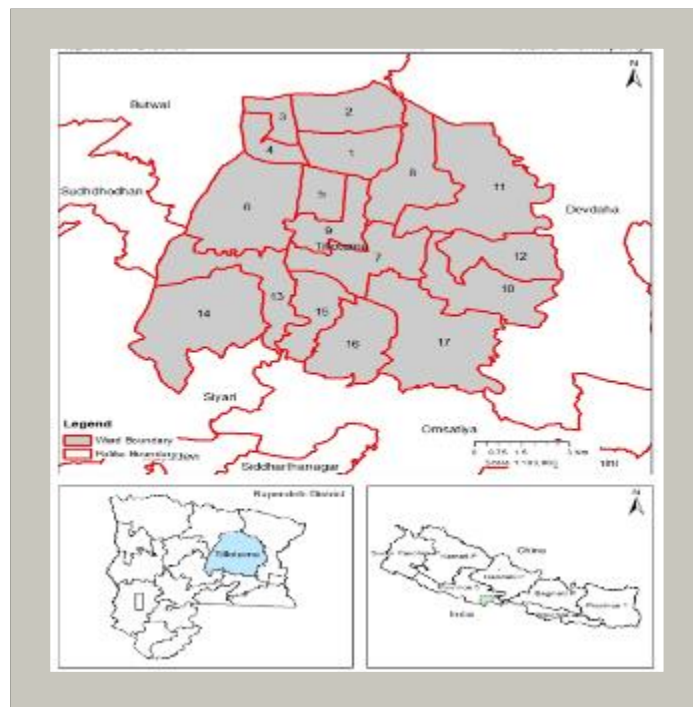


Environment and Social Impact Assessment and Environment and Social Management Plan of Upgradation of Mangalapur - Kanchibazar Road



TILOTTAMA MUNICIPALITY

January, 2022

ACRONYM

BoQ	: Bill of Quantity
CBOs	: Community Based Organizations
CBS	: Central Bureau of Statistics
CESMP	: Construction Environment and Social Management Plan
DIZ	: Direct Influence Zone
DPR	: Detailed Project Report
DSC	: Design and Supervision Consultant
DTMP	: District Transport Master Plan
DTO	: District Transport Office
DUDBC	: Department of Urban Development & Building Construction
EA	: Environmental Assessment
EHS	: Environment, Health and Safety
EPR	: Environmental Protection Rule
ESIA	: Environmental and Social Impact Assessment
ESMP	: Environmental and Social Management Plan
FGD	: Focus Group Discussion
FR	: Feasibility Report
HIV AIDS	: Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome
HR	: Human Resources
IDA	: International Development Association
IIZ	: Indirect Influence Zone
ILO	: International Labor Organization
IP	: Indigenous People
ISR	: Implementation Status Review
KII	: Key Informant Interview
NGO	: Non-Governmental Organization
NUGIP	: Nepal Urban Governance and Infrastructure Project
OP	: Operational Policy
OP/BP	: Operational Policy/Bank Policy
PAP	: Project Affected Person
PCO	: Project Coordination Office
PCU	: Passenger Car Unit
PIM	: Project Implementation Manual
PIU	: Project Implementation Unit
PPE	: Personal Protective Equipment
RAP	: Resettlement Action Plan
RoW	: Right of Way
SEA/SH	: Sexual Exploitation and Abuse/Sexual Harassment
SHE	: Safety, Health and Environment
STD	: Sexually Transmitted Disease
TOR	: Terms of Reference
ULG	: Urban Local Governments

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Executive Summary

Introduction

This environmental and social impact assessment covers the subproject connecting Mangalapur at Siddhartha Highway to Rohini Bridge so as to improve livelihood of the local people along the settlement. The subproject is expected to contribute towards the municipal capacity for urban development planning, infrastructure development and institutional development of the municipality.

The overall length of the proposed road is 5.00 km of with the geographical location of that starting point is 27°36'44.2"N, 83°30'33.71"E (Siddhartha Highway) and end co-ordinate 27°35'30.5"N, 83°30'54.74"E (Bewara Chowk) through wards 7, 9, and 10 of Tilottama Municipality. The total road width varies from 6.25m to about 8.2m at some places. But the average road width is about 4.5m. This route has 3.5 km of settlement, 1.22 km of agricultural land & 0.28 km of barren land on either side of the road alignment. The average gradient of the road varies from 0.8 to 1.1 %. The upgradation project has proposed Carriageway width of 2 lanes (3.5 m each), barrier kerbs, covered RCC drains along the alignment, 47 road crossings, 178 ramps, shifting 206 electric poles and relocation of 3.7 km water supply pipelines and up gradation of the road furniture.

Baseline Information

The project area altitude varies from 25m to 60m from sea level. In the proposed road alignment and Right of Way (RoW) there is no landslide/flood area and other disaster-prone area. Mostly the project area consists of boulder and gravel. The main rivers of Tilottama are Tinau River, Rohani River & Sukhaura River and the project ends on the Rohini river bridge. The mean minimum temperature reaches up to 19.32°C and means maximum temperature is nearly 30.92°C. with an average precipitation of 1753mm. The catchment of the project road is 6 km². The peak ground acceleration of the project site is 0.29g. The proposed project alignment has 3.5 km of settlement & 1.22 km of agricultural land, 0.28 km of barren land on either side of the road length. The project alignment has 3.7 km water supply pipeline network, 206 electric poles. The average wind speed at the project site is 19 km/hr, water quality complied to Government of Nepal (GoN) standard and the PM₁₀, PM_{2.5} and CO were lesser than 40µg/m³, 30µg/m³ and 130µg/m³ respectively.

The nearby forest is Kariya Community Forest and Banbatika Community Forest at distance of 3.46 km and 4.58 km respectively from project direct impact area (within the RoW). The indirect project area (50 m from edge of the road) has built up area and agricultural land. There is no forest within project impact area and it is not a habitat for terrestrial fauna and avifauna. There are only 64 trees that need to be removed in 5 km road upgradation work.

The proposed project lies in Tilottama Municipality of Rupandehi District in Lumbini Province of Nepal. The total population of the district, according to the Census of Nepal, 2011 is 880,196 and the number of households is 163,916. The average family size of the district is 5.37, which is higher than that of the national average (4.88). The total population of Tilottama Municipality is 123836 and total household is 21957. The average household size of the municipality is 4.56 which are lower than that of district household size (5.37). The project area is inhabited by Brahmins, Chhetri, Tharu, Gurung, Magar, Thakali, Kewat, Muhsar, Yadav, Dhobi, Muslim, Chepang, Jogi, Thakuri, Kami, Damai, Chamar, Harijan, Ram and Hindus. Muslims, Christians, Sikhs, etc. are found living in religious communities. There are also Shiva Temple, Durga Temple, Radhakrishna Temple, Mokshyadham, Buddhist Gumba, Stupa, Mosque and Churches. The indigenous people in project area are Gurung, Chepang, Tamang, Tharu, Sherpa, Sunuwar, Rai. There is diversity in the cultural practices of the castes within the project area. Cultural festivals like Dashain, Tihar, Chhath, Ram Navami, Shivaratri, Maghi, Buddha Jayanti, Eid, Moharram, Christmas are celebrated in this region which is inhabited by different castes and religions. There are 5 schools along the alignment, 7 health posts, 1 Ayurvedic hospital, 1 private and 1 public hospital in the project municipality. The project area is the hub for people coming from Palpa, Baglung, Gulmi, Arghakhachi district. The main occupations of the residents living within the project area are agriculture, animal husbandry, trade, government jobs and foreign employment. In the ward 7 and 10, there are two female members each elected showing woman active participation at community level in 6 different women user group.

Legal and Regulatory Requirements

The sectoral and cross-sectoral guidelines and standards promulgated by the GoN in various periods are adequate to mainstream the environmental and social safeguard dimensions in the project preparation and implementation phases. The report has included the applicable GoN plan, policies, act, regulations, guidelines, and standards. Similarly, the report has also included the environmental and social standards of the World Bank.

Screening, Scoping, Impact identification, Prediction and Management

Direct Impact area of the project is considered as RoW (40 meter from Mangalapur Junction towards Kanchibazar: 7.7 meters; from 40 meter to 1660 meter: 11 meters; remaining up to 5 km is: 13 meters) of the subproject. Similarly, the indirect impact is fall within 50 meters from the edge of the RoW. Environmental and Social checklists were used for screening and summarizing the overall impacts. The site-specific impacts in construction and operation phases are included in the ESIA report. Some of the impacts include:

Physical Impacts

- *Land Use*
- *Quarrying material and operation*
- *Stockpiling and construction area*
- *Noise pollution*
- *Air pollution,*
- *Water pollution*
- *Solid waste generation*
- *Disaster risk*

Socio-economic and Cultural Impacts

- *Impact on physical resources like change in land use, temporary obstruction to structures*
- *Temporary impacts on Business*
- *Impacts to community infrastructures like school, water pipelines, health facilities and cultural sites – specifically, three boundaries wall requiring dismantling and relocation, of one school, one health post and one temple*
- *Occupational health and safety*
- *Social disturbances/risk of GBV/AIDS*
- *Community health risk*
- *Traffic management issues etc*

The mitigation measures corresponding to the impacts have been suggested in the report. Some of the mitigation measures are

Physical Impacts

- *Reuse of the top soil for backfilling*
- *Use of IEE approved quarry site and refilling*
- *Suitable selection of site for stockpiling*
- *Equipment meeting GoN emission standard to be used*
- *Regular maintenance of equipment*
- *Follow 3 R approach*
- *Waste segregation at source*
- *Compensatory plantation for felling trees*
- *Implementation and monitor of site specific Environmental and Social Management Plan (ESMP)*

Socio-economic and Cultural Impacts

- *Working condition and management of the worker relationship complying to national law and World Bank (WB) safeguard policies*
- *Provision of the safe, clean and hygienic workplace and use of Personal Protective Equipment (PPE) during work*
- *The project will restrict child labor (under age of 16)*

- *Public awareness raising against the community induced disease*
- *The project to make provision such that the workforce don't trespass other's property or nearby forest*
- *Gender based issues will be addressed from administrative work till construction work*
- *The diversion design during the construction phase should incorporate the needs of differently able people, school children, pedestrian, women and proper administrative and on site provision will be made.*

Resettlement Action plan

The structures and additional land acquisition along the proposed up-gradation project will be avoided by adjusting the road alignment within the RoW of the road in related sections where such needs to be avoided. Hence, there are no structures or private or public land within RoW of road which requires acquisition. The Resettlement Action Plan (RAP) aims to provide policy and procedures of land acquisition, compensation and resettlement of affected persons if design changes. The PCO within the DUDBC will assume overall responsibility for the management procedures as mentioned in the RAP.

Sexual exploitation and Abuse and Sexual Harassment Prevention and Response Action Plan

Based on the Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) Risk Assessment checklist and assessment carried out for NUGIP by the World Bank, the Project's SEA/SH risks are assessed to be "Low". An SEA/SH Prevention and Response Action Plan has been developed for NUGIP based on this assessment and includes specific measures that aim to prevent and mitigate SEA/SH risks that the project activities might trigger. The Plan has also addressed "Table – 1: Recommended actions to address SEA/SH Risks in IPF Projects" as per the "Good Practice Note" published by the World Bank in September 2018.

Environment and Social Management Plan

Environmental and Social Management Plan (ESMP) has been proposed with present report including issues identified, possible effects and impacts, measures for their mitigation, monitoring methods. The mitigation cost for environmental and social impacts in construction and operation phases are included in ESIA report. In addition, agencies responsible for executing environmental mitigation measures and monitoring have been identified in the ESMP. Different monitoring indicators on the physical, biological, socio-economic and cultural environment have also been identified. The project along with the stakeholders will monitor during reconstruction and operation phase. The project also includes a grievance redress mechanism (GRM) for timely update and resolution of stakeholders' queries and grievances.

Institutional arrangements

The Ministry of Urban Development (MoUD) has set up a Project Coordination Office (PCO) under the Department of Urban Development and Building Construction (DuDBC) to implement NUGIP. The PCO is responsible for overall project compliance including compliance with environmental and social measures. The PCO will be supported by a Project Management Support Team (PMST). A Project Implementation Unit (PIU) will be established in each municipality for implementation of the subproject project at the local level and will be responsible for implementation of the ESMP and other environmental and social instruments. Technical Assistance will be provided through a Design and Supervision Consultancy (DSC) which includes safeguards specialists.

