report of Charikot Water Supply & Sanitation Project (Updated), 2018

Due Diligence Report of Charikot Water Supply & Sanitation Project, 2018

Environmental Assessment and Review Framework, (2017). Regional Urban Development Project (RUDP), Ministry of Urban Development (MoUD), Government of Nepal for ADB

Environmental Assessment and Review Framework, (2018). Urban Water Supply & Sanitation (Sector) Project,Ministry of Water Supply, Government of Nepal for ADB

Final Socio-Economic Profile of Charikot Water Supply & Sanitation Project, 2016

Labor Act (1991), Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu

Land Acquisition Act, 1977 and latest amendments. www.lawcommission.gov.np

Local Government Operation Act, (2017). www.lawcommission.gov.np

Municipality profile and baseline information of Former Bhimeshwore Municipality, and National Population and Housing 2011, CBS, 2012

National Drinking Water Quality Standards and Implementation Directives for National Drinking Water Quality Standards (2005), Ministry of Physical Planning and Works, Government of Nepal

National Transport Policy, (2001). Ministry of Physical Infrastructure and Transport, Government of Nepal, Nepal

National Urban Policy (2007). Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu

National Water Supply & Sanitation Policy (Draft) (2014). Ministry of Urban Development, Government of Nepal, Kathmandu

Nepal Disaster Management Reference Handbook (2017). Center for Excellence in Disaster Management and Humanitarian Assistance, http://www.cfe-dmha.org

Proximity Report Generated by the Integrated Biodiversity Assessment Tool (Dolakha), (2018), ADB

Rural Water Supply and Sanitation National Policy, (2005) and Rural Water Supply and Sanitation National Strategy, (2005.Ministry of Physical Planning and Works, His Majesty's Government, Singhadurbar, Kathmandu, Nepal

Shrestha K 1998. Dictionary of Nepalese Plant names. Mandala Book Point, Kathmandu, Nepal.

Solid Waste Management Act (2011). Ministry of Science and Technology and Environment, Kathmandu

The Updated Fifteen-Year Development Plan for Small Towns' Water Supply and Sanitation Sector,2009

Town Development Act (1998), www.lawcommission.gov.np

Uprety, B.K (2003). Safeguard the Resources Environmental Impact Assessment Process and Practice Kathmandu

Urban Water Supply & Sanitation Policy (2009)

Water Resource Act (1992). Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu

https://cites.org/eng/disc/what.php

https://www.cbd.int/

www.mofald.gov.np

APPENDIXES

Appendix 1

Rapid Environmental Assessment Checklist, Preliminary Climate Risk Screening Checklist and No Mitigation Scenario (Scoping Checklist) for Charikot Water Supply & Sanitation Project

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST CHARIKOT TOWN PROJECT

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 (SDES) for endorsement by the Director, SDES and for approval by the Chief Compliance Officer.

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

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

Country/Project Title: **NEP: Urban Water Supply and Sanitation (Sector) Project**

Subproject: **Charikot Water Supply and Sanitation project**

Screening Questions	Yes	No	Remarks
A. Project Siting: Is the project area			
Densely populated?		√	Charikot town has a moderate population density.
Heavy with development activities?		√	
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		√	
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?		√	It is a gravity system; hence, there is no requirement of pumping.
Social conflicts arising from displacement of communities?		√	
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		√	
Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?	√		Water Treatment proposed in detailed design and water quality monitoring in EMP will ensure the water supply as prescribed in

Screening Questions	Yes	No	Remarks
			the NDWQS & its Directives.
Delivery of unsafe water to distribution system?	√		Water Treatment proposed in detailed design, water quality monitoring and continuous trainings to WUSC as stated in EMP will ensure the water supply as prescribed in the NDWQS & its Directives.
Inadequate protection of intake works or wells, leading to pollution of water supply?	√		Design proposes housing for intake wells, and perimeter fencing of the intake wells
Over pumping of ground water, leading to salinization and ground subsidence?		√	
Excessive algal growth in storage reservoir?	√		EMP provides mitigation measures.
Increase in production of sewage beyond the capabilities of community facilities?		√	
Inadequate disposal of sludge from water treatment plants?	√		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?		√	Transmission lines and access roads will not be affected. As stated in EMP, 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.	√		EMP provides measures to mitigate health and safety impacts from improper handling, potential accidents or human error in dosing.
Health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?	√		EMP provides measures to mitigate health and safety impacts from improper handling, potential accidents or human error in dosing.
Dislocation or involuntary resettlement of people?		√	
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	
Noise and dust from construction activities?	√		EMP provides mitigation measures.
Increased road traffic due to interference of construction activities?	√		EMP provides mitigation measures.
Continuing soil erosion/silt runoff from construction operations?		√	
Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?	√		EMP incorporates monitoring of distributed water according to the Directives for the NDWQS.
Delivery of water to distribution system, which is corrosive due to inadequate attention to the feeding of corrective chemicals?	√		EMP provides mitigation measures.
Accidental leakage of chlorine gas?		√	Regular and Effective Monitoring during operation phase should be strictly carried out
Excessive abstraction of water affecting downstream		√	

Screening Questions	Yes	No	Remarks
water users?			
Competing uses of water?		√	
Increased sewage flow due to increased water supply	√		EMP provides mitigation measures.
Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant		√	This is not applicable for this project as this covers only water supply components.
Large population influx during project construction and operation that causes an increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	
Social conflicts if workers from other regions or countries are hired?	√		Expected as low concern. Priority will be given to local workers.
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 providesmitigation 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 providesmitigation measures.

Preliminary Climate Risk Screening Checklist

Country/Project Title: Deurali Hupsekot Water Supply & Sanitation Project
Sector:
Subsector:
Division/Department:

	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 proposed project will not likely be affected by climate change and extreme weather events due to the siting of project.
	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	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity, and hydro-meteorological parameters) affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	Regular operation and maintenance will not allow this effect to occur

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a 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): _____
Other
Comments:_____
_____
_____

Prepared by: _____

NO MITIGATION SCENARIO CHECKLIST

Checklist 1: Scoping Checklist Part 1 - Questions on Project Characteristics

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc)?				
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?	Yes	Temporary change in land use at the designated stockyards by disposing excess of excavated materials	No, it is short term and is limited to construction period only
1.2	Clearance of existing land, vegetation and buildings?	No		
1.3	Creation of new land uses?	No		
1.4	Pre-construction investigations e.g. boreholes, soil testing?	No		
1.5	Construction works?	Yes	Same as 1.1	
1.6	Demolition works?	Yes	Will require demolition of ROW for excavation works for distribution pipelines	No. The demolished ROW will also be readily rehabilitated.
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Possibility of disposal of the daily wastes to the nearby land or water bodies by the construction workers	No, there will be provision to prohibit such actions.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	Earthworks may bring change in land use disrupting the access to roadside shops and houses.	No, the spoils will be readily disposed and the immediate backfilling works will be done.
1.9	Underground works including mining or tunnelling?	No		
1.10	Reclamation works?	No		
1.11	Dredging?	No		
1.12	Coastal structures eg seawalls, piers?	No		
1.13	Offshore structures?	No		
1.14	Production and manufacturing processes?	No		
1.15	Facilities for storage of goods or materials?	No		
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	No		
1.17	Facilities for long term housing of operational workers?	No		
1.18	New road, rail or sea traffic during construction or operation?	No		
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	stations, ports, airports etc?			
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No		
1.21	New or diverted transmission lines or pipelines?			
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No		
1.23	Stream crossings?	Yes	It may affect the integrity of biological habitat of the encountered rivers & streams.	No, care will be taken during laying of transmission line.
1.24	Abstraction or transfers of water from ground or surface waters?	Yes	It will abstract water from surface water sources i.e., river which may affect the availability of water.	No, design of this system has been done on the basis of assessment of water resources.
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	No		
1.26	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Will generate dust and noise by vehicles for transportation of construction materials	No, because transportation of materials will be intermittent.
1.27	Long term dismantling or decommissioning or restoration works?	No		
1.28	Ongoing activity during decommissioning which could have an impact on the environment?	No		
1.29	Influx of people to an area in either temporarily or permanently?	No		
1.30	Introduction of alien species?	No		
1.31	Loss of native species or genetic diversity?	No		
1.32	Any other actions?	No		
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?				
2.1	Land especially undeveloped or agricultural land?	No		
2.2	Water?	No		
2.3	Minerals?	No		
2.4	Aggregates?	No		
2.5	Forests and timber?	No		
2.6	Energy including electricity	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	and fuels?			
2.7	Any other resources?	No		
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?				
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, water supplies)?	No		
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)?	Yes	The surroundings of the worker's camp may be affected as they may not have access to safe supply of water and good sanitation practice.	No because it is limited to construction period only and it can also be avoided by provision of safe access to water, sanitation and health care
3.3	Will the project affect the welfare of people e.g. by changing living conditions?	No		
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g. hospital patients, the elderly?	No		
3.5	Any other causes?	No		
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?	Yes	The spoil if not readily disposed at safe site, it will occupy the land and may create discomfort to the passer-by.	No, because it is short term and can also be avoided by provision of immediate disposal of the spoils at safe site
4.2	Municipal waste (household and or commercial wastes)?	Yes	The living environment of worker's camp may be polluted by the waste generated by the workers.	No, it is short term
4.3	Hazardous or toxic wastes (including radioactive wastes)?	No		
4.4	Other industrial process wastes?	No		
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	No		
4.7	Construction or demolition wastes?	Yes	Air Pollution by the dust generated from the wastes Discomfort to the passer-by if the wastes are not safely disposed	No, because it is limited to the construction phase only and there will be provision of

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				immediate waste disposal
4.8	Redundant machinery or equipment?	No		
4.9	Contaminated soils or other material?	No		
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?				
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	No		
5.2	Emissions from production processes?	No		
5.3	Emissions from materials handling including storage or transport?	Yes	Dust generation by the unloading of materials like cement, aggregates etc.	No -there will be regular monitoring
5.4	Emissions from construction activities including plant and equipment?	Yes	Dust generation by construction works like earthworks	No -there will be regular monitoring
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Yes	Air pollution by the dust generation during unloading of materials like aggregates.	No -there will be regular monitoring
5.6	Emissions from incineration of waste?			
5.7	Emissions from burning of waste in open air (eg slash material, construction debris)?	Yes	The locality of the worker's camp may be affected by the open burning of waste generated from the worker's camp.	No, because it is limited to the local area only and is limited to the duration up to which the labours will be residing.
5.8	Emissions from any other sources?	No		
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment eg engines, ventilation plant, crushers?	No		
6.2	From industrial or similar processes?	No		
6.3	From construction or demolition?	Yes	The noise generated from the demolition of ROW for distribution lines may disturb the people residing at core bazaar area.	No because it is short term (limited to construction phase)
6.4	From blasting or piling?	No		
6.5	From construction or operational traffic?	Yes	Moving of vehicles carrying construction materials may affect core area like Charikot Bazaar	No- because it is short term
6.6	From lighting or cooling systems?	No		
6.7	From sources of	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?			
6.8	From any other sources?	No		
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	No		
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	Yes	The proposed project may attract people from rural areas that will increase the population of the project area which in turn increase the generation of municipal sewage	No, there will be provision of treatment facilities and there will be also regular monitoring of this issue.
7.3	By deposition of pollutants emitted to air, onto the land or into water?	Yes	The land nearby the workers camp may be polluted by the daily activities of the workers residing there temporarily.	No because there will be provision of strict monitoring of this area.
7.4	From any other sources?	No		
7.5	Is there a risk of long term build-up of pollutants in the environment from these sources?	No		
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	No		
8.2	From events beyond the limits of normal environmental protection e.g. failure of pollution control systems?	No		
8.3	From any other causes?	No		
8.4	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	No		
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
9.1	Changes in population size, age, structure, social groups etc?	Yes	There is chance of in migration due to this project that will affect the existing community, cultural identity, economic conditions etc.	No, the ethnicity of project area is of heterogeneous type. So, in migration of new community may

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				not affect the existing community groups' identity.
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g. schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities?	Yes	People from the neighbouring remote areas may migrate to this project town to achieve improved living standards and this may bring change in demography as the population of the project area may be increased.	No, despite of change in demography, the proposed project has been designed on the basis of prediction of population growth in the future i.e., for 20 years.
9.4	By placing increased demands on local facilities or services eg housing, education, health?			
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes	Requirement of labour for the construction works prioritize the local people hence, providing employment opportunities to the local people.	Yes, because the skills they learnt during their employment period can be utilized in the future in other similar kind of works.
9.6	Any other causes?	No		
Question - Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?				
9.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g. more housing, new roads, new supporting industries or utilities, etc?	No		
9.2	Will the project lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g. supporting infrastructure (roads, power supply, waste or waste water treatment, etc) housing development extractive industries supply industries	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	other?			
9.3	Will the project lead to after-use of the site which could have an impact on the environment?	No		
9.4	Will the project set a precedent for later developments?	Yes	The safe access to water supply and sanitation by this project may create opportunities for other development infrastructures.	Yes, because it will be the important factor for the sustainable development of the town.
9.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?	No		

Checklist 2: Scoping Checklist Part 2 - Characteristics of the Project Environment (Environmental Sensitivity)

Question - Are there features of the local environment on or around the Project location which could be affected by the Project? • Areas which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project? • Other areas which are important or sensitive for reasons of their ecology e.g. • Wetlands, • Watercourses or other waterbodies, • the coastal zone, • mountains, • forests or woodlands • Areas used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project? • Inland, coastal, marine or underground waters? • Areas or features of high landscape or scenic value? • Routes or facilities used by the public for access to recreation or other facilities? • Transport routes which are susceptible to congestion or which cause environmental problems? • Areas or features of historic or cultural importance?	Yes, the core Dolakha bazaar area may be susceptible to traffic congestion during distribution pipeline laying works that may provide discomfort to the passer-by and also may disrupt the access to the roadside shops and houses. Similarly, as the topography of the service area of this project is slightly sloped terrain, during pipeline laying works, there is possibility of erosion. Hence, it should be ensured that the trench for pipeline should not be abandoned and the contractor should be recommended to backfill the trench immediately.
Question - Is the Project in a location where it is likely to be highly visible to many people?	Yes. The project area is proposed to serve the Bhimeshwore municipality which includes the main market area due to which it will be highly visible to many people.
Question - Is the Project located in a previously undeveloped area where there will be loss of greenfield land?	No
Question - Are there existing land uses on or around the Project location which could be affected by the	No

Project? For example: • Homes, gardens, other private property, • Industry, • Commerce, • Recreation, • public open space, • community facilities, • agriculture, • forestry, • tourism, • mining or quarrying	
Question - Are there any plans for future land uses on or around the location which could be affected by the Project?	No
Question - Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?	No
Question - Are there any areas on or around the location which are occupied by sensitive land uses which could be affected by the Project? • hospitals, • schools, • places of worship, • community facilities	No
Question - Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project? For example: • groundwater resources, • surface waters, • forestry, • agriculture, • fisheries, • tourism, • minerals.	No
Question - Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No
Question - Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	No
Question - Is the Project likely to affect the physical condition of any environmental media? • The atmospheric environment including microclimate and local and larger scale climatic conditions? • Water – e.g. quantities, flows or levels of rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Soils – e.g. quantities, depths, humidity, stability or erodibility of soils?	Yes, the sloped terrain of the project areas indicates the susceptibility to the soil erosion however if precautions are made, the effects can be made insignificant.

• Geological and ground conditions?	
Question - Are releases from the Project likely to have effects on the quality of any environmental media? • Local air quality? • Global air quality including climate change and ozone depletion • Water quality – rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Nutrient status and eutrophication of waters? • Acidification of soils or waters? • Soils • Noise? • Temperature, light or electromagnetic radiation including electrical interference? • Productivity of natural or agricultural systems?	Yes, the construction activities may affect local air quality through dust emissions especially during dry season. It also generate noise pollution by the movement of vehicles for transporting materials, and demolition works of ROW for distribution pipe laying works.
Question - Is the Project likely to affect the availability or scarcity of any resources either locally or globally? • Fossil fuels? • Water? • Minerals and aggregates? • Timber? • Other non-renewable resources? • Infrastructure capacity in the locality - water, sewerage, power generation and transmission, telecommunications, waste disposal roads, rail?	No
Question - Is the Project likely to affect human or community health or welfare? • The quality or toxicity of air, water, foodstuffs and other products consumed by humans? • Morbidity or mortality of individuals, communities or populations by exposure to pollution? • Occurrence or distribution of disease vectors including insects? • Vulnerability of individuals, communities or populations to disease? • Individuals' sense of personal security? • Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions?	Yes, • This project may offer employment to the local people to involve as a construction worker. This can be viewed as positive impact of the project. • This project may also result in the occurrence or distribution of disease vector due to the temporary settlement of workers as they may not have access to safe water supply and sanitation. • Similarly, this project if properly implemented will have positive effect on the welfare of the local people as they will have safe and easy access to drinking water supply which will enhance their health. • Well planned water supply system of this town will also boost the economic condition of the project town.

Checklist 3: Significance of Impacts

Questions to be Considered	
1. Will there be a large change in environmental conditions?	No
2. Will new features be out-of-scale with the existing environment?	No
3. Will the effect be unusual in the area or particularly complex?	No
4. Will the effect extend over a large area?	No
5. Will there be any potential for trans boundary impact?	No

Questions to be Considered	
6. Will many people be affected?	No
7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?	No
8. Will valuable or scarce features or resources be affected?	No
9. Is there a risk that environmental standards will be breached?	No
10. Is there a risk that protected sites, areas, features will be affected?	No
11. Is there a high probability of the effect occurring?	No
12. Will the effect continue for a long time?	No
13. Will the effect be permanent rather than temporary?	No
14. Will the impact be continuous rather than intermittent?	No
15. If it is intermittent will it be frequent rather than rare?	No
16. Will the impact be irreversible?	No
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?	No

Appendix 2: Environmental Standards, Sample Forms & Report Template

Appendix 2A
Relevant Environmental Quality Standards

National Ambient Air Quality Standards for Nepal, 2003

Parameter	Averaging Period	Nepal's Ambient Air Quality Standard ($\mu g/m^3$) *	WHO Air Quality Guidelines ($\mu g/m^3$) **	
			Global Update 2005	Second Edition ^ 2000
TSP	Annual	-	-	-
	24-hour	230	-	-
PM_{10}	Annual	-	20	-
	24-hour	120	50	-
$PM_{2.5}$	1-year	-	10	-
	24-hour	-	25	-
SO_2	Annual	50	-	
	24-hour	70	20	-
	10-minute	-	500	-
NO_2	1-year	40	40	-
	24-hour	80	-	-
	1-hour	-	200	-
CO	8-hour	10,000	-	10,000
	15-minute	100,000	-	100,000
Pb	1-year	0.5	-	0.5
Benzene	1-year	20	-	-

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

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

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

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

National Noise Standard Guidelines, 2012

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

* Guidelines for Community Noise, WHO, 1999.

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

Tolerance limits for wastewater to be discharged into inland surface waters from combined wastewater treatment plant (generic standards)

Characteristics	Tolerance Limit
Total Suspended solids, mg/L, Max	50
Particle size of total suspended particles	Shall pass 850-micron Sieve.
pH	5.5 to 9.0
Temperature	Shall not exceed 40 degree C in any section of the stream within 15 meters down-stream from the effluent outlet.
Biochemical oxygen demand (BOD) for 5 days at 20 degree C, mg/L, Max	50
Oils and grease, mg/L, Max	10
Phenolic compounds, mg/L, Max	1
Cyanides (as CN), mg/L, Max	0.2
Sulphides (as S), mg/L, Max	2
Radioactive materials:	
a. Alpha emitters, c/ml, Max	7-Oct
b. Beta emitters, c/ml, Max	8-Oct
Insecticides	Absent
Total residual chlorine, mg/L	1
Fluorides (as F), mg/L, Max	2
Arsenic (as As), mg/L, Max	0.2
Cadmium (as, Cd), mg/L, Max	2
Hexavalent chromium (as Cr), mg/L, Max	0.1
Copper (as Cu), mg/L, Max	3
Lead (as Pb), mg/L, Max	0.1
Mercury (as Hg), mg/L, Max	0.01
Nickel (as Ni), mg/L, Max	3
Selenium (as Se), mg/L, Max	0.05
Zinc (as Zn), mg/L, Max	5
Ammonical nitrogen, mg/L, Max	50
Chemical Oxygen Demand, mg/L, Max	250
Silver, mg/L, Max	0.1

Appendix 2B
Sample Grievance Redress Form

SAMPLE GRIEVANCE REDRESS FORM

(To be available in Nepalese and English)

The _____ Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to 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:	

Appendix 2C
Sample Traffic Management Plan

A. Principles

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

(i) the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
(ii) protection of work crews from hazards associated with moving traffic;
(iii) mitigation of the adverse impact on road capacity and delays to the road users;
(iv) maintenance of access to adjoining properties
(v) Avoid hazards in
(vi) Addressing issues that may delay the project.

B. Operating Policies for TMP

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

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

C. Analyze the impact due to street closure

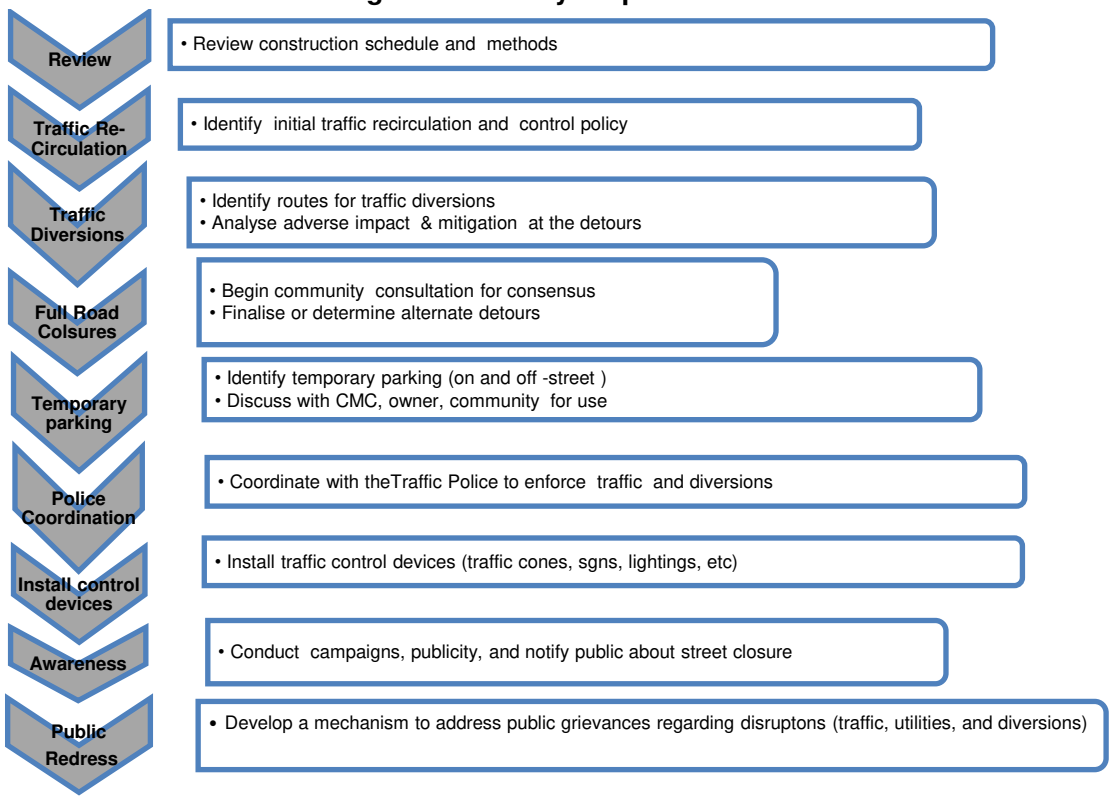
Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

(i) approval from the ICG, local administration to use the local streets as detours;
(ii) consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
(iii) determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
(iv) determining if additional traffic control or temporary improvements are needed along the detour route;
(v) considering how access will be provided to the worksite;
(vi) contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and

(vii) developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

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

Figure A1: Policy Steps for the TMP



D. Public awareness and notifications

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

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

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

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

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

The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the ICG, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

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

E. Vehicle Maintenance and Safety

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

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

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

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

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

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

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

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

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

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

Appendix 2D
Spoil Management Plan

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

Objectives of SMP: The objectives of SMP are:

- **A** To minimize spoil generation where possible
- **B** Maximize beneficial reuse of spoil from construction works in accordance with spoil management hierarchy
- **C** 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 surface and ground water
Noise	Associated with spoil handling and haulage and storage
Traffic	Impacts associated with spoil haulage
Land Use	Potential for spoil to be transported to a receivable site that doesn't have permission for storage/disposal
Design specifications	Limitations on opportunities to minimize spoil generation
Sustainability	Limited sites for storage reuse opportunities

Spoil volumes, Characteristics and Minimization

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

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

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

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

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

Storage and Stockpiling 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

Appendix 2E
Sample Semi-Annual Environmental Monitoring Report Template

I. INTRODUCTION

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number
1. PMU			
2. PIUs			
3. Consultants			

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/List of Works	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M)[a]	Contract Status (specify if under bidding or contract awarded)	If On-going Construction	
				%Physical Progress	Expected Completion Date

[a] If on-going construction, include %physical progress and expected date of completion.

II. COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS[a]

Package No.	Subproject Name	Statutory Environmental Requirements[b]	Status of Compliance[c]	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish[d]

[a] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.

[b] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)

[c] Specify if obtained, submitted and awaiting approval, application not yet submitted

[d] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

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 plan (refer to EMP Tables in APPROVED IEE/s)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise Implementation Status

Package Number	Components	Design Status (Preliminary Design Stage/Detailed Design Completed)	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
			Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

- Identify the role/s of Safeguards Team including schedule of on-site verification of reports submitted by consultants and contractors.
- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.
- Include as appendix all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors.
- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

- Provide the monitoring results as per the parameters outlined in the approved EMP (or site-specific EMP/construction EMP when applicable).
- In addition to the table on EMP implementation, the main text of the report should discuss in details the following items:

  (i) **Grievance Redress Mechanism.** Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

  (ii) **Complaints Received during the Reporting Period.** Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

    - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
    - Identify muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads.

- Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area.
- Confirm spill kits on site and site procedure for handling emergencies.
- Identify any chemical stored on site and provide information on storage condition. Attach photograph.
- Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
- Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
- Provide information on barricades, signages, and on-site boards. Provide photographs.
- Provide information on
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary of Environmental Monitoring Activities (for the Reporting Period)[a]

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						

[a] Attach Laboratory Results and Sampling Map/Locations.

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 and Additional Measures Required

Approach and methodology for environmental monitoring of the project

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

Monitoring of environmental IMPACTS on PROJECT SURROUNDINGS (ambient air, water quality and noise levels)

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

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

Air Quality Results

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

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m^3	**SO2** µg/m^3	**NO2** µg/m^3

Water Quality Results

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

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

Noise Quality Results

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

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Day Time	**Night Time**

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

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

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- Other

Appendix 2F
Sample Environmental Site Inspection Report

Project Name
Contract Number

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

WEATHER CONDITION:
_____

INITIAL SITE CONDITION:_____

CONCLUDING SITE CONDITION:

Satisfactory_____Unsatisfactory_____ Incident_____ Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____
Intervention Steps:
_____
Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions		Waste Minimization		
Air Quality		Reuse and Recycling		
Noise pollution		Dust and Litter Control		
Hazardous Substances		Trees and Vegetation		
Site Restored to Original Condition	Yes		No	

Signature
_____

Sign off

_____ _____
Name **Name**
Position **Position**

Appendix 3
Proximity Report on Charikot Town Generated by ADB

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Integrated Biodiversity Assessment Tool

Proximity report generated by the Integrated Biodiversity Assessment Tool

Site name	Charikot Town, Dolokha
Latitude/Longitude	27° 40' 1" North, 86° 2' 51" East
Date generated	27th April 2018
Generated by	asiandb
Company	ADB

About this report

This report presents the results of a proximity analysis to identify the biodiversity features and species which are located within 1 km, 5 km and 10 km.

Data used to generate this report

IUCN and UNEP-WCMC, 2017. *The World Database on Protected Areas (WDPA) [On-line], March 2018.*

BirdLife International (on behalf of the KBA Partnership), 2016. *Key Biodiversity Areas: December 2016 version.*

IUCN, 2017. *The IUCN Red List of Threatened Species grid analysis of range maps. Version 2017-3 (December).*

Limitations

This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species - close to the specified location. It provides an early indication of potential biodiversity concerns, and can provide valuable guidance in making decisions. For example, this information can be helpful when assessing the potential environmental risk and impact of a site, categorising investments/projects, preparing the terms of reference for an impact assessment, focusing attention on key species of conservation concern and sites of known conservation value, and reviewing the results of an impact assessment.

The report does not provide details of potential indirect, downstream or cumulative impacts. Furthermore, the report should be regarded as a " first-step", providing a set of conservation values sourced from global data sets, and is not a substitute for further investigation and due diligence, especially concerning national and/or local conservation priorities.

For ultimate accuracy, distance calculations are performed by reprojecting the spatial data (as shown through the map viewer) to an equal distance projection, and so may not match precisely the results shown on the map.

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Protected Areas and Key Biodiversity Areas

The following sites are found within the selected buffer distances:

Features within 1 km

There are no features within 1 km.

Features within 5 km

There are no features within 5 km.