Executive Summary (Nepali)

INTRODUCTION

1.1. Project Background

Nepal has recently transitioned from a unitary to a federal government system, comprised of three tiers of government with seven provinces and 753 local governments for which new legislation, institutions, and administrative procedures are being formalized as constitutionally prescribed. To enable the federal implementation process and to support Urban Local Governments (ULGs) in the efficient provision of assigned service delivery responsibilities in the context of rapid urbanization, the proposed Nepal Urban Governance and Infrastructure Project (NUGIP), with support from the World Bank (WB), aims to address two main challenges under the new federal context: (i) limited institutional systems and capacities of ULGs; and (ii) critical gaps in core municipal services and infrastructure.

The Government of Nepal (GoN) is receiving financing from the International Development Association ("World Bank") towards the cost of the Nepal Urban Governance and Infrastructure Project (NUGIP). The Department of Urban Development and Building Construction (DUDBC) within the Ministry of Urban Development (MoUD) is the primary implementing agency for NUGIP, and bears the complete responsibility of project implementation, management, supervision and coordination. A Project Coordination Office (PCO) has been established under the MOUD, DUDBC for carrying out activities related to the project and is responsible for coordinating implementation on a day-to-day basis. The PCO is comprised of a Project Director (PD), Deputy Project Director (DPD), Project Engineers (PE), and other key project management and technical staff.

The Project Development Objective (PDO) of NUGIP is to strengthen institutional capacity in participating municipalities for strategic municipal infrastructure and service delivery. In particular, NUGIP will aim at: a) improving access to core municipal services (includes expansion of coverage, and construction and rehabilitation of basic infrastructure systems, e.g., urban roads & storm water drainage etc) in participating municipalities; b) strengthening planning, budgeting and implementation systems for municipal service delivery; and c) strengthening municipal finances and financial management systems.

NUGIP is comprised of five components:

- Component One will provide urban development grants (UDGs) to 17 municipalities for strategic municipal infrastructure and service delivery in two priority strategic urban clusters in eastern cluster (Provinces 1 and 2) and western cluster (Provinces 4 and 5). The 17 participating municipalities will be responsible for planning, preparation and implementation of the municipal infrastructure investments with direct support from proposed Design and Supervision Consultants (DSCs) and PCO.
- Component Two will support the 17 participating municipalities under Component One, plus 4 additional municipalities, on institutional strengthening through capacity building programs. The PCO and an Urban Development Support Team (UDST) will support the 21 participating municipalities in planning, preparation and implementation of institutional capacity development programs.
- Component Three will support COVID-19 response and recovery through Labour Intensive Public Works (LIPW) in 12 other municipalities. The 12 participating municipalities will take the overall responsibility of planning, administration, financial management, implementation and monitoring of LIPWs
- Component 4 supports a Contingent Emergency Response, and
- Component 5 supports Project Management and Coordination.

This environmental and social impact assessment covers the subproject connecting Mangalapur at Sidhartha Highway to Rohini Bridge so as to improve livelihood of the local people along the settlement. The subproject is expected to contribute towards the municipal capacity for urban development planning, infrastructure development and institutional development of the municipality.

1.2. Subproject Objectives and components

The objective of the project is to provide better and enhanced services to the road user along with better quality of road and improving the aesthetics of the street. As such, the proposed road subproject serves the purpose to provide basic service to the people and connect the settlements to the local and national strategic road network (SRN).

The subproject comprises of the following components:

- a) *Upgradation of existing single lane carriageway into two lanes Carriageway*
- b) *Side Drain*
- c) *Rehabilitation and Construction of Cross Drainage Structures*
- d) *Footpath*
- e) *Street light*
- f) *Bus Laybys*
- g) *Retaining Wall*
- h) *Zebra Crossing.*
- i) *Major and minor intersection improvements.*
- j) *Signage and pavements marking.*
- k) *Shifting of utilities.*

The subproject was chosen based on its economic value addition and urban development requirements. The selection of the sub-projects is based on technical, environmental, social and financial sustainability.

1.3. Subproject Details

Tilottama Municipality lies in Lumbini Province, Rupandehi district at the Eastern rim of Lumbini, the birthplace of Buddha. Geographically, it is located between 83° 24' 0" to 83° 33' 30" east longitude and 27° 33' 0" to 27° 40' 30" north latitude. It is surrounded by Devdaha Municipality in the east, Suddhodhan Rural Municipality and Tinau river in the west, Butwal Sub- Metropolitan in the north and Omsatiya and Siyari rural municipalities

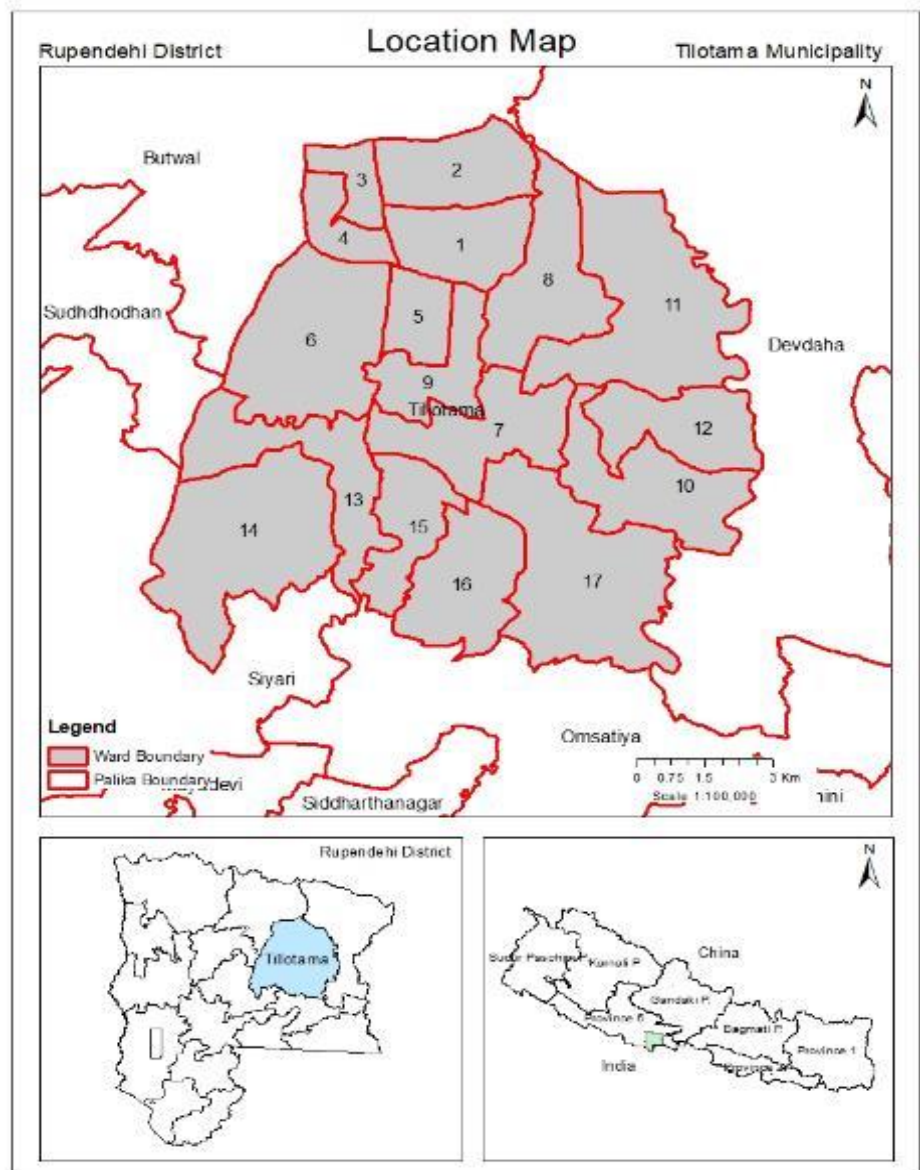
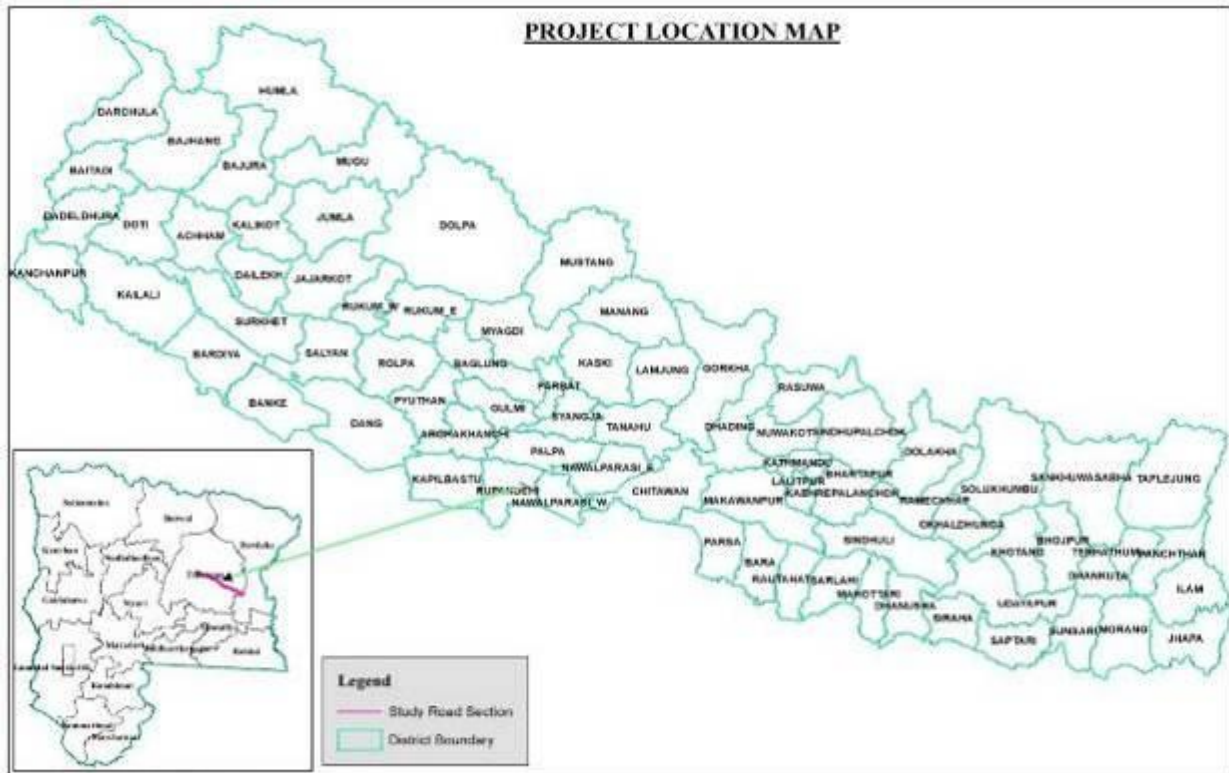


Figure 0.1: Location Map of the Tilottama Municipality

in the south. It was formed on 25th Baisakh 2071 with the combination of seven existing VDCs, i.e. Shankarnagar, Aanandaban, Karahiya, Makrahar, Madhwaliya, Tikuligadh and Gangolliya VDCs. The place was named for Tilotama River. Whereas, the Tilotama River was named after an Apsara named Tilotama described in the Hindu mythology. “Tila” in Sanskrit means a sesame seed and “uttama” means better. Tilotama therefore means smallest particle is the finest. It covers an area of 126.3 sq.km with total 17 wards.

The overall length of the proposed road is 5.00 km of with the geographical location of that starting point is 27°36'44.2"N, 83°30'33.71"E (Siddhartha Highway) and end co-ordinate 27°35'30.5"N, 83°30'54.74"E (Bewara Chowk). The location of the project can be depicted from **Figure 1.1**.



Data Source: Department of Survey, Nepal

Figure 0.2: Project Location Map

The proposed subproject involves rehabilitation of the 5.0 kilometers section of the Mangalapur-KanchiBazar Road in Tilotama Municipality of Rupandehi district in Lumbini Province. The road under the subproject passes through wards 7, 9, and 10 of Tilotama Municipality. The road connects Siddhartha Highway with Devdaha Border. The road starts from Mangalapur in Siddhartha Highway and ends at Rohani River Bridge which is the border between Devdaha Municipality and Tilotama Municipality. The proposed subproject is located in plain land and passes through settlements, agricultural lands. The subproject road currently has a single lane operational paved carriageway and does not segregate slow-moving vehicles and pedestrians. The road section requires pavement reconstruction to maintain acceptable levels of service. There are no alternative routes to the project road that serve the same function as that of the stated road.

The declared Right of Way (RoW) of Mangalapur –Kanchibazar road is 13 meters. Different road width is fixed along this alignment to avoid the demolition of existing structures that fall within the RoW. The subproject is divided in to three different cross sections viz type –A, type B, and type C. Type A proposed road width is 7.7 meters (from Chainage CH 0+000 to 0+0380), total length of type A is 0.038 Km, ii) type B: proposed road width is 11 meters (at different chainage of settlement area), total length of type B is 0.942 Km. iii) Type C-proposed road width is 13 meters (at different chainage). The total length of type C is 4.02 Km.

The existing traffic circulation pattern shows that the project road experience heavy traffic during the peak hours i.e morning 9.00 AM to 11.00 A.M. and evening at 4.00 PM to 6.00 P.M. Most of the trips are home based trips and Manigram, Madhuwaliya, Tikuligadh, Shankarnagar, Kothihawa, Yogikuti are the major destinations.

Mangalapur is a collector road having ROW of 13 m. This road continues joining further to the Devdaha municipality through the proposed road alignment. This road is straight and shortest route to Bewara Chowk, one of the major destination points. There are numbers of other municipal roads coming and meeting as arterials to this main Mangalapur -Kanchibazar road. This alignment can be used as a bypass road in future to connect Siddhartha highway and Bhumahi - Parasi Highway through Devdaha Municipality which reduces traffic congestion of Butwal and Bhairahawa.

The proposed scheme of Mangalapur Kanchibazar Road (upgradation up to Bewara Chowk) compared to the existing scenario is described in **Table 0.1**.

Table 0.1: Existing Condition and Proposed Scheme Comparison

S. No.	Description	Existing Scenario	Proposed Scheme
1	Length of Road	5.0 km	5.0 km (Mangalapur-Bewara Chowk)
2	Right of Way (RoW)-Declared by municipality	13m	13m
	Total Road Width	4 to 6 m	Type -A-7.7 m width (0+000.00 to0+038.00) – 38 m Type -B -11 m width (different chainage at settlement area) – 0.942 km Type -C – 13 m width (at different chainage) Length - 4.02 km
3	Traffic	i. 567 PCU (traffic count in 2018 at CH 0+250.00) ii. 380 PCU (traffic count in 2018 at CH 6+500.00)	i. 8047 PCU in 2039 at CH 0+250.00 ii. 5053 PCU in 2036 at CH 6+500.00
4	Carriageway	Average 3.75 m	7m for (0+000.00-0+038.00) & 7.5m including shyness for (0+038.00-5+000.00)
5	Pavement type	Single lane blacktopped (poor condition) road	Double lane upgradation with the 40mm of asphalt concrete, 50mm of DBM material, 150mm of base course and 175mm of sub base course with proper grade and camber
6	Median/Landscape or Green land areas	No median Provided and green land area	Median is not provided
7	Parking	Haphazard parking on shoulder and carriage way area obstructing traffic movement.	Due to space restriction, separate parking is not provided.
8	Cycle track	Nil	Nil
9	Side Drain	630m of Masonary Side Drain along the road. About 200 m. length of drain cover's slab as footpath.	Tick drain in both sides from chainage Type A1 0+000.00-0+014.96 (i.e. length = 29.92m)-tick drain (0.3*0.2) Type A2 0+014.96-0+038.00 (i.e. length = 46.08m)-tick drain (0.3*0.3) Type B (0.45m*0.4m) (L-2764.8 2m) Type C (0.6m*0.4m) (L-824.92m) Type D (0.75m*0.4m) (L-1723.02m) Type E (0.9m*0.4m) (L-4085.84m) Type F (0.9m* 0.5m)(L-844) note: drain length includes both sides drain length and Size given is internal dimension of drain
10	Cross drainage Structures	12pipe culverts 15 slab culverts	15 pipe culverts 12 box culverts - Rehabilitation of existing pipe culverts

S. No.	Description	Existing Scenario	Proposed Scheme
			and slab culverts in order to make double lane
11	Protection Works	Nil	Retaining wall/slope protection measures as per requirement
12	Traffic signs/signage and road marking	Nil	Provided all along the road to ensure maximum safety to pedestrian and vehicular traffic.
13	Road furniture (street lights, delineators, etc)	Nil	Provided
14	Utility	All wires and cable are hanging above ground and are in unmanaged condition	Unmanaged electric poles and wire are managed according to requirement
15	Trees and plants	Unmanaged plantation	Trees are provided on footpath
16	Total cost of road		NRs 781, 574, 621.29 (including VAT and contingency)
17	Per KM cost of road		NRs. 156,314,924.26

Source: DPR 2021

1.3.1. Existing Road conditions and inventory

The whole route of 5.0 km is black-top surface. The total road width varies from 6.25m to about 8.2m at some places. But the average road width is about 4.5m. This route has 3.5 km of settlement, 1.22 km of agricultural land & 0.28 km of barren land on either side of the road alignment. The average gradient of the road varies from 0.8 to 1.1 %. The list of some of the prominent features along the 5 KM road section for upgradation includes the following:

Schools: - There are five schools alongside the road alignment: Shree Gautam Buddha High School. (1+140.00, Right side), Janahit High School (2+350.00, Right Side), Shree Semra Secondary School (3+400.00, left Side), Namuna Boarding School (4+4350.00, Right Side) and Everest Boarding School.

Health Post/Hospital: - Semara Heath Post is found at chainage (3+850.00, Left Side) Administrative Buildings: - Nepal Telecom Office (0+100.00, Left Side), Ward Office-7 (1+270.00, Right Side), Ward Office-10 (4+500.00, Left Side)

Temple/ Gumba: - Siddharth Gumba (3+010.00, left Side), Shiva Temple (3+050.00, Left Side).

Waiting Station/ Chautara: - Waiting Station is found along chainage (3+050.00 Left Side) and (3+450.00 Left Side).

The DPR of the project has categorically provided the details along with chainage for Road inventory and conditions, inventory of existing culverts and side drains, minor intersections, existing footpath and, electrical poles, existing water supply pipelines and other details.

1.4. Components of proposed upgrading of road

Detail of the proposed upgradation of road components are provided below:

1.4.1. Cross-sectional Elements

Detail cross-sectional elements proposed in the Mangalapur-Kanchibazar Road (up gradation upto 5 km from Mangalapur to Bewara Chowk) are provided in **Figure 0.3**.

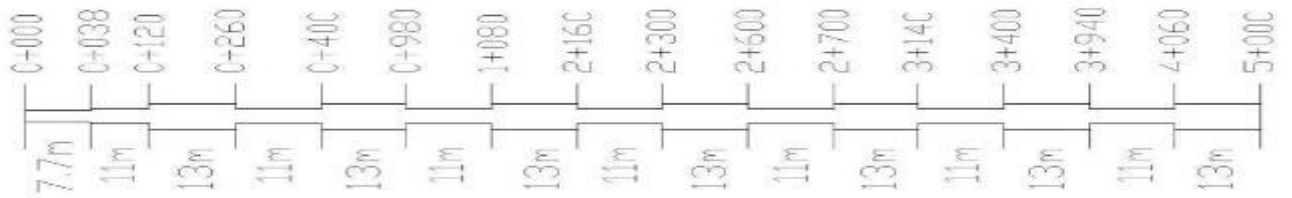


Figure 0.3: Proposed road width and their chainage

Note:

Type A :7.7 m

Type – B:11 m

Type –C:13 m

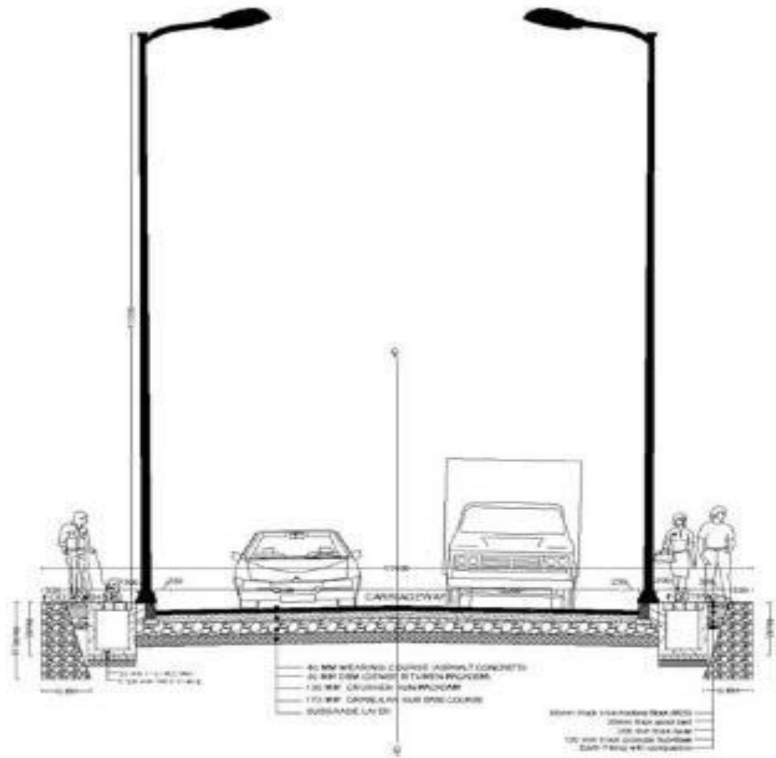


Figure 0.4: Typical Cross section for 11 m road (section Type B)

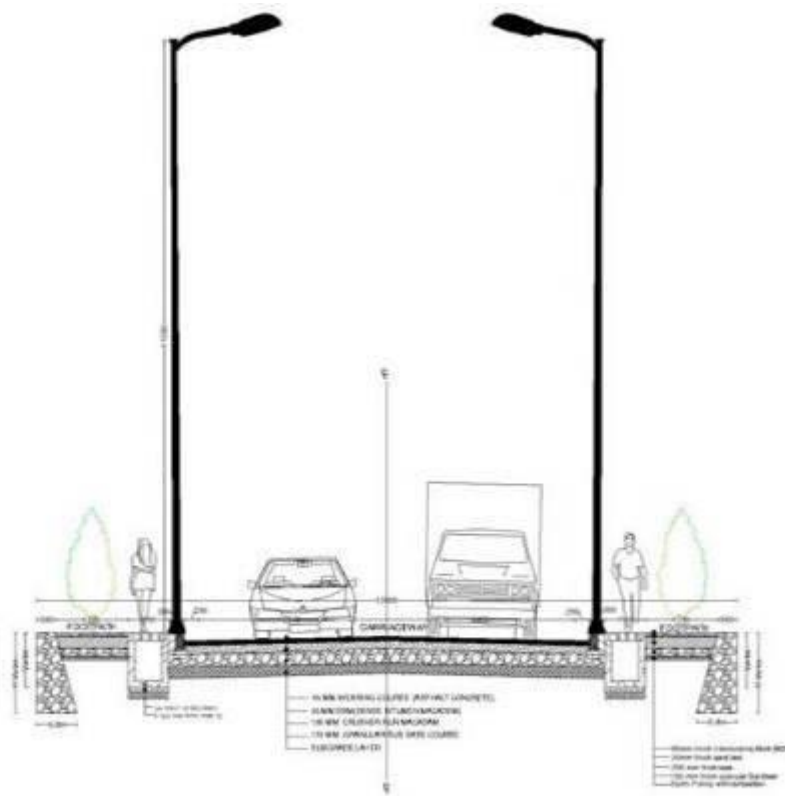


Figure 0.5: Typical Cross Section for 13m road (section Type C)