Features within 10 km

National-level protected areas		
IUCN Category V-VI	Gauri-Shankar	221,473 ha

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IUCN RED LIST OF THREATENED SPECIES

Given suitable habitat, the following species are potentially found close to the area of interest:

Taxonomic group	Scientific Name	Common Name	IUCN Red List category
Amphibians	*Amolops formosus*		LC
Amphibians	*Amolops marmoratus*		LC
Amphibians	*Amolops monticola*		LC
Amphibians	*Amolops nepalicus*		DD
Amphibians	*Duttaphrynus himalayanus*	Himalayan Toad	LC
Amphibians	*Duttaphrynus stomaticus*		LC
Amphibians	*Fejervarya nepalensis*	Nepal Wart Frog	LC
Amphibians	*Fejervarya pierrei*	Pierre's Wart Frog	LC
Amphibians	*Hoplobatrachus crassus*	Jerdon's Bullfrog	LC
Amphibians	*Hoplobatrachus tigerinus*	Indian Bullfrog	LC
Amphibians	*Megophrys parva*	Concave-crowned Horned Toad	LC
Amphibians	*Microhyla ornata*	Ant Frog	LC
Amphibians	*Nanorana blanfordii*		LC
Amphibians	*Nanorana liebigii*		LC
Amphibians	*Nanorana parkeri*		LC
Amphibians	*Nanorana polunini*		LC
Amphibians	*Ombrana sikimensis*		LC
Amphibians	*Polypedates maculatus*	Himalayan Tree Frog	LC
Amphibians	*Polypedates taeniatus*		LC
Amphibians	*Rhacophorus maximus*		LC
Amphibians	*Scutiger boulengeri*		LC
Amphibians	*Scutiger sikimmensis*		LC
Amphibians	*Theloderma asperum*	Hill Garden Bug-eyed Frog	LC
Birds	*Abroscopus albogularis*	Rufous-faced Warbler	LC
Birds	*Abroscopus schisticeps*	Black-faced Warbler	LC
Birds	*Accipiter badius*	Shikra	LC
Birds	*Accipiter gentilis*	Northern Goshawk	LC
Birds	*Accipiter nisus*	Eurasian Sparrowhawk	LC
Birds	*Accipiter trivirgatus*	Crested Goshawk	LC
Birds	*Accipiter virgatus*	Besra	LC
Birds	*Acridotheres fuscus*	Jungle Myna	LC
Birds	*Acridotheres tristis*	Common Myna	LC
Birds	*Acrocephalus dumetorum*	Blyth's Reed-warbler	LC
Birds	*Actinodura egertoni*	Rusty-fronted Barwing	LC
Birds	*Aegithalos iouschistos*	Rufous-fronted Tit	LC
Birds	*Aegithalos iredalei*	Red-headed Tit	LC
Birds	*Aegithina tiphia*	Common Iora	LC

Birds	*Aegypius monachus*	Cinereous Vulture	NT
Birds	*Aerodramus brevirostris*	Himalayan Swiftlet	LC
Birds	*Aethopyga gouldiae*	Gould's Sunbird	LC
Birds	*Aethopyga ignicauda*	Fire-tailed Sunbird	LC
Birds	*Aethopyga nipalensis*	Green-tailed Sunbird	LC
Birds	*Aethopyga saturata*	Black-throated Sunbird	LC
Birds	*Aethopyga siparaja*	Crimson Sunbird	LC
Birds	*Agraphospiza rubescens*	Blanford's Rosefinch	LC
Birds	*Alauda gulgula*	Oriental Skylark	LC
Birds	*Alcedo atthis*	Common Kingfisher	LC
Birds	*Alcedo meninting*	Blue-eared Kingfisher	LC
Birds	*Alcippe nipalensis*	Nepal Fulvetta	LC
Birds	*Alectoris chukar*	Chukar	LC
Birds	*Amaurornis phoenicurus*	White-breasted Waterhen	LC
Birds	*Anas acuta*	Northern Pintail	LC
Birds	*Anas crecca*	Common Teal	LC
Birds	*Anser anser*	Greylag Goose	LC
Birds	*Anthipes monileger*	White-gorgeted Flycatcher	LC
Birds	*Anthracoceros albirostris*	Oriental Pied Hornbill	LC
Birds	*Anthus godlewskii*	Blyth's Pipit	LC
Birds	*Anthus hodgsoni*	Olive-backed Pipit	LC
Birds	*Anthus richardi*	Richard's Pipit	LC
Birds	*Anthus roseatus*	Rosy Pipit	LC
Birds	*Anthus rubescens*	Buff-bellied Pipit	LC
Birds	*Anthus rufulus*	Paddyfield Pipit	LC
Birds	*Anthus similis*	Long-billed Pipit	LC
Birds	*Anthus sylvanus*	Upland Pipit	LC
Birds	*Apus nipalensis*	House Swift	LC
Birds	*Apus pacificus*	Pacific Swift	LC
Birds	*Aquila chrysaetos*	Golden Eagle	LC
Birds	*Aquila fasciata*	Bonelli's Eagle	LC
Birds	*Aquila heliaca*	Eastern Imperial Eagle	VU
Birds	*Aquila nipalensis*	Steppe Eagle	EN
Birds	*Aquila rapax*	Tawny Eagle	LC
Birds	*Arachnothera magna*	Streaked Spiderhunter	LC
Birds	*Arborophila rufogularis*	Rufous-throated Partridge	LC
Birds	*Arborophila torqueola*	Hill Partridge	LC
Birds	*Ardea alba*	Great White Egret	LC
Birds	*Ardea cinerea*	Grey Heron	LC
Birds	*Ardeola grayii*	Indian Pond-heron	LC

Birds	*Arundinax aedon*	Thick-billed Warbler	LC
Birds	*Asio flammeus*	Short-eared Owl	LC
Birds	*Asio otus*	Northern Long-eared Owl	LC
Birds	*Athene brama*	Spotted Owlet	LC
Birds	*Athene noctua*	Little Owl	LC
Birds	*Aythya ferina*	Common Pochard	VU
Birds	*Aythya fuligula*	Tufted Duck	LC
Birds	*Aythya nyroca*	Ferruginous Duck	NT
Birds	*Blythipicus pyrrhotis*	Bay Woodpecker	LC
Birds	*Botaurus stellaris*	Eurasian Bittern	LC
Birds	*Brachypteryx cruralis*	Himalayan Shortwing	LC
Birds	*Brachypteryx leucophris*	Lesser Shortwing	LC
Birds	*Brachypteryx montana*	Javan Shortwing	LC
Birds	*Bubo bengalensis*	Rock Eagle-owl	LC
Birds	*Bubo nipalensis*	Spot-bellied Eagle-owl	LC
Birds	*Bubulcus ibis*	Cattle Egret	LC
Birds	*Buteo hemilasius*	Upland Buzzard	LC
Birds	*Buteo japonicus*	Japanese Buzzard	LC
Birds	*Buteo refectus*	Himalayan Buzzard	LC
Birds	*Cacomantis passerinus*	Grey-bellied Cuckoo	LC
Birds	*Cacomantis sonneratii*	Banded Bay Cuckoo	LC
Birds	*Calandrella acutirostris*	Hume's Lark	LC
Birds	*Callacanthis burtoni*	Spectacled Finch	LC
Birds	*Calliope calliope*	Siberian Rubythroat	LC
Birds	*Calliope pectoralis*	Himalayan Rubythroat	LC
Birds	*Caprimulgus affinis*	Savanna Nightjar	LC
Birds	*Caprimulgus asiaticus*	Indian Nightjar	LC
Birds	*Caprimulgus jotaka*	Grey Nightjar	LC
Birds	*Carduelis caniceps*	Eastern Goldfinch	LC
Birds	*Carpodacus erythrinus*	Common Rosefinch	LC
Birds	*Carpodacus pulcherrimus*	Beautiful Rosefinch	LC
Birds	*Carpodacus puniceus*	Red-fronted Rosefinch	LC
Birds	*Carpodacus rodochroa*	Pink-browed Rosefinch	LC
Birds	*Carpodacus rodopeplus*	Spot-winged Rosefinch	LC
Birds	*Carpodacus rubicilla*	Great Rosefinch	LC
Birds	*Carpodacus sipahi*	Scarlet Finch	LC
Birds	*Carpodacus subhimachalus*	Crimson-browed Finch	LC
Birds	*Carpodacus thura*	Himalayan White-browed Rosefinc	LC
Birds	*Carpodacus vinaceus*	Vinaceous Rosefinch	LC
Birds	*Centropus bengalensis*	Lesser Coucal	LC

Birds	*Centropus sinensis*	Greater Coucal	LC
Birds	*Cephalopyrus flammiceps*	Fire-capped Tit	LC
Birds	*Certhia discolor*	Sikkim Treecreeper	LC
Birds	*Certhia hodgsoni*	Hodgson's Treecreeper	LC
Birds	*Certhia nipalensis*	Rusty-flanked Treecreeper	LC
Birds	*Ceryle rudis*	Pied Kingfisher	LC
Birds	*Cettia brunnifrons*	Grey-sided Bush-warbler	LC
Birds	*Cettia castaneocoronata*	Chestnut-headed Tesia	LC
Birds	*Cettia major*	Chestnut-crowned Bush-warbler	LC
Birds	*Chalcophaps indica*	Grey-capped Emerald Dove	LC
Birds	*Charadrius alexandrinus*	Kentish Plover	LC
Birds	*Chelidorhynx hypoxanthus*	Yellow-bellied Fairy-fantail	LC
Birds	*Chloris spinoides*	Yellow-breasted Greenfinch	LC
Birds	*Chloropsis aurifrons*	Golden-fronted Leafbird	LC
Birds	*Chloropsis hardwickii*	Orange-bellied Leafbird	LC
Birds	*Chrysococcyx maculatus*	Asian Emerald Cuckoo	LC
Birds	*Chrysominla strigula*	Bar-throated Minla	LC
Birds	*Chrysophlegma flavinucha*	Greater Yellownape	LC
Birds	*Ciconia ciconia*	White Stork	LC
Birds	*Ciconia episcopus*	Asian Woollyneck	VU
Birds	*Ciconia nigra*	Black Stork	LC
Birds	*Cinclus cinclus*	White-throated Dipper	LC
Birds	*Cinclus pallasii*	Brown Dipper	LC
Birds	*Cinnyris asiaticus*	Purple Sunbird	LC
Birds	*Circaetus gallicus*	Short-toed Snake-eagle	LC
Birds	*Circus cyaneus*	Hen Harrier	LC
Birds	*Cissa chinensis*	Common Green Magpie	LC
Birds	*Cisticola juncidis*	Zitting Cisticola	LC
Birds	*Clamator coromandus*	Chestnut-winged Cuckoo	LC
Birds	*Cochoa purpurea*	Purple Cochoa	LC
Birds	*Columba hodgsonii*	Speckled Woodpigeon	LC
Birds	*Columba leuconota*	Snow Pigeon	LC
Birds	*Columba livia*	Rock Dove	LC
Birds	*Columba palumbus*	Common Woodpigeon	LC
Birds	*Columba pulchricollis*	Ashy Woodpigeon	LC
Birds	*Columba rupestris*	Hill Pigeon	LC
Birds	*Conostoma aemodium*	Great Parrotbill	LC
Birds	*Copsychus saularis*	Oriental Magpie-robin	LC
Birds	*Coracias benghalensis*	Indian Roller	LC
Birds	*Coracina macei*	Indian Cuckooshrike	LC

Birds	*Corvus corax*	Common Raven	LC
Birds	*Corvus macrorhynchos*	Large-billed Crow	LC
Birds	*Corvus splendens*	House Crow	LC
Birds	*Coturnix coturnix*	Common Quail	LC
Birds	*Cuculus canorus*	Common Cuckoo	LC
Birds	*Cuculus micropterus*	Indian Cuckoo	LC
Birds	*Cuculus poliocephalus*	Lesser Cuckoo	LC
Birds	*Cuculus saturatus*	Oriental Cuckoo	LC
Birds	*Culicicapa ceylonensis*	Grey-headed Canary-flycatcher	LC
Birds	*Cutia nipalensis*	Himalayan Cutia	LC
Birds	*Cyanecula svecica*	Bluethroat	LC
Birds	*Cyanoderma chrysaeum*	Golden Babbler	LC
Birds	*Cyanoderma pyrrhops*	Black-chinned Babbler	LC
Birds	*Cyornis poliogenys*	Pale-chinned Flycatcher	LC
Birds	*Cyornis rubeculoides*	Blue-throated Blue-flycatcher	LC
Birds	*Cyornis tickelliae*	Tickell's Blue-flycatcher	LC
Birds	*Cyornis unicolor*	Pale Blue-flycatcher	LC
Birds	*Delichon dasypus*	Asian House Martin	LC
Birds	*Delichon nipalense*	Nepal House Martin	LC
Birds	*Dendrocitta formosae*	Grey Treepie	LC
Birds	*Dendrocopos darjellensis*	Darjeeling Woodpecker	LC
Birds	*Dendrocopos hyperythrus*	Rufous-bellied Woodpecker	LC
Birds	*Dendrocopos macei*	Fulvous-breasted Woodpecker	LC
Birds	*Dicaeum chrysorrheum*	Yellow-vented Flowerpecker	LC
Birds	*Dicaeum erythrorhynchos*	Pale-billed Flowerpecker	LC
Birds	*Dicaeum ignipectus*	Fire-breasted Flowerpecker	LC
Birds	*Dicaeum melanozanthum*	Yellow-bellied Flowerpecker	LC
Birds	*Dicaeum minullum*	Plain Flowerpecker	LC
Birds	*Dicrurus aeneus*	Bronzed Drongo	LC
Birds	*Dicrurus annectens*	Crow-billed Drongo	LC
Birds	*Dicrurus hottentottus*	Hair-crested Drongo	LC
Birds	*Dicrurus leucophaeus*	Ashy Drongo	LC
Birds	*Dicrurus macrocercus*	Black Drongo	LC
Birds	*Dicrurus paradiseus*	Greater Racquet-tailed Drongo	LC
Birds	*Dicrurus remifer*	Lesser Racquet-tailed Drongo	LC
Birds	*Dryobates cathpharius*	Scarlet-breasted Woodpecker	LC
Birds	*Ducula badia*	Mountain Imperial-pigeon	LC
Birds	*Egretta garzetta*	Little Egret	LC
Birds	*Elanus caeruleus*	Black-winged Kite	LC
Birds	*Emberiza aureola*	Yellow-breasted Bunting	CR

Birds	*Emberiza lathami*	Crested Bunting	LC
Birds	*Enicurus immaculatus*	Black-backed Forktail	LC
Birds	*Enicurus maculatus*	Spotted Forktail	LC
Birds	*Enicurus schistaceus*	Slaty-backed Forktail	LC
Birds	*Enicurus scouleri*	Little Forktail	LC
Birds	*Eremophila alpestris*	Horned Lark	LC
Birds	*Erpornis zantholeuca*	White-bellied Erpornis	LC
Birds	*Erythrogenys erythrogenys*	Rusty-cheeked Scimitar-babbler	LC
Birds	*Eudynamys scolopaceus*	Western Koel	LC
Birds	*Eumyias thalassinus*	Verditer Flycatcher	LC
Birds	*Falco amurensis*	Amur Falcon	LC
Birds	*Falco cherrug*	Saker Falcon	EN
Birds	*Falco columbarius*	Merlin	LC
Birds	*Falco naumanni*	Lesser Kestrel	LC
Birds	*Falco peregrinus*	Peregrine Falcon	LC
Birds	*Falco severus*	Oriental Hobby	LC
Birds	*Falco subbuteo*	Eurasian Hobby	LC
Birds	*Falco tinnunculus*	Common Kestrel	LC
Birds	*Ficedula albicilla*	Red-throated Flycatcher	LC
Birds	*Ficedula erithacus*	Slaty-backed Flycatcher	LC
Birds	*Ficedula hodgsoni*	Pygmy Blue-flycatcher	LC
Birds	*Ficedula hyperythra*	Snowy-browed Flycatcher	LC
Birds	*Ficedula ruficauda*	Rusty-tailed Flycatcher	LC
Birds	*Ficedula strophiata*	Rufous-gorgeted Flycatcher	LC
Birds	*Ficedula superciliaris*	Ultramarine Flycatcher	LC
Birds	*Ficedula tricolor*	Slaty-blue Flycatcher	LC
Birds	*Ficedula westermanni*	Little Pied Flycatcher	LC
Birds	*Francolinus francolinus*	Black Francolin	LC
Birds	*Fringilla coelebs*	Common Chaffinch	LC
Birds	*Fringilla montifringilla*	Brambling	LC
Birds	*Fulica atra*	Common Coot	LC
Birds	*Fulvetta vinipectus*	White-browed Fulvetta	LC
Birds	*Gallicrex cinerea*	Watercock	LC
Birds	*Gallinago nemoricola*	Wood Snipe	VU
Birds	*Gallinago solitaria*	Solitary Snipe	LC
Birds	*Gallinula chloropus*	Common Moorhen	LC
Birds	*Gallus gallus*	Red Junglefowl	LC
Birds	*Garrulax albogularis*	White-throated Laughingthrush	LC
Birds	*Garrulax caerulatus*	Grey-sided Laughingthrush	LC
Birds	*Garrulax leucolophus*	White-crested Laughingthrush	LC

Birds	*Garrulax monileger*	Lesser Necklaced Laughingthrush	LC
Birds	*Garrulax ocellatus*	Spotted Laughingthrush	LC
Birds	*Garrulax pectoralis*	Greater Necklaced Laughingthrush	LC
Birds	*Garrulax rufogularis*	Rufous-chinned Laughingthrush	LC
Birds	*Garrulus bispecularis*	Plain-crowned Jay	LC
Birds	*Geokichla citrina*	Orange-headed Thrush	LC
Birds	*Geokichla wardii*	Pied Thrush	LC
Birds	*Glareola maldivarum*	Oriental Pratincole	LC
Birds	*Glaucidium brodiei*	Collared Owlet	LC
Birds	*Glaucidium cuculoides*	Asian Barred Owlet	LC
Birds	*Grammatoptila striata*	Striated Laughingthrush	LC
Birds	*Grandala coelicolor*	Grandala	LC
Birds	*Gyps bengalensis*	White-rumped Vulture	CR
Birds	*Gyps himalayensis*	Himalayan Griffon	NT
Birds	*Halcyon smyrnensis*	White-breasted Kingfisher	LC
Birds	*Haliaeetus leucoryphus*	Pallas's Fish-eagle	EN
Birds	*Harpactes erythrocephalus*	Red-headed Trogon	LC
Birds	*Hemiprocne coronata*	Crested Treeswift	LC
Birds	*Hemipus picatus*	Bar-winged Flycatcher-shrike	LC
Birds	*Hemitesia pallidipes*	Pale-footed Bush-warbler	LC
Birds	*Hemixos flavala*	Ashy Bulbul	LC
Birds	*Heterophasia capistrata*	Rufous Sibia	LC
Birds	*Heterophasia picaoides*	Long-tailed Sibia	LC
Birds	*Hieraaetus pennatus*	Booted Eagle	LC
Birds	*Hierococcyx sparverioides*	Large Hawk-cuckoo	LC
Birds	*Hirundapus caudacutus*	White-throated Needletail	LC
Birds	*Hirundapus cochinchinensis*	Silver-backed Needletail	LC
Birds	*Hirundo rustica*	Barn Swallow	LC
Birds	*Hirundo smithii*	Wire-tailed Swallow	LC
Birds	*Hodgsonius phaenicuroides*	White-bellied Redstart	LC
Birds	*Horornis brunnescens*	Hume's Bush-warbler	LC
Birds	*Horornis flavolivaceus*	Aberrant Bush-warbler	LC
Birds	*Hydrophasianus chirurgus*	Pheasant-tailed Jacana	LC
Birds	*Hypothymis azurea*	Black-naped Monarch	LC
Birds	*Hypsipetes leucocephalus*	Black Bulbul	LC
Birds	*Ibidorhyncha struthersii*	Ibisbill	LC
Birds	*Ictinaetus malaiensis*	Black Eagle	LC
Birds	*Iduna caligata*	Booted Warbler	LC
Birds	*Indicator xanthonotus*	Yellow-rumped Honeyguide	NT
Birds	*Ithaginis cruentus*	Blood Pheasant	LC

Birds	*Ixobrychus cinnamomeus*	Cinnamon Bittern	LC
Birds	*Ixos mcclellandii*	Mountain Bulbul	LC
Birds	*Jynx torquilla*	Eurasian Wryneck	LC
Birds	*Ketupa zeylonensis*	Brown Fish-owl	LC
Birds	*Lalage melanoptera*	Black-headed Cuckooshrike	LC
Birds	*Lalage melaschistos*	Black-winged Cuckooshrike	LC
Birds	*Lanius cristatus*	Brown Shrike	LC
Birds	*Lanius schach*	Long-tailed Shrike	LC
Birds	*Lanius tephronotus*	Grey-backed Shrike	LC
Birds	*Larus ridibundus*	Black-headed Gull	LC
Birds	*Larvivora brunnea*	Indian Blue Robin	LC
Birds	*Leiopicus auriceps*	Brown-fronted Woodpecker	LC
Birds	*Leiothrix argentauris*	Silver-eared Mesia	LC
Birds	*Leiothrix lutea*	Red-billed Leiothrix	LC
Birds	*Leptopoecile sophiae*	White-browed Tit-warbler	LC
Birds	*Leptoptilos dubius*	Greater Adjutant	EN
Birds	*Leptoptilos javanicus*	Lesser Adjutant	VU
Birds	*Leucosticte nemoricola*	Plain Mountain-finch	LC
Birds	*Limosa limosa*	Black-tailed Godwit	NT
Birds	*Linaria flavirostris*	Twite	LC
Birds	*Lioparus chrysotis*	Golden-breasted Fulvetta	LC
Birds	*Locustella certhiola*	Pallas's Grasshopper-warbler	LC
Birds	*Locustella lanceolata*	Lanceolated Warbler	LC
Birds	*Locustella tacsanowskia*	Chinese Grasshopper-warbler	LC
Birds	*Locustella thoracica*	Spotted Grasshopper-warbler	LC
Birds	*Lonchura punctulata*	Scaly-breasted Munia	LC
Birds	*Lonchura striata*	White-rumped Munia	LC
Birds	*Lophophanes dichrous*	Grey-crested Tit	LC
Birds	*Lophophorus impejanus*	Himalayan Monal	LC
Birds	*Lophotriorchis kienerii*	Rufous-bellied Eagle	LC
Birds	*Lophura leucomelanos*	Kalij Pheasant	LC
Birds	*Loriculus vernalis*	Vernal Hanging-parrot	LC
Birds	*Loxia curvirostra*	Red Crossbill	LC
Birds	*Machlolophus xanthogenys*	Black-lored Tit	LC
Birds	*Macropygia unchall*	Barred Cuckoo-dove	LC
Birds	*Mareca strepera*	Gadwall	LC
Birds	*Megaceryle lugubris*	Crested Kingfisher	LC
Birds	*Megalurus palustris*	Striated Grassbird	LC
Birds	*Melanochlora sultanea*	Sultan Tit	LC
Birds	*Mergus merganser*	Goosander	LC

Birds	*Merops leschenaulti*	Chestnut-headed Bee-eater	LC
Birds	*Microhierax caerulescens*	Collared Falconet	LC
Birds	*Micropternus brachyurus*	Rufous Woodpecker	LC
Birds	*Milvus migrans*	Black Kite	LC
Birds	*Minla ignotincta*	Red-tailed Minla	LC
Birds	*Mirafra assamica*	Bengal Bushlark	LC
Birds	*Monticola cinclorhyncha*	Blue-capped Rock-thrush	LC
Birds	*Monticola rufiventris*	Chestnut-bellied Rock-thrush	LC
Birds	*Monticola solitarius*	Blue Rock-thrush	LC
Birds	*Montifringilla nivalis*	White-winged Snowfinch	LC
Birds	*Motacilla alba*	White Wagtail	LC
Birds	*Motacilla cinerea*	Grey Wagtail	LC
Birds	*Motacilla citreola*	Citrine Wagtail	LC
Birds	*Motacilla maderaspatensis*	White-browed Wagtail	LC
Birds	*Muscicapa dauurica*	Asian Brown Flycatcher	LC
Birds	*Muscicapa ferruginea*	Ferruginous Flycatcher	LC
Birds	*Muscicapa sibirica*	Dark-sided Flycatcher	LC
Birds	*Mycerobas affinis*	Collared Grosbeak	LC
Birds	*Mycerobas carnipes*	White-winged Grosbeak	LC
Birds	*Mycerobas melanozanthos*	Spot-winged Grosbeak	LC
Birds	*Mycteria leucocephala*	Painted Stork	NT
Birds	*Myiomela leucura*	White-tailed Blue Robin	LC
Birds	*Myophonus caeruleus*	Blue Whistling-thrush	LC
Birds	*Myzornis pyrrhoura*	Fire-tailed Myzornis	LC
Birds	*Neophron percnopterus*	Egyptian Vulture	EN
Birds	*Niltava grandis*	Large Niltava	LC
Birds	*Niltava macgrigoriae*	Small Niltava	LC
Birds	*Niltava sundara*	Rufous-bellied Niltava	LC
Birds	*Nisaetus nipalensis*	Mountain Hawk-eagle	LC
Birds	*Nucifraga hemispila*	Southern Nutcracker	LC
Birds	*Numenius arquata*	Eurasian Curlew	NT
Birds	*Nycticorax nycticorax*	Black-crowned Night-heron	LC
Birds	*Oenanthe deserti*	Desert Wheatear	LC
Birds	*Oriolus kundoo*	Indian Golden Oriole	LC
Birds	*Oriolus tenuirostris*	Slender-billed Oriole	LC
Birds	*Oriolus traillii*	Maroon Oriole	LC
Birds	*Oriolus xanthornus*	Black-hooded Oriole	LC
Birds	*Orthotomus sutorius*	Common Tailorbird	LC
Birds	*Otus lettia*	Collared Scops-owl	LC
Birds	*Otus spilocephalus*	Mountain Scops-owl	LC

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Birds	*Otus sunia*	Oriental Scops-owl	LC
Birds	*Parus major*	Great Tit	LC
Birds	*Parus monticolus*	Green-backed Tit	LC
Birds	*Passer cinnamomeus*	Russet Sparrow	LC
Birds	*Passer domesticus*	House Sparrow	LC
Birds	*Passer montanus*	Eurasian Tree Sparrow	LC
Birds	*Pavo cristatus*	Indian Peafowl	LC
Birds	*Pellorneum ruficeps*	Puff-throated Babbler	LC
Birds	*Pericrocotus brevirostris*	Short-billed Minivet	LC
Birds	*Pericrocotus cinnamomeus*	Small Minivet	LC
Birds	*Pericrocotus ethologus*	Long-tailed Minivet	LC
Birds	*Pericrocotus flammeus*	Scarlet Minivet	LC
Birds	*Pericrocotus roseus*	Rosy Minivet	LC
Birds	*Pericrocotus solaris*	Grey-chinned Minivet	LC
Birds	*Periparus ater*	Coal Tit	LC
Birds	*Periparus rubidiventris*	Rufous-vented Tit	LC
Birds	*Pernis ptilorhynchus*	Oriental Honey-buzzard	LC
Birds	*Phaenicophaeus tristis*	Green-billed Malkoha	LC
Birds	*Phalacrocorax carbo*	Great Cormorant	LC
Birds	*Phoenicurus coeruleocephala*	Blue-capped Redstart	LC
Birds	*Phoenicurus erythrogastrus*	White-winged Redstart	LC
Birds	*Phoenicurus frontalis*	Blue-fronted Redstart	LC
Birds	*Phoenicurus fuliginosus*	Plumbeous Water-redstart	LC
Birds	*Phoenicurus hodgsoni*	Hodgson's Redstart	LC
Birds	*Phoenicurus leucocephalus*	White-capped Water-redstart	LC
Birds	*Phoenicurus ochruros*	Black Redstart	LC
Birds	*Phoenicurus schisticeps*	White-throated Redstart	LC
Birds	*Phylloscopus affinis*	Tickell's Leaf-warbler	LC
Birds	*Phylloscopus burkii*	Green-crowned Warbler	LC
Birds	*Phylloscopus castaniceps*	Chestnut-crowned Warbler	LC
Birds	*Phylloscopus chloronotus*	Lemon-rumped Leaf-warbler	LC
Birds	*Phylloscopus fuligiventer*	Smoky Warbler	LC
Birds	*Phylloscopus fuscatus*	Dusky Warbler	LC
Birds	*Phylloscopus griseolus*	Sulphur-bellied Warbler	LC
Birds	*Phylloscopus humei*	Hume's Leaf-warbler	LC
Birds	*Phylloscopus inornatus*	Yellow-browed Warbler	LC
Birds	*Phylloscopus maculipennis*	Ashy-throated Warbler	LC
Birds	*Phylloscopus magnirostris*	Large-billed Leaf-warbler	LC
Birds	*Phylloscopus poliogenys*	Grey-cheeked Warbler	LC
Birds	*Phylloscopus pulcher*	Buff-barred Warbler	LC

Birds	*Phylloscopus reguloides*	Blyth's Leaf-warbler	LC
Birds	*Phylloscopus trochiloides*	Greenish Warbler	LC
Birds	*Phylloscopus whistleri*	Whistler's Warbler	LC
Birds	*Phylloscopus xanthoschistos*	Grey-hooded Warbler	LC
Birds	*Picoides canicapillus*	Grey-capped Woodpecker	LC
Birds	*Picoides nanus*	Indian Pygmy Woodpecker	LC
Birds	*Picumnus innominatus*	Speckled Piculet	LC
Birds	*Picus chlorolophus*	Lesser Yellownape	LC
Birds	*Picus guerini*	Black-naped Woodpecker	LC
Birds	*Pitta sordida*	Western Hooded Pitta	LC
Birds	*Plegadis falcinellus*	Glossy Ibis	LC
Birds	*Ploceus philippinus*	Baya Weaver	LC
Birds	*Pnoepyga albiventer*	Scaly-breasted Cupwing	LC
Birds	*Pnoepyga immaculata*	Nepal Cupwing	LC
Birds	*Pnoepyga pusilla*	Pygmy Cupwing	LC
Birds	*Pomatorhinus ruficollis*	Streak-breasted Scimitar-babbler	LC
Birds	*Pomatorhinus schisticeps*	White-browed Scimitar-babbler	LC
Birds	*Pomatorhinus superciliaris*	Slender-billed Scimitar-babbler	LC
Birds	*Porphyrio porphyrio*	Purple Swamphen	LC
Birds	*Prinia crinigera*	Striated Prinia	LC
Birds	*Prinia hodgsonii*	Grey-breasted Prinia	LC
Birds	*Prinia socialis*	Ashy Prinia	LC
Birds	*Procarduelis nipalensis*	Dark-breasted Rosefinch	LC
Birds	*Prunella fulvescens*	Brown Accentor	LC
Birds	*Prunella immaculata*	Maroon-backed Accentor	LC
Birds	*Prunella rubeculoides*	Robin Accentor	LC
Birds	*Prunella strophiata*	Rufous-breasted Accentor	LC
Birds	*Psarisomus dalhousiae*	Long-tailed Broadbill	LC
Birds	*Psilopogon asiaticus*	Blue-throated Barbet	LC
Birds	*Psilopogon franklinii*	Golden-throated Barbet	LC
Birds	*Psilopogon lineatus*	Lineated Barbet	LC
Birds	*Psilopogon virens*	Great Barbet	LC
Birds	*Psittacula alexandri*	Red-breasted Parakeet	NT
Birds	*Psittacula cyanocephala*	Plum-headed Parakeet	LC
Birds	*Psittacula eupatria*	Alexandrine Parakeet	NT
Birds	*Psittacula himalayana*	Slaty-headed Parakeet	LC
Birds	*Pteruthius aeralatus*	White-browed Shrike-babbler	LC
Birds	*Pteruthius melanotis*	Black-eared Shrike-babbler	LC
Birds	*Pteruthius rufiventer*	Black-headed Shrike-babbler	LC
Birds	*Pteruthius xanthochlorus*	Green Shrike-babbler	LC

Birds	*Ptyonoprogne rupestris*	Eurasian Crag Martin	LC
Birds	*Pycnonotus cafer*	Red-vented Bulbul	LC
Birds	*Pycnonotus flaviventris*	Black-crested Bulbul	LC
Birds	*Pycnonotus jocosus*	Red-whiskered Bulbul	LC
Birds	*Pyrrhocorax graculus*	Yellow-billed Chough	LC
Birds	*Pyrrhocorax pyrrhocorax*	Red-billed Chough	LC
Birds	*Pyrrhoplectes epauletta*	Gold-naped Finch	LC
Birds	*Pyrrhula erythaca*	Grey-headed Bullfinch	LC
Birds	*Pyrrhula erythrocephala*	Red-headed Bullfinch	LC
Birds	*Pyrrhula nipalensis*	Brown Bullfinch	LC
Birds	*Rallina eurizonoides*	Slaty-legged Crake	LC
Birds	*Regulus regulus*	Goldcrest	LC
Birds	*Rhipidura albicollis*	White-throated Fantail	LC
Birds	*Riparia chinensis*	Asian Plain Martin	LC
Birds	*Sarcogyps calvus*	Red-headed Vulture	CR
Birds	*Saroglossa spilopterus*	Spot-winged Starling	LC
Birds	*Sasia ochracea*	White-browed Piculet	LC
Birds	*Saxicola caprata*	Pied Bushchat	LC
Birds	*Saxicola ferreus*	Grey Bushchat	LC
Birds	*Saxicola insignis*	White-throated Bushchat	VU
Birds	*Saxicola torquatus*	Common Stonechat	LC
Birds	*Schoeniparus castaneceps*	Rufous-winged Fulvetta	LC
Birds	*Scolopax rusticola*	Eurasian Woodcock	LC
Birds	*Sibia nipalensis*	Hoary-throated Barwing	LC
Birds	*Sitta cinnamoventris*	Chestnut-bellied Nuthatch	LC
Birds	*Sitta frontalis*	Velvet-fronted Nuthatch	LC
Birds	*Sitta himalayensis*	White-tailed Nuthatch	LC
Birds	*Siva cyanouroptera*	Blue-winged Minla	LC
Birds	*Spatula clypeata*	Northern Shoveler	LC
Birds	*Spilopelia senegalensis*	Laughing Dove	LC
Birds	*Spilopelia suratensis*	Western Spotted Dove	LC
Birds	*Spilornis cheela*	Crested Serpent-eagle	LC
Birds	*Spinus thibetanus*	Tibetan Siskin	LC
Birds	*Stachyris nigriceps*	Grey-throated Babbler	LC
Birds	*Sterna aurantia*	River Tern	NT
Birds	*Streptopelia decaocto*	Eurasian Collared-dove	LC
Birds	*Streptopelia orientalis*	Oriental Turtle-dove	LC
Birds	*Strix leptogrammica*	Brown Wood-owl	LC
Birds	*Sturnia malabarica*	Chestnut-tailed Starling	LC
Birds	*Sturnia pagodarum*	Brahminy Starling	LC

Birds	*Surniculus dicruroides*	Fork-tailed Drongo-cuckoo	LC
Birds	*Suthora fulvifrons*	Fulvous Parrotbill	LC
Birds	*Sylviparus modestus*	Yellow-browed Tit	LC
Birds	*Tachybaptus ruficollis*	Little Grebe	LC
Birds	*Tachymarptis melba*	Alpine Swift	LC
Birds	*Tadorna ferruginea*	Ruddy Shelduck	LC
Birds	*Tadorna tadorna*	Common Shelduck	LC
Birds	*Tarsiger chrysaeus*	Golden Bush-robin	LC
Birds	*Tarsiger cyanurus*	Orange-flanked Bush-robin	LC
Birds	*Tarsiger hyperythrus*	Rufous-breasted Bush-robin	LC
Birds	*Tarsiger indicus*	White-browed Bush-robin	LC
Birds	*Tarsiger rufilatus*	Himalayan Bush-robin	LC
Birds	*Tephrodornis pondicerianus*	Common Woodshrike	LC
Birds	*Tephrodornis virgatus*	Large Woodshrike	LC
Birds	*Terpsiphone paradisi*	Indian Paradise-flycatcher	LC
Birds	*Tesia cyaniventer*	Grey-bellied Tesia	LC
Birds	*Tetraogallus himalayensis*	Himalayan Snowcock	LC
Birds	*Threskiornis melanocephalus*	Black-headed Ibis	NT
Birds	*Tichodroma muraria*	Wallcreeper	LC
Birds	*Tickellia hodgsoni*	Broad-billed Warbler	LC
Birds	*Timalia pileata*	Chestnut-capped Babbler	LC
Birds	*Tragopan satyra*	Satyr Tragopan	NT
Birds	*Treron apicauda*	Pin-tailed Green-pigeon	LC
Birds	*Treron bicinctus*	Orange-breasted Green-pigeon	LC
Birds	*Treron curvirostra*	Thick-billed Green-pigeon	LC
Birds	*Treron phoenicopterus*	Yellow-footed Green-pigeon	LC
Birds	*Treron sphenurus*	Wedge-tailed Green-pigeon	LC
Birds	*Tringa totanus*	Common Redshank	LC
Birds	*Trochalopteron affine*	Black-faced Laughingthrush	LC
Birds	*Trochalopteron erythrocephalum*	Chestnut-crowned Laughingthrush	LC
Birds	*Trochalopteron lineatum*	Streaked Laughingthrush	LC
Birds	*Trochalopteron squamatum*	Blue-winged Laughingthrush	LC
Birds	*Trochalopteron subunicolor*	Scaly Laughingthrush	LC
Birds	*Trochalopteron variegatum*	Variegated Laughingthrush	LC
Birds	*Troglodytes troglodytes*	Northern Wren	LC
Birds	*Turdoides striata*	Jungle Babbler	LC
Birds	*Turdus albocinctus*	White-collared Blackbird	LC
Birds	*Turdus atrogularis*	Black-throated Thrush	LC
Birds	*Turdus boulboul*	Grey-winged Blackbird	LC
Birds	*Turdus maximus*	Tibetan Blackbird	LC