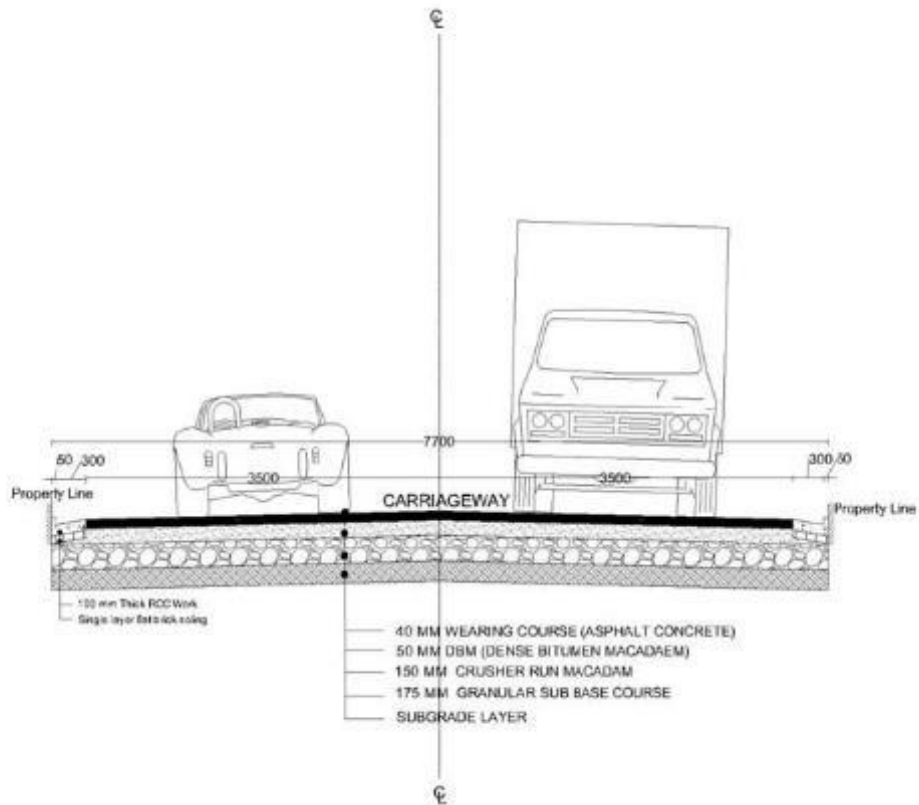


Figure 0.6: Typical Cross section for 7.7 m road (section Type A)

Note: Above figures is general typical cross section. Other typical cross sections in accordance to the surrounding are provided in DPR.

1.4.2. Carriageway

Carriageway width of 2 lanes (3.5 m each) has been proposed.

1.4.3. Kerbs

Barrier kerbs are designed to discourage vehicles leaving the pavement. In some places height of kerb stone has been lowered for house access for cars and motorcycle. In zebra crossing, mountable kerbs is provided for wheelchair passage.

1.4.4. Median

Median is not provided along the alignment.

1.4.5. Covered RCC drain

Tick drain is provided from chainage 0+000.00 to 0+038.00. RCC covered drain is provided from chainage 0+038.00 to the end of alignment in integration with footpath. Storm water collected are disposed through the nearest culvert sections.

1.4.6. Parking

Due to space restriction, separate provision of parking is not provided. However, Alternative parking locations are recommended for urban areas: Kanchibazar, Semara and Mangalapur for future development.

1.4.7. Intersections

Due to availability of less space and low traffic flow movements in junction, physical structures such as roundabouts and islands are not provided. However necessary safety measures such as traffic signs and signals, footpath etc. are proposed to be installed. The crossroad up to 15m is proposed to be upgraded.

1.4.8. Road crossings

Zebra crossings in combination with cycle crossing have been provided at locations with high pedestrian crossing areas as well as settlement areas. 47 nos of such crossings have been provided along the alignment.

1.4.9. Ramps

There are 178nos. of Ramps proposed along the Road. The cost for construction of Ramp is stated in BOQ.

1.4.10. Shifting of Existing Electric Poles

206 nos. of electric poles located within the proposed road of width need to be demolished and to be replaced and to be shifted (to be relocated) near kerb stone (source: DPR, 2021).

1.4.11. Sewer Drainage

As per discussion with the municipal officials, future planning of any type of sewer drainage projects has not been done. Thus, in future if any plan is made for sewer network, it will be constructed below footpath area.

1.4.12. Manhole

Manholes at existing locations are required to be raised to FRLs of the road. Cost of same has to be provided in the cost estimate and BOQ. However, there are no any sewer line system and manhole present along the road.

1.4.13. Water Supply Pipeline

The existing pipeline is in both side of the road for distribution of pipelines. Existing Pipe line between the chainage of 0+000 to 3+700 has been proposed to be relocated below footpath.

1.4.14. Cross-Roads Development

Stretch of 15 m of each cross-road will be developed under this project. Minimum radius of 6.5 m has been provided for cross roads. This development of cross-roads will include the following aspects:

- Improvement of Carriageway of all major as well as minor intersections.
- Installation of Road markings at all major as well as minor intersections.

1.4.15. Road Signs and Markings

Road Markings has been provided as per Traffic Sign and Marking manual Volume I and II. Broken Line markings have been done separate lanes. There are 94 numbers of informative, regulatory and warning signs proposed at different chainage of 5 KM of road length.

1.4.16. Footpaths

Dedicated cycle lane is not provided along the road. On chainage 0+000.00 to 0+200.00 (left side), 0+100.00-0+200.00 (right side) nearly 200 m of the drain cover's slab has been used as a footpath or walkway near to the location of Mangalapur Bazaar whereas another section of the road alignment is devoid of the footpath or walkway.

1.4.17. Street Lights and Bollard Lights

Street lights pole @ spacing 2X20m (alternatively) is proposed from chainage 0+000-5+000.

1.4.18. Bus laybys and Bus Shelters

Bus laybys are provided at various locations mentioned in the table below where public buses or micro buses pull out of the traffic to pick and drop off passengers.

Table 0.2: Location of Bus Laybys

SN	Chainage	Side	Length (m)
1.	0+110.00 to 0+161.00	left	51
2.	0+210.00 to 0+261.00	Right	51
3.	0+429.00 to 0+480.00	Left	51
4.	0+600.00 to 3+380	Right	51
5.	0+880.00 to 0+931.00	Left	51
6.	1+063.00 to 0+114.00	Right	51
7.	1+393.00 to 0+444.00	Left	51
8.	1+980.00to 2+031.00	Right	51
9.	2+103.00 to 2+154.00	Left	51
10.	2+384.00 to 2+435.00	Left	51
11.	2+436.00 to 2+487.00	Right	51
12.	2+935.00 to 2+986.00	Left	51
13.	3+030.00 to 3+081.00	Right	51
14.	3+214.00 to 3+256.00	Left	51
15.	3+342.00 to 3+393.00	Right	51
16.	3+ 537.00 to 3+588.00	Left	51
17.	3+586.00 to 3+ 637.00	Right	51
18.	3+911.00 to 3+ 962.00	Left	51
19.	4+ 131.00 to 4+ 182.00	Right	51
20.	4+ 209.00 to 4+ 260.00	Left	51
21.	4+ 671.00 to 4+722.00	Left	51
22.	4+ 843.00 to 4+ 894.00	Right	51

1.4.19. Hand railings

Hand railings are provided in 8 different locations along the alignment of 5 KM. The cost (Except Culvert) is NRs. 3343690.17 while the cost of Hand Railing for BOX Culvert is. NRs. 664,530.98.

1.4.20. Retaining/ Breast wall

Stone Masonry Retaining wall has been provided along the alignment where embankment is required. The locations and details of retaining walls are given in detail in DPR.

1.4.21. Interlock Concrete Block Pavement Design

The interlock concrete block pavement is proposed for footpath. The typical block pavement composition is given below:

- Concrete paver block-60 mm (Hexagon interlock block with compressive strength M 20)
- Sand Bed : 30 mm

- Base : 200 mm
- Granular sub base : 150 mm

1.5. ESIA Methodology

The study is undertaken following an overarching approach for Environmental and Social Impact Assessment (ESIA) and subsequently developing an Environmental and Social Management Plan (ESMP) following guidance provided by the Environmental and Social Management Framework (ESMF). A consultative and participatory process was adopted to conduct the ESIA and prepare the ESMP for the sub-project of Mangalapur –Kanchibazar road. The strategies to undertake the ESIA and preparing the ESMP required both qualitative and quantitative information gathering at both primary and secondary levels. The project team at Project Coordination Office (PCO) of Department of Urban Development and Building Construction (DUDBC), the World Bank, different national and local level stakeholders involved in NUGIP and the interaction with the community and related stakeholders on technical, environmental and social issues and consultants’ observation of the intervention sites were undertaken. The ESIA/ESMP is in compliance with the GoN and the World Bank’s policies and builds on the recent approaches and incorporates learning and previous experiences. The stepwise process in the preparation of ESIA/ESMP includes the following activities:

- Reviewed scope of works in the Terms of Reference (TOR) for the ESIA/ESMP, Project Implementation Manual (PIM), feasibility reports of the sub-project
- Reviewed applicable laws of the GoN and the WB policies.
- Consulted project team, PCO, stakeholders, WB and experts.
- Reviewed the DPR of the proposed project, consulted PCO and DPR consultants.
- Followed checklist for environmental and social data of DPR.
- Prepared safeguard (including resettlement) checklists prior to the field visit.
- Visited sub-project site and consulted municipality office, district level.
- Conducted consultations, Focus Group Discussions (FGDs), Key Informant Interviews (KII), with several stakeholders. Indigenous people from the outside of the project area are also considered during FGD (Refer Annex 1, Annex II)

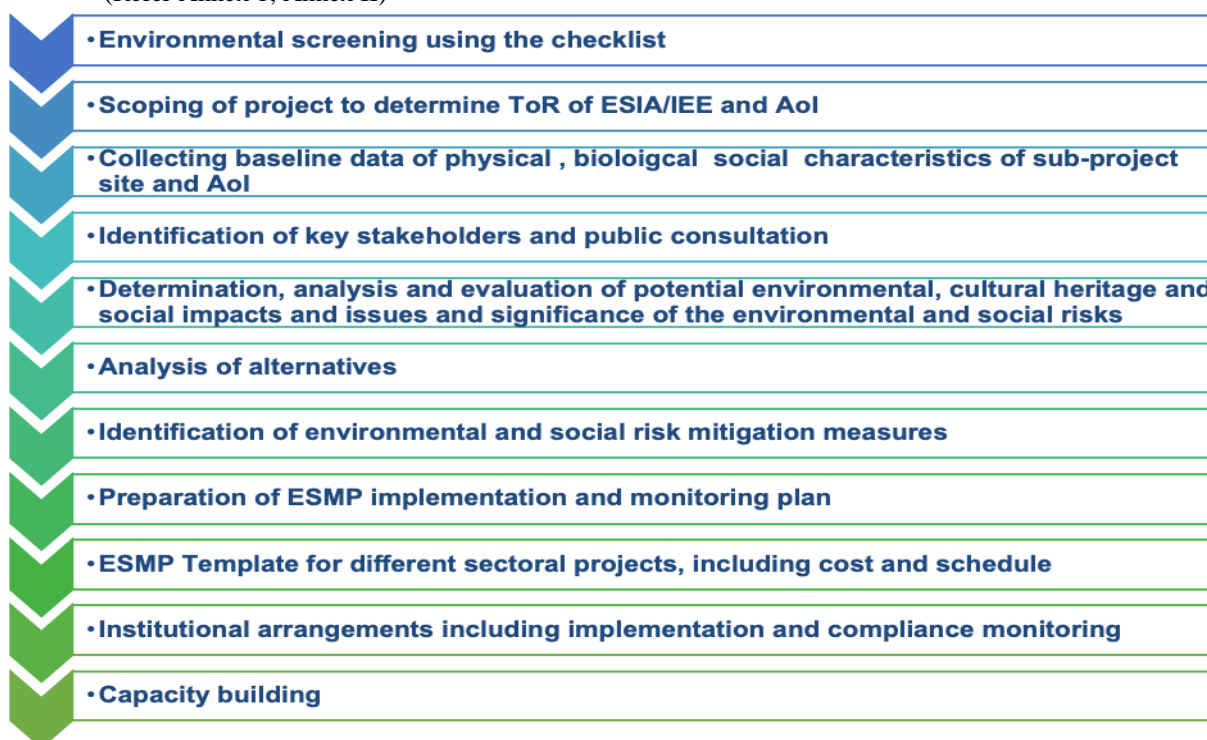


Figure 0.7: ESIA Process for all sub-projects

Collected primary data for physical, biological, and socio-economic baseline information. Instrumentation monitoring was performed for air, water, and noise. For biological assessment, vegetation survey was carried out. The representation of the methodologies for the ESIA of sub= project is shown in **Figure 0.5**.