Birds	*Turdus rubrocanus*	Chestnut Thrush	LC
Birds	*Turdus ruficollis*	Rufous-throated Thrush	LC
Birds	*Turdus unicolor*	Tickell's Thrush	LC
Birds	*Turnix suscitator*	Barred Buttonquail	LC
Birds	*Turnix sylvaticus*	Common Buttonquail	LC
Birds	*Turnix tanki*	Yellow-legged Buttonquail	LC
Birds	*Tyto alba*	Common Barn-owl	LC
Birds	*Upupa epops*	Common Hoopoe	LC
Birds	*Urocissa erythroryncha*	Red-billed Blue Magpie	LC
Birds	*Urocissa flavirostris*	Yellow-billed Blue Magpie	LC
Birds	*Vanellus cinereus*	Grey-headed Lapwing	LC
Birds	*Vanellus vanellus*	Northern Lapwing	NT
Birds	*Yuhina flavicollis*	Whiskered Yuhina	LC
Birds	*Yuhina gularis*	Stripe-throated Yuhina	LC
Birds	*Yuhina nigrimenta*	Black-chinned Yuhina	LC
Birds	*Yuhina occipitalis*	Rufous-vented Yuhina	LC
Birds	*Zapornia fusca*	Ruddy-breasted Crake	LC
Birds	*Zoonavena sylvatica*	White-rumped Spinetail	LC
Birds	*Zoothera dauma*	Scaly Thrush	LC
Birds	*Zoothera dixoni*	Long-tailed Thrush	LC
Birds	*Zoothera major*	Amami Thrush	NT
Birds	*Zoothera marginata*	Dark-sided Thrush	LC
Birds	*Zoothera mollissima*	Alpine Thrush	LC
Birds	*Zoothera monticola*	Long-billed Thrush	LC
Birds	*Zosterops palpebrosus*	Oriental White-eye	LC
Fishes	*Acanthocobitis botia*	Striped Loach	LC
Fishes	*Anguilla bengalensis*	Indian Mottled Eel	NT
Fishes	*Badis badis*		LC
Fishes	*Bagarius yarrelli*		NT
Fishes	*Bangana ariza*	Ariza Labeo	LC
Fishes	*Channa gachua*	Dwarf Snakehead	LC
Fishes	*Channa marulius*		LC
Fishes	*Cirrhinus mrigala*	Mrigal	LC
Fishes	*Cirrhinus reba*	Reba Carp	LC
Fishes	*Esomus danrica*	Flying barb	LC
Fishes	*Garra annandalei*	Annandale garra	LC
Fishes	*Gibelion catla*	Catla	LC
Fishes	*Glossogobius giuris*	Bareye Goby	LC
Fishes	*Glyptothorax indicus*	Catfish	LC
Fishes	*Heteropneustes fossilis*	Stinging catfish	LC

Fishes	*Labeo angra*	Angra Labeo	LC
Fishes	*Lepidocephalus guntea*	Peppered Loach	LC
Fishes	*Mastacembelus armatus*	Spiny eel	LC
Fishes	*Nandus nandus*		LC
Fishes	*Nangra nangra*	Kosi Nangra	LC
Fishes	*Neolissochilus dukai*		DD
Fishes	*Neotropius atherinoides*		LC
Fishes	*Notopterus notopterus*		LC
Fishes	*Oreichthys cosuatis*		LC
Fishes	*Parachiloglanis hodgarti*	Torrent Catfish	LC
Fishes	*Pseudapocryptes elongatus*		LC
Fishes	*Pseudecheneis crassicauda*		DD
Fishes	*Psilorhynchus nepalensis*		LC
Fishes	*Psilorhynchus pseudecheneis*	Stone Carp	LC
Fishes	*Rasbora daniconius*	Slender Barb	LC
Fishes	*Schistura multifasciata*		LC
Fishes	*Schizothorax progastus*	Dinnawah snowtrout	LC
Fishes	*Setipinna phasa*	Gangetic Hairfin Anchovy	LC
Fishes	*Silonia silondia*	Silong Catfish	LC
Fishes	*Sperata aor*	Long-whiskered Catfish	LC
Fishes	*Trichogaster fasciata*		LC
Fishes	*Wallago attu*		NT
Invertebrates	*Aciagrion hisopa*		LC
Invertebrates	*Aciagrion pallidum*		LC
Invertebrates	*Acisoma panorpoides*	Grizzled Pintail	LC
Invertebrates	*Agriocnemis clauseni*		LC
Invertebrates	*Agriocnemis lacteola*		LC
Invertebrates	*Agriocnemis pygmaea*	Wandering Midget	LC
Invertebrates	*Amphiallagma parvum*		LC
Invertebrates	*Anaciaeschna jaspidea*		LC
Invertebrates	*Anax ephippiger*	Vagrant Emperor	LC
Invertebrates	*Anax guttatus*	Lesser Green Emperor	LC
Invertebrates	*Anax indicus*		LC
Invertebrates	*Anax nigrofasciatus*	Blue-spotted Emperor	LC
Invertebrates	*Angulyagra oxytropis*		LC
Invertebrates	*Anisopleura comes*		LC
Invertebrates	*Anisopleura subplatystyla*		LC
Invertebrates	*Bayadera indica*		LC
Invertebrates	*Bellamya bengalensis*		LC
Invertebrates	*Bithynia cerameopoma*		LC

Invertebrates	*Bithynia pulchella*		LC
Invertebrates	*Brachydiplax chalybea*		LC
Invertebrates	*Brachydiplax farinosa*		LC
Invertebrates	*Brachydiplax sobrina*		LC
Invertebrates	*Brachythemis contaminata*		LC
Invertebrates	*Brotia costula*		LC
Invertebrates	*Calicnemia eximia*		LC
Invertebrates	*Calicnemia pulverulans*		LC
Invertebrates	*Caliphaea confusa*		LC
Invertebrates	*Camacinia gigantea*		LC
Invertebrates	*Camptoceras lineatum*		LC
Invertebrates	*Cephalaeschna acutifrons*		DD
Invertebrates	*Cephalaeschna viridifrons*		LC
Invertebrates	*Cercion malayanum*		LC
Invertebrates	*Ceriagrion azureum*		LC
Invertebrates	*Ceriagrion coromandelianum*		LC
Invertebrates	*Ceriagrion fallax*		LC
Invertebrates	*Ceriagrion olivaceum*		LC
Invertebrates	*Cherax cainii*	Smooth Marron	LC
Invertebrates	*Chloropetalia selysi*		VU
Invertebrates	*Clenchiella microscopica*		LC
Invertebrates	*Clithon reticularis*		LC
Invertebrates	*Copera marginipes*		LC
Invertebrates	*Copera vittata*		LC
Invertebrates	*Corbicula striatella*		LC
Invertebrates	*Cratilla lineata*		LC
Invertebrates	*Cratilla metallica*		LC
Invertebrates	*Cristaria plicata*		DD
Invertebrates	*Crocothemis erythraea*	Broad Scarlet	LC
Invertebrates	*Diplacodes trivialis*		LC
Invertebrates	*Erhaia banepaensis*		DD
Invertebrates	*Erhaia chandeshwariensis*		DD
Invertebrates	*Erhaia sugurensis*		DD
Invertebrates	*Euphaea ochracea*		LC
Invertebrates	*Ferrissia baconi*		LC
Invertebrates	*Ferrissia verruca*		LC
Invertebrates	*Gabbia orcula*		LC
Invertebrates	*Gabbia stenothyroides*		LC
Invertebrates	*Gyraulus barrackporensis*		LC
Invertebrates	*Gyraulus convexiusculus*		LC

Invertebrates	*Gyraulus euphraticus*		LC
Invertebrates	*Gyraulus labiatus*		LC
Invertebrates	*Himalayapotamon emphyseteum*		LC
Invertebrates	*Indoplanorbis exustus*		LC
Invertebrates	*Intha umbilicalis*		LC
Invertebrates	*Ischnura forcipata*		LC
Invertebrates	*Lamellidens consobrinus*		LC
Invertebrates	*Lamellidens corrianus*		LC
Invertebrates	*Lamellidens jenkinsianus*		LC
Invertebrates	*Lamellidens marginalis*		LC
Invertebrates	*Lamellidens narainpirensis*		LC
Invertebrates	*Lestes dorothea*		LC
Invertebrates	*Libellago lineata*		LC
Invertebrates	*Lymnaea acuminata*		LC
Invertebrates	*Lymnaea andersoniana*		LC
Invertebrates	*Lymnaea luteola*		LC
Invertebrates	*Lymnaea persica*		LC
Invertebrates	*Macrobrachium nepalense*		DD
Invertebrates	*Macromia flavocolorata*		LC
Invertebrates	*Maydeliathelphusa lugubris*		LC
Invertebrates	*Melanoides pyramis*		LC
Invertebrates	*Melanoides tuberculata*		LC
Invertebrates	*Mieniplotia scabra*		LC
Invertebrates	*Musculium goshaitanensis*		DD
Invertebrates	*Neurobasis chinensis*		LC
Invertebrates	*Nychogomphus duaricus*		LC
Invertebrates	*Onychargia atrocyana*		LC
Invertebrates	*Orthetrum chrysis*		LC
Invertebrates	*Orthetrum japonicum*		LC
Invertebrates	*Orthetrum luzonicum*		LC
Invertebrates	*Paludomus conica*		LC
Invertebrates	*Pantala flavescens*	Wandering Glider	LC
Invertebrates	*Paracercion melanotum*	Eastern Lilysquatter	LC
Invertebrates	*Parreysia bonneaudi*		LC
Invertebrates	*Parreysia caerulea*		LC
Invertebrates	*Parreysia favidens*		LC
Invertebrates	*Parreysia lima*		LC
Invertebrates	*Parreysia occata*		LC
Invertebrates	*Parreysia shurtleffiana*		LC
Invertebrates	*Parreysia sikkimensis*		LC

Invertebrates	*Parreysia triembolus*		LC
Invertebrates	*Pila globosa*		LC
Invertebrates	*Pila theobaldi*		LC
Invertebrates	*Pisidium annandalei*		LC
Invertebrates	*Pisidium atkinsonianum*		LC
Invertebrates	*Pisidium casertanum*	Caserta Pea Mussel	LC
Invertebrates	*Pisidium chandanbariensis*		DD
Invertebrates	*Pisidium clarkeanum*		LC
Invertebrates	*Pisidium ellisi*		LC
Invertebrates	*Pisidium kuiperi*		DD
Invertebrates	*Pisidium nevillianum*		LC
Invertebrates	*Pisidium prasongi*		LC
Invertebrates	*Pomacea lineata*		LC
Invertebrates	*Procambarus clarkii*	Red Swamp Crayfish	LC
Invertebrates	*Pseudagrion rubriceps*		LC
Invertebrates	*Radix auricularia*		LC
Invertebrates	*Radix brevicauda*		LC
Invertebrates	*Radix hookeri*		DD
Invertebrates	*Radix viridis*		LC
Invertebrates	*Rhinocypha biforata*		LC
Invertebrates	*Rhyothemis variegata*		LC
Invertebrates	*Segmentina calatha*		LC
Invertebrates	*Segmentina trochoidea*		LC
Invertebrates	*Sermyla riqueti*		LC
Invertebrates	*Sphaerium indicum*		LC
Invertebrates	*Sympetrum hypomelas*		LC
Invertebrates	*Tarebia granifera*		LC
Invertebrates	*Tarebia lineata*		LC
Invertebrates	*Tholymis tillarga*	Old World Twister	LC
Invertebrates	*Tramea basilaris*	Keyhole Glider	LC
Invertebrates	*Tramea limbata*	Ferruginous Glider	LC
Invertebrates	*Trichopotamon sikkimensis*		LC
Invertebrates	*Tricula godawariensis*		DD
Invertebrates	*Tricula mahadevensis*		VU
Invertebrates	*Tricula montana*		LC
Invertebrates	*Trithemis aurora*		LC
Invertebrates	*Trithemis pallidinervis*	Dancing Dropwing	LC
Invertebrates	*Urothemis signata*		LC
Invertebrates	*Vestalaria smaragdina*		LC
Invertebrates	*Vestalis gracilis*		LC

Invertebrates	*Zygonyx iris*		LC
Invertebrates	*Zyxomma petiolatum*	Long-tailed Duskdarter	LC
Mammals	*Ailurus fulgens*	Red Panda	EN
Mammals	*Alticola stoliczkanus*	Stoliczka's Mountain Vole	LC
Mammals	*Aonyx cinereus*	Asian Small-clawed Otter	VU
Mammals	*Axis axis*	Chital	LC
Mammals	*Bandicota bengalensis*	Lesser Bandicoot Rat	LC
Mammals	*Bandicota indica*	Greater Bandicoot Rat	LC
Mammals	*Callosciurus pygerythrus*	Hoary-bellied Squirrel	LC
Mammals	*Canis aureus*	Golden Jackal	LC
Mammals	*Canis lupus*	Gray Wolf	LC
Mammals	*Capricornis thar*	Himalayan Serow	NT
Mammals	*Caprolagus hispidus*	Hispid Hare	EN
Mammals	*Crocidura attenuata*	Grey Shrew	LC
Mammals	*Cynopterus sphinx*	Greater Shortnosed Fruit Bat	LC
Mammals	*Dremomys lokriah*	Orange-bellied Himalayan Squirrel	LC
Mammals	*Episoriculus caudatus*	Hodgson's Brown-toothed Shrew	LC
Mammals	*Episoriculus leucops*	Long-tailed Brown-toothed Shrew	LC
Mammals	*Episoriculus macrurus*	Arboreal Brown-toothed Shrew	LC
Mammals	*Eptesicus serotinus*	Serotine	LC
Mammals	*Falsistrellus affinis*	Chocolate Pipistrelle	LC
Mammals	*Funambulus pennantii*	Five-striped Palm Squirrel	LC
Mammals	*Hemitragus jemlahicus*	Himalayan Tahr	NT
Mammals	*Herpestes auropunctatus*	Small Indian Mongoose	LC
Mammals	*Hipposideros armiger*	Great Himalayan Leaf-nosed Bat	LC
Mammals	*Hipposideros cineraceus*	Least Leaf-nosed Bat	LC
Mammals	*Hipposideros pomona*	Andersen's Leaf-nosed Bat	LC
Mammals	*Lepus oiostolus*	Woolly Hare	LC
Mammals	*Lutra lutra*	Eurasian Otter	NT
Mammals	*Macaca assamensis*	Assam Macaque	NT
Mammals	*Macaca mulatta*	Rhesus Monkey	LC
Mammals	*Manis pentadactyla*	Chinese Pangolin	CR
Mammals	*Marmota himalayana*	Karakoram Marmot	LC
Mammals	*Martes flavigula*	Yellow-throated Marten	LC
Mammals	*Martes foina*	Beech Marten	LC
Mammals	*Megaderma lyra*	Greater False Vampire	LC
Mammals	*Moschus leucogaster*	Himalayan Muskdeer	EN
Mammals	*Muntiacus vaginalis*	Northern Red Muntjac	LC
Mammals	*Murina huttoni*	White-bellied Tube-nosed Bat	LC
Mammals	*Mus booduga*	Little Indian Field Mouse	LC

Mammals	*Mus cervicolor*	Fawn-colored Mouse	LC
Mammals	*Mus cookii*	Ryley's Spiny Mouse	LC
Mammals	*Mus musculus*	House Mouse	LC
Mammals	*Mus terricolor*	Earth-colored Mouse	LC
Mammals	*Mustela altaica*	Altai Weasel	NT
Mammals	*Mustela kathiah*	Yellow-bellied Weasel	LC
Mammals	*Mustela sibirica*	Siberian Weasel	LC
Mammals	*Myotis formosus*	Hodgson's Bat	LC
Mammals	*Myotis muricola*	Nepalese Whiskered Myotis	LC
Mammals	*Myotis nipalensis*	Nepal Myotis	LC
Mammals	*Myotis sicarius*	Mandelli's Mouse-eared Myotis	VU
Mammals	*Myotis siligorensis*	Himalayan Whiskered Myotis	LC
Mammals	*Naemorhedus goral*	Himalayan Goral	NT
Mammals	*Neodon sikimensis*	Sikkim Vole	LC
Mammals	*Neofelis nebulosa*	Clouded Leopard	VU
Mammals	*Niviventer eha*	Little Himalayan Rat	LC
Mammals	*Niviventer fulvescens*	Chestnut White-bellied Rat	LC
Mammals	*Niviventer niviventer*	Himalayan White-bellied Rat	LC
Mammals	*Ochotona macrotis*	Large-eared Pika	LC
Mammals	*Ochotona roylei*	Royle's Pika	LC
Mammals	*Paguma larvata*	Masked Palm Civet	LC
Mammals	*Panthera pardus*	Leopard	VU
Mammals	*Paradoxurus hermaphroditus*	Common Palm Civet	LC
Mammals	*Pardofelis marmorata*	Marbled Cat	NT
Mammals	*Petaurista elegans*	Spotted Giant Flying Squirrel	LC
Mammals	*Petaurista magnificus*	Hodgson's Giant Flying Squirrel	LC
Mammals	*Phaiomys leucurus*	Blyth's Vole	LC
Mammals	*Philetor brachypterus*	Short-winged Pipistrelle	LC
Mammals	*Pipistrellus coromandra*	Coromandel Pipistrelle	LC
Mammals	*Pipistrellus javanicus*	Javan Pipistrelle	LC
Mammals	*Pipistrellus tenuis*	Least Pipistrelle	LC
Mammals	*Prionailurus bengalensis*	Leopard Cat	LC
Mammals	*Prionodon pardicolor*	Spotted Linsang	LC
Mammals	*Pteropus giganteus*	Indian Flying Fox	LC
Mammals	*Rattus andamanensis*	Indochinese Forest Rat	LC
Mammals	*Rattus nitidus*	Himalayan Field Rat	LC
Mammals	*Rattus pyctoris*	Himalayan Rat	LC
Mammals	*Rattus rattus*	House Rat	LC
Mammals	*Rattus tanezumi*	Oriental House Rat	LC
Mammals	*Rhinolophus affinis*	Intermediate Horseshoe Bat	LC

Mammals	*Rhinolophus ferrumequinum*	Greater Horseshoe Bat	LC
Mammals	*Rhinolophus lepidus*	Blyth's Horseshoe Bat	LC
Mammals	*Rhinolophus luctus*	Great Woolly Horsehoe Bat	LC
Mammals	*Rhinolophus macrotis*	Big-eared Horseshoe Bat	LC
Mammals	*Rhinolophus pearsonii*	Pearson's Horseshoe Bat	LC
Mammals	*Rhinolophus pusillus*	Least Horseshoe Bat	LC
Mammals	*Rhinolophus rouxii*	Rufous Horseshoe Bat	LC
Mammals	*Rhinolophus sinicus*	Chinese Horseshoe Bat	LC
Mammals	*Rhinolophus subbadius*	Little Nepalese Horseshoe Bat	LC
Mammals	*Rusa unicolor*	Sambar	VU
Mammals	*Scotophilus heathii*	Greater Asiatic Yellow House Bat	LC
Mammals	*Semnopithecus hector*	Tarai Gray Langur	NT
Mammals	*Semnopithecus schistaceus*	Nepal Gray Langur	LC
Mammals	*Suncus murinus*	House Shrew	LC
Mammals	*Suncus stoliczkanus*	Anderson's Shrew	LC
Mammals	*Sus scrofa*	Wild Boar	LC
Mammals	*Tatera indica*	Indian Gerbil	LC
Mammals	*Ursus thibetanus*	Asiatic Black Bear	VU
Mammals	*Vandeleuria oleracea*	Asiatic Long-tailed Climbing Mouse	LC
Mammals	*Viverra zibetha*	Large Indian Civet	LC
Mammals	*Viverricula indica*	Small Indian Civet	LC
Mammals	*Vulpes ferrilata*	Tibetan Fox	LC
Mammals	*Vulpes vulpes*	Red Fox	LC
Plants	*Anacyclus pyrethrum*	Atlas Daisy	VU
Plants	*Medicago sativa*	Alfalfa	LC
Plants	*Pistacia khinjuk*		LC
Reptiles	*Boiga trigonata*	Indian Gamma Snake	LC
Reptiles	*Crocodylus palustris*	Mugger	VU
Reptiles	*Elachistodon westermanni*	Indian Egg-eater	LC
Reptiles	*Eutropis carinata*	Keeled Indian Mabuya	LC
Reptiles	*Herpetoreas sieboldii*	Sikkim Keelback	DD
Reptiles	*Japalura tricarinata*	Three Keeled Mountain Lizard	LC
Reptiles	*Ovophis monticola*	Chinese Mountain Pit Viper	LC
Reptiles	*Psammophis condanarus*	Indo-chinese Sand Snake	LC
Reptiles	*Pseudoxenodon macrops*	Large-eyed False Cobra	LC
Reptiles	*Sibynophis collaris*	Collared Black-headed Snake	LC
Reptiles	*Sitana ponticeriana*	Fan Throated Lizard	LC
Reptiles	*Trachischium guentheri*	Gunther's Oriental Worm Snake	LC
Reptiles	*Varanus bengalensis*	Common Indian Monitor	LC

About IBAT

The Integrated Biodiversity Assessment Tool (IBAT) provides key decision-makers with access to critical information on biodiversity priority sites to inform risk management and decision-making processes that address potential biodiversity impacts. Developed through a partnership of BirdLife International, Conservation International, International Union for Conservation of Nature (IUCN) and United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), the vision of IBAT is that decisions affecting critical natural habitats are informed by the best scientific information and in turn decision makers will support the quest to collect and enhance the underlying datasets and maintain that scientific information.

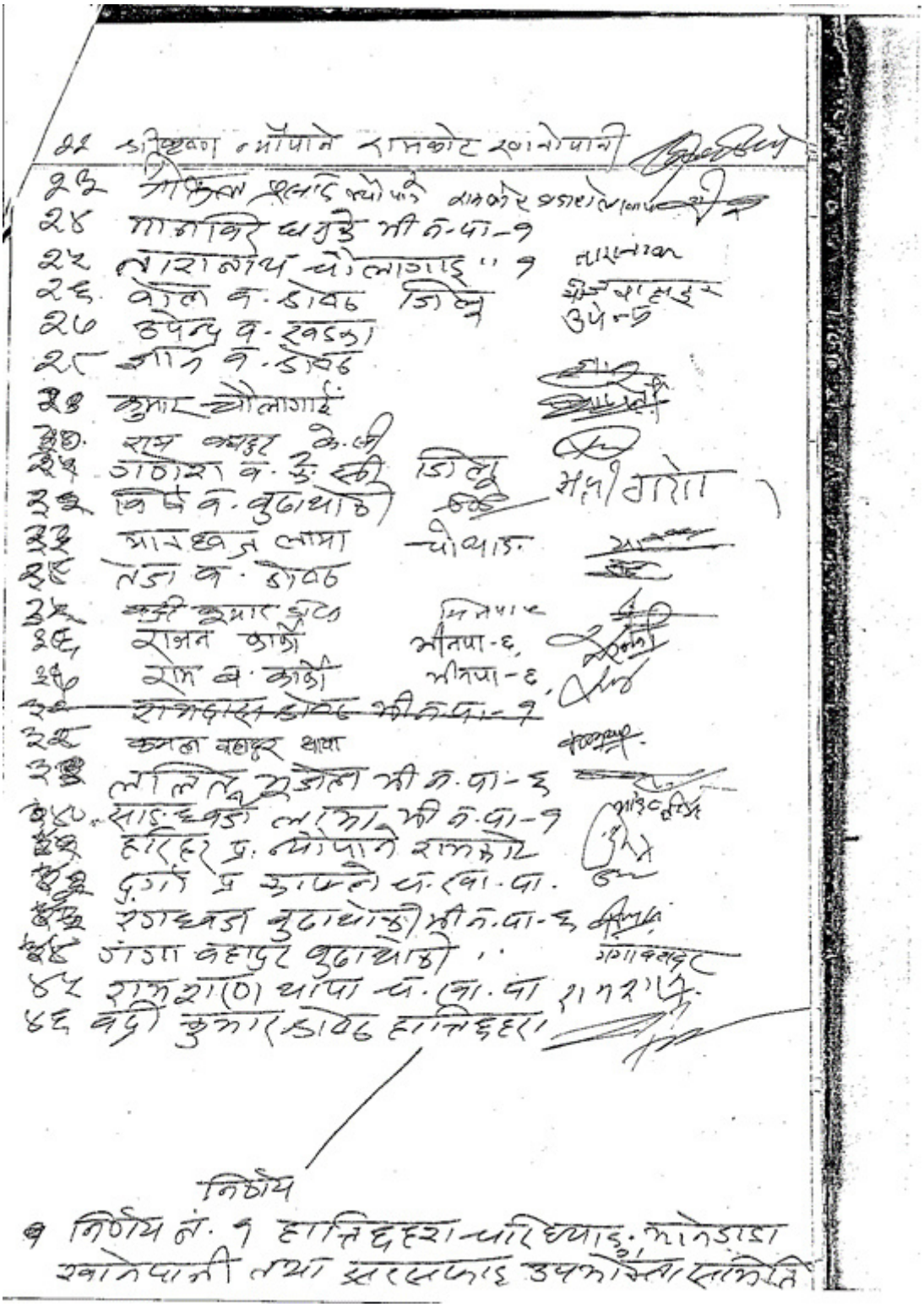
Appendix 4
Minutes of Meeting, No Objection Letters and Approval Letter of IEE Report from MoWS

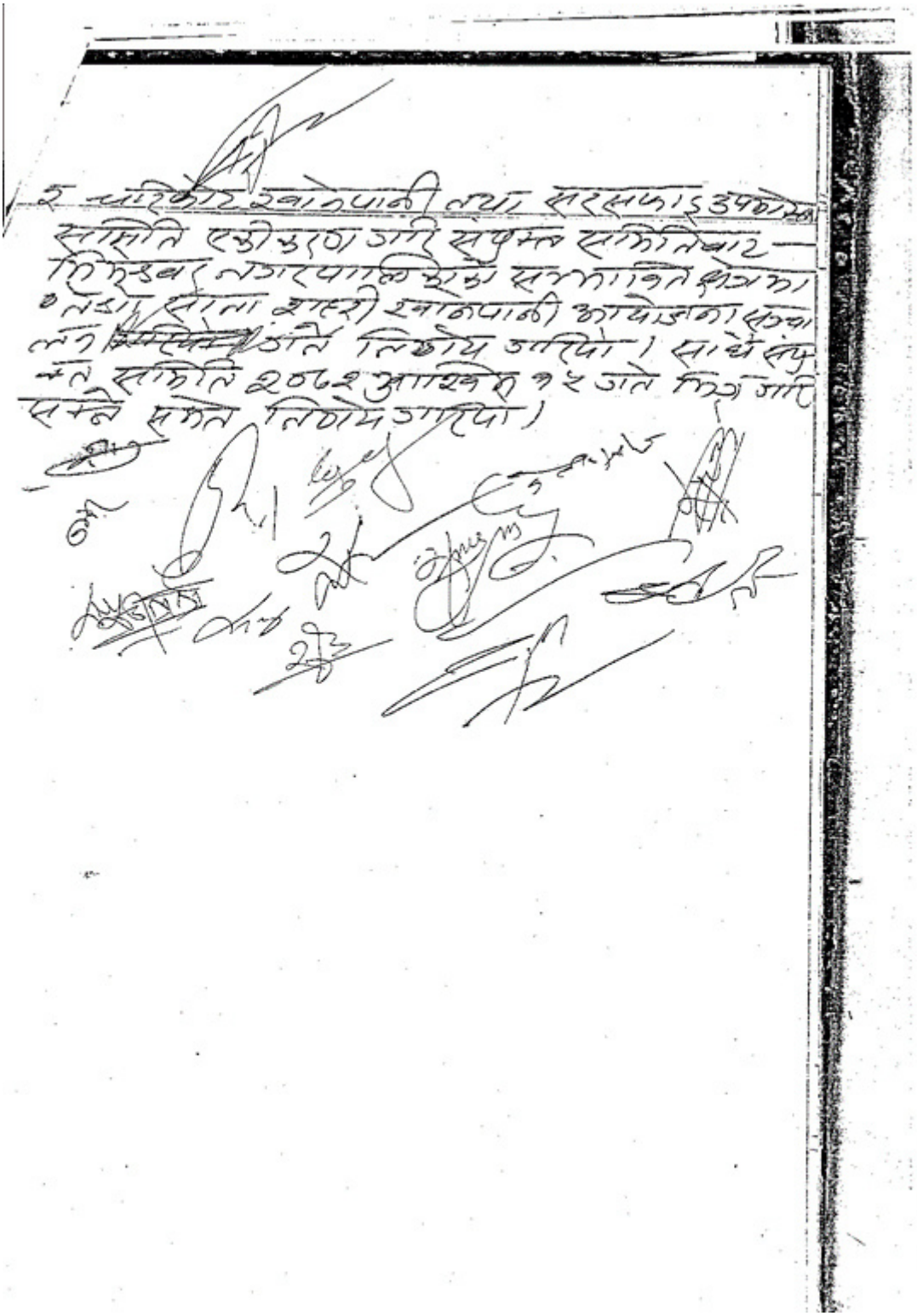
Minutes of Meeting-1

आज मिति २०६२ भाद्र ४ गते भिमेश्वर नगरपालिका भित्र खानेपानी तथा ढलको व्यवस्थापन सम्बन्धमा गराउनका लागि विभिन्न खानेपानी उपभोक्ता समितिहरु नेता, भिमेश्वर नगरपालिकामा रहेको साना शहरी खानेपानी आयोजना सञ्चालनका लागि यस नगरपालिकाका कार्यकारी अधिकृत श्री संजय बहादुर [illegible]को अध्यक्षतामा बसी तपसिलको अनुसारको उपस्थितिमा तपसिलको अनुसारको प्रस्ताव माथी छलफल तपसिलको अनुसारको निर्णय गरियो।

उपस्थिति

१ संजय बहादुर [illegible] अध्यक्ष
२ राम कृष्ण के. सी. — च. खा. पा.
३ कृष्ण बहादुर कार्की हाकिमडाँडा खा. पा.
४ कृष्ण बहादुर खड्का — च. खा. पा.
५ [illegible] हाकिमडाँडा खा. पा.
६ ध्रुव बस्नेत " "
७ कमिला श्रेष्ठ [illegible] खा. पा.
८ रामप्रसाद सापकोटा डिलु खा. पा.
९ दावा शेर्पा — च. खा. पा.
१० सीमा कार्की S. T.
११ कृष्ण कुमारी थापा
१२ [illegible] (शाही)
१३ शीला के.सी. भि.न.पा. १० [illegible]
१४ [illegible]
१५ [illegible]
१६ [illegible]
१७ [illegible] भि.न.पा. - ६ डिलु
१८ [illegible]
१९ [illegible]
२० यादव प्र. दहाल भि.न.पा. १०
२१ धन बहादुर [illegible]





English Translation of Minute of Meeting-1

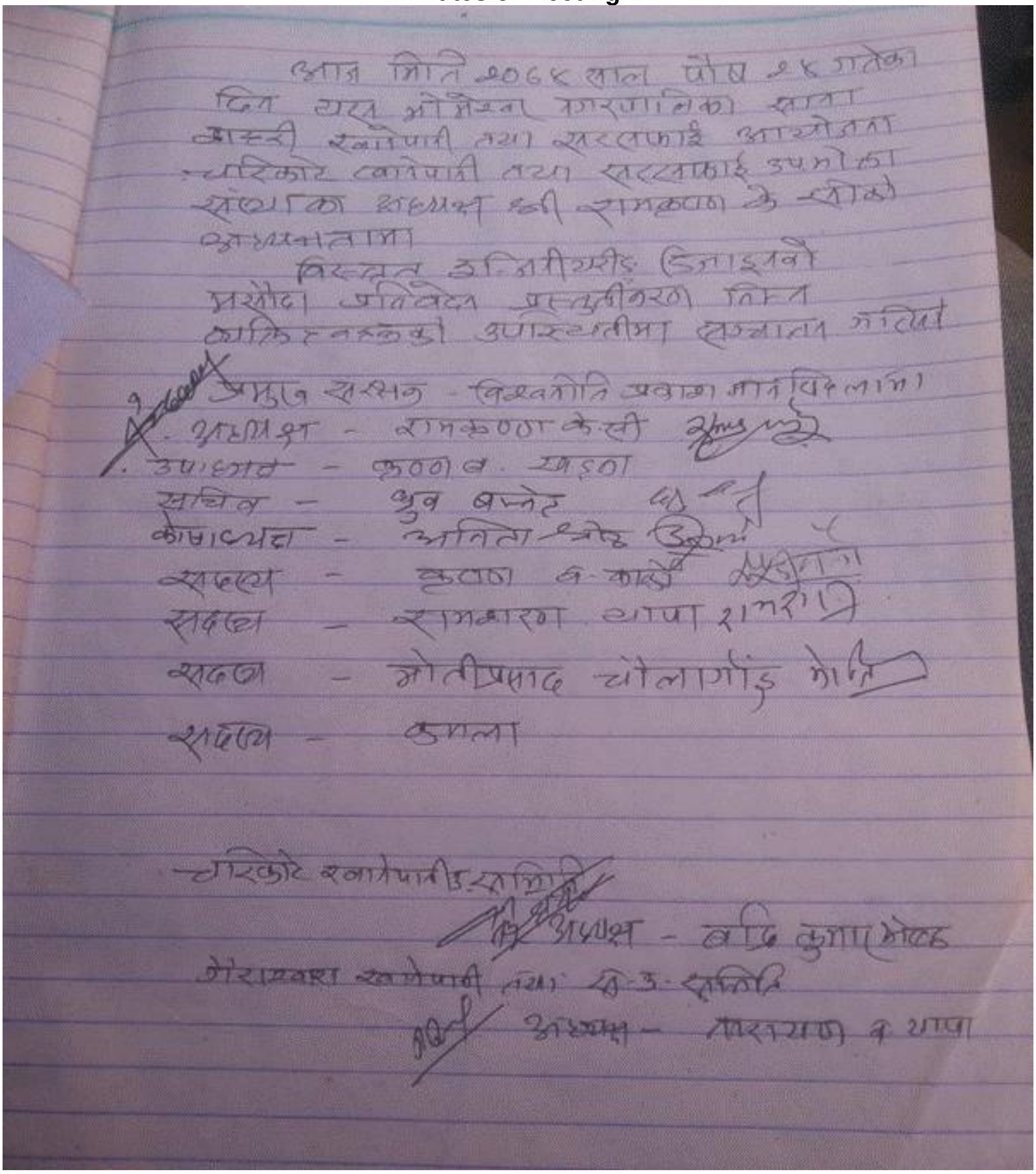
Today dated January 08, 2018, gathering of various WUSCs has been carried out at the premises of Bhimeswore Municipality to implement the proposed TSTWSSP in Bhimeswore municipality to make water supply and sewerage management available within the Bhimeswore town, under the chairmanship of Mr. Sanjaya Bahadur Rajlawat, Executive Officer of Bhimsewore Municipality and in the presence of the following mentioned participants, discussions on the following mentioned agenda and decisions were made under the consent of all.

S. No.	Name of the Participants	Designation/Address
1	Mr.Sanjaya Bahadur Rajlawat	Chairman
2	Mr. RamKrishna KC	Charikot Drinking Water
3	Mr. Krishna Bahadur Karki	Hattichahara Drinking Water
4	Mr. Krishna Bahadur Khadka	Charikot Drinking Water
5	Mr. Kailash Shrestha	Hattichahara Drinking Water
6	Mr. Dhruba Basnet	Hattichahara Drinking Water
7	Mr. Anil Shrestha	Dolakha Drinking Water
8	Mr. Ram Prasad Sapkota	Jilu Drinking Water
9	Mr. Dawa Sherpa	Charikot Drinking Water
10	Ms. Roma Karki	S.T.
11	Ms. Krishna Kumari Thapa	
12	Ms. Rupa Bhujel (Shahi)	
13	Ms. Geeta KC	Bhimeshwor Municipality-10, Taganagi
14	Mr. Suku Shrestha	Treasurer, Drinking water committee
15	Mr. Ram Das Shrestha	Bhimeshwor Municipality
16	Mr. Lalbahadur Khadka	Chairman,Taganagi
17	Mr. Kabindra Das Shrestha	Bhimeshwor Municipality-07, Jilu
18	Mr. Jhamak Bahadur Basnet	
19	Mr. Yadav Prasad Dahal	Bhimeshwor Municipality-10, Taganagi
20	Mr. Dhan Bahadur Chaulagain	
21	Mr. Shree Krishna Neupane	Ramkot Drinking Water
22	Mr. Gokul Prasad Neupane	Ramkot Drinking Water
23	Mr. Manbir Dhanuke	Bhimeshwor Municipality-01
24	Mr. Taranath Chaulagai	Bhimeshwor Municipality-01
25	Mr. Bal Bahadur Shrestha	Bhimeshwor Municipality-07, Jilu
26	Mr. Gyan Bahadur Shrestha	Bhimeshwor Municipality-07, Jilu
27	Mr. Upendra Bahadur Khadka	Bhimeshwor Municipality-07, Jilu
28	Mr. Kumar Chaulagain	
29	Mr. Ram Bahadur KC	
30	Mr. Ganesh Bahadur KC	
31	Mr. Birsha Bahadur Budhathoki	
32	Mr. Mandhwoj Lama	Chothang
33	Mr. Tej Bahadur Shrestha	
34	Mr. Badri Kumar Shrestha	
35	Mr. Rajan Karki	Bhimeshwor Municipality-06
36	Mr. Ram Bahadur Karki	Bhimeshwor Municipality-06
37	Mr. Kamal Bahadur Thawa	Kamal Bahadur Thawa
38	Mr. Lalit Bhujel	Lalit Bhujel… Bhimeshwor Municipality-07
39	Mr. Sangdhwoj Lama	Bhimeshwor Municipality-01
40	Mr. Harihar Prasad Neupane	Ramkot
41	Mr. Durga Prasad Kafle	Charikot Drinking Water
42	Mr. Ranga Dhwoj Budhathoki	Bhimeshwor Municipality-06
43	Mr. Ganga Bahadur Budhathoki	Bhimeshwor Municipality-06

S. No.	Name of the Participants	Designation/Address
44	Mr. Ram Sharan Thapa	Charikot Drinking Water
45	Mr. Badri Kumar Shrestha	Hattichahara

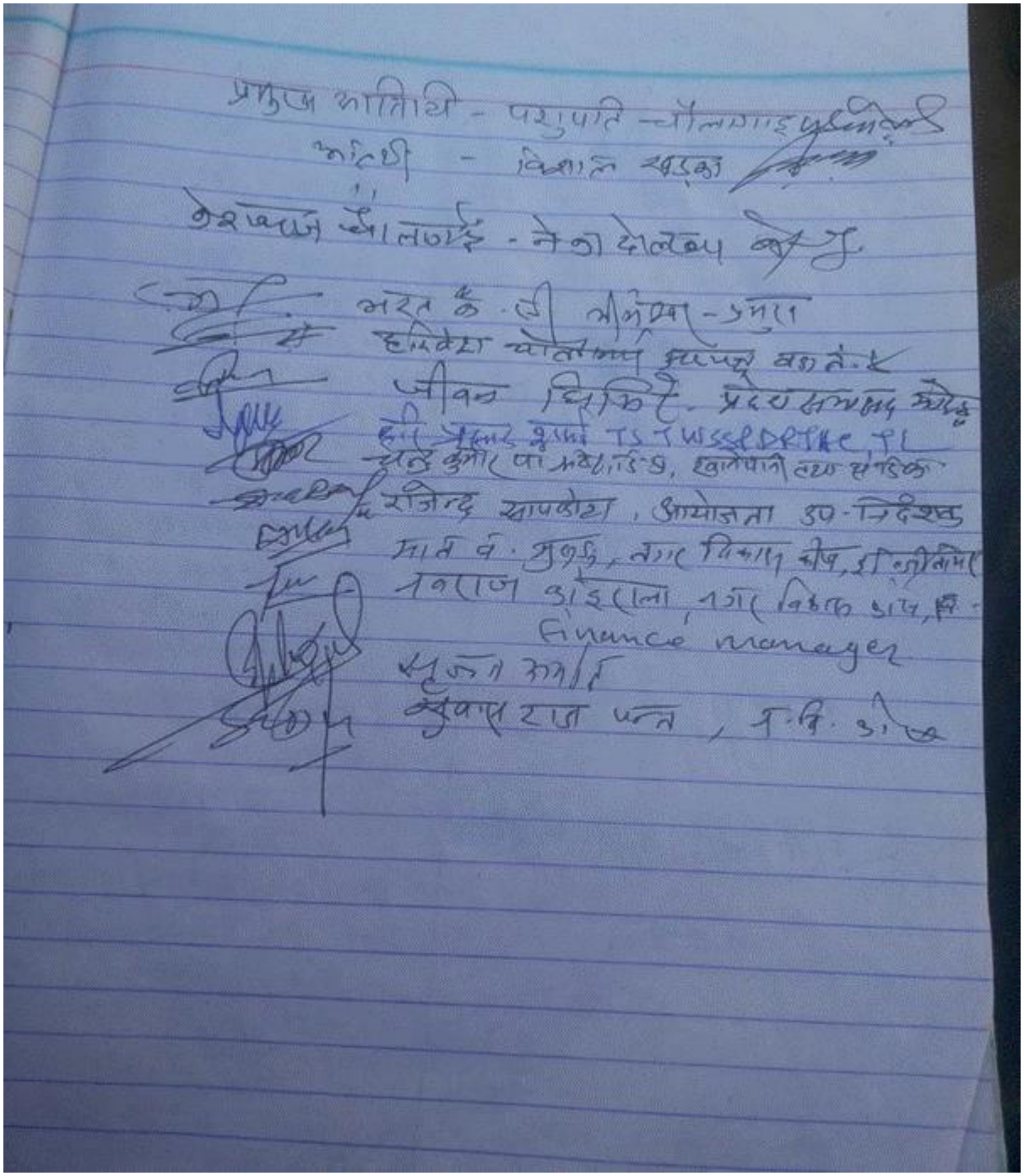
Decision 1:
It has been decided to implement TSTWSSP at the possible areas of Bhimeswore town by the unified WUSC that has been formed by the unification of Hattichhahara Manedanda WUSC and Charikot WUSC. Along with this, it has also been decided to form the joint WUSC within October 02, 2015.

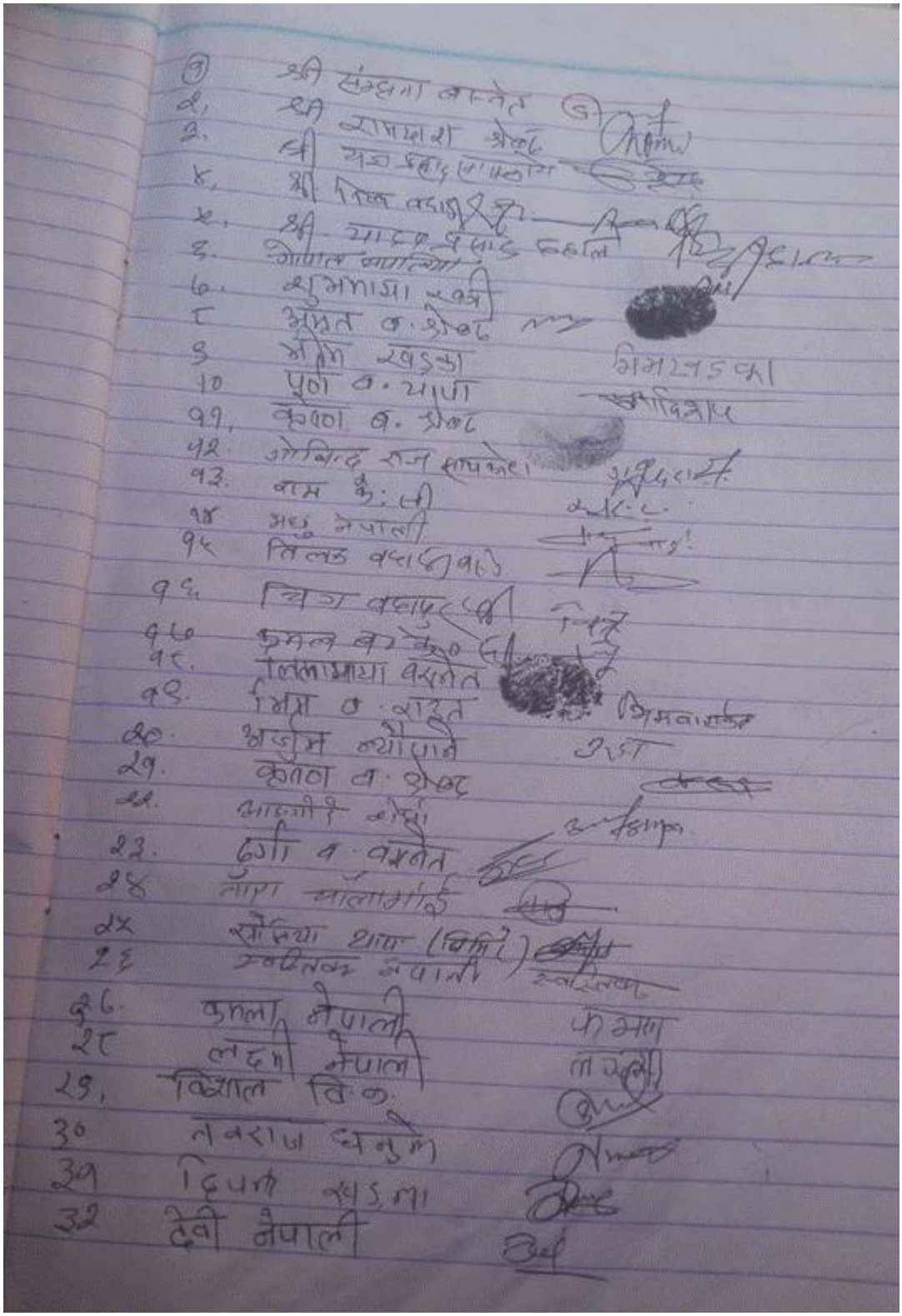
Minutes of Meeting-2

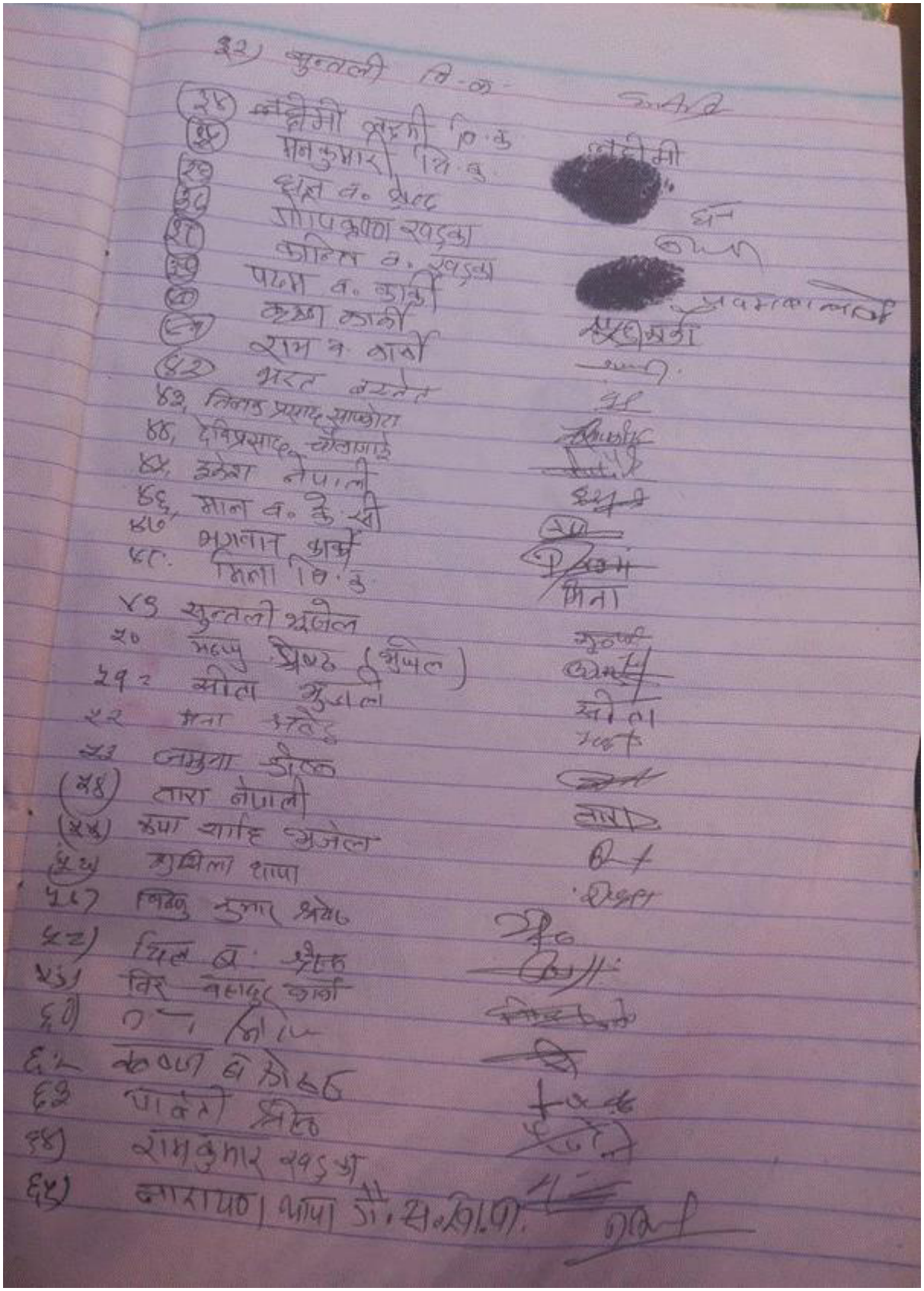

आज मिति २०६८ साल पौष २८ गतेका
दिन यस भीमेश्वर नगरपालिकाको साता
आहरी खानेपानी तथा सरसफाई आयोजना
चरिकोट खानेपानी तथा सरसफाई उपभोक्ता
संस्थाका अध्यक्ष श्री रामकृष्ण के.सी.को
अध्यक्षतामा
विस्तृत इन्जिनीयरीङ डिजाइनको
मस्यौदा प्रतिवेदन प्रस्तुतीकरण निम्न
व्यक्तिहरुको उपस्थितीमा सम्पन्न गरियो

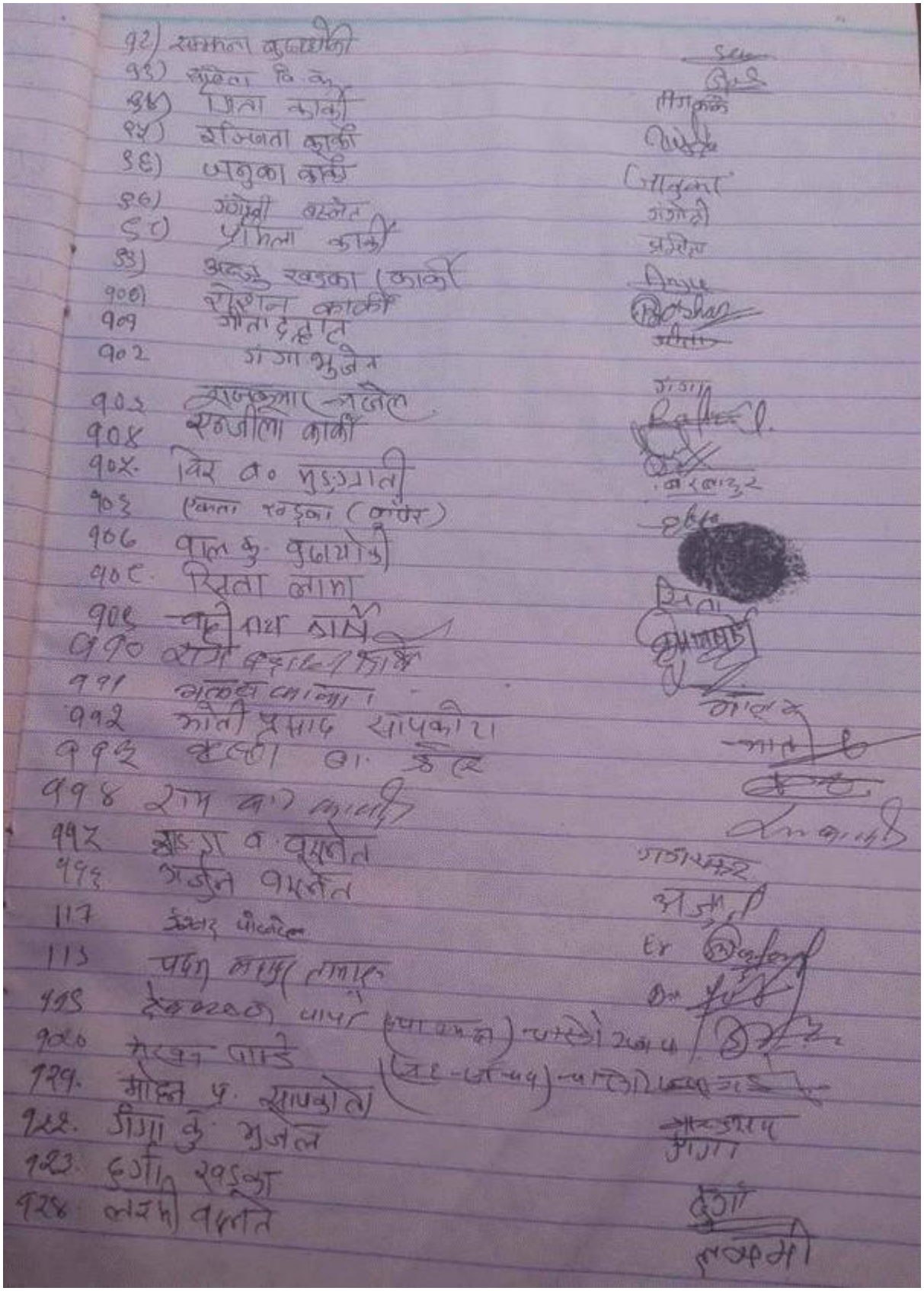
१ प्रमुख सल्लाहकार - विश्वज्योति प्रकाश मानविदलाभ
. अध्यक्ष - रामकृष्ण के.सी.
. उपाध्यक्ष - कृष्ण ब. खड्का
सचिव - ध्रुव बस्नेत
कोषाध्यक्ष - अनिता श्रेष्ठ
सदस्य - कृष्ण ब. कार्की
सदस्य - रामशरण थापा
सदस्य - मोतीप्रसाद चौलागाईं
सदस्य - कमला

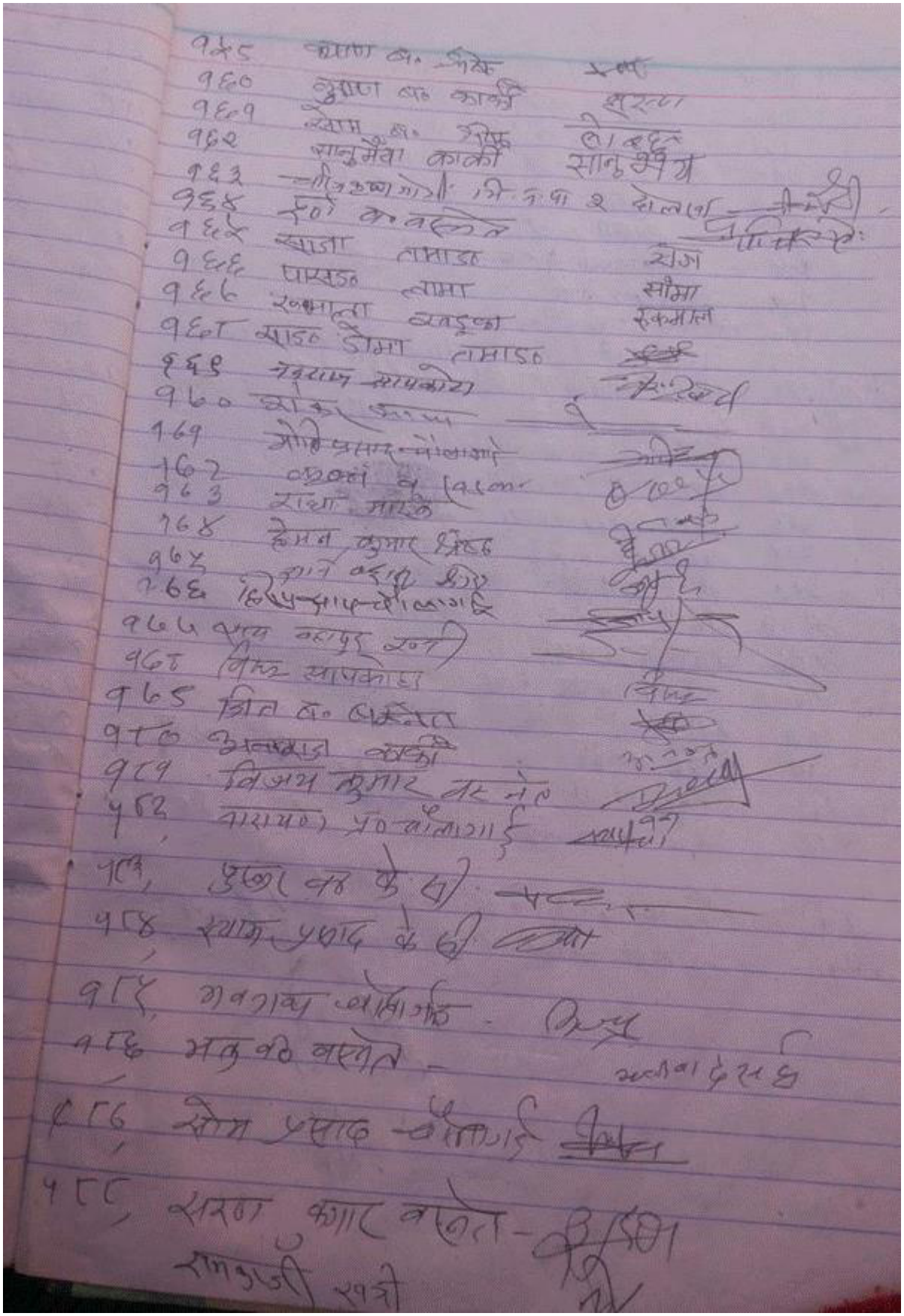
चरिकोट खानेपानी उ. समिति
अध्यक्ष - वृद्धि कुमार श्रेष्ठ
गौरीशंकर खानेपानी तथा स.उ. समिति
अध्यक्ष - नारायण ब. थापा

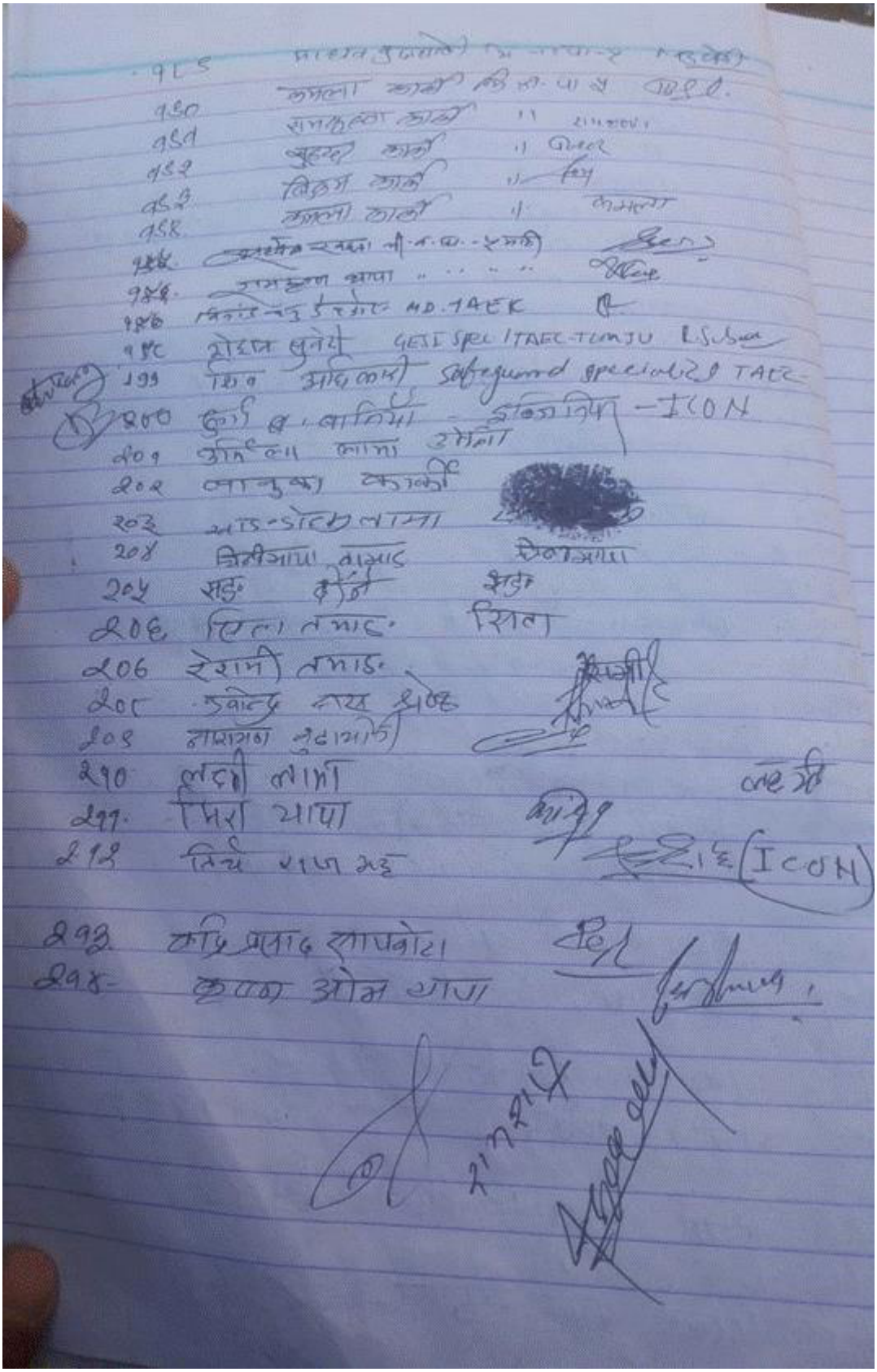












प्रस्ताव तथा निर्णयहरू

प्रस्ताव नं. १. भीमेश्वर नगरपालिका अन्तरगत तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजनाको विस्तृत इन्जिनियरिङ डिजाइनको मस्यौदा प्रतिवेदन सम्बन्धमा

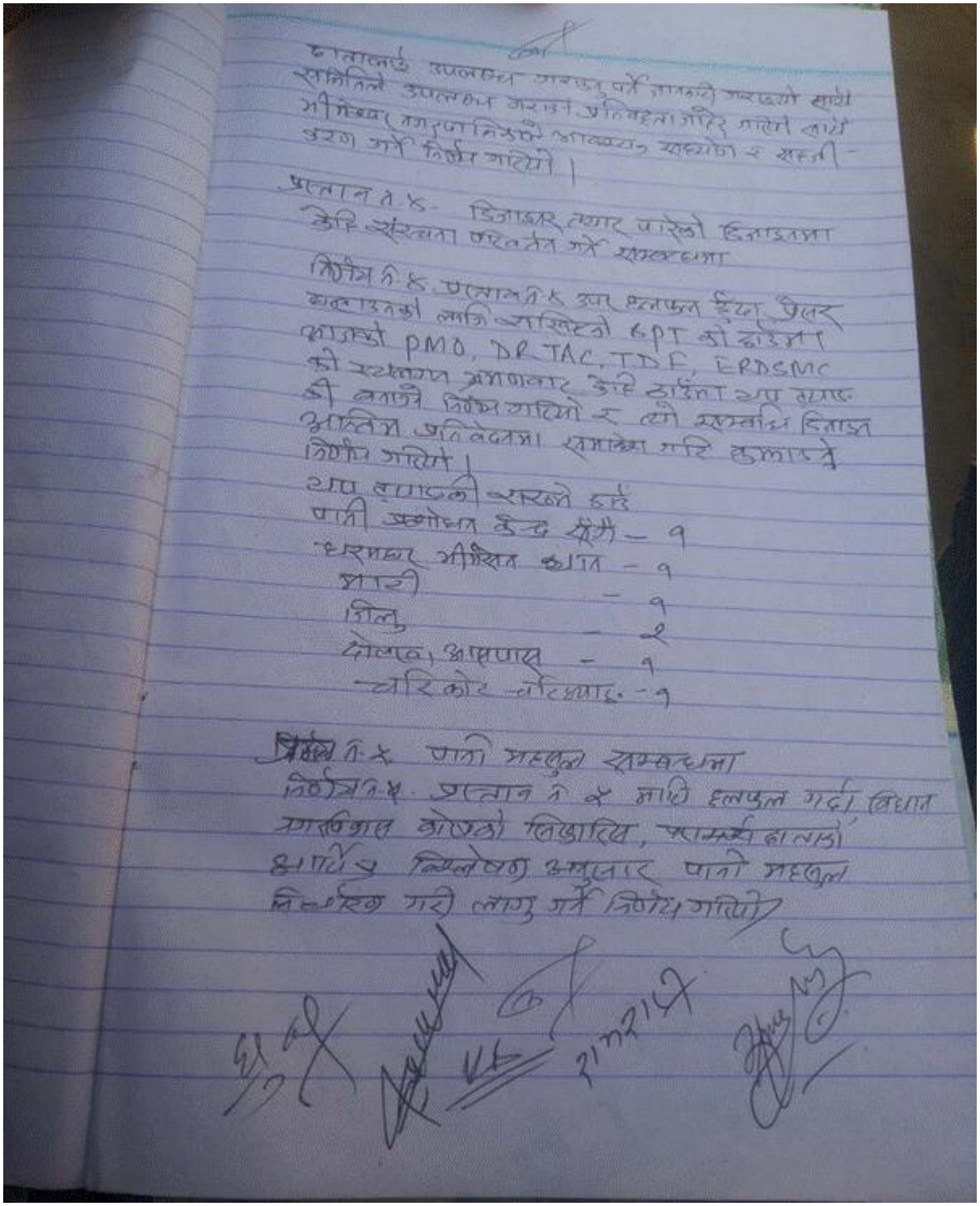
निर्णय नं १. प्रस्ताव नं १ उपर छलफल गर्दा यस भीमेश्वर नगरपालिकाको तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजनाको विस्तृत इन्जिनियरिङ डिजाइनको मस्यौदा प्रतिवेदनको प्राविधिक, सामाजिक, आर्थिक तथा वातावरणीय पक्षको प्रतिवेदन उपभोक्ता समिति, उपभोक्ताहरु, नगरपालिका, राजनैतिक दलका प्रतिनिधिहरु समेतको उपस्थितीमा प्रस्तुत गरी विस्तृत छलफल तथा निर्णय गरियो साथै ढल र [illegible] कार्यक्रमको लागि आवश्यक पूर्वाधार तयार पार्ने सम्बन्धमा छलफल तथा निर्णय गरियो।