1.5.1. Baseline study

Baseline data was collected for both environmental (physical and biological) and social aspects in conducting the ESIA and was used in developing the ESMP, based on the ESMF.

1.5.2. Stakeholder Analysis

A stakeholder analysis was carried out during the ESIA stage. The following activities were carried out during the analysis:

- Identified stakeholders of the sub-project
- Consulted stakeholders
- Incorporated feedback from the stakeholders into project design
- Incorporated recommendations and mitigation measures during construction and operation
- Involved stakeholders in stages of project implementation for ownership.

1.5.3. Gender assessment and GBV status analysis

The following activities were undertaken for gender assessment.

- Review of the legal policy framework of GoN
- Review of the set-up, capacity, and constrains within relevant institutions
- Analyze the culture amongst women of different cultural groups
- Analyze potential positive and negative impacts on women
- Analyze barriers, challenges, and constrains for the participation of women
- Identify potential entry points and interventions to enhance gender sensitivity
- Recommend project planning and implementation teams in addressing gender context

1.5.4. Assessment of potential environmental and social impacts

- Likely Beneficial Impacts
- Likely Adverse Impacts

1.5.5. Environmental and social screening

Every sub-project under the NUGIP is subject to an environmental and social screening process. The screening process establishes the level of environmental and social assessment required. The screening process intends to identify relevant possible environmental and social concerns as well as suggest any further investigation and assessment as necessary. Primarily, the environmental and social screening exercise is undertaken to determine the key environmental and social issues/concerns and the nature and magnitude of the potential impacts that are likely to arise on account of the proposed sub-projects. The fundamental environmental and social issues to be identified were determined by the type, location, sensitivity and scale of the municipal investment and sub-grant intervention. The results were used to determine the need for detailed assessment and the extent and type of environmental and social assessment.

1.5.6. World Bank Safeguard Policies

The World Bank classifies projects into one of the four categories, depending upon the type of project or specific components which have inherent environmental risks, location proximity to environmentally, socially and culturally important areas, sensitivity, potential impacts which may be irreversible or environment sensitive to changes, the scale and extent of environmental and social issues of the project, and the nature and magnitude of its potential environmental impacts.

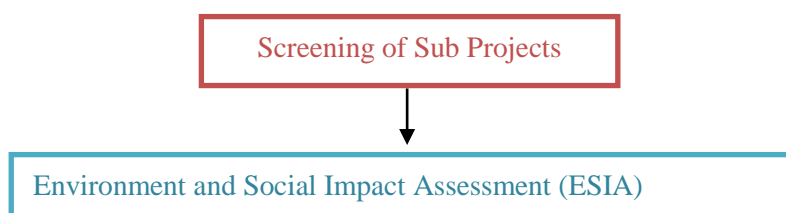


Figure 0.8: Flow of preparation of safeguard instruments for the project

1.5.7. Revision and modification of ESMP

The ESIA and ESMP is an 'up-to-date' document that will be publicly disclosed and disseminated. Unexpected situations in the sub-project or component design would therefore be assessed and appropriate management measures will be incorporated by updating the ESMP. Such revisions will also cover any modifications introduced in the design of sub-project at any stage of the project. Also, based on the experience of application and implementation of such a framework, provisions and procedures would be updated as applicable and when required with due process.

ENVIRONMENT AND SOCIO-ECONOMIC BASELINE

1.6. Physical environment

1.4.22. Physiography, Geomorphology and Geology

Physiographically, Nepal is divided into eight different zones. i.e. Terai, Siwalik, Dun Valley, Mahabharat Range and Midlands (hills), Fore Himalaya (Middle mountain), Higher Himalaya and Trans Himalaya (High Mountain). Each of the above zones has different altitude, topography, climate, soil type, geology and vegetation characteristics. Rupandehi district covers Chure hills and Duns 12.5%, Bhabar and Terai 87.5% (Source: Rastrapati Churia Conservation Program, 2015).

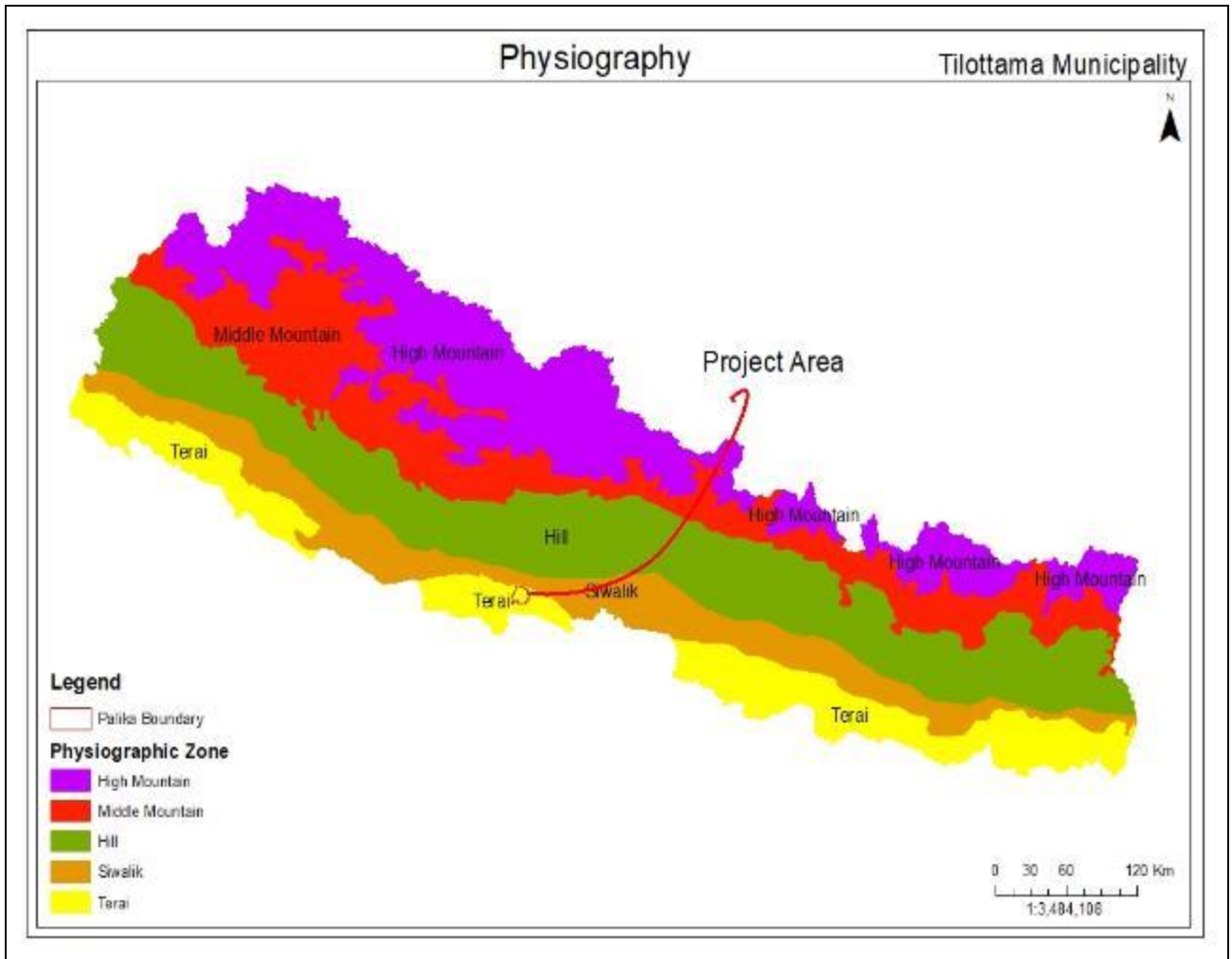


Figure 0.1: Physiographic Division of Nepal and project area

Tilottama Municipality falls on Terai zone. Topographically, Terai is generally flat with minor relief caused by river channel shifting and down warping of the basin. This Municipality is characterized by flat plain and lower in elevation. Also, small river valleys are filled up by the alluvial and fan deposit in the northern region. The major rock types are Alluvium (gravels in the north near the foot of the mountain, and gradually becomes finer southward. Boulder, cobble, pebble and sands and pebbly sands, silts, clay and silt in the plain Terai.

Geologically, Nepal is divided into 5 different regions. They are Terai, Siwaliks, Lesser Himalaya, Higher Himalaya and Tibetan Tethys Himalaya.

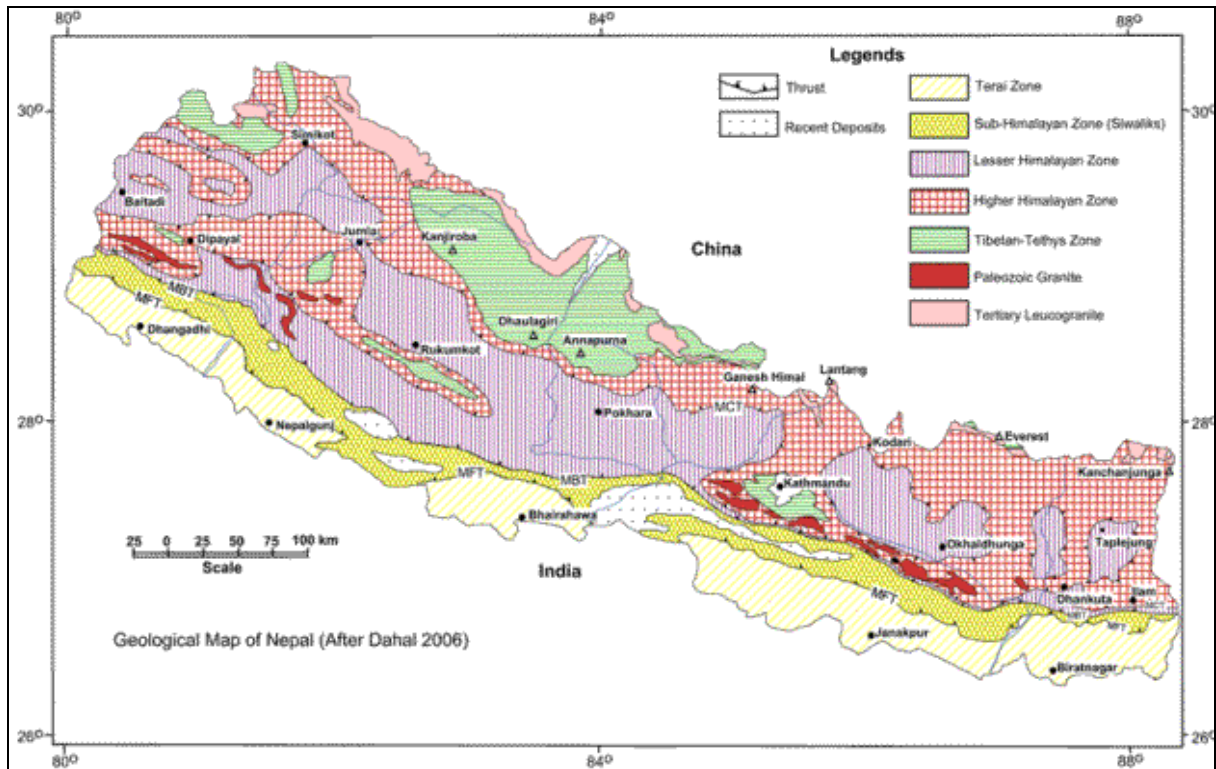


Figure 0.2: Geological map of Nepal

Geologically, Tilottama Municipality falls in the Terai zone. Northern part of the Terai zone is bounded by Main Frontal Thrust (MFT). Tilottama Municipality exhibits Recent Formation (Re), geological class. Recent Formation (Re) is characterized by alluvium, boulders, gravels, sands and clays. Churia hills have contributed to the restoration of soil fertility of this plain in the south.

Geological Boundary Map of Project Area



Data Source: Updated from ICIMOD Landuse Data, 2010, Google Earth, DMG and Dept. Survey, Nepal

Figure 0.3: Geology of Project Site (Source: Updated from ICIMOD and Google Earth, 2021)

The municipality is located towards southwest from Kathmandu and the south from the provincial capital of Lumbini Province of Nepal. Physiographically, it lies between the latitudes 27° 36' 34.3" North and longitudes 83° 29' 4.3" East and the altitude varies from 25m to 60m from sea level. It covers an area of 126.2 square kilometers. Two main rivers, the Tinau and the Rohini Khola run from its border to the west and east respectively. The geological map of the project area is shown in **Figure 0.3**.

1.4.23. Topography

The municipality is located towards southwest from Kathmandu and the south from the provincial capital of Lumbini province of Nepal. This municipality lies in plain terrain of Terai region. Two main rivers, the Tinau, and the Rohini Khola run from its border to the west and east respectively. The length of the Tinau is 95 km starting from Palpa to Indo-Nepal Border at Marchawar. The catchment area of the river is about 1081 sq.km up to the border. The Rohini River rises in the Chure or Siwalik Hills in Kapilvastu and Rupandehi Districts of Nepal's Lumbini Zone and flows south into Uttar Pradesh state, India. At Gorakhpur it becomes a left bank tributary of West Rapti River, which in turn joins the Ghāghara above GauraBarhaj, then Ghaghara, in turn, joins the Ganges. The municipality was formed by merging existing seven Village Development Committees (VDCs) namely Shankarnagar, Aanandaban, Karahiya, Makrahar, Tikuligadh and Madhabaliya in May 2014, and Gangoliya VDC in September 2015. The municipality is surrounded by Devadaha municipality in the East, Omsatariya and Siyari rural municipalities in the south, Siyari and Suddhodhan rural municipalities in the west and Butwal sub-metropolitan city and Devdaha municipality in the North. In the proposed road alignment and in RoW there is no landslide/flood area and other disaster prone area.

The physical conditions of the project area are shown in **Figure 0.1**.



- The start point of Mangalapur - Rohini road section at Siddhartha Highway (Tillotama Ward Number 9)



- Existing condition of the road



- Tree within the RoW to be removed



- Electric Poles within the RoW to be relocated



Condition of the road in Ward on 7



Public waiting place along the road alignment in Ward 7

Figure 0.4: Pictorial highlights of the Project Area

1.4.24. Climate and Hydrology

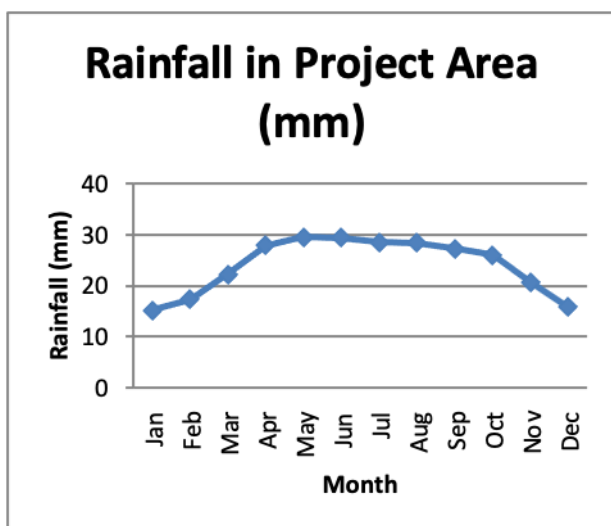
Tilottama Municipality falls on tropical climatic zone. This climate has three distinct seasons. Dry summer season begins in the month of March when the sun starts to move northward from the equator. It lasts till the middle of May. The mean minimum temperature reaches up to 19.32°C and mean maximum temperature is nearly 30.92°C. Rainy season starts from the month of May and ends in September. Winter season begins in the month of October and lasts till February as the sun moves southward from the equator. Higher temperature is observed in the month of April and it remains active till October. Extreme cold starts from November and last till February.

The average annual rainfall is 1753mm. November, December, and February are the driest month and most precipitation falls in July, with an average of 510 mm.

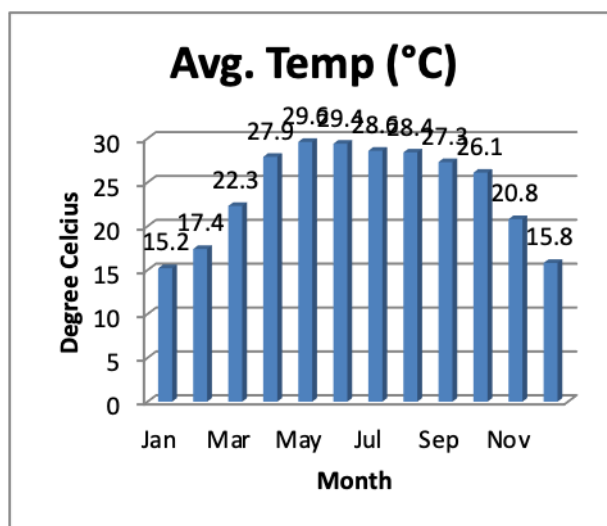
Table 0.1: Weather Data for Project Area

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Temp (°C)	15.2	17.4	22.3	27.9	29.6	29.4	28.6	28.4	27.3	26.1	20.8	15.8
Min. Temp (°C)	7.9	9.7	13.7	19.7	23	24.4	25	24.7	23.1	21.3	13.9	8.3
Max. Temp (°C)	22.5	25.2	30.9	36.1	36.3	34.5	32.2	32.2	31.6	30.9	27.8	23.4
Rainfall (mm)	20	4	15	18	61	335	594	564	312	88	2	2

Source: DPR, 2021



Rainfall in the Project Area



Average Temperature in the Project Area

Figure 0.5: Weather Details for the Project Area

The main rivers of Tilottama are Tinau River, Rohani River & Sukhaura River. These rivers are the main river originating from Mahabharat Mountains and Middle Hills. Sukhaura (27°40'21.8"N, 83°29'32.3"E and major

stream are originating from the Chure hills and are tributaries of the main rivers of Tilottama Municipality. In the sub-project, Rohani River is the major River that is located at the end of the road and the principal drainage system of project site. Existing drainage system will be managed to reduce the problem of water logging. The relevant DHM established rainfall station for the estimation of the discharges in the natural drains crossing the road is Butwal –Station No. 0703. The latitude, longitude and elevations of the station are shown in **Table 0.2**.

Table 0.2: Hydrology Station of Tilottama Municipality

Stn. No.	Stn. Name	Latitude	Longitude	Elevation(m)
0703	Butwal	27°41'39.8"	83°27'58.7"	180

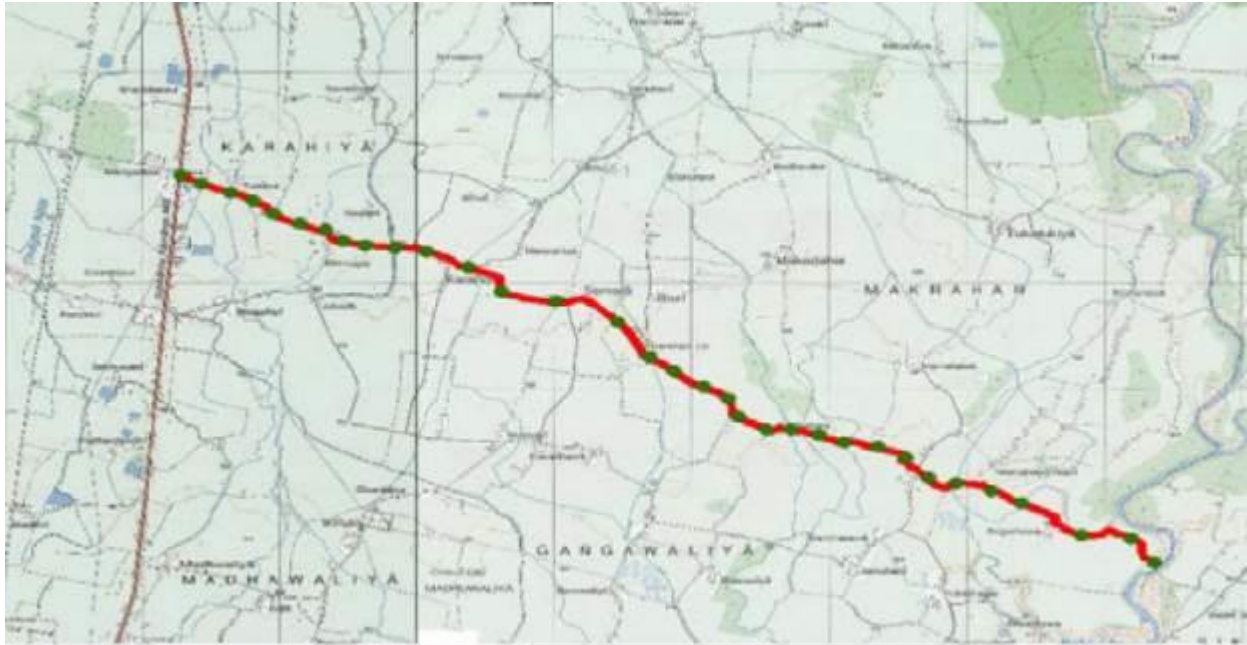


Figure 0.6: Zoning of the Catchment Area of the project (Source: DPR, 2021)

The hydrological catchment area of the project road covers about 6 sq.km including various rivers. The catchment zoning of the culvert points is provided in **Figure 0.6**.

1.4.25. Liquefaction Susceptibility

The Peak Ground Acceleration (PGA) for the Mangalapur-Kanchibazar site (up gradation up to 5 KM which is Bewara Chowk) has been taken as 0.29g referred from the Seismic Hazard Map of Nepal published by Nepal Seismological Centre. As per the literature reviews the strata with corrected N value greater than 30 are not susceptible to liquefaction. As the site falls under Zone V of seismic zone, the design for seismic forces should be done considering the project in Zone V. Earthquake hazard map of Nepal is shown in **Figure 0.7**.

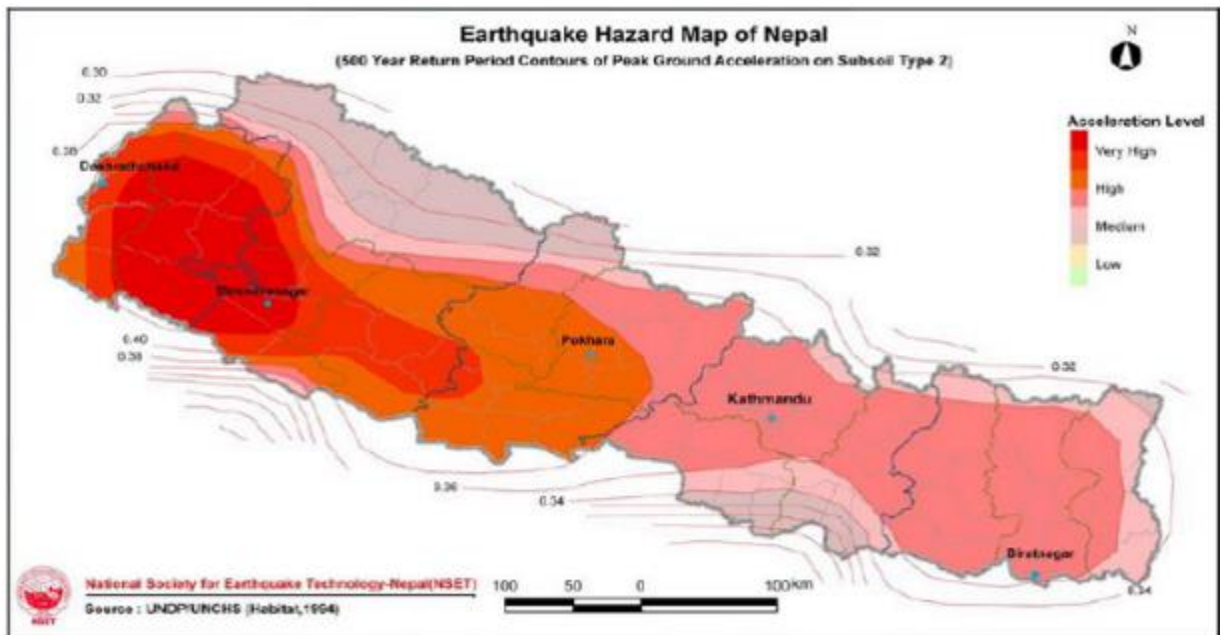


Figure 0.7: Earthquake Hazard Map of Nepal (Source: UNDP/UNCHS, 1994)

The sub-surface strata of the project area primarily consist of boulder and gravel. The liquefaction analysis indicates that the site is not susceptible to liquefaction. The materials to be used for backfilling purposes shall be of selected fill composed of sand and/or granular mixture free from organic matter or other deleterious substances. It shall be spread in layers not exceeding 25cm in un-compacted thickness, moisture conditioned to its optimum moisture content, and compacted to a dry density not less than 95% of the maximum dry density as obtained by modified proctor test (IS 2720 Part 8).