प्रस्ताव नं २. उपभोक्ताले उठाउनु पर्ने रकम सम्बन्धमा

निर्णय नं २ प्रस्ताव नं २ उपर छलफल गर्दा भीमेश्वर नगरपालिका साना शहरी खानेपानी तथा सरसफाई आयोजनाको लागि उपभोक्ताले लगानी गर्ने तथा प्रतिबद्ध संकलित रकम उपभोक्ताले उपभोक्ता समितिको खातामा २ (दुई) महिना भित्रमा जम्मा गरी सो को बैंक भौचर बुझाउनु पर्ने निर्णय गरियो।

प्रस्ताव नं ३. प्रशोधन केन्द्र, ट्याङ्की र अन्य संरचनाहरूको लागि आवश्यक जग्गा प्राप्त गर्ने सम्बन्धमा

निर्णय नं ३ प्रस्ताव नं ३ उपर छलफल गर्दा यस आयोजना सञ्चालनको लागि आवश्यक पर्ने जग्गा प्रशोधन केन्द्र, ट्याङ्की र अन्य संरचनाहरूको लागि आवश्यक जग्गाको कागजात समितिले प्रयोग गर्न पाउने अधिकार पत्र १ महिना भित्रमा परामर्श-



English Translation of Minute of Meeting-2

On today's date January 08, 2018, detailed engineering design report presentation has been conducted under the chairmanship of Mr. Ram Krishna K.C, Chairman of Charikot WUSC in the presence of the following mentioned participants:

S. No.	Name of Participants	Designation
A.	Key Persons	
1	Mr.Bishwonidhi Prakash Man Singh Lama	Chief Guardian
2	Mr. Ram Krishna K.C	Chairman
3	Mr. Krishna Bahadur Khadka	Vice Chairman
4	Mr. Dhurba Basnet	Secretary
5	Ms. Anita Shrestha	Treasurer
6	Mr. Krishna Bahadur Karki	Member
7	Mr. Ram Sharan Thapa	Member
8	Mr.Moti Prasad Chaulagain	Member
9	Ms. Kamala	Member
10	Mr.BadrikumarShrestha	Chairman,Charikot WUSC
11	Mr Narayan BdrThapa	Chairman,Gaurishankar WUSC
B.	Chief Guest:	Mr.PasupatiChaulagain
C.	Guests	
1	Bishal Khadka	
2	Mr.KeshabrajChaulagain	Nepali Congress, Dolakha
3	Mr. Bharat K.C	Mayor, Bhimeshowar Municipality
4	Mr.Haribamsa Chaulagain	Chairman Ward no.4
5	Mr.JeevanGhimire	State Member Morang
6	Mr.Hariprasad Sharma	DRTAC/TSTWSSSP
7	Mr. Chandra Kumar	DE, District Water Supply and Sanitation Office,Charkiot
8	Mr.RajendraSapkota	Deputy Project Director TSTWSSSP
9	Mr. Man Bahadur Gurung	Engineer, TDF
10	Mr.Nawaraj Koirala	Financial Manager TDF
11	Mr. Sirjan Aryal	Design Engineer
12	Mr.Subas Raj Panta	TDF
13	Mr. Binod Chandra Devkota	MD, TAEC
14	Mr. Roshan Subedi	GESI Specialist, TAEC ICON JV
15	Mr. Shiva Adhikari	Safeguard Specialist, TAEC
16	Mr. Durga Bahadur Baniya	Engineer, ICON
D.	Other Participants:	
1	Ms.Samjhana Basnet	
2	Mr. Ram Das Shrestha	

S. No.	Name of Participants	Designation
3	Mr.Yagya Prasad Sapkota	
4	Mr. Nil Bahadur	
5	Mr.Yadav Prasad Dahal	
6	Mr Gopal Thapaliya	
7	Ms. Subha Maya Khatri	
8	Mr. Amrit Bahadur Shrestha	
9	Mr.Bhim Khadka	
10	Mr.Purna Bahadur Thapa	
11	Mr. Krishna Bahadur Shrestha	
12	Mr.Govinda Raj Sapkota	
13	Mr. Ram K.C	
14	Mr.Madhu Nepali	
15	Mr. Tilak Bahadur Basnet	
16	Mr.Chitra Bahadur	
17	Mr. Kamal Bahadur K.C	
18	Ms.Lila Maya Basnet	
19	Mr. Bhim Bahadur Raut	
20	Mr. Arjun Neupane	
21	Mr. Krishna Bahadur Shrestha	
22	Mr. Angore Sherpa	
23	Mr. Durga Bahadur Basnet	
24	Ms Tara Chaulagain	
25	Ms. Soniya Thapa (Ghimire)	
26	Mr.Swostik Nepali	
27	Ms. Kamala Nepali	
28	Ms. Laxmi Nepali	
29	Mr. Bishal B.K	
30	Mr.Nawaraj Dhanume	
31	Mr. Deepak Khadka	
32	Ms. Devi Nepali	
33	Ms. Suntali B.K.	
34	Ms. Laxmi B. K.	
35	Ms. Mankumari B.K.	
36	Mr. Dhan Bahadur Shrestha	
37	Mr. Gopi Krishna Khadka	
38	Mr. Kanti Bahadur Khadka	
39	Mr. Padam Bahadur Karki	
40	Mr. Krishna Karki	
41	Mr. Ram Bahadur Karki	
42	Mr. Bharat Basnet	
43	Mr. Tilak Prasad Sapkota	
44	Mr. Devi Prasad Chaulagain	
45	Mr. Mukesh Nepali	

S. No.	Name of Participants	Designation
46	Mr. Man Bahadur K.C.	
47	Mr. Bhagwan Karki	
48	Ms. Meena B.K.	
49	Ms. Suntali Bhujel	
50	Ms. Manju Shrestha (Bhujel)	
51	Ms. Sita Bhujel	
52	Ms. Muna Shrestha	
53	Ms. Jamuna Shrestha	
54	Ms. Tara Nepali	
55	Ms. Rupa Shahi Bhujel	
56	Ms. Sushila Thapa	
57	Mr. Bishnu Kumar Shrestha	
58	Mr. Dil Bahadur Shrestha	
59	Mr. Bir Bahadur Karki	
60	Mr. Krishna Bahadur Shrestha	
61	Ms. Parbati Shrestha	
62	Mr. Ram Kumar Khadka	
63	Mr. Narayan Thapa	
64	Ms. Samjhana Budhathoki	
65	Ms. Sabita B.K.	
66	Ms. Gita Karki	
67	Ms. Ranjita Karki	
68	Ms. Januka Karki	
69	Ms. Gangotri Basnet	
70	Ms. Pramila Karki	
71	Ms. Anju Khadka (Karki)	
72	Mr. Roshan Karki	
73	Ms. Geeta Dahal	
74	Ms. Ganga Bhujel	
75	Mr. Rajkumar Bhujel	
76	Ms. Anjila Karki	
77	Mr. Bir Bahadur Mungranti	
78	Ms. Ekta Khadka (Kunwar)	
79	Mr. Bal Kumar Budhathoki	
80	Ms. Sita Lama	
81	Mr. Badri Nath Karki	
82	Mr. Ram Bahadur Shrestha	
83	Mr. Bhakta Bahadur	
84	Mr. Moti Prasad Sapkota	
85	Mr. Krishna Bahadur Shrestha	
86	Mr. Ram Bahadur Karki	
87	Mr. Ganga Bahadur Basnet	
88	Mr. Arjun Basnet	

S. No.	Name of Participants	Designation
89	Mr. Ishwor Pokhrel	
90	Mr. Padam Bahadur Tamang	
91	Mr. Dev Krishna Thapa	
92	Mr. Roshan Pandey	
93	Mr. Mohan Prasad Sapkota	
94	Mr. Ganga Kumar Bhujel	
95	Mr. Durga Khadka	
96	Ms. Laxmi Basnet	
97	Mr. Krishna Bahadur Shrestha	
98	Mr. Krishna Bahadur Karki	
99	Mr. Som Bahadur Shrestha	
100	Ms. Sanu Maya Karki	
101	Mr. Charitra Krishna Joshi	
102	Mr. Purna Bahadur Basnet	
103	Mr. Saja Tamang	
104	Mr. Pasang Tamang	
105	Ms. Rumala Khadka	
106	Ms. Sang Doma Tamang	
107	Mr. Nawaraj Sapkota	
108	Mr. Shankar Thapa	
109	Mr. Moti Prasad Chaulagain	
110	Mr. Krishna Bahadur Khadka	
111	Ms. Radha Maskey	
112	Mr. Heman Kumar Shrestha	
113	Mr. Gyan Bahadur Shrestha	
114	Mr. Hiru Prasad Chaulagain	
115	Mr. Ram Bahadur Khatri	
116	Mr. Bishwo Sapkota	
117	Mr. Jeet Bahadur Basnet	
118	Mr. Araj Karki	
119	Mr. Bijaya Kumar Basnet	
120	Mr. Narayan Prasad Chaulagain	
121	Mr. Puskar Bahadur K.C.	
122	Mr. Shyam Prasad K.C.	
123	Mr. Bhawanath Chaulagain	
124	Mr. Bhakta Bahadur Basnet	
125	Mr. Som Prasad Chaulagain	
126	Mr. Saran Kumar Basnet	
127	Mr. Ram Kaji Khatri	
128	Mr. Madhav Budhathoki	
129	Ms. Kamala Karki	
130	Mr. Ram Krishna Karki	
131	Mr. Bikram Karki	

S. No.	Name of Participants	Designation
132	Ms. Kamala Karki	
133	Mr. Ram Krishna Thapa	
134	Ms. Urmila Lama	
135	Ms. Januka Karki	
136	Ms. Sang Dolma Lama	
137	Ms. Chini Maya Tamang	
138	Mr. Sang Dorje	
139	Ms. Sita Tamang	
140	Ms. Reshami Tamang	
141	Mr. Kabindra Das Shrestha	
142	Mr. Narayan Budhathoki	
143	Ms. Laxmi Lama	
144	Ms. Meera Thapa	
145	Mr. Tirtha Raj Bhatta	
146	Mr. Badri Prasad Sapkota	
147	Mr.Krishna Om Thapa	

Proposals & Decisions:

Proposal 1: Regarding the detailed engineering design report presentation

Decision for Proposal 1: Regarding the proposal 1, detailed discussion has been held in regard to the presentation of the detailed engineering design report including technical, social, economic and environmental aspects and It has also been decided to prepare required infrastructures for sewerage & waste management of the proposed town.

Proposal 2: Regarding the upfront cash collection from local user

Decision for Proposal 1: As per discussion on the proposal 2, it has been decided that WUSC will invest for the proposed project and the water supply users have to deposit amount for O & M fund in bank account of WUSC within two months and to submit bank voucher.

Proposal 3: Regarding the land availability for treatment plant, reservoirs and other components

Decision for Proposal 3: As per discussion on the proposal 3, it has been decided to provide the letter of authority of WUSC to use the necessary documents of the required land of the proposed components to the consultant within 1 month. Along with this, WUSC committed to provide the said letter of authority to the consultant and Bhimsewore Municipality decided to provide necessary support and fluency.

Proposal 4: Regarding some changes in the structures that has been proposed in the detailed design

Decision for Proposal 4: As per discussion on the proposal 4 and as per the field visit conducted by PMO, DRTAC, TDF and ERDSMC, it has been decided to replace BPT that

has been proposed to lower the pressure, by some additional reservoirs at various locations and the design regarding these additional components to be submitted in final presentation.

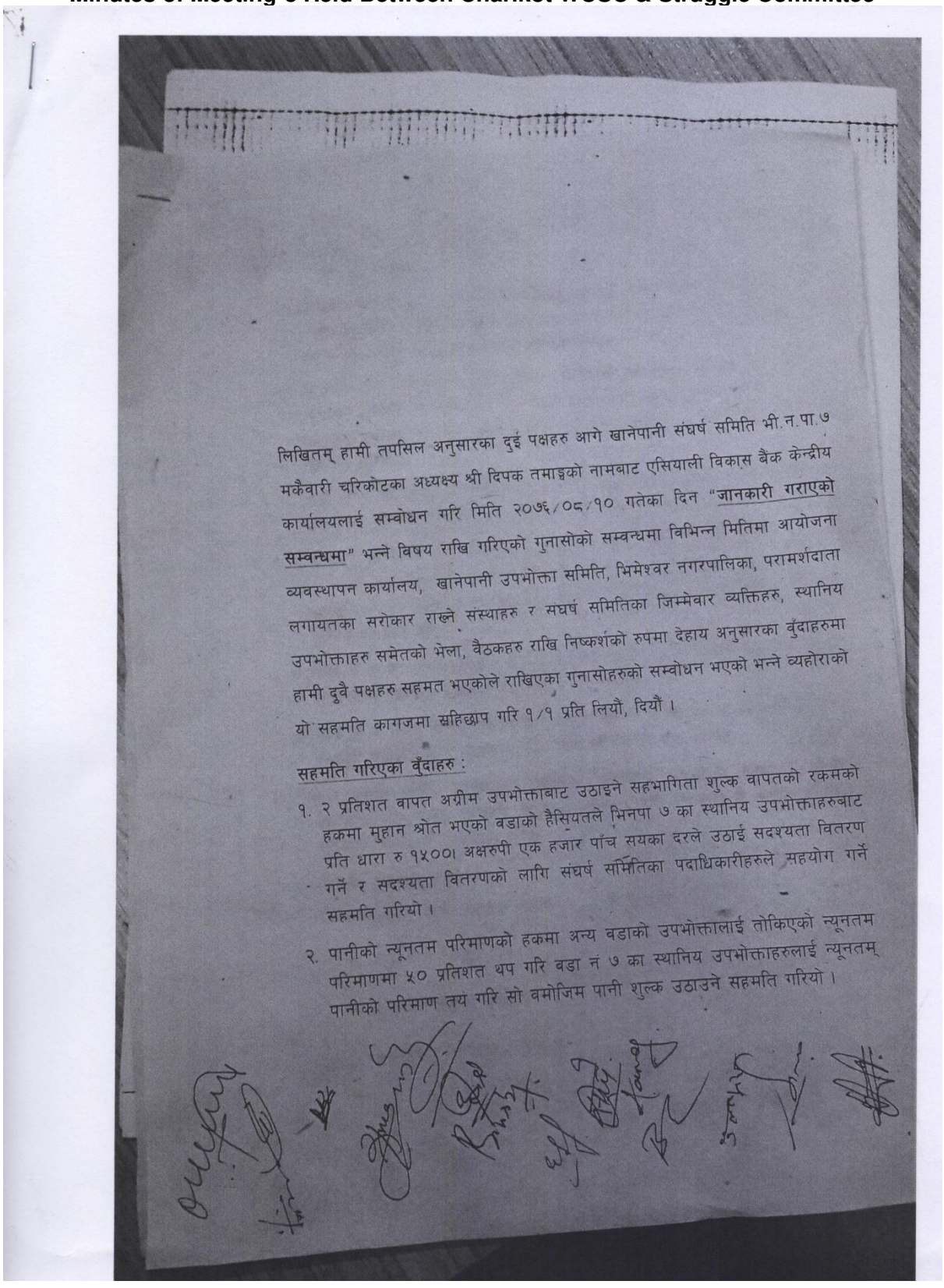
Proposed locations of additional reservoirs:

Near WTP- 1 no.
Dharamghar Bhimsenthan- 1 no.
Matti-1 no.
Jillu-2 nos.
Around Dolakha-1 no.
Charikot Charighyang-1 no.

Proposal 5: Regarding monthly water tariffs

Decision for Proposal 5: As per discussion on the proposal 5, it has been decided to fix the monthly water tariff under the recommendation of TDF and as per the financial & economic analysis of the consultant.

Minutes of Meeting-3 Held Between Charikot WUSC & Struggle Committee

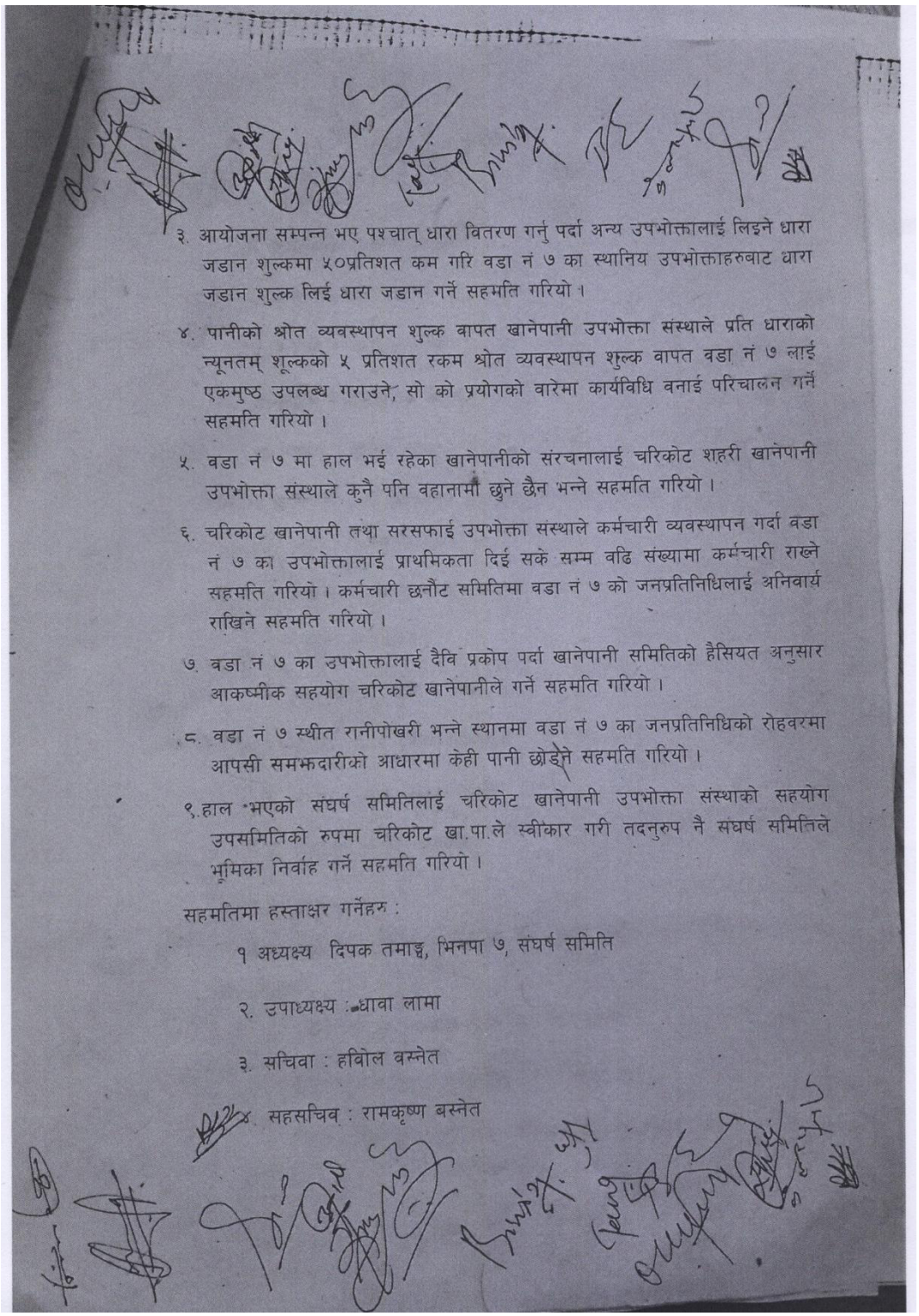


लिखितम् हामी तपसिल अनुसारका दुई पक्षहरु आगे खानेपानी संघर्ष समिति भी.न.पा.७ मकैवारी चरिकोटका अध्यक्ष्य श्री दिपक तमाङको नामबाट एसियाली विकास बैंक केन्द्रीय कार्यालयलाई सम्बोधन गरि मिति २०७६/०८/१० गतेका दिन "जानकारी गराएको सम्बन्धमा" भन्ने विषय राखि गरिएको गुनासोको सम्बन्धमा विभिन्न मितिमा आयोजना व्यवस्थापन कार्यालय, खानेपानी उपभोक्ता समिति, भिमेश्वर नगरपालिका, परामर्शदाता लगायतका सरोकार राख्ने संस्थाहरु र संघर्ष समितिका जिम्मेवार व्यक्तिहरु, स्थानिय उपभोक्ताहरु समेतको भेला, वैठकहरु राखि निष्कर्शको रुपमा देहाय अनुसारका वुँदाहरुमा हामी दुवै पक्षहरु सहमत भएकोले राखिएका गुनासोहरुको सम्बोधन भएको भन्ने व्यहोराको यो सहमति कागजमा सहिछाप गरि १/१ प्रति लियौं, दियौं ।

सहमति गरिएका वुँदाहरु :

१. २ प्रतिशत वापत अग्रीम उपभोक्ताबाट उठाइने सहभागिता शुल्क वापतको रकमको हकमा मुहान श्रोत भएको वडाको हैसियतले भिनपा ७ का स्थानिय उपभोक्ताहरुबाट प्रति धारा रु १५००। अक्षरुपी एक हजार पाँच सयका दरले उठाई सदश्यता वितरण गर्ने र सदश्यता वितरणको लागि संघर्ष समितिका पदाधिकारीहरुले सहयोग गर्ने सहमति गरियो ।

२. पानीको न्यूनतम परिमाणको हकमा अन्य वडाको उपभोक्तालाई तोकिएको न्यूनतम परिमाणमा ५० प्रतिशत थप गरि वडा नं ७ का स्थानिय उपभोक्ताहरुलाई न्यूनतम् पानीको परिमाण तय गरि सो वमोजिम पानी शुल्क उठाउने सहमति गरियो ।



३. आयोजना सम्पन्न भए पश्चात् धारा वितरण गर्नु पर्दा अन्य उपभोक्तालाई लिइने धारा जडान शुल्कमा ५०प्रतिशत कम गरि वडा नं ७ का स्थानिय उपभोक्ताहरुबाट धारा जडान शुल्क लिई धारा जडान गर्ने सहमति गरियो ।

४. पानीको श्रोत व्यवस्थापन शुल्क वापत खानेपानी उपभोक्ता संस्थाले प्रति धाराको न्यूनतम् शूल्कको ५ प्रतिशत रकम श्रोत व्यवस्थापन शुल्क वापत वडा नं ७ लाई एकमुष्ठ उपलब्ध गराउने, सो को प्रयोगको वारेमा कार्यविधि वनाई परिचालन गर्ने सहमति गरियो ।

५. वडा नं ७ मा हाल भई रहेका खानेपानीको संरचनालाई चरिकोट शहरी खानेपानी उपभोक्ता संस्थाले कुनै पनि वहानामा छुने छैन भन्ने सहमति गरियो ।

६. चरिकोट खानेपानी तथा सरसफाई उपभोक्ता संस्थाले कर्मचारी व्यवस्थापन गर्दा वडा नं ७ का उपभोक्तालाई प्राथमिकता दिई सके सम्म वढि संख्यामा कर्मचारी राख्ने सहमति गरियो । कर्मचारी छनौट समितिमा वडा नं ७ को जनप्रतिनिधिलाई अनिवार्य राखिने सहमति गरियो ।

७. वडा नं ७ का उपभोक्तालाई दैवि प्रकोप पर्दा खानेपानी समितिको हैसियत अनुसार आकष्मीक सहयोग चरिकोट खानेपानीले गर्ने सहमति गरियो ।

८. वडा नं ७ स्थीत रानीपोखरी भन्ने स्थानमा वडा नं ७ का जनप्रतिनिधिको रोहवरमा आपसी समझदारीको आधारमा केही पानी छोड्ने सहमति गरियो ।

९.हाल भएको संघर्ष समितिलाई चरिकोट खानेपानी उपभोक्ता संस्थाको सहयोग उपसमितिको रुपमा चरिकोट खा.पा.ले स्वीकार गरी तदनुरुप नै संघर्ष समितिले भूमिका निर्वाह गर्ने सहमति गरियो ।

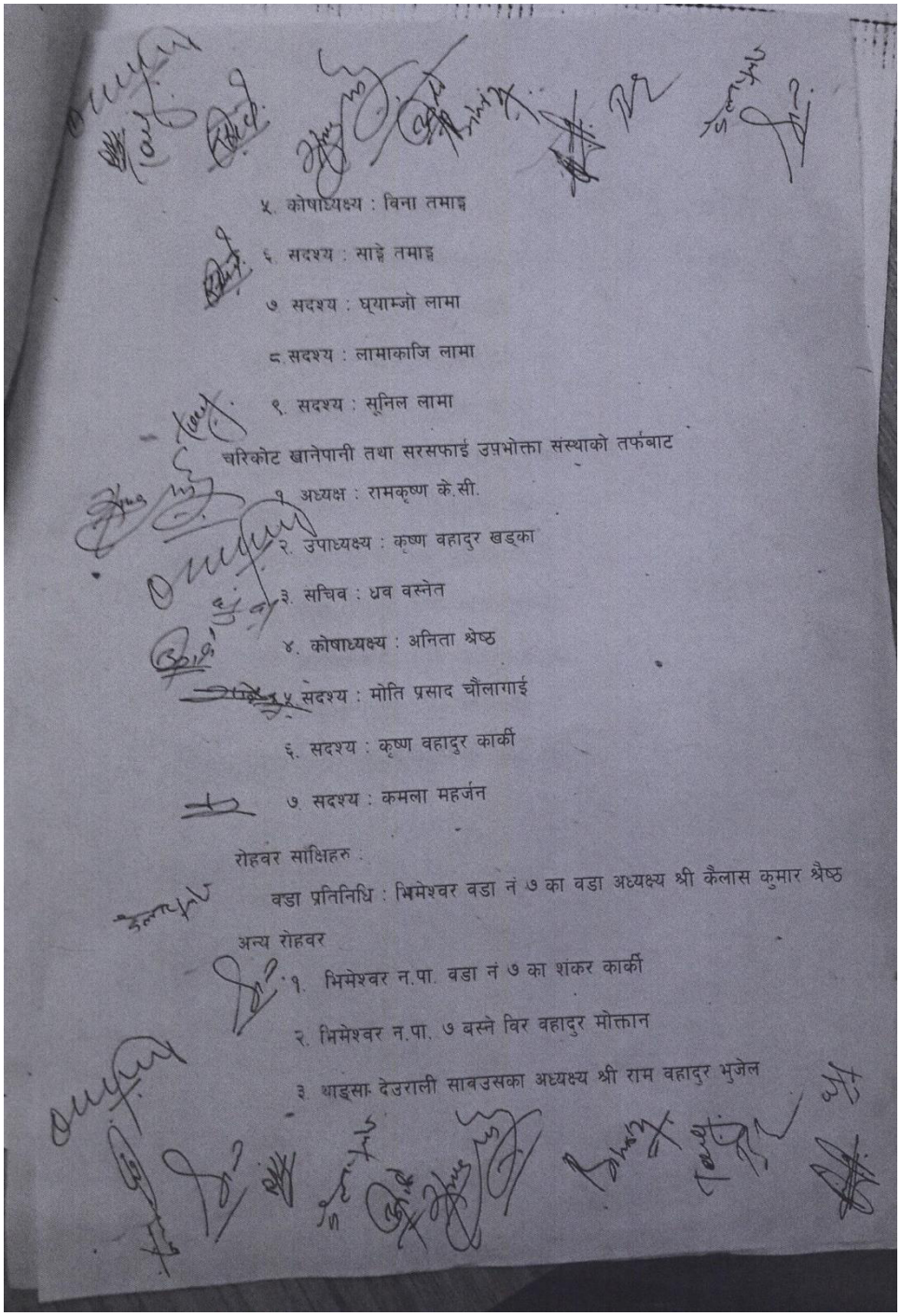
सहमतिमा हस्ताक्षर गर्नेहरु :

१ अध्यक्ष्य दिपक तमाङ्ग, भिनपा ७, संघर्ष समिति

२. उपाध्यक्ष्य : धावा लामा

३. सचिवा : हविोल वस्नेत

४. सहसचिव : रामकृष्ण बस्नेत



५. कोषाध्यक्ष : विना तमाङ

६. सदश्य : साङे तमाङ

७. सदश्य : घ्याम्जो लामा

८.सदश्य : लामाकाजि लामा

९. सदश्य : सुनिल लामा

चरिकोट खानेपानी तथा सरसफाई उपभोक्ता संस्थाको तर्फबाट

१. अध्यक्ष : रामकृष्ण के.सी.

२. उपाध्यक्ष : कृष्ण वहादुर खड्का

३. सचिव : धव वस्नेत

४. कोषाध्यक्ष : अनिता श्रेष्ठ

५. सदश्य : मोति प्रसाद चौलागाई

६. सदश्य : कृष्ण वहादुर कार्की

७. सदश्य : कमला महर्जन

रोहवर साक्षिहरु :

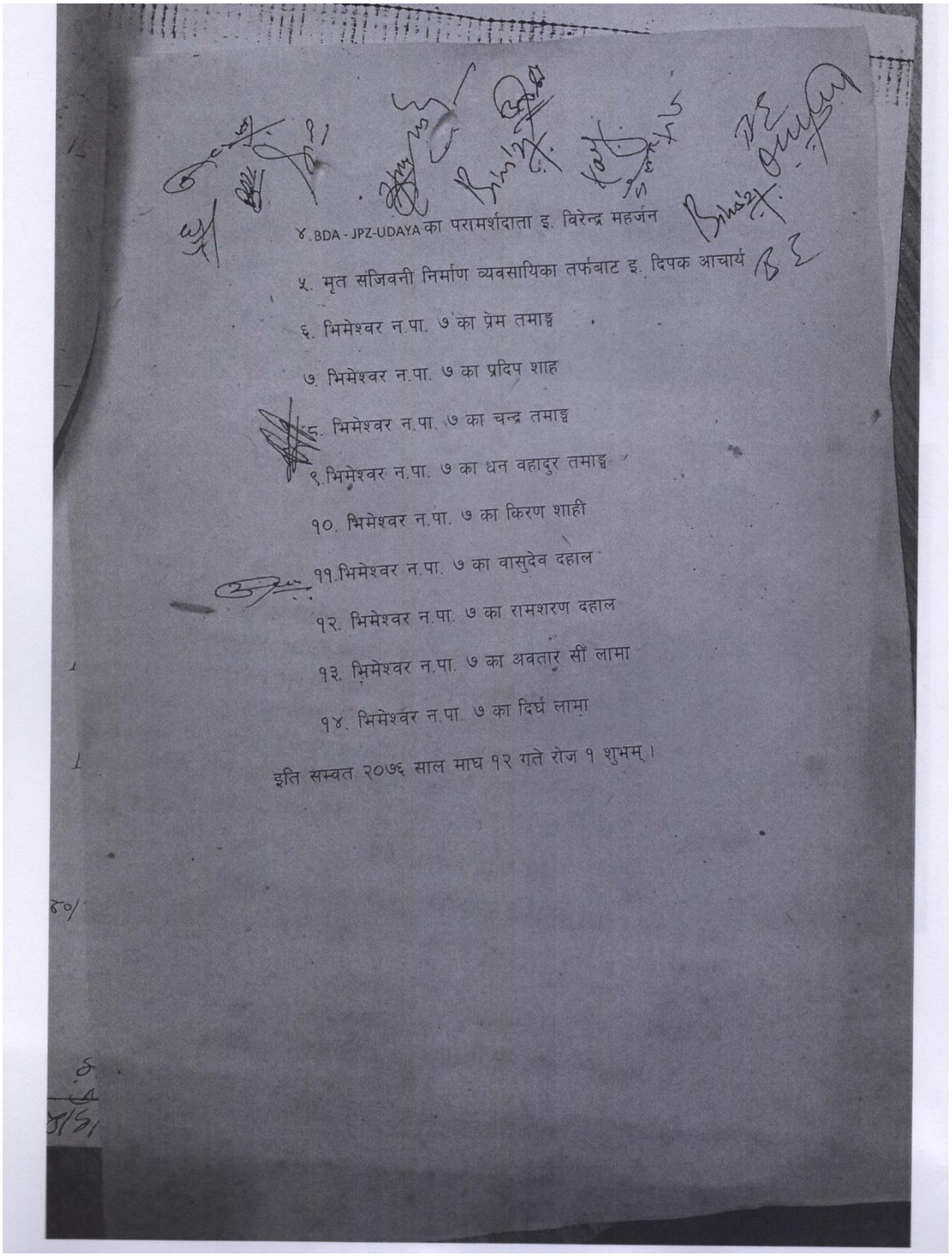
वडा प्रतिनिधि : भिमेश्वर वडा नं ७ का वडा अध्यक्ष श्री कैलास कुमार श्रेष्ठ

अन्य रोहवर

१. भिमेश्वर न.पा. वडा नं ७ का शंकर कार्की

२. भिमेश्वर न.पा. ७ बस्ने विर वहादुर मोक्तान

३. थाङ्सा देउराली साबउसका अध्यक्ष श्री राम वहादुर भुजेल



४. BDA - JPZ-UDAYA का परामर्शदाता इ. विरेन्द्र महर्जन

५. मृत संजिवनी निर्माण व्यवसायिका तर्फबाट इ. दिपक आचार्य

६. भिमेश्वर न.पा. ७ का प्रेम तमाङ्ग

७. भिमेश्वर न.पा. ७ का प्रदिप शाह

८. भिमेश्वर न.पा. ७ का चन्द्र तमाङ्ग

९. भिमेश्वर न.पा. ७ का धन वहादुर तमाङ्ग

१०. भिमेश्वर न.पा. ७ का किरण शाही

११. भिमेश्वर न.पा. ७ का वासुदेव दहाल

१२. भिमेश्वर न.पा. ७ का रामशरण दहाल

१३. भिमेश्वर न.पा. ७ का अवतार सीं लामा

१४. भिमेश्वर न.पा. ७ का दिर्घ लामा

इति सम्वत २०७६ साल माघ १२ गते रोज १ शुभम् ।

English Translation of Minutes of Meeting held between Charikot WUSC and Struggle Committee

In regard to the complaint lodged by Mr. Deepak Tamang, Chairman of Water Supply Struggle Committee, Bhimeswore Municipality-7, Makaibari, Charikot, addressed in the name of ADB, Head Office on the day of November 26, 2019 " with subject that states **"In relation to the Information Provided"** , we both parties have signed on this agreement paper that includes explicit information that states that the complaint lodged has been addressed as we, both parties have provided consent to the following mentioned points as conclusion from the gatherings and meetings held on various dates that comprises PMO, WUSC, Bhimeswore Municipality, Consultant including concerned organizations & accountable persons of Struggle committee and Local Users.