1.4.26. Land Use

The project area consists of different settlements like commercial, residential, agriculture and open / barren land. This route has 3.5 KM of settlement & 1.22 KM of agricultural land, 0.28 KM of barren land on either side of the road length. The proposed road includes marshes and barren land too along with its alignment and has the problem of water logging in some areas. The proposed road would directly serve about 473 households i.e. about 2365 population of the municipality considering buffer of 500 meter in either direction of proposed road alignment (Project DPR report, Sept 2021). Trees can be seen along the alignment at some places. The land use map of the project area is shown in **Figure 0.8**.

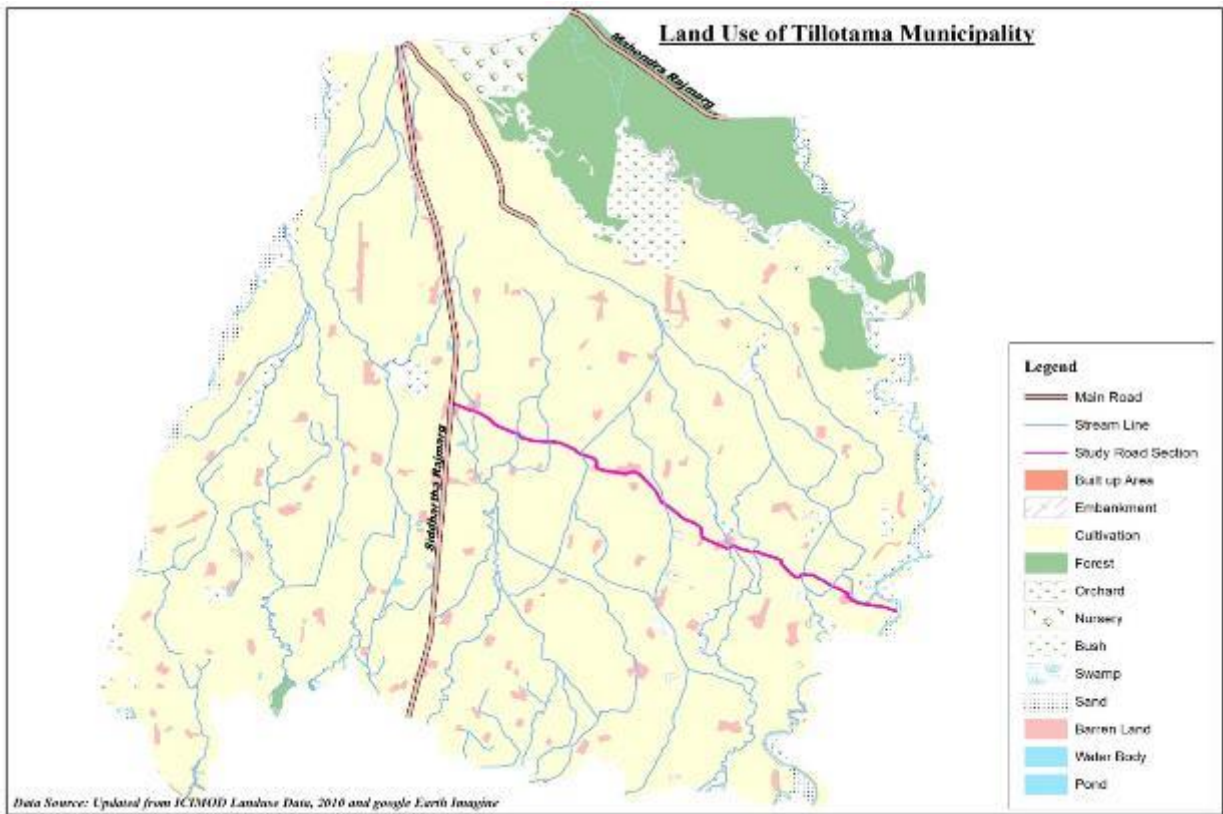


Figure 0.8: Land Use Map of the Project Area

1.4.27. Existing Infrastructures along the road alignment

2.1.6.1. Existing Waste Water/ Sewerage Network

The municipality lacks any kind of systematic sewerage system for urbanizing settlement and market areas. Majority of the households, mainly in urban settlements, have their own septic tanks for collection of sewage seepage which is disposed of via private service providers when filled.

2.1.6.2. Existing Water Supply Network

As per field observation, about 3.7 km (from chainage 0+000 to 3+700) of existing water supply pipe network is located in the proposed alignment. Kariya Makrar KhaniPani Tatha Sarsafai Abhiyan and Kariya Kahanepani Thatha Sarsaphai Abhiyan cater the water supply demand of Karahiya, Haraliya, Semara, Ramnagar, Keulani, and Tulshipur area of ward no 9 and 7 and some part of ward 10 area.

The water supply network map shows that distribution of diameter 90 mm HDPE pipelines from Mangalapur to Semara which passes parallel to the project road and is at center of existing carriage way. It has been proposed that the pipe line will be shifted to edge of road i.e under the footpath during the construction of road project. Currently there are no planed or potential sewage and water supply projects in the project area

2.1.6.3. Existing Electrical and Telecom Lines

206 nos. of electric poles lie within the proposed road width which are to be relocated to new place.

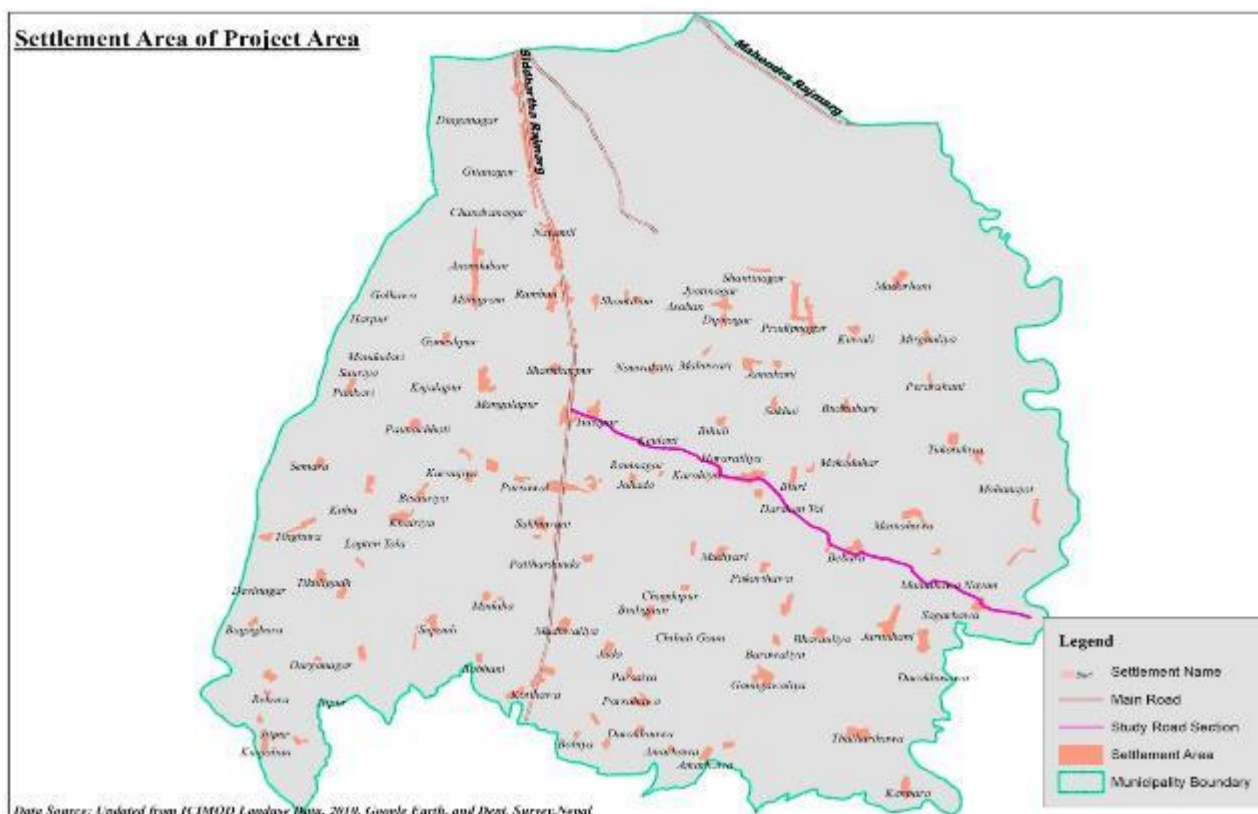


Figure 0.9: Settlement along the Project Area

2.1.6.4. Existing Road Networks

The Municipality has 5.199 km per square km of coverage of roads Municipality Transport Master Plan (MTMP-2017). The road density per 1000 populations is 5.59 km. Total Road network within Tilottama Municipality is 584.33 km of which Strategic Road Network is 16 km. The current status of road network including strategic, Feeder and some of the Municipal Road network are blacktopped. Although blacktopped, sections of these roads do not have storm water drainage. Out of total road length, 328.75km (56.02%) is graveled, 245.65 km (41.21 %) is black topped and 16.39 km (2.77%) is earthen roads (MTMP-2017). The main and intercity roads lack public facilities like bus stand, street light and intercity bus park. Among total blacktopped road within the municipality, about 30% of road surfaces have worn out. The roads in wards 17, 10, 11, 8 and 3 mostly have graveled road surfaces. Ward 12, 14 and 17 do not have sufficient road networks as compared to other wards. The list of roads is given in Table 0.3.

Table 0.3: Road Infrastructure in the Project Municipality

SN.	Road Name	Total Length (km)	Average Width (m)	Graveled Road (km)	Metalled Road (km)
1.	Harpur-(Ganeshpur-Manglapur) to Kanchibazar	12.68	9.69	1.45	11.23
2.	Manigram-Pradipnagar-Madrahani Road	7.53	8.55	2.35	5.19
3.	Rehara Tikuligadh Road	2.12	6.6	1.01	1.11
4.	Jabarjastpur-SiddharthaLokmarga-Gangoliya-Kanchibazar Road	7.89	8.55	0.48	7.41
5.	Ashaban-Bhalwari-Parsawal Road	4.89	7.11	2.86	2.03
6.	Purano Bato	5.89	7.5	2.93	2.97
7.	Pradipnagar-Jamuhani-Semara Baazar road	7.5	8.15	4.5	3.00
8.	Tilottama Ringroad	30.24	8.77	24.06	6.18
	Total	78.74	-	39.64	39.12

Source: MTMP, 2015

1.4.28. Air and, Water, Quality

During the physical environment survey (air and water) on project road alignment at recipient level measurement data were obtained. The water samples were collected from the project affected areas and tested in laboratory. The real time based 24 hours average PM₁₀, PM_{2.5} and CO were lesser than 40µg/m³, 30µg/m³ and 130µg/m³ respectively at the site. The observed values were significantly lower than NAAQS 2012 for the respective air quality parameters. The average wind was directed from South to North with maximum with speed of 19Km/hr (**Figure 0.13**). The water quality report was found complied with National Drinking Water Quality Standards /GoN. The detail of water quality report is enclosed in **Annex V**.