Agreed Points:

1. In favor of 2% as upfront contribution fees collected from the beneficiaries, Ward no. 7 being the location of the proposed source, agreement has been made to provide membership by collecting Rs 1500 per each household connection from the local users of ward no. 7 of Bhimeswore Municipality and it has also been agreed to provide support by the members of Struggle Committee for the provision of membership.
2. Agreement has been made to fix minimum water quantity to be provided to the local users of ward no. 7 by adding 50% more in the minimum water quantity allocated to the users of other wards and to collect water tariffs accordingly.
3. It has been agreed to minimize the fees of tap connection by 50% for the local users of ward no. 7 in comparison to the connection fees of users of other wards after the completion of the project.
4. 5% of minimum tap connection fee as source management fee has been agreed to be made available in lump sum, to ward no. 7 and to prepare work procedure regarding its use and to mobilize it accordingly.
5. It has been agreed not to interfere the existing water supply components placed at ward no.7 at any cost by Charikot WUSC.
6. At the time of management of employee by Charikot WUSC, it has been agreed to prioritize users of ward no. 7 and to employ large number of staffs as much as possible. It has also been agreed to compulsorily appoint local representative of ward no. 7 in Staff Selection Committee.
7. It has been agreed to provide emergency aid to the users of ward no. 7 by Charikot WUSC as per their status, if any event of natural calamities occurs.
8. It has been agreed to provide water to the place named Ranipokhari situated at ward no.7 in the presence of local representative of ward no. 7 as witness on the basis of mutual understanding.
9. It has been agreed to accept the existing Struggle committee as Support Subcommittee of Charikot WUSC and to play role by the Struggle committee accordingly.

Agreement Signed By:

On the behalf of Struggle Committee:

1. Chairman, Mr. Deepak Tamang, Bhimeswore Municipality-7
2. Vice Chairman, Mr. Dhava Lama
3. Secretary, Mr. Haribol Basnet
4. Assistant Secretary, Mr. Ram Krishna Basnet

5. Treasurer, Ms. Bina Tamang
6. Member, Mr. Sange Tamang
7. Member, Mr. Ghyamjo Lama
8. Member, Mr. Lama Kaji Lama
9. Member, Mr. Sunil Lama

On the behalf of Charikot WUSC:

1. Chairman: Ram Krishna K.C.
2. Vice Chairman: Mr. Krishna Bahadur Khadka
3. Secretary: Mr. Dhruba Basnet
4. Treasurer: Ms. Anita Shrestha
5. Member: Mr. Moti Prasad Chaulagain
6. Member: Mr. Krishna Bahadur Karki
7. Member: Ms. Kamala Maharjan

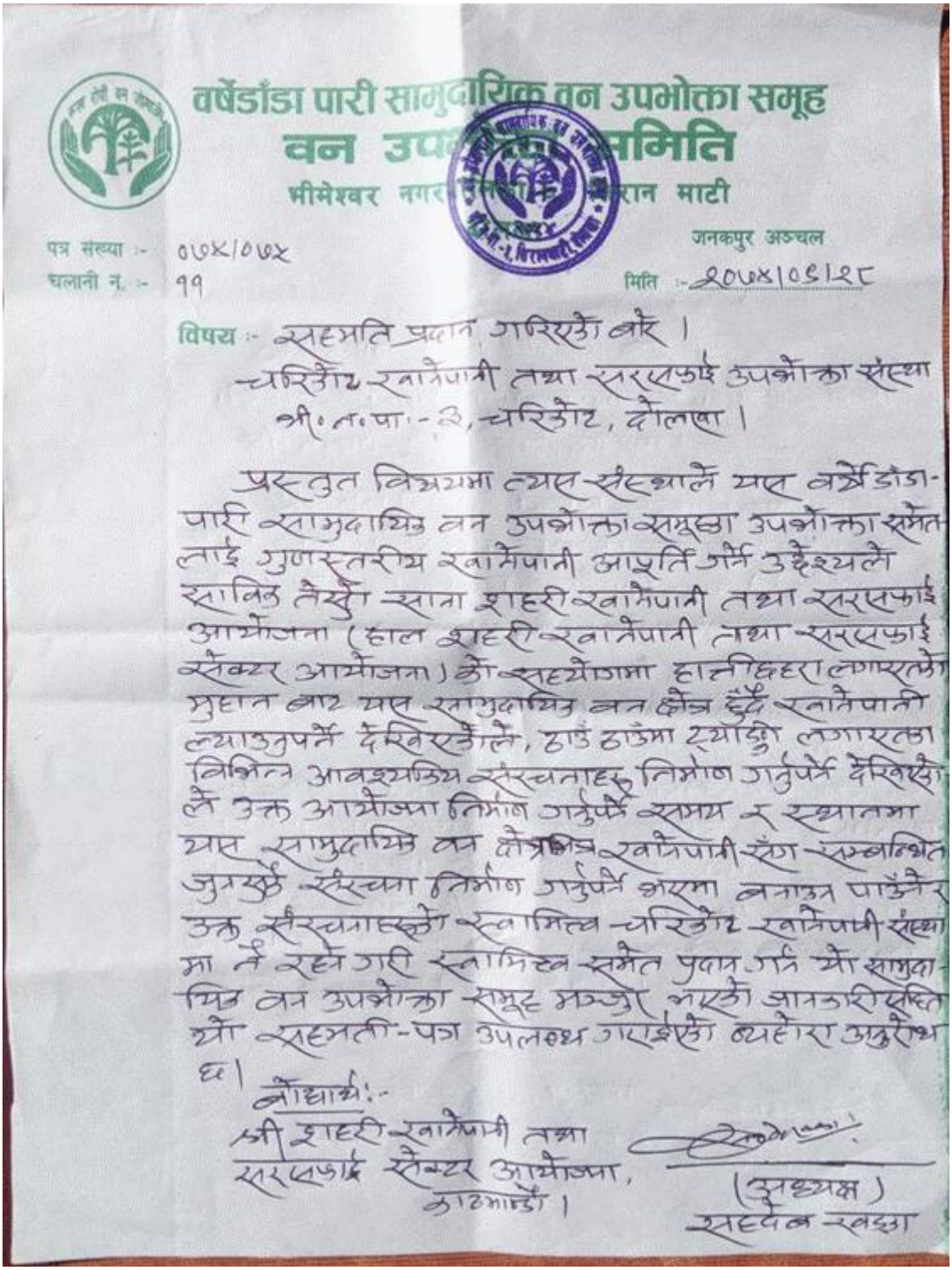
Eye Witness:

Ward Representative: Chairman of Bhimeswore Municipality Ward no. 7, Mr. Kailash Kumar Shrestha

Other Witnesses:

1. Mr. Shankar Karki, Ward no. 7, Bhimeswore Municipality
2. Mr. Bir Bahadur Moktan, Ward no.7, , Bhimeswore Municipality
3. Mr. Ram Kumar Bhujel, Chairman of Thangsa Deurali
4. Er. Birendra Maharjan, BDA-JPZ-UDAYA
5. Er. Deepak Acharya, Mrita Sanjivani Construction Company
6. Mr. Prem Tamang, Ward no. 7, Bhimeswore Municipality
7. Mr. Pradeep Shah, Ward no. 7, Bhimeswore Municipality
8. Mr. Chandra Tamang, Ward no. 7, Bhimeswore Municipality
9. Mr. Dhana Bahadur Tamang, Ward no. 7, Bhimeswore Municipality
10. Mr. Kiran Shahi, Ward no. 7, Bhimeswore Municipality
11. Mr. Basudev Dahal, Ward no. 7, Bhimeswore Municipality
12. Mr. Ramsharan Dahal, Ward no. 7, Bhimeswore Municipality
13. Mr. Avatar Singh Lama, Ward no. 7, Bhimeswore Municipality
14. Mr. Dirgha Lama, Ward no. 7, Bhimeswore Municipality

NO OBJECTION LETTER



वर्षेडाँडा पारी सामुदायिक वन उपभोक्ता समूह
वन उप[illegible] समिति
भीमेश्वर नगर[illegible] [illegible]रान माटी

पत्र संख्या :- ०७४/०७२
चलानी नं. :- ११

जनकपुर अञ्चल
मिति :- २०७४/०६/२८

विषय :- सहमति प्रदान गरिएको बारे ।

चरिकोट स्वास्थ्य तथा सरसफाई उपभोक्ता संस्था
श्री ५ पा-३, चरिकोट, दोलखा ।

प्रस्तुत विषयमा त्यस संस्थाले यस वर्षेडाँडा-पारी सामुदायिक वन उपभोक्ता समूहा उपभोक्ता समेत लाई गुणस्तरीय स्वास्थ्यपानी आपूर्ति गर्ने उद्देश्यले साविक जैसी खानेपानी तथा सरसफाई आयोजना (हाल शहरी स्वास्थ्यपानी तथा सरसफाई सेक्टर आयोजना) को सहयोगमा हात्तिछहरा लगायतको पुहान बाट यस सामुदायिक वन क्षेत्र हुँदै स्वास्थ्यपानी ल्याउनुपर्ने देखिएकोले, ठाउँ ठाउँमा ट्यांकी लगायतका विभिन्न आवश्यकिय संरचनाहरु निर्माण गर्नुपर्ने देखिएको ले उक्त आयोजना निर्माण गर्नुपर्ने समय र स्थानमा यस सामुदायिक वन क्षेत्रभित्र स्वास्थ्यपानी संग सम्बन्धित जुनसुकै संरचना निर्माण गर्नुपर्ने भएमा बनाउन पाउने र उक्त संरचनाहरुको स्वामित्व चरिकोट स्वास्थ्यपानी संस्था मा नै रहने गरी स्वामित्व समेत प्रदान गर्ने यो सामुदायिक वन उपभोक्ता समूह मञ्जुर भएको जानकारी दिंदै यो सहमती-पत्र उपलब्ध गराईएको व्यहोरा अनुरोध छ ।

बोधार्थ:-
श्री शहरी स्वास्थ्यपानी तथा
सरसफाई सेक्टर आयोजना,
ललितपुर ।

(अध्यक्ष)
[illegible]

No Objection Letter from Municipality and Community Forest User Committee

Shree BarsedandaPari Community Forest User Committee
Bhimeshwor Municipality 4, Mati, Dolakha

Letter no.2074/75-10 Date: 2074/9/28

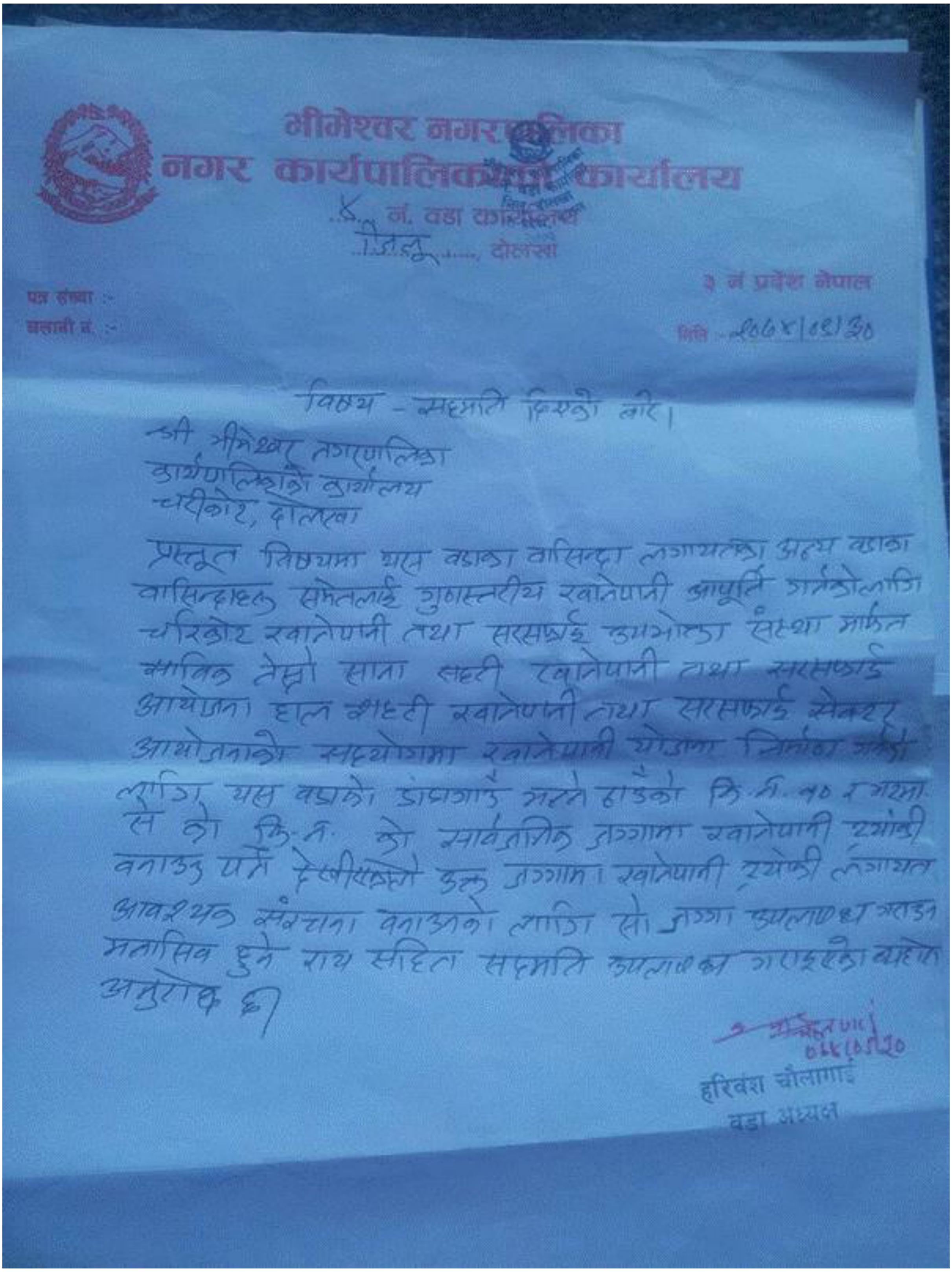
Subject: **About the consent paper**

Shree Charikot Small Town Water Supply and Sanitation Users Committee Bhimeshwor 3, Charikot

In subject matter, The Former Third Small Town Water Supply and Sanitation Sector Project.Now Urban Water Supply and Sanitation Sector Project. Under the leadership of WUSCCarikot going to implement a water supply project in Bhimeshwor Municipality through the financing by TSTWSSSP. The water supply source is HattichaharaJhaprekhola and Dhungekhola. From this source, the transmission pipeline has to be passed through this community forest and construction of RVT and other necessary structures in the forest area. We are the Shree BarsedandaPari Community Forest User Committee, in the response to the land demand by WUSC. The community forest user committee declared that all necessary structure and pipeline construction work within the forest land all are acceptable for Community forest user committee. So we are ready to provide required land for water supply project. After the construction of the structure and other pipeline works the properties right goes to WUSC. The community forest User committee providing consensus letter to CharikotWUSC.

CC: M/s Urban Drinking Water and Sanitation Sector Project,
Kathmandu

Shahadev Khadka
Chairman Forest User Committee



भीमेश्वर नगरपालिका
नगर कार्यपालिकाको कार्यालय
४ नं. वडा कार्यालय
जिडु......, दोलखा

३ नं प्रदेश नेपाल

पत्र संख्या :-
चलानी नं. :-

मिति - २०७४।०३।३०

विषय - सहमति दिएको बारे।

श्री भीमेश्वर नगरपालिका
कार्यपालिकाको कार्यालय
चरीकोट, दोलखा

प्रस्तुत विषयमा यस वडाका वासिन्दा लगायतका अन्य वडाका वासिन्दाहरु समेतलाई गुणस्तरीय खानेपानी आपूर्ति गर्नकोलागि चरिकोट खानेपानी तथा सरसफाई उपभोक्ता संस्था मार्फत कार्यक्रम तेस्रो साना सहरी खानेपानी तथा सरसफाई आयोजना हाल शहरी खानेपानी तथा सरसफाई सेक्टर आयोजनाको सहयोगमा खानेपानी योजना निर्माण गर्नको लागि यस वडाको डाँडागाउँ सल्ले डाँडाको कि.नं. ७० र गत्ता. से को कि.नं. को सार्वजनिक जग्गामा खानेपानी ट्याङ्की बनाउनु पर्ने देखिएकोले उक्त जग्गामा खानेपानी ट्याङ्की लगायत आवश्यक संरचना बनाउनको लागि सो जग्गा उपलब्ध गराउन मनासिव हुने राय सहित सहमति उपलब्ध गराइएको व्यहोरा अनुरोध छ।

०७४।०३।३०
हरिवंश चौलागाईं
वडा अध्यक्ष

Bhimeshwor Municipality
Municipal Executive Office
Ward No. 4 Office.Jilu, Dolakha

State no. 3
Date: 2074.9.30

Subject: About the consent paper

To:
Bhimeshwor Municipalit
Executive Office
Charikot, Dolakha

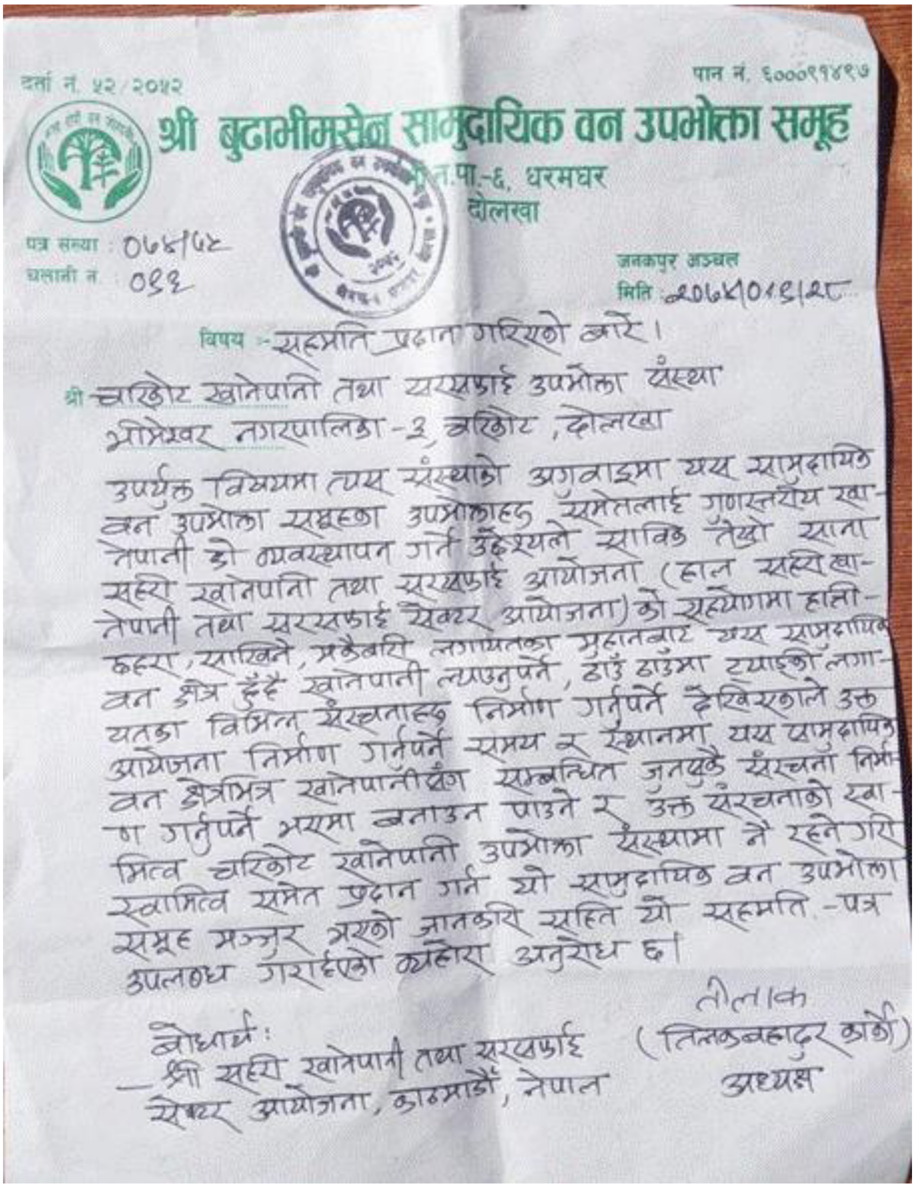
On the subject matter, a resident of ward number four and including other wards to serve potable drinking water the Charikot Water Supply and Sanitation User Committee have to construct water Reservoir Tank (RVT) and other associated structures in the Dandagun area. The suitable land is government own public land plot no 10 of the same ward. The said land construction of RVT and other necessary structures, the ward number four of Vimeshowar Municipality has provided a consensus letter to the water supply project by truly and honestly.
Name of the project:

Third Small Town Water Supply and Sanitation project.

Now: Urban Drinking Water and Sanitation Sector Project.

CC: M/s Urban Drinking Water and Sanitation Sector Project, Kathmandu

Haribamsa Chaulagain
Chairperson, Ward no. 4



दर्ता नं. ५२/२०५२ पान नं. ६०००९१४९७

श्री बुढाभीमसेन सामुदायिक वन उपभोक्ता समूह

न.पा.-६, धरमघर

दोलखा

पत्र संख्या : ०७४/७५

चलानी नं. : ०९६

जनकपुर अञ्चल

मिति : २०७५/०१/२८

विषय :- सहमति प्रदान गरिएको बारे।

श्री चरिकोट खानेपानी तथा सरसफाई उपभोक्ता संस्था
भीमेश्वर नगरपालिका-३, चरिकोट, दोलखा

उपर्युक्त विषयमा त्यस संस्थाको अगुवाइमा यस सामुदायिक वन उपभोक्ता समूहका उपभोक्ताहरु समेतलाई गुणस्तरीय खानेपानी को व्यवस्थापन गर्ने उद्देश्यले साविक तेस्रो साना सहरी खानेपानी तथा सरसफाई आयोजना (हाल सहरी खानेपानी तथा सरसफाई सेक्टर आयोजना) को सहयोगमा हाल कहरा, साखिने, मकैबारी लगायतका मुहानबाट यस सामुदायिक वन क्षेत्र हुँदै खानेपानी ल्याउनुपर्ने, ठाउँ ठाउँमा ट्याङ्की लगायतका विभिन्न संरचनाहरु निर्माण गर्नुपर्ने देखिएकाले उक्त आयोजना निर्माण गर्नुपर्ने समय र स्थानमा यस सामुदायिक वन क्षेत्रभित्र खानेपानीसँग सम्बन्धित जुनसुकै संरचना निर्माण गर्नुपर्ने भएमा बनाउन पाउने र उक्त संरचनाको स्वामित्व चरिकोट खानेपानी उपभोक्ता संस्थामा नै रहने गरी स्वामित्व समेत प्रदान गर्न यो सामुदायिक वन उपभोक्ता समूह मन्जुर भएको जानकारी सहित यो सहमति-पत्र उपलब्ध गराइएको व्यहोरा अनुरोध छ।

तीलाक
(तिलकबहादुर कार्की)
अध्यक्ष

बोधार्थ:
– श्री सहरी खानेपानी तथा सरसफाई सेक्टर आयोजना, काठमाडौं, नेपाल

Shree BhudhaBhimsen Community Forest User Committee
Bhimeshwor Municipality 6, Dharamghar, Dolakha
Subject: About the consent paper

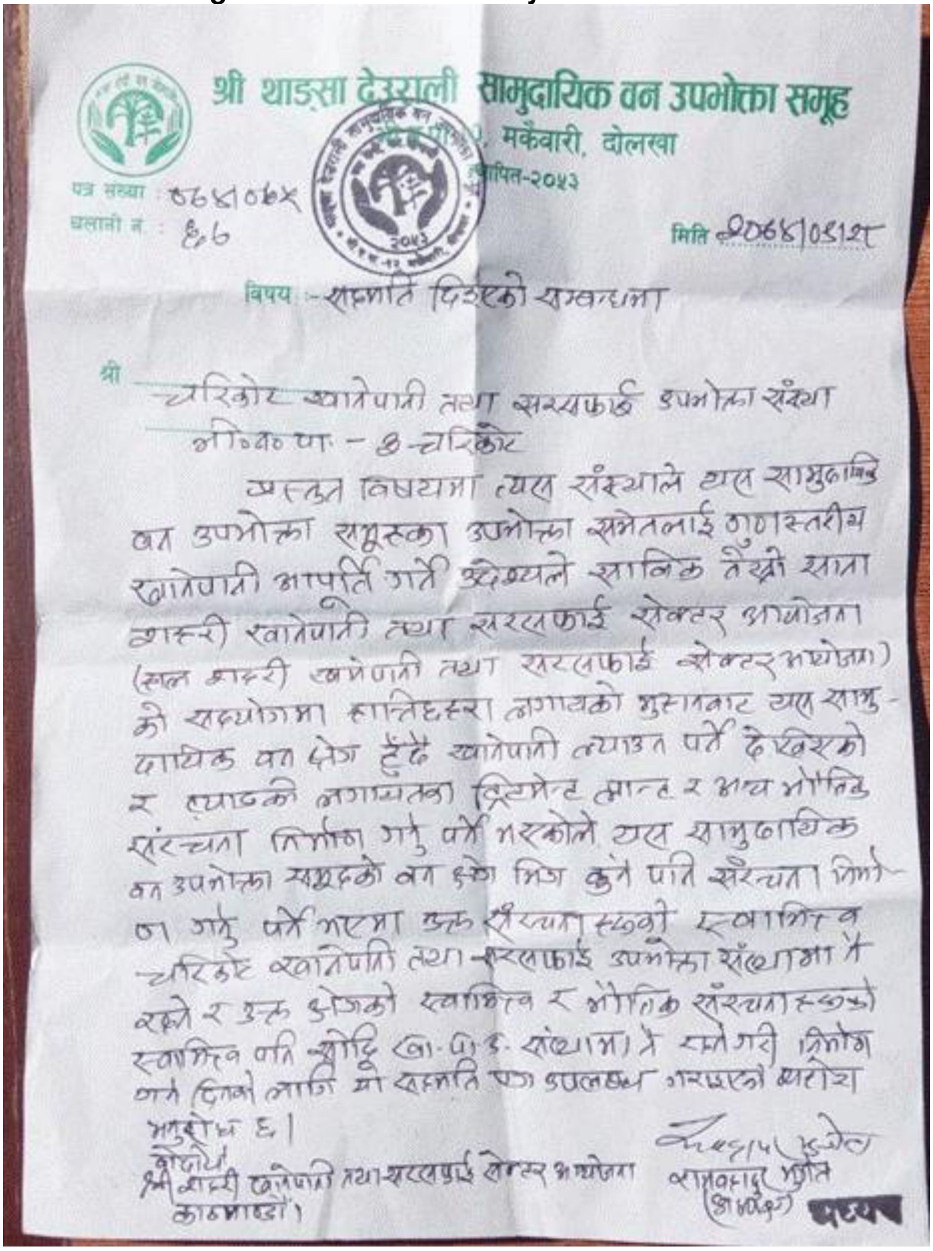
Shree Carikot Small Town water supply and Sanitation User Committee
Bhimeshwor 3, Charikot

In subject matter, The Former Third Small Town Water Supply and Sanitation Sector Project. Now Urban Water Supply and Sanitation Sector Project. Under the leadership of WUSC Carikot going to implement a water supply project in Bhimeshwor Municipality through the financing by TSTWSSSP. The water supply source is Hattichahara and Makaibari. From this source, the transmission pipeline has to be passed through this community forest and construction of RVT and other necessary structures in the forest area. We are the Shree Bhudha Bhimsen community forest User Committee, in the response to the land demand by WUSC. The community forest user committee declared that all necessary structure and pipeline construction work within the forest land all are acceptable for Community forest user Committee, So we are ready to provide required land for water supply project. After the construction of the structure and other pipeline works the properties right goes to WUSC. The community forest User committee providing consensus letter to Charikot WUSC.

CC: M/s Urban Drinking Water and Sanitation Sector Project, Kathmandu

Tilak Bahadur Karki
Chairman Forest User Committee

Shree Thangse Deurali Community Forest User Commiittee



श्री थाङ्सा देउराली सामुदायिक वन उपभोक्ता समूह

[illegible], मकैबारी, दोलखा

स्थापित-२०५३

पत्र संख्या : ०६८।०६९

चलानी नं. : ८६

मिति २०६८।०३।२५

विषय :- सहमति दिइएको सम्बन्धमा

श्री चरिकोट खानेपानी तथा सरसफाई उपभोक्ता संस्था

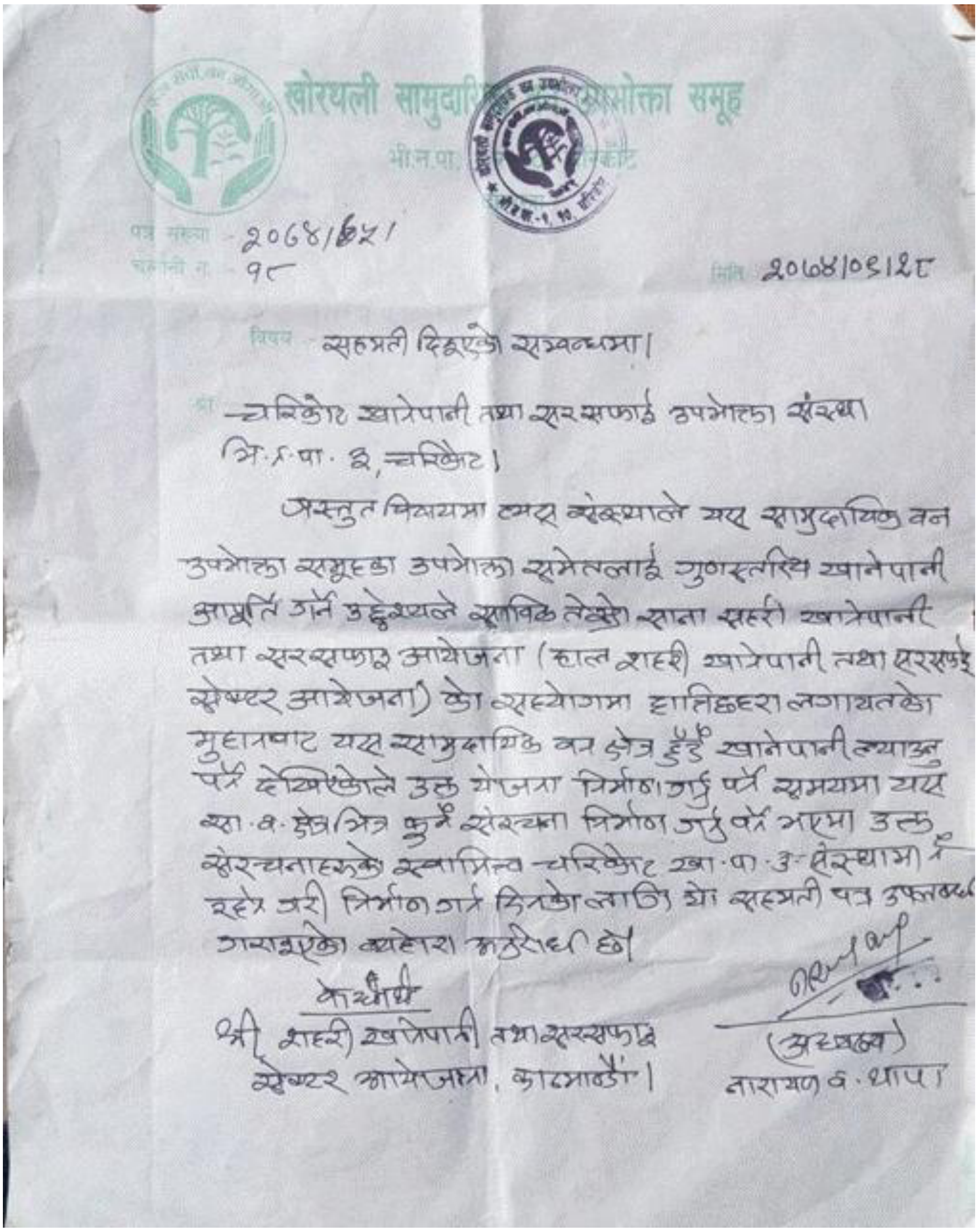
भी.न.पा. - ३ चरिकोट

प्रस्तुत विषयमा त्यस संस्थाले यस सामुदायिक वन उपभोक्ता समूहका उपभोक्ता समेतलाई गुणस्तरीय खानेपानी आपूर्ति गर्ने उद्देश्यले साविक तेस्रो साना शहरी खानेपानी तथा सरसफाई सेक्टर आयोजना (हाल साना शहरी खानेपानी तथा सरसफाई सेक्टर आयोजना) को सहयोगमा हात्तिदहरा लगायतको मुहानबाट यस सामुदायिक वन क्षेत्र हुँदै खानेपानी ल्याउनु पर्ने देखिएको र ट्याङ्की लगायतका ट्रिटमेन्ट प्लान्ट र अन्य भौतिक संरचना निर्माण गर्नु पर्ने भएकोले यस सामुदायिक वन उपभोक्ता समूहको वन क्षेत्र भित्र कुनै पनि संरचना निर्माण गर्नु पर्ने भएमा उक्त संरचनाहरुको स्वामित्व चरिकोट खानेपानी तथा सरसफाई उपभोक्ता संस्थामा नै रहने र उक्त योजनाको स्वामित्व र भौतिक संरचनाहरुको स्वामित्व पनि छोड्दै खा.पा.उ. संस्थामा नै रहने गरी निर्माण गर्न दिनको लागि यो सहमति पत्र उपलब्ध गराइएको व्यहोरा अनुरोध छ।