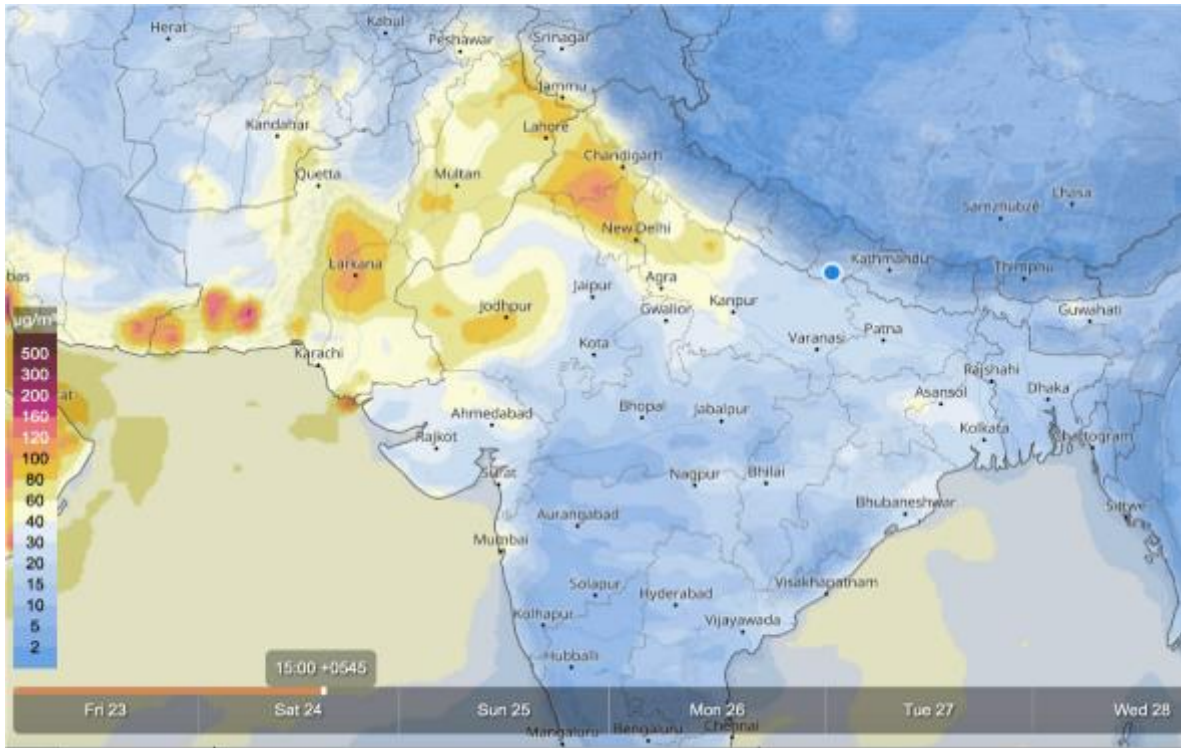


Figure 0.10: PM₁₀

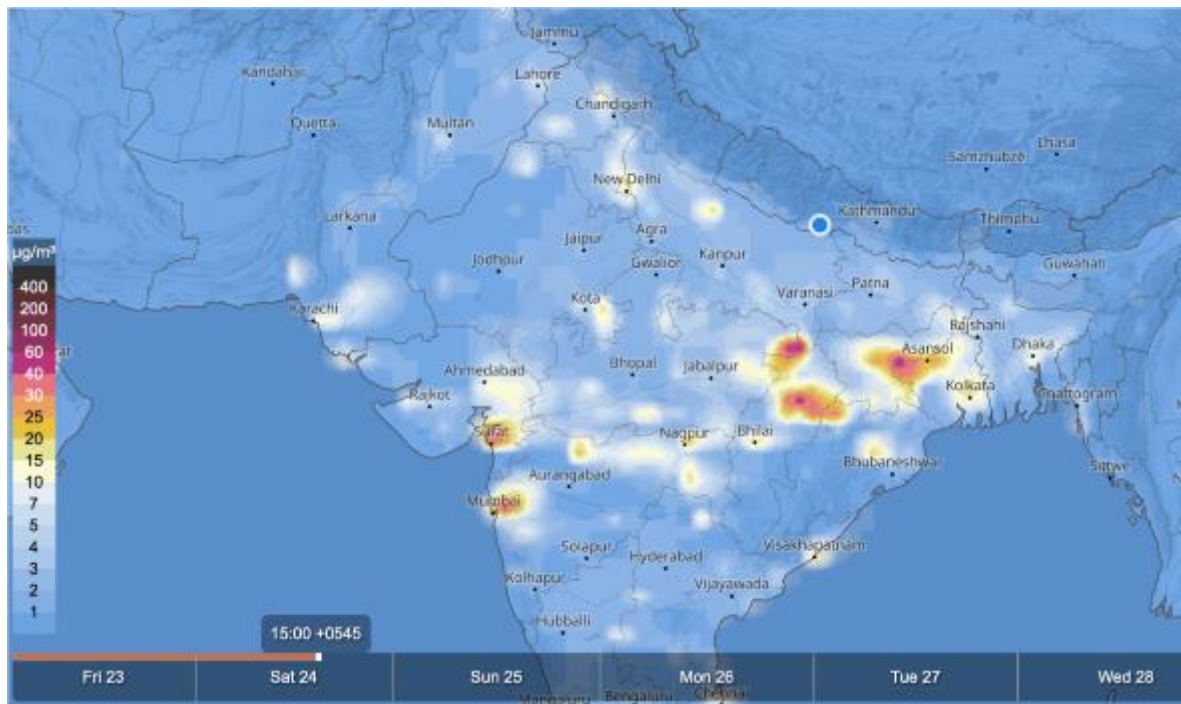


Figure 0.11: PM_{2.5}

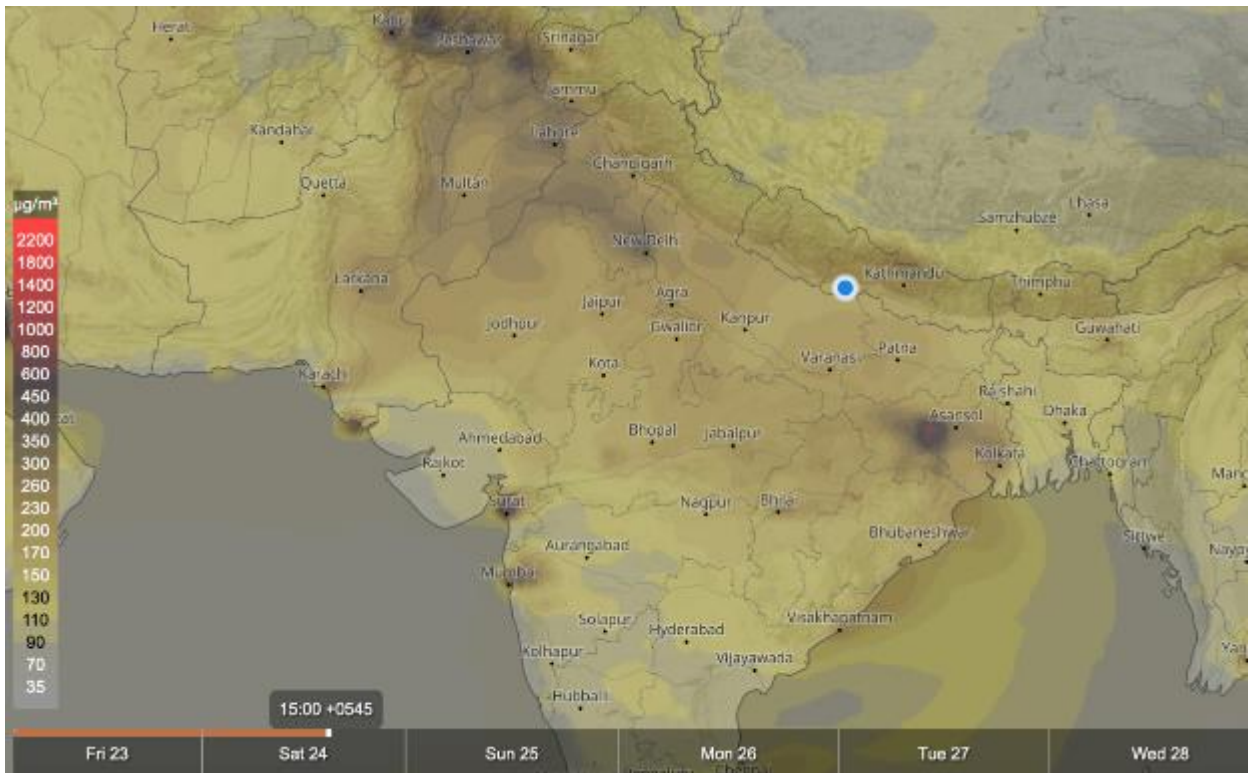


Figure 0.12: CO

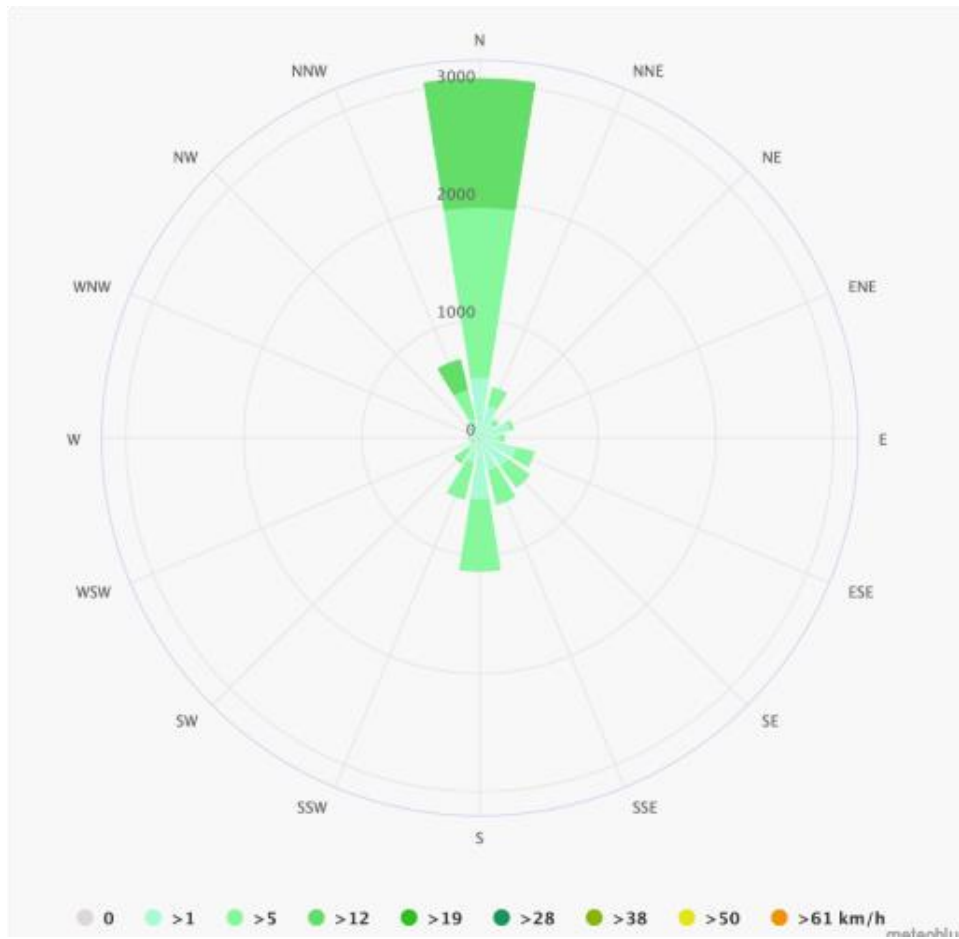


Figure 0.13: Windrose

2.1.7.1. Noise Quality

The daytime and nighttime observed sound pressure level at the monitoring site were 66dB(A) and 67dB(A) respectively. Similarly, the observed day and night sound pressure level was about 69dB(A). The observed daytime and nighttime average sound pressure levels complied the prescribed limits of GoN 2012{L_d: 75dB(A); L_n: 70dB(A)} for industrial area. The details of air, and noise are summarized in Annex V.

1.7. Biological Environment

The nearby forest is Kariya Community Forest and Banbatika Community Forest at distance of 3.46 km and 4.58 km respectively from project direct impact area (within RoW). The indirect project area (50 m from edge of the road) has built up area and agricultural land. There is no forest within project impact area and it is not a habitat for terrestrial fauna and avifauna. Major trees found in the RoW of the project are presented in **Error! Reference source not found.**

Table 0.4: Major tree species found in the RoW of the project

SN	Scientific Name	Common Name	Use
1.	<i>Dalbergia Sissoo</i>	Sissoo	Timber
2.	<i>Magnifera indica</i>	Aanp	Fruit/Fuelwood
3.	<i>Azadirachta indica</i>	Nim	Traditional Medicine/Fodder
4.	<i>Melia azadirach</i>	Bakaino	Fuelwood/Fodder
5.	<i>Saraca asoca</i>	Ashoka	Ornamental
6.	<i>Psidium guajava</i>	Amba	Fruit/Fuelwood

Source: Field