बोधार्थ:
श्री साना शहरी खानेपानी तथा सरसफाई सेक्टर आयोजना
काठमाडौं।

रामबहादुर [illegible]
(अध्यक्ष)
अध्यक्ष

Shrees Khorthali Communittee Forest User Committee



खोरथली सामुदा[illegible]भोक्ता समूह
भी.न.पा. [illegible] चरिकोट

पत्र संख्या - २०६८/[illegible]
चलानी नं. - १८

मिति २०६८/०३/२८

विषय - सहमती दिइएको सम्बन्धमा।

श्री चरिकोट खानेपानी तथा सरसफाई उपभोक्ता संस्था
भि.न.पा. ३, चरिकोट।

प्रस्तुत विषयमा तपाई संस्थाले यस सामुदायिक वन उपभोक्ता समूहका उपभोक्ता समेतलाई गुणस्तरिय खानेपानी आपूर्ति गर्ने उद्देश्यले साविक तेस्रो साना सहरी खानेपानी तथा सरसफाइ आयोजना (हाल शहरी खानेपानी तथा सरसफाइ सेक्टर आयोजना) को सहयोगमा हात्तिछहरा लगायतका मुहानबाट यस सामुदायिक वन क्षेत्र हुँदै खानेपानी ल्याउनु पर्ने देखिएकोले उक्त योजना निर्माण गर्नु पर्ने समयमा यस सा.व. क्षेत्र भित्र कुनै संरचना निर्माण गर्नु पर्ने भएमा उक्त संरचनाहरूको स्वामित्व चरिकोट खा.पा.उ. संस्थामा नै रहने गरी निर्माण गर्न दिनको लागि यो सहमती पत्र उपलब्ध गराइएको व्यहोरा अनुरोध छ।

[illegible]
(अध्यक्ष)
नारायण ब. थापा

बोधार्थ
श्री शहरी खानेपानी तथा सरसफाइ सेक्टर आयोजना, काठमाडौं।

भीमेश्वर नगरपालिका कार्यालय
चरिकोट,दोलखा

पत्र संख्या : २०७२/०७३
चलानी नं. :९६९०

मिति २०७२।०९।१९

विषय :– निर्णयको प्रतिलिपि पठाइएको वारे ।

श्री तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना
पानीपोखरी, काठमाडौं ।

प्रस्तुत विषयमा यस नगरपालिकाको क्षेत्रमा संचालन हुने तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना कार्यान्वयनका लागि एकीकृत तदर्थ समिति गठन गरी आवश्यक परियोजनाका सम्पूर्ण कार्यहरु कार्यान्वयनका लागि प्रकिया अगाडि बढाउन हुन उपभोक्ता भेलाको निर्णय प्रतिलिपि यसै पत्र साथ पठाइएको व्यहोरा अनुरोध छ ।

बोधार्थ :

श्री तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना
क्षेत्रीय कार्यालय, ईटहरी
श्री अध्यक्ष, तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना,
उपभोक्ता तदर्थ समिति, चरिकोट

२०७२/९/१९
रमाजी थापा

Bhimeshwore Municipality Office
Charikot, Dolakha

Date: 072-09-19

Letter no. 072/073, 1790

Subject: About a copy of the decision

Third Small Town Drinking Water and Sanitation Project
Panipokhari, Kathmandu
Presented subject herewith, to implement plan for the third small **town** drinking water and sanitation project to be operated in this municipal area by forming an integrated adherent committee for implementing the entire works of the projects by proceeding of the users gatherings a copy of decision accompanied by this request letter has been made.
CC
Regional Office, Itahari
Third Small Town and Sanitation Project

Chairman, Users committee
Third Small Town and Sanitation Project

Approval Letter of IEE Report from MoWS

नेपाल सरकार

खानेपानी मन्त्रालय

सिंहदरबार, काठमाडौं

फोन नं.: ४२११६९३
फ्याक्स : ९७७-१-४२११४३३
सिंहदरबार,
काठमाडौं, नेपाल ।

visit nepal 2020
VISIT Nepal Year 2020

पत्र संख्या:- ०६६।७६
चलानी नं.:- ९४९

मिति २०७६।०६।०२

खा. पा. आयोजना
आयोजना व्यवस्थापन कार्यालय
दर्ता नं.: ४६६
मिति: ०६।६।१६

श्री खानेपानी तथा ढल व्यवस्थापन विभाग,
पानीपोखरी, काठमाडौं ।

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

प्रस्तुत विषयमा तहां विभाग मार्फत स्वीकृतिका लागि मन्त्रालयमा प्राप्त भएको तेस्रो साना सहरी खानेपानी तथा सरसफाई आयोजना, पानीपोखरी काठमाण्डौं, प्रस्तावक रहेको **चरीकोट दोलखा नगर सहरी खानेपानी तथा सरसफाई आयोजना (दोलखा)**को परिमार्जित प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन नेपाल सरकार (सचिवस्तर) को मिति २०७६।०६।०२ को निर्णयानुसार स्वीकृत भएको व्यहोरा निर्देशानुसार अनुरोध छ ।

बोधार्थ :
श्री तेस्रो साना सहरी खानेपानी तथा सरसफाई आयोजना,
आयोजना व्यवस्थापन कार्यालय,
पानीपोखरी, काठमाण्डौं ।

संलग्न :
स्वीकृत प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन २ प्रति ।

(अन्जना महर्जन)
ईन्जिनियर

"नतिजामुखी प्रशासन :समृद्धि र सुशासन"

English Translation of the Approval Letter for IEE Report from MoWS

Government of Nepal
Ministry of Water Supply

Phone No: 4211693
Fax: 977-1-4211433
Singhadurbar,
Kathmandu, Nepal

Date: 2076/06/02

To,
The Department of Water Supply & Sewerage Management
Panipokhari, Kathmandu

Subject: In Relation to the Approval of Initial Environment Examination (IEE) Report

Regarding the above-mentioned subject, it is informed that the updated Initial Environment Examination (IEE) report of Charikot Water Supply & Sanitation Project (Dolakha), the proponent of which is Third Small Town Water Supply & Sanitation Project, Panipokhari, Kathmandu, submitted through DWSSM for approval, has been approved as per the decision made by Government of Nepal on 2076/06/02.

Cc:
Third Small Town Water Supply & Sanitation Sector Project
Project Management Office,
Panipokhari, Kathmandu

Attachments:
Approved Initial Environment Examination (IEE) Report 2 Copies

(Anjana Maharjan)
Engineer

Appendix 5
Simple Checklists & Sample Survey Questionnaire

तेश्रो साना शहरी खानेपानी तथा सरसफाइ आयोजना
घरधुरी सर्वेक्षण वृस्तित् प्रश्नावली
(आयोजना प्रयोजनको लागिमात्र तथ्याँकको प्रयोग गरिनेछ)

नगर आयोजना: सरोकोट खानेपानी घर नं. १३१

जिल्ला: दोलखा नगरपालिका/गा.वि.स. भीमेश्वर वडा नं. ८

अन्तरवार्ता लिनेको नाम : सुजना कुमाल अन्तरवार्ता मिति : २०७२/०५/१०

सुपरिवेक्षकको नाम : राजु सर्की नोड नं.: २७१४

१. सामाजिक-आर्थिक तथा अन्य विवरण
(उपयुक्त कोठामा (√) यो चिन्ह लगाउनुस् वा आवश्यक विवरणहरु भर्नुहोस्)

१.१ अन्तरवार्ता दिनेको नाम : कृष्ण बहादुर श्रेष्ठ

१.२ घरमुलिको नाम कृष्ण ब. श्रेष्ठ लिङ्ग : पुरुष ☑ महिला ☐ तेस्रो लिङ्गि ☐ पेशा ☐

परिवार सदस्य: पुरुष: ४ महिला: २ तेस्रो लिङ्गि..... जम्मा: ६ एकल महिला घरमुलि भए ☒

१.३ यस परिवारमा शारिरिक रुपमा अशक्तता भएका परिवार सदस्य संख्या: ☒

१.४ जाति/जनजातिमध्ये कुन हो? क) ब्राम्हण/क्षेत्री ☐ ख) जनजाति ☑ ग) दलित ☐ घ) अन्य ☐

परिवारको स्वरुप : एकल ☐ संयुक्त ☑

१.५ घर परिवारका सदस्यहरुको विवरण दिनुहोस्

क्र.सं.	घरपरिवारका सदस्यको नाम	उमेर	लिङ्ग	शिक्षा स्तर	पेशा
१					
२					
३					
४					
५					
६					
७					
८					
९					
१०					

नोट: पेशा : १. कृषि २. व्यापार ३. नौकरी ४. उद्योगधन्दा ५. रेमिटेन्स (वैदेशिक रोजगार)
६. ज्याला ७. अन्य ८) कुनै पेशा नभएका आश्रित जस्तै: विधार्थी, गृहिणी, अशक्त बूढाबूढी, ५ वर्ष मुनिका बालबालिका आदि नोट गर्ने)

१.६ 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 विवरण: सहयोगी ☐ डेरावाल ☐ 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 ☐

१.१० यो घर आफ्नै हो ? हो ☑ भाडामा बसेको ☐ अन्य ☐ भाडामा बसेको भए मासिक कति तिर्नुहुन्छ ☐

१.११ यस घरमा भान्छा कोठा बाहेक अन्य कति वटा कोठाहरू छन् ?

१ कोठा ☐ २ कोठा ☐ ३ कोठा ☐ कोठा वा सो भन्दा बढी ☑

१.१२ घरको अवलोकन गरी घरको किसिम लेख्ने । पक्की ☐ पक्की ☐ कच्ची ☑

(**पक्की** : छत ढलान, **अर्ध पक्की** : ढुङ्गा/इट्टाको गारो, टीनको छाना/ढुङ्गा/स्लेट,फिंगटी/टायल आदि, **कच्ची** : माटो गारो ? खर/टायल/खपडाले छाएको)

१.१३ यस परिवारसंग जग्गा जमीन छ ? छ ☑ छैन ☐ (छैनभने सुकुम्बासीको रूपमा गणना गर्ने)

जग्गा कति छ ?: ५ रोपनी

१.१४ यहाँले गाई/भैसी पाल्नु भएकोछ ? छ ☑ छैन ☐ छ भने कतिवटा ? एउटा ☐ दुईवटा वा बढी ☑

१.१५ तपाईको परिवारमा तल उल्लेखित कुन कुन सामान छन् ? (भएको सामानको संख्या लेख्ने)

क्र.सं.	सम्पत्ती	संख्या	कैफियत	क्र.सं.	सम्पत्ती	संख्या	कैफियत
१	साइकल/रिक्सा			९	स्टोभ/ग्यास/चुलो	1	
२	मोटरसाईकल			१०	रेफ्रिजेटर		
३	बैलगाडा			११	वासिङ मेशिन		
४	कार/जिप			१२	वाटर फिल्टर		
५	मिनीबस/बस			१३	कम्प्युटर		
६	ट्र्याक्टर/ट्रक			१४	इमेल/इन्टरनेटको पहुँच		
७	रेडियो/क्यासेट	1		१५	अन्य भए उल्लेख गर्ने ।		
८	टेलिभिजन/भिडियोसेट	1					

१.१६ यदि मुल पेशा कृषि भए कति महिना खान पुग्छ? ३ महिना ☐ ६ महिना ☐ ९महिना ☐ १२ महिना ☐

यदि नपुग भएमा कसरी धान्नु हुन्छ ? १. व्यापार २. नोकरी ३. उद्योगधन्दा ४. रेमिटेन्स (वैदेशिक रोजगार) ५. ज्याला ६. अन्य

१.१७ तपाईको परिवारको औसत वार्षिक खर्च कति छ उल्लेख गर्नुहोस । ☐

क्र.सं.	खर्चको शिर्षक र किसिम	मासिक खर्च रु.	कैफियत
१	(क) कृषि तर्फ		
१.१	रसायनिक मल, बिउ, किटनाशक आदी खरिद गर्न		
१.२	माटोको तैयारी, रोप्ने, गोड्ने, बाली काट्ने, भित्राउने, ढुवानी र बिक्री गर्दा हुने खर्च		
१.३	अन्य भए (उल्लेख गर्नुस्)		
	(क) को जम्मा		
२	(ख) गैह्र कृषि तर्फ		
२.१	खाद्यान्न (अन्न र दैनिक उपभोग्य वस्तु)		
२.२	कपडा		
२.३	शिक्षा		
२.४	घर भाडा/घर मर्मत		
२.५	यातायात/संचार		
२.६	विद्युत		
२.७	पानी पोत /मर्मत सम्भार		
२.८	औषधि/उपचार (पानीबाट हुने रोग)		.... वार्षिक खर्च
२.९	औषधि/उपचार (अन्य रोग)		.... वार्षिक खर्च
२.१०	अन्य: चाडपर्व कर्मकाण्ड संस्कार आदि उल्लेख गर्ने		.... वार्षिक खर्च
	(ख) को जम्मा		
	क+ख को कुल जम्मा	10,000/–	

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

क्र.सं.	आयस्रोत	संलग्न परिवार		प्राप्त हुने आय (रु. मासिक)	कैफियत
		पुरुष	महिला		
१	(क) कृषि तर्फ				

१.१	कृषि उत्पादनको बिक्रीबाट आय (मकै, गहुँ, धान, तरकारी, फलफूल)				
१.२	पशुजन्य उत्पादन (दुध, दही, घ्यू, बाख्रा, कुखुरा आदि)				
	(क) को जम्मा				
२	(ख) गैह्र कृषि तर्फ				
२.१	नोकरी / जागिर				
२.२	ज्याला मजदुरी				
२.३	पेन्सन/उपदान आदी				
२.४	वैदेशीक रोजगार (रेमिटेन्स)				
२.५	पसल/व्यापार				
२.६	उद्योग				
२.७	पसल/घर भाडा				
२.८	गाडी/ढुवानी व्यवसाय				
२.९	अन्य भए उल्लेख गर्ने				
	(ख) को जम्मा				
	क+ख कुल जम्मा			१५०००।-	

१.१९ यहाँको परिवारले कुनै ऋण लिएको छ ? छ ☐ छैन ☑ (छ भने रकम रु:)

२. खानेपानी तथा सरसफाइ व्यवस्थापन

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

क.सं.	वर्षायाममा	✓	लिटर/दैनिक	सुख्खा याममा	✓	लिटर/दैनिक
१.	इनार/कुवा	☐		इनार/कुवा	☐	
३.	ट्युबेल/हयाण्डपम्प/डिप ट्युबेल	☐		ट्युबेल/हयाण्डपम्प/डिप ट्युबेल	☐	
६.	सार्वजनिक धारा	☑	५००	सार्वजनिक धारा	☑	५००
७.	निजी धारा	☐		निजी धारा	☐	
८.	मुल, खोला, नदी, पोखरी	☐		मुल खोला, नदी, पोखरी	☐	
९.	बिक्रेतासँग पानी किनेर	☐		बिक्रेतासँग पानी किनेर	☐	
१०.	वर्षातको पानी संकलन गरेर	☐		वर्षातको पानी संकलन गरेर	☐	
११.	अन्य	☐		अन्य	☐	

२.३ दैनिक आवश्यक पानी आपूर्ति गर्नका लागि पानी संकलनबारे निम्न विस्तृत विवरण दिनुहोस् ।

क.सं.	विवरण	वर्षा याममा					सुख्खा याममा				
		पुरुष	महिला	बालिका	बालक	जम्मा	पुरुष	महिला	बालिका	बालक	जम्मा
१.	कति खेप/पटक					X					X
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 परिमाणउल्लेख गर्ने ।

३. निजी धारा जडान

३.१ के तपाईले घरमा पाइप धारा जडान गर्नु भएको छ ? छ ☐ छैन ☑ यदि छ भने कस्तो प्रकारको छ ?

क) घरभित्र निजी धारा ☐ ख) कम्पाउण्डभित्र निजी धार ग) सामुदायिक धारा ☐

३.२ तपाइको घरमा प्रयोग हुने पानीको गुणस्तर कस्तो छ ? १) राम्रो २) ठिकै ३) खराब

३.३ के तपाई आफ्नो घरमा धारा जोड्न चाहनु हुन्छ ? चाहन्छु ☑ चाहन्न ☐

३.४ 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 ☑

३.५ हाल तपाईले पानीधारा बापत महिनामा पानीको महशुल तिर्दै हुनुहुन्छ ? छ ☐ छैन ☑

सह-लगानि 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	☐	छ)	विद्युत	☐
ख)	कालोपत्रे सडक	☐	ज)	संचार	☐
ग)	विद्यालय	☐	झ)	सरसफाइ/सुविधा	☑
घ)	अस्पताल	☐	ञ)	सिचाई	☐
ङ)	व्यवस्थित खानेपानी प्रणाली	☑	ट)	पाटीपौवा धर्मशाला	☐
च)	पैदलयात्री सडक	☐	ठ)	अन्य	

४.२ 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	क्र.सं.	लगानीको विवरण	☑ चिन्ह लगाउने
१.	१५००० भन्दा माथि	☐	४.	३००१ देखि ६००० सम्म	☐
२.	९००१ देखि १५००० सम्म	☐	५.	१५०१ देखि ३००० सम्म	☐
३.	६००१ देखि ९००० सम्म	☐	६.	१५०० भन्दा कम	☑

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

४.४ नयाँ खानेपानी योजना शुरु भएमा आफ्नो घरमा धारा जडान गरी नयाँ नियमानुसार मासिक पानी महशुल नियमित बुझाउनु तयार हुनुहुन्छ? ☐

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

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	☐

४.५ नयाँ खानेपानी वितरण प्रणालीको व्यवस्था हुँदा तपाईको परिवारबाट प्रतिवद्धता स्वरुप अग्रिम लागतको ५% रकम दिन तयार हुनु हुन्छ ? छु ☑ छैन ☐

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

५.लैङ्गिक दृष्टिकोणबाट महिला सहभागिता

(आयोजनाको विभिन्न चरणमा महिला सहभागिता सम्बन्धि, गैरलाभान्वित विपन्न वर्गको, आदिवासी जनजाति, दलित तथा पिछाडि एका वर्गको समावेशी सहभागिता सम्बन्धि जानकारी संकलन गर्न प्रत्येक घरदैलोमा सोधिने प्रश्नहरूतल प्रस्तुत गरिएको छ ।)

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 ☑ अन्तर्क्रियात्मक ☐ निर्णायक ☐

५.३ आयोजनाको क्रियाकलापहरुको रेखदेख गर्न के खानेपानी उपभोक्ता तथा सरसफाइ समिति/संस्था गठन भएको छ ? छ ☑ छैनथाहा छैन ☐

ख) लैङ्गिकताका आधारमा कार्य विभाजन

५.४ तलको तालिकामा दिइएको कामहरूअक्सर कस्ले गर्ने गर्दछ? (√)चिन्ह लगाउनुस्
(दैनिक घण्टामा)

क्र.सं	घरायसि क्रियाकलापहरु	पुरुष	महिला	कुल समय
१	खानेपानी भर्ने, बोक्ने, भण्डारण		✓	
२	भान्छा तयार गर्ने, भाडाँ माझ्ने		✓	
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

५.५ तलको तालिकामा उल्लेखित पारिवारीक विषय वा क्षेत्रहरुमा निर्णय गर्दा यहाँको घर परिवारमा **महिलाको भनाई सुनुवाई हुन्छ ? उपयुक्त कोठामा (√)चिन्ह लगाउनुस्**

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

५.६ यहाँको परिवारमा पारिवारीक सम्पतिका निम्न विषयमा महिलाको पहुँच र स्वामित्व रहेको छ छैन तलको तालिकामा उपयुक्त कोठामा (√)चिन्ह लगाउनुस्

क्र स	विवरण	पहुँच	स्वामित्व
१	जग्गा जमिन	✓	
२	घर तथा अन्य संरचनाहरू	✓	
३	चल सम्पति/सचित पैसा	✓	
४	दैनिक क्रियाकलापहरू	✓	
५	अन्य		

घ) **खा.पा.उ.स.स. तथा समुदायमा महिलाको स्तर (हैसियत)** (निम्न बुँदाहरू फोकस ग्रुप छलफलको आधारमा जानकारी लिएर टिपोट गर्नुपर्नेछ)

क्रस	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

क) **आयोजना क्रियाकलापमा गैरलाभान्वित विपन्न वर्गहरु, पिछडिएका वर्ग, 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 अपनाईएको 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**

१ तपाईंको विचारमा पानीको गुणस्तर नराम्रो (खराब) भएमा के समस्याहरूदेखिन 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 गर्नुपर्छ भन्ने थाहा छ ? छ ☑ छैन ☐

यदि छ भने, पानी राख्ने भाँडो कसरी सफा गर्नु हुन्छ ?

२.१) खाली पानी मात्रले ☑ २.२)खरानी पानीले ☐ २.३) भुस/पिठो र पानीले ☐

२.४)साबुन पानीले ☐ २.५) 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 बैटोबाट पानी कसरी निकाल्नुहुन्छ ?

४.१) पानी सानु 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. के तपाईको घरमा चर्पी छ ? छ ☑ छैन ☐ **(छैनभने १.३ जाने)**

१.१ यदि छ भने, कस्तो प्रकारको चर्पी छ ? ☐

१) खाल्डे चर्पी ☐ ४) सिस्टर्न फ्लस ☐

२) भेन्टिलेटेड खाल्डे चर्पी ☐ ५) अन्य ..... ☐

३) पोर फ्लस ☑

१.२ यदि छ भने, तपाईको घरमा चर्पी कसकसले प्रयोग गर्नुहुन्छ ? १ ☐

(१. सबैले, २. बच्चा बाहेक सबैले ३. वयस्क र प्रौढले मात्रै ४. विरामी मात्रैले)

१.३ यदि छैन भने, दिसा गर्न कहाँ जानुहुन्छ ? ☐ ☐

(क. खोला/जङ्गल/किनार ख. खुल्ला मैदान/ठाउँ ग. घर/सडक छेउ घ. जहाँ सजिलो हुन्छ)

१.४ के तपाईको समुदाय खुल्लदिसामुक्त क्षेत्र घोषणा भएको छ ? छ ☐ छैन ☐

ग. खानेकुराको सरसफाइ

१. खाद्यपदार्थ दूषित हुनबाट कसरी बचाउनुहुन्छ ? (एक भन्दा बढी उत्तर आउनसक्ने)

१.१) पकाएको खाना छोपेर/ढाकेर राख्ने ☑ १.२) सफा हातले खाना पस्कने गर्नाले ☑

१.३) काँचै खाइने खानेकुरा राम्रोसँग पखालेर धोएर ☑ १.४) हात गोडा सफा गरेर मात्र भान्सामा पस्ने ☑

१.५) धेरै बासी वा सडे गलेका खाना, फलफुल बिसर्जन गर्ने ☑

१.६) डाडु पन्यु, थाल/भाँडाकुँडा सफा गरेर मात्र खाना पस्कने/खाने ☑

१.७) चुलो चौकी पकाउने भाडा, ढकनहरूसफा राख्ने ☑

२. के तपाई खानेकुरा छोपेर/ढाकेर राख्नुहुन्छ ? राख्छु ☑ राख्दिन ☐

घ. व्यक्तिगत सरसफाइ (घरपरिवारको संख्या अनुसार कृयाकलापमा टीक चिन्ह लगाएर संख्या राख्ने । जस्तो चारजनाको परिवार भए हरेक कृयाकलापमा टीक सहित चारको संख्या आउनुपर्ने)

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)

क.सं.	विवरण	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	✓		✓		✓	

७

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.	विवरण	५ वर्ष मुनिका बालबालिका		महिला		पुरुष	
		धुने (✓)	नधुने (✗)	धुने (✓)	नधुने (✗)	धुने (✓)	नधुने (✗)
१.	पानी मात्र						
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.	विवरण	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 असरहरूके के हुन् ? (एक भन्दा बढी उत्तर आउन सक्ने)

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 खाल्डोमा (Soak pit) ☐ 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 ☐ 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 खुट्टे गोठमा राख्ने
१	गाई/भैंसी	✓	✓
२	बंगुर/सुंगुर		
३	बाख्रा		

४	कुखुरा/हाँस		
५	ऋनय		

२. बस्तुभाउबाट निस्कने फोहोर कहाँ र कसरी विसर्जन गर्नुहुन्छ ?

२.१ मलखादमा ☐ २.२ आगो बाल्ने/गुईठा बनाउने ☑

२.३ गोबर ग्यास प्लान्टमा प्रयोग गर्ने ☐ २.४ अन्य (उल्लेख गर्ने)

३. बस्तुभाउको फोहोर मैलाको जथाभावि अव्यवस्थित तवरले विसर्जन गर्दा हुने खराब असरहरूके के हुन् ? (एक भन्दा बढी उत्तर आउन सक्ने)

३.१ वातावरणीय 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. सेफ्टेज (फोहरलेदो) व्यवस्थापन (चर्पिबाट सेफ्टीट्यांकमा जम्मा भएको फोहरलेदो **थप प्रश्नहरु सहित**)

१) चर्पिबाट बिसर्जित मलमुत्र व्यवस्थापन (जम्मा) कहाँ गर्ने गरेको छ ?

खाल्डो ☑ रिङ्ग खाल्डो ☐ सेफ्टी ट्यांक ☐ अन्य ☐

२) सो सेफ्टी ट्यांक/खाल्डोको क्षमता कति (ठुलो सानो साइज) छ ?

३) हालसम्म कहिल्यै सफा गर्नु भएको छ ? छ ☐ छैन् ☐ छभने कति वर्षमा भरियो ? ☐

सफागर्न कति रकम तिर्नु भयो ? रु.

४) सेफ्टी ट्यांकबाट निस्केको फोहर प्रशोधन पछि मलका रुपमा प्रयोग गर्न तयार हुनुहुन्छ ? छ ☐ छैन् ☐

५) सेफ्टी ट्यांकबाट निस्केको फोहर सफागर्न कतिसम्म रकम तिर्न तयार हुनुहुन्छ ? छ ☐ छैन् ☐

५.१ तिर्न तयार भए कतिसम्म तिर्नुहुन्छ ? रु २००० सम्म ☐ रु २००० माथि ☐

६.तपाईको घरबाट सेफ्टीट्यांकमा जम्मा भएको फोहर लेदो (सेफ्टेज) कसरी थान्को गर्नुहुन्छ ?

१ आफै सफा गर्ने ☐ २ सफागर्ने मान्छे प्रयोग गर्ने ☐ ३ व्यवस्थित कम्पनीको सेवालिने ☐ ४ अन्य

७. सेफ्टेज(फोहर लेदो) कहाँ व्यवस्थान गर्ने गरेको छ ?

१ खेतबारीमा ☐ २ खोलानाला, खोल्साखोल्सीमा ☐ ३ बनजंगल सार्वजनिक स्थानमा ☐ ४ सडक बाटो छेउछाउ ☐ ५ अनुकुल अनुसार ☐ ६ अन्य ☐

८. सेफ्टेज(फोहर लेदो) व्यवस्थान सुधार गर्न चाहनुहुन्छ ? चाहान्छु ☐ चाहन्न ☐

९. सेफ्टेज(फोहरलेदो व्यवस्थान सुधार गर्दा के गर्न चाहानु हुन्छ ?

१ सेफ्टीट्यांक बनाउने ☐ २ भएको सेफ्टीट्यांक/चर्पीको खाल्डो सुधार गर्ने ☐

३ तपाँइको चर्पिबाट ढल जोडी सामुहिक रुपमा सेप्टेज प्रशोधन प्रणाली व्यवस्थापन गरे सेवालिन तयार हुनुहुन्छ ?

४ अन्य (उल्लेख गर्ने) ☐

१०. सुधार गर्न कति रकम सम्म लगानी गर्न ईच्छा छ ? सोधेर नोट गर्ने रु. ☐

ज. पानीजन्य सरुवा रोगहरु

१. पानीजन्य सरुवा रोगको कारणहरूके 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 बिसर्जन गर्नाले ☑

१.५ फोहोर मैला जथाभावी फ्याँक्ने गर्दा ☑ १.६स्वास्थ्य शिक्षा तथा स्वस्थ बानीको अभाव ☑

१.७ सरसफाई र स्वास्थ्य सम्बन्धी ज्ञान र चेतनाको अभावले ☐ १.८ अन्य .....

२. तपाईंको परिवारमा कोही बिरामी परेमा के गर्नुहुन्छ ?(प्राथमिकता अनुसार नम्बर लेख्ने)

२.१ घरायसी उपचार गर्ने [१] २.२ धामी, झाँक्री, पुजारी कहाँ लाने [ ]

२.३ औषधि पसलमा जाने [२] २.४ स्वस्थ्य चौकि वा अस्पतालमा जाने [३]

२.५ अन्य (उल्लेख गर्ने)

३. यदि परिवारमा कसैलाई झाडापखाला लागेमा के गर्नुहुन्छ ? (प्राथमिकता अनुसार नम्बर लेख्नो)

३.१ जीवनजल खुवाउने [१] 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 [२] ३.६ अन्य (उल्लेख गर्ने).....

४. गत एक सालभित्रमा तँपाइका परिवारका सदस्यहरु झाडा पखाला तथा पानीजन्य अन्य सरुवा रोगहरुबाट प्रभावित थिए ? प्रभावित भएका भए कति जना थिए तलको तालिकामा सख्या नोट गर्ने ।

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

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

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

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

रोग	खर्च रकम (रु.मा)
झाडापखाला	
पानीजन्य अन्य सरुवा रोगहरु	
जम्मा	X

धन्यवाद!

Checklist for Physico-chemical Environment

Parameters	Description
Topography	Hilly region, Extensive Terraces and Steep Gorges
Geology (Rock and Soil Types)	Gneiss, Schist, grey to greenish-grey phyllites and quartzite Colluvial Deposits, Alluvium Deposits
Erosion and Sedimentation	No such events recorded and observed
Climate	Sub-tropical to Temperate Climate
Quarry Sites (If any)	No
Land Use	Agriculture: 39.63% Forest: 52.52% Residential:4.72% Others:3.13%
Air Quality	Not that severe
Water Quality	Moderate
Noise Level	Not that severe
Drainage Network	No proper drainage system

Project: Charikot WSSP

CHECKLIST OF FLORA

Date: August, 2015

S.No.	Name of plants	Uses			Others
		Fuel-wood	Fodder	Medicine	
1.	Ainsetu			✓	Fruits, Agroforestry
2.	Amala	✓		✓	Edible
3.	Angeri	✓		✓	
4.	Ashare Fut			✓	
5.	Asuro			✓	
6.	Bakaino			✓	Edible Fruits, Agroforestry
7.	Bas			✓	" "
8.	Basro			✓	Fruits
9.	Bet			✓	Fruits, Agroforestry, Religious
10.	Bhatgyo				Edible Oil
11.	Bhote Pipal	✓	✓	✓	Paper Manufacturing
12.	Bhot Dhayaro				Edible gum, others
13.	Chilaune			✓	Agroforestry, Dyeing
14.	Chyusi	✓		✓	Ediblefruits, Agroforestry
15.	Chiuro			✓	Fruits, Dyeing, Alcohol drink
16.	Daar	✓			Fruits for flavouring
17.	Dabdabe				Edible fruits, Agroforestry
18.	Dhobeni			✓	Salad Vegetable, "
19.	Dhusure			✓	
20.	Githa			✓	
21.	Guyanlo	✓		✓	Edible Fruit
22.	Hallunde			✓	Edible leaves, Agroforestry
23.	Harro			✓	Edible Fruits Dyeing
24.	Jamun	✓		✓	Edible Fruits, Agroforestry
25.	Jhankri Syaula	✓			Agroforestry
26.	Kabro			✓	
27.	Kadam			✓	Edible Fruits Agroforestry
28.	Kafal			✓	Edible Fruits, Dyeing
29.	Karam			✓	
30.	Khayar	✓	✓	✓	Edibleseeds, Dyeing, Tanning
31.	Khanayo			✓	Edible fruits,
32.	Khirro			✓	
33.	Kimbu	✓		✓	Agroforestry, Edible Fruits
34.	Kutmiro			✓	Furnitures, Industrial Purpose
35.	Loampate				Edible Fruits
36.	Mauca				Agroforestry, Furnitures, Ornamental
37.	Phaledo			✓	Agroforestry
38.	Pipal	✓		✓	Religious

S.No.	Name of plants	Uses			Others
		Fuel-wood	Fodder	Medicine	
39.	Satlo			✓	
40.	Saj	✓		✓	Furnitures
41.	Simal			✓	
42.	Simali	Firewood		✓	Edible Seeds, Agroforestry
43.	Sindure	✓		✓	Agroforestry, Preservative
44.	Siris	✓			Agroforestry
45.	Sisoo	✓		✓	" , Paper making, Plywood, Furnitures
46.	Tanki	✓		✓	Edible Fruits, Vegetables, Agroforestry, Dyeing
47.	Tuni			✓	" , Furniture, Carvings
48.	Utis	✓		✓	Agroforestry

Note:.....
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Project: Charikot WSSP

CHECKLIST OF MAMMALS

Date: August, 2015

S.N.	Wild Animals	Remarks
1	Badar	
2.	Ban Bhade	
3.	Chituwa	
4.	Chameso	
5.	Dumsi	
6.	Fyauro	
7.	Lokharke	
8.	Dhedu	
9.	Malsapro	
10.	Musa	
11.	Syaal	

Note:.....

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Project: Chautkot LOSSP

CHECKLIST OF BIRDS

Date: August, 2015

S.No.	Birds	Remarks
1.	Gothe Latokoseso	
2.	Chil	
3.	Basanta	
4.	Koili	
5.	Dangre Rupi	
6.	Battai	
7.	Dhukur	
8.	Phura	
9.	Hapsilo	
10.	Nyauli	
11.	Kafal Pakyo	
12	Kalo Kaag	
13.	Lampuchhre Chaite Chara	
14.	Tuisi Suga	
15.	Bhangera	
16.	Mahakauchik (Owl)	
17.	Kalij	
18.	Thople Bhyakur	

Note:.....

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Project: Charikot WSSP

CHECKLIST OF REPTILES, AMPHIBIANS & FISHES

Date: August, 2015

S.No.	Reptiles, Amphibians & Fishes	Remarks
1.	Reptiles & Amphibions	
	Chheparo	
	Haryau	
	Mausuli	
	Bhyaguto	
	Aandhe Sarpa	
	Dhaman	
2.	Fishes	
	Asala	
	Chuche Buduna	
	Faketa	
	Katle	
	Mungri	
	Gadela	
	Singhi	
	Tite	
	Sahas	
	Hile	

Note:.....
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APPENDIX 6:
Chlorine Use Guidelines

GUIDELINE VALUE

In humans and animals exposed to chlorine in drinking-water, specific adverse treatment related effects have not been observed.

Chlorine in drinking water is safe for consumption .The small amount of chlorine typically used to disinfect water does not pose risks to human health. The World Health Organization (WHO) has established a guideline value of 5 mg/L for chlorine in drinking water, meaning that such concentrations are considered acceptable for lifelong human consumption. Furthermore, WHO concludes that this value is “conservative,” as no adverse effects from chlorine in drinking water were observed in studies reviewed by WHO.

Guideline values for chlorine WHO Guidelines for drinking water quality (2004)

Chlorine	**below 5 milligrams per liter (mg/L)***

*For effective disinfection, there should be a residual concentration of free chlorine of 0.5 mg/L after at least 30 min contact time at pH<8.0

Chlorination does not harm aquatic environments

Chlorinated drinking water is unlikely to be harmful when discharged into aquatic environments. An extensive risk assessment conducted under European Union guidelines examined potential harm from various processes to make drinking water using sodium hypochlorite. This assessment found no significant environmental risks from chlorine or byproducts formed during drinking water chlorination. The DBPs formed in drinking water depend on the nature and quantity of organic matter present as well as on the disinfectant and other treatments used. In drinking water the principal byproducts are trihalomethanes (THMs; mainly chloroform) and haloacetic acids (HAAs), with smaller amounts of other byproducts. Direct ‘whole effluent’ experiments representing various uses, including drinking water, have shown that no significant amounts of persistent and potentially bioaccumulative substances are formed. Toxicity tests on these mixtures demonstrated that the presence of DBPs did not increase the toxicity.

A major concern from the past was the formation of some highly-chlorinated, high-hazard molecules, such as dioxins, resulting from chlorine used in paper pulp bleaching. However, dioxins were only formed from ‘active chlorine’ under specific conditions: acid pH and in the presence of certain phenols such as those abundant in the lignin component of wood. There is no significant formation of dioxins or other high-hazard molecules at neutral or alkaline pH. All current uses of ‘active chlorine’ for microbial control and cleaning take place at alkaline or neutral pH.

Appendix 7
Water Quality Test Reports

Nepal Environmental & Scientific Services (P) Ltd.
G.P.O. Box: 7301, Thapathali, Kathmandu, Nepal
Phone : +977-1-4244989, 4241001, Fax No.: +977-1-4226028, Email: ness@mos.com.np
http:\\www.nesspltd.com

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 91(W) (3) - 08 - 2015
Sample : Water (Hatti Chahara)
Client : TAEC/ICON
Location : Dolakha

Date Received : 31 - 08 - 2015
Date Completed : 03 - 09 - 2015
Sampled By : Client

S. N.	Parameters	Test Methods	Observed Values	NDWQS, Nepal
1.	pH at 28°C	Electromeric, 4500 - H^+ B,: APHA	7	6.5 - 8.5
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	86	1500
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	<1	5
4.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	46	500
5.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	50	-
6.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	1.50	250
7.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	N. D. (<0.05)	1.5
8.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	0.59	50
9.	Nitrite, (mg/L)	NEDA, Colorimetric, 4500 - NO_2^- B, APHA	N. D. (<0.02)	-
10.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B &	10.82	200
11.	Magnesium, (mg/L)	3500 - Mg B APHA	4.62	-
12.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	0.24	0.3
13.	Manganese, (mg/L)		N. D. (<0.02)	0.2
14.	Arsenic, (mg/L)	Hydride Generation, AAS, 3114 B: APHA	N. D. (<0.005)	0.05

N. D.: Not Detected

Note:

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

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

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

Note:

1. This report/certificate is in reference to Laboratory Quality Control Manual, QS (006), section OPT.
2. The result listed refer only to the tested samples & applicable parameters. Endorsement of products is neither inferred nor implied.
3. Liability of our institute is limited to the invoiced test parameters & amount only.
4. Samples will be destroyed after one month from the date of issue of test certificate unless otherwise specified.
5. This report is not to be reproduced wholly / partially & cannot be used as an evidence in the Court of Law & should not be used in any advertizing media without our permission in writing.
6. The clients are requested to take back their hazardous samples along with the report/certificate.

NESS
Nepal Environmental & Scientific Services (P) Ltd.
G.P.O. Box: 7301, Thapathali, Kathmandu, Nepal
Phone : +977-1-4244989, 4241001, Fax No.: +977-1-4226028, Email: ness@mos.com.np
http:\\www.nesspltd.com

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 91(W) (3) - 08 - 2015
Sample : Non Treatment Water
Client : TAEC/ICON
Location : Dolakha

Date Received : 31 - 08 - 2015
Date Completed : 03 - 09 - 2015
Sampled By : Client

S. N.	Parameters	Test Methods	Observed Values	NDWQS, Nepal
1.	pH at 28°C	Electromeric, 4500 - H^+ B.; APHA	7	6.5 - 8.5
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	116	1500
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	<1	5
4.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	63	500
5.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	63	-
6.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	0.50	250
7.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	N. D. (<0.05)	1.5
8.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	0.52	50
9.	Nitrite, (mg/L)	NEDA, Colorimetric, 4500 - NO_2^- B, APHA	N. D. (<0.02)	-
10.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B APHA	12.82	200
11.	Magnesium, (mg/L)		7.53	-
12.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	0.05	0.3
13.	Manganese, (mg/L)		N. D. (<0.02)	0.2
14.	Arsenic, (mg/L)	Hydride Generation, AAS, 3114 B; APHA	N. D. (<0.005)	0.05

N. D.: Not Detected

Note:

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

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

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

Note:

1. This report/certificate is in reference to Laboratory Quality Control Manual, QS (006), section OPT.
2. The result listed refer only to the tested samples & applicable parameters. Endorsement of products is neither inferred nor implied.
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6. The clients are requested to take back their hazardous samples along with the report/certificate.

NESS
Nepal Environmental & Scientific Services (P) Ltd.
G.P.O. Box: 7301, Thapathali, Kathmandu, Nepal
Phone : +977-1-4244989, 4241001, Fax No.: +977-1-4226028, Email: ness@mos.com.np
http:\\www.nesspltd.com

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 91(W) (3) - 08 - 2015
Sample : Treatment Water
Client : TAEC/ICON
Location : Dolakha

Date Received : 31 - 08 - 2015
Date Completed : 03 - 09 - 2015
Sampled By : Client

S. N.	Parameters	Test Methods	Observed Values	NDWQS, Nepal
1.	pH at 28°C	Electromeric, 4500 - H^+ B, APHA	7	6.5 - 8.5
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	115	1500
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	<1	5
4.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	62	500
5.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	66	-
6.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	2	250
7.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	N. D. (<0.05)	1.5
8.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	0.37	50
9.	Nitrite, (mg/L)	NEDA, Colorimetric, 4500 - NO_2^- B, APHA	N. D. (<0.02)	-
10.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B &	13.23	200
11.	Magnesium, (mg/L)	3500 - Mg B APHA	7.05	-
12.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B,	0.08	0.3
13.	Manganese, (mg/L)	APHA	N. D. (<0.02)	0.2
14.	Arsenic, (mg/L)	Hydride Generation, AAS, 3114 B: APHA	N. D. (<0.005)	0.05

N. D.: Not Detected

Note:

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

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

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

Note:
1. This report/certificate is in reference to Laboratory Quality Control Manual, QS (006), section OPT.
2. The result listed refer only to the tested samples & applicable parameters. Endorsement of products is neither inferred nor implied.
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5. This report is not to be reproduced wholly / partially & cannot be used as an evidence in the Court of Law & should not be used in any advertizing media without our permission in writing.
6. The clients are requested to take back their hazardous samples along with the report/certificate.

NS Lab Accreditation No.: 09-2068/69 Regd. No. 53875/064/065

AASTHA SCIENTIFIC RESEARCH SERVICE PVT. LTD.

P.O. Box No. 4316, Dillibazar, Kathmandu, Nepal
Tel: +977-1-4433748, E-mail: aasthalab2065@gmail.com

(Center for complete scientific solution)

Test Report/Certificate

Report No. : 22/2073
Entry No. : AASTHA – 14– 2073
Sample : Surface Water
Client : ICON - TAEC JV
Location : Jhapre, Dolakha

Date received : 10 – 01 – 2073
Date completed : 18 – 01 – 2073
Sampled By : Client

S. N.	Parameters	Method	Observed Values	National Drinking Water Quality Standard
1.	pH at 26°C	4500-H+ APHA-AWWA-WEF 2012, 22nd Edition	7.0	6.5 - 8.5
2.	Electrical Conductivity, (µmhos/cm)	2510 B, APHA-AWWA-WEF 2012, 22nd Edition	31	1500
3.	Turbidity, (NTU)	2130 B, APHA-AWWA-WEF 2012, 22nd Edition	2.0	5 (10)
4.	Taste and Odor	-	N. O.	Not Objectionable
5.	Color, (TCU)	2120 C, APHA - AWWA - WEF 2012, 22nd Edition	0.09	500
6.	Total Hardness as $CaCO_3$, (mg/l)	2340 C, APHA-AWWA-WEF 2012, 22nd Edition	20	5(15)
7.	Total Dissolved Solid, (mg/l)	2540 C , APHA - AWWA - WEF 2012, 22nd Edition	19	1000
8.	Total Residual Chlorine, (mg/l)	4500 - Cl B, APHA - AWWA - WEF 2012, 22nd Edition	<0.10	0.1-0.2
9.	Chloride, (mg/l)	4500-Cl- B, APHA-AWWA-WEF 2012, 22nd Edition	<0.50	250
10.	Ammonia, (mg/l)	4500-NH3 D, APHA, AWWA, WPCF, 17th Edition	0.45	1.5
11.	Nitrate, (mg/l)	4500-NO_3-B, APHA-AWWA-WEF 2012, 22nd Edition	0.80	50.0
12.	Aluminum, (mg/l)	3500-Al B, APHA, AWWA, WEF, 22nd Edition	<0.01	0.20
13.	Fluoride, (mg/l)	4500-F- D, APHA - AWWA - WEF 2012, 22nd Edition	0.15	0.5-1.5
14.	Sulfate, (mg/l)	4500-SO_4^{2-} C, APHA - AWWA - WEF 2012, 22nd Edition	4.2	250
15.	Mercury*, (mg/l)	3500-Hg-C, APHA-AWWA-WEF , WPCF, 17th Edition	<0.001	0.001
16.	Calcium, (mg/l)	3500-Ca B, APHA-AWWA-WEF 2012, 22nd Edition	4.8	200
17.	Iron*, (mg/l)	3111 B, APHA - AWWA - WEF 2012, 22nd Edition	0.21	0.30(3)
18.	Manganese*, (mg/l)		<0.05	0.20
19.	Lead*, (mg/l)		<0.01	0.01
20.	Cadmium*, (mg/l)		<0.003	0.003
21.	Chromium*, (mg.l)		<0.05	0.05
22.	Copper*, (mg/l)		<0.05	1.0
23.	Zinc*, (mg/l)		<0.02	3.0
24.	Arsenic, (mg/l)	3500-As B, APHA - AWWA - WEF 2012, 22nd Edition	<0.01	0.05

Remarks: *Water quality meets NDWQS required limit.*

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4. Even in the case of stable samples such as limestone, minerals, soil etc. they will not be stored more than six months.
5. Parameters in * are not accreditated by NBSM.

NS Lab Accreditation No.: 09-2068/69 Regd. No. 53875/064/065

AASTHA SCIENTIFIC RESEARCH SERVICE PVT. LTD.

P.O. Box No. 4316, Dillibazar, Kathmandu, Nepal
Tel: +977-1-4433748, E-mail: aasthalab2065@gmail.com

(Center for complete scientific solution)

Test Report/Certificate

Report No. : 24/2073
Entry No. : AASTHA – 14– 2073
Sample : Surface Water
Client : ICON - TAEC JV
Location : Hattichhare, Dolakha

Date received : 10 – 01 – 2073
Date completed : 18 – 01 – 2073
Sampled By : Client

S. N.	Parameters	Method	Observed Values	National Drinking Water Quality Standard
1.	pH at 26°C	4500-H+ APHA-AWWA-WEF 2012, 22nd Edition	7.4	6.5 - 8.5
2.	Electrical Conductivity, (µmhos/cm)	2510 B, APHA-AWWA-WEF 2012, 22nd Edition	162	1500
3.	Turbidity, (NTU)	2130 B, APHA-AWWA-WEF 2012, 22nd Edition	2.1	5 (10)
4.	Taste and Odor		N. O.	Not Objectionable
5.	Color, (TCU)	2120 C, APHA - AWWA - WEF 2012, 22nd Edition	0.15	500
6.	Total Hardness as $CaCO_3$, (mg/l)	2340 C, APHA-AWWA-WEF 2012, 22nd Edition	80	5(15)
7.	Total Dissolved Solid, (mg/l)	2540 C , APHA - AWWA - WEF 2012, 22nd Edition	98	1000
8.	Total Residual Chlorine, (mg/l)	4500 - Cl B, APHA - AWWA - WEF 2012, 22nd Edition	<0.10	0.1-0.2
9.	Chloride, (mg/l)	4500-Cl- B, APHA-AWWA-WEF 2012, 22nd Edition	<0.50	250
10.	Ammonia, (mg/l)	4500-NH3 D, APHA, AWWA, WPCF, 17th Edition	0.46	1.5
11.	Nitrate, (mg/l)	4500-NO_3-B, APHA-AWWA-WEF 2012, 22nd Edition	0.89	50.0
12.	Aluminum, (mg/l)	3500-Al B, APHA, AWWA, WEF, 22nd Edition	<0.01	0.20
13.	Fluoride, (mg/l)	4500-F- D, APHA - AWWA - WEF 2012, 22nd Edition	0.51	0.5-1.5
14.	Sulfate, (mg/l)	4500-SO_4^{2-} C, APHA - AWWA - WEF 2012, 22nd Edition	9.7	250
15.	Mercury*, (mg/l)	3500-Hg-C, APHA-AWWA-WEF , WPCF, 17th Edition	<0.001	0.001
16.	Calcium, (mg/l)	3500-Ca B, APHA-AWWA-WEF 2012, 22nd Edition	12.8	200
17.	Iron*, (mg/l)	3111 B, APHA - AWWA - WEF 2012, 22nd Edition	<0.05	0.30(3)
18.	Manganese*, (mg/l)		<0.01	0.20
19.	Lead*, (mg/l)		<0.003	0.01
20.	Cadmium*, (mg/l)		<0.05	0.003
21.	Chromium*, (mg.l)		<0.05	0.05
22.	Copper*, (mg/l)		<0.02	1.0
23.	Zinc*, (mg/l)		<0.01	3.0
24.	Arsenic, (mg/l)	3500-As B, APHA - AWWA - WEF 2012, 22nd Edition	<0.01	0.05

Remarks: *Water quality meets NDWQS required limit.*

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(C e n t e r f o r c o m p l e t e s c i e n t i f i c s o l u t i o n)

Nepal Laboratory Accreditation Scheme — Accredited Laboratory No - 09 - 068/69

Test Report/Certificate

Report No. : 23/2073
Entry No. : AASTHA – 14– 2073
Sample : Surface Water
Client : ICON - TAEC JV
Location : Odare, Dolakha

Date received : 10 – 01 – 2073
Date completed : 18 – 01 – 2073
Sampled By : Client

S. N.	Parameters	Method	Observed Values	National Drinking Water Quality Standard
1.	pH at 26°C	4500-H+ APHA-AWWA-WEF 2012, 22nd Edition	7.7	6.5 - 8.5
2.	Electrical Conductivity, (µmhos/cm)	2510 B, APHA-AWWA-WEF 2012, 22nd Edition	272	1500
3.	Turbidity, (NTU)	2130 B, APHA-AWWA-WEF 2012, 22nd Edition	2.1	5 (10)
4.	Taste and Odor	-	N. O.	Not Objectionable
5.	Color, (TCU)	2120 C, APHA - AWWA - WEF 2012, 22nd Edition	0.14	500
6.	Total Hardness as $CaCO_3$, (mg/l)	2340 C, APHA-AWWA-WEF 2012, 22nd Edition	124	5(15)
7.	Total Dissolved Solid, (mg/l)	2540 C , APHA - AWWA - WEF 2012, 22nd Edition	165	1000
8.	Total Residual Chlorine, (mg/l)	4500 - Cl B, APHA - AWWA - WEF 2012, 22nd Edition	<0.10	0.1-0.2
9.	Chloride, (mg/l)	4500-Cl- B, APHA-AWWA-WEF 2012, 22nd Edition	<0.50	250
10.	Ammonia, (mg/l)	4500-NH3 D, APHA, AWWA, WPCF, 17th Edition	0.47	1.5
11.	Nitrate, (mg/l)	4500-NO_3-B, APHA-AWWA-WEF 2012, 22nd Edition	0.84	50.0
12.	Aluminum, (mg/l)	3500-Al B, APHA, AWWA, WEF, 22nd Edition	0.02	0.20
13.	Fluoride, (mg/l)	4500-F- D, APHA - AWWA - WEF 2012, 22nd Edition	0.13	0.5-1.5
14.	Sulfate, (mg/l)	4500-SO_4^{2-} C, APHA - AWWA - WEF 2012, 22nd Edition	12.4	250
15.	Mercury*, (mg/l)	3500-Hg-C, APHA-AWWA-WEF , WPCF, 17th Edition	<0.001	0.001
16.	Calcium, (mg/l)	3500-Ca B, APHA-AWWA-WEF 2012, 22nd Edition	24	200
17.	Iron*, (mg/l)	3111 B, APHA - AWWA - WEF 2012, 22nd Edition	<0.05	0.30(3)
18.	Manganese*, (mg/l)		<0.01	0.20
19.	Lead*, (mg/l)		<0.003	0.01
20.	Cadmium*, (mg/l)		<0.05	0.003
21.	Chromium*, (mg.l)		<0.05	0.05
22.	Copper*, (mg/l)		<0.02	1.0
23.	Zinc*, (mg/l)		<0.01	3.0
24.	Arsenic, (mg/l)	3500-As B, APHA - AWWA - WEF 2012, 22nd Edition	<0.01	0.05

Remarks: *Water quality meets NDWQS required limit.*

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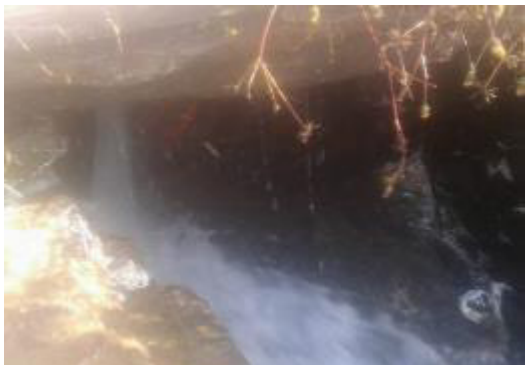
Appendix 8
Photographs

1. Charnawati River



2. Ghatte Khola

3. Gairi Khola

4. Dund Khola

5. Jhapre Khola

6. Kagate Khola

7. Odare Source

8. Hattichhahara (D/S of Intake)

9. Existing Condition of Distribution Pipelines

10. Existing WTP (WTP-E)

11. Proposed WTP Area (WTP-2) near Tower

12. Proposed RVT at Lower Jillu

13. Existing WS Scheme near Tower

14. Proposed RVT area for Upper Dolakha System

15. Existing RVT and Proposed RVT Site at Barsedanda

16. D/S of Ghatte Khola of SS-3

19. Participants during meeting held for the establishing agreement between Charikot WUSC and Struggle Committee on January 26, 2020

20. Agreement Signed between Charikot WUSC and Struggle Committee on January 26, 2020

SAUW IEE Review - Information Log

Instructions: Provide information based on IEE submitted by Project Management Office (PMO). This IEE log sheet will serve as record of the review findings, comments, and/or further actions required during implementation. A copy of the IEE log sheet should be (i) provided to PMO for their record and guidance on actions during implementation; (ii) attached in the cleared IEE to be disclosed; (iii) used as reference for review of updated/final IEE and (iv) inputted in the SARD Safeguards Compliance Tracking System.

<table>
<tr><td>Project:</td><td colspan="3">Nepal: Urban Water Supply and Sanitation Project (UWSSP): Charikot (Dolakha) Water Supply and Sanitation Subproject</td></tr>
<tr><td>Loan No.:</td><td>3711</td><td>Package No.:</td><td>W01</td></tr>
<tr><td>Components:</td><td colspan="3">
<table>
<tr><th>Items</th><th>Description</th></tr>
<tr><td>Source Name</td><td>a) SS-1: S1 (Jhapre Khola),S2 (Dund Khola),S3(Gairi Khola),S4(Kagate), S5 (Odare 1) & S6 (Odare 2)
b) SS-2: HC1 (Hattichhahara Source) & HC2 (Hattichhahara Source-Nigale Khola)
c) SS-3: Ghatte Khola & Pani Ghatta</td></tr>
<tr><td>Source Type</td><td>a) SS-1:S1, S2, S3 & S6: Stream Sources
S5 & S6: Spring Sources
b) SS-2:HC1 & HC2: Stream Sources
c) SS-3:G1 & G2: Stream Sources</td></tr>
<tr><td>Source Location</td><td>a) SS-1: S1-WN 7 , S2-WN 7, S3-WN 7, S4-WN 1, S5-WN 1 & S6-WN 1
b) SS-2: HC1: WN 7 & HC2: WN 8
c) SS-3: Ghatte Khola (G1)- WN 7 & Pani Ghatta (G2)- WN 8</td></tr>
<tr><td>Proposed intakes</td><td>Total: 10 nos.
SS-1: 2 nos (New) and 4nos.(Rehabilitated)
SS-2: 2 nos.(New)
SS-3: 2 nos. (New)</td></tr>
<tr><td>Collection Chambers/Collection Tanks</td><td>SS-1: 5 nos.
SS-2: 1 no.
SS-3: 1 no.</td></tr>
<tr><td>Water treatment plant</td><td>WTP-1: SSF-0.3lps
WTP-2: SB+HRF+SSF-10.3 lps
WTP-E: SSF-6.7 lps
WTP-3: SB+SSF-23.9 lps
WTP-4: SB +HRF+SSF-10.3lps</td></tr>
<tr><td>Ground Reservoir (No and Capacity in CUM)</td><td>a) SS-1
i) Deurali RVT -50cum
ii) Tower RVT-50cum
iii) Existing Charikot RVT-250cum
iv) Upper Dolakha RVT-150cum
v) Lower Dolakha-150cum
b) SS-2
i) Makaibari RVT-150cum
ii) Tindhare RVT-150cum
iii) Charighyang RVT-250cum
c) SS-3
i) Upper Matti RVT-50cum
ii) Lower Matii RVT-50cum
iii) Upper Dharamghar RVT-50cum
iv) Lower Dharamghar RVT-50cum
v) Upper Jillu RVT-50cum
vi) Middle Jillu RVT-150cum
vii) Lower Jillu RVT-50cum</td></tr>
<tr><td>Valve Chamber (Bricks/RCC)</td><td>Bricks: 70 nos.
RCC: 25 nos.</td></tr>
<tr><td>Office Cum GH</td><td>1 no.</td></tr>
<tr><td>Guard House</td><td>3 nos.</td></tr>
</table>
</td></tr>
</table>

	Small Guard House	3 nos.
	Dosing Pump House (DPH)	9 nos.
	Household Connection	3,842 connections
	Fire Hydrant	14 sets
	Protection Works	• Barbed Wire Fencing 60 m & 180m (Deurali RVT), 266m (Makaibari System), 180m (Upper & Lower Dharamghar), 160m (Upper & Lower Jillu System), 216m (Intakes, IC,CC & BPT) • Fencing by galvanized chain link 288 m^2 (Tower System), 154 m^2 (Upper Dolakha System), 140 m^2 (Lower Dolakha System), 127 m^2 (Charighyang System), 167 m^2 (Tindhare System), 288 m^2 (Upper Matti System), 127 m^2 (Lower Matti System), 154 m^2 (Middle Jillu System), 181 m^2 (Proposed Office Premises) and 261 m^2 (Existing Charikot System)
	Total Length of pipe in transmission and Bulk Distribution	44,674 m (with 1351 m of BDS)
	Total Length of pipe in Distribution	143,321 m
Contract Type:	Civil Works	
Date of IEE:	December 2019	

Draft IEE?	**Updated/Revised IEE?**	**Others**
		For immediate action: Provide explicit confirmation in the IEE report if the detailed engineering design information used is the final.

	Activity	**Status**		**Detailed Comments and Further Actions Required**
		Yes	**No**	
1.	Environmental assessment has been satisfactorily conducted based on ADB REA Checklist and scoping checklist.[1]	X		The IEE report provides information on the safe yields of sources of water (Hattichhahara and Ghatta Khola). Accordingly, withdrawal rates by the project from these sources are below the safe yield during the lean flow seasons. Follow up and further stakeholder consultations was undertaken on 26 January 2020. All issues related to water source and other issues contained in the complaint filed against the project has been discussed and settled. Appendix 4 includes the minutes of this consultation done, including all the agreements that led to the settlement of the complaint. **Important Reminder:** 1. PMO to ensure to conduct continuing consultation activities

[1] ADB Rapid Environmental Assessment Checklist for screening and categorization. Scoping Checklist ("No Mitigation Scenario" Checklist) for scope of IEE, identification of impacts and development of environmental management plan.

	Activity	Status		Detailed Comments and Further Actions Required
				and monitor compliance of the project with ALL the agreements reached with stakeholders during the meeting/s held, particularly on the agreements resolving the complaint filed against the project. 2. Report results of consultation and status of compliance with the agreements in the next SEMRs.
2.	Environmental assessment based on latest project components and design	**Yes** X	**No**	
3.	Statutory Requirements[2]		Forest Clearance	The IEE report explicitly states no trees will be cut. However, for any unanticipated cutting of trees during the implementation phase, ensure that PMO/RPMO obtain appropriate clearance (forest clearance or tree cutting clearance). No civil works will commence unless forest clearance or tree cutting clearance, if required, is obtained. PMO to report status in the SEMR.
			No Objection Certificate	To be obtained by PMO/RPMO if needed. No civil works will commence unless NOC, if required, is obtained. PMO to report status in the SEMR.
			Site Location Clearance	To be obtained by PMO/RPMO if needed. No civil works will commence unless site location clearance, if required, is obtained. PMO to report status in the SEMR.
			Environmental Compliance Certificate	PMO obtained MOWS-approved IEE. On 20 September 2019, PMO reported the MOWS approval in its responses to ADB comments on SEMR for the period January – June 2019. Accordingly, the IEE report was approved by MOWS in September 2019. This has been reported in the SEMR for July – December 2019.
			Permit to Construct (or equivalent)	To be obtained by PMO/RPMO if needed. No civil works will commence unless permit to construct (or equivalent), if required, is obtained. PMO to report status in the SEMR.
			Permit to Operate (or equivalent)	To be obtained by PMO/RPMO if needed. No civil works will commence unless permit to operate (or equivalent), if required, is obtained. PMO to report status in the SEMR.

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

	Activity	Status					Detailed Comments and Further Actions Required
			Others				
5.	Policy, legal, and administrative framework	**Adequate**		**Not Adequate**			Section II discusses the policy, legal and administrative framework of the subproject.
		X					
		Included discussions and requirements of the:					
		Yes	National regulation/law on EIA				
		Yes	Environmental agency				
		Yes	Relevant international environmental agreements				
		Yes	Environmental standards (IFC's EHS Guidelines)				
6.	Anticipated environmental impacts and mitigation measures	**assessed impacts and risks:**		**mitigation measures included:**			
				Yes	**No**	**n/a**	
			Biodiversity conservation	X			Protection status of species at the project sites was verified through IUCN Red List and IBAT. All species identified are categorized as Least Concern, except for one mammal (Common Leopard) that is considered Vulnerable. No endangered or critically endangered species was found in the project area. The IEE report mentions that the nature of the subproject activities will not impact Common Leopard. Further, the project will not encroach any forest area. The EMP provides measure that contractor/s will not encroach forest areas, otherwise, the legal provisions of the law including penalties will be imposed.
			Pollution prevention and abatement	X			
			Health and safety	X			Community and occupational health and safety measures are included.
			Physical cultural resources	X			No PCRs identified at the subproject sites.
			Cumulative impacts			X	
			Transboundary impacts			X	
7.	Impacts from Associated Facilities[3]	**Addressed**	**Not Addressed**	**Not applicable**			
				X			
8.	Analysis of Alternatives	**Yes**		**No**			An analysis of alternatives is provided, but this is not required.
		X					
9.	EMP budget included	**Yes**		**No**			

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

	Activity	Status		Detailed Comments and Further Actions Required
		X		Section VIII provides indicative budget of NPR 4,690,000 for EMP implementation.
10.	EMP implementation integrated in FAM/PAM and bid documents	**Yes**	**No**	(i) Included in PAM during loan processing. (ii) Section VIII includes discussion on the inclusion of the EMP in the bid and contract documents. PMO and the RPMO will have the responsibility to ensure compliance with this requirement.
		X		
11.	Consultation and Participation	**Yes**	**No**	(i) Section IX discusses the conduct of consultation activities from 2016 to 2018. No critical issue was raised. The questions raised were answered satisfactorily by the project. (ii) Appendix 5 shows a minutes of consultative meeting, with translation in the English language. Follow up and further stakeholder consultations was undertaken on 26 January 2020. All issues related to water source and other issues contained in the complaint filed against the project has been discussed and settled. Appendix 4 includes the minutes of this consultation done, including all the agreements that led to the settlement of the complaint. **Important Reminder:** 1. PMO to ensure to conduct continuing consultation activities and monitor compliance of the project with ALL the agreements reached with stakeholders during the meeting/s held, particularly on the agreements resolving the complaint filed against the project. 2. Report results of consultation and status of compliance with the agreements in the next SEMRs.
		X		
12.	Grievance Redress Mechanism	**Yes**	**No**	
		X		
		Description of GRM.		Section X discusses the GRM.
		GRC members identified.		Section X discusses the GRC membership.

	Activity	Status		Detailed Comments and Further Actions Required
		GRM established and notified?		GRM is established. PMO to confirm in the applicable SEMR that (i) GRM is already notified and GRC members have the capacity to address project-related grievances/complaints, and (ii) contractors are given instructions and orientation on GRM.
13.	Disclosure	To be complied	Endorsement to disclose on ADB website	To be complied after endorsement from PMO is received by ADB.
		To be complied	Disclosed on project website	To be complied by PMO once clearance of the IEE is received from ADB.
		To be complied	Relevant information available to stakeholders and affected people in language and form they understand.	To be complied by PMO once clearance of the IEE is received from ADB.
14.	Mobilized PMO Environment Specialist	**Yes**	**No**	PMO has its Environment Officer who is supervising the implementation of the EMP.
		X		
15.	Mobilized RPMO Environment Specialist	**Yes**	**No**	The Eastern and Western RPMOs are staffed with Environment Officers who were assigned by DWSSM.
		X		
16.	Mobilized PMQAC Environment Specialists	**Yes**	**No**	PMQAC has an environment specialist supporting the RPMOs.
		X		
17.	Mobilized DSMC/RDMSC Environment Specialists	**Yes**	**No**	Section VIII (subsection on Institutional Arrangement) discusses the mobilization of environment specialist. These are now on board.
		X		
18.	Confirm bid and contract documents and/or EMP include requirement for the contractor to appoint EHS supervisor and/or nodal person for environment safeguards	**Yes**	**No**	
		X		Section VIII (subsection on Institutional Arrangement) explains this role and responsibility of the contractor.
19.	If contract awarded already, confirm contractor's appointment of EHS supervisor and/or nodal person for environmental safeguards	**Yes**	**No**	
		X		Section VIII (subsection on Institutional Arrangement) explains contractor has the responsibility to appoint an environment supervisor. The contract has been awarded and the PMO confirmed that contractor has already appointed its EHS officer.
20.	Awareness training on compliance to safeguard requirements	**Yes**	**No**	Section VIII discusses the institutional capacity development program, schedule, and topics for the subproject, which PMQAC will supervise. In the SEMR covering the period January – June 2019, details of training activities are included.
		X		
21.	Monitoring and Reporting	**Yes**	**No**	

	Activity	Status		Detailed Comments and Further Actions Required
		X		Section XI clarifies the monitoring and reporting roles of stakeholders.
22.	**Others/Remarks**			
	Documents/References:	1. Revised Final IEE report of Charikot (Dolakha) WSS Subproject dated February 2020. 2. Final IEE of Charikot (Dolakha) WSS Subproject dated September 2019. 3. EARF of UWSSP.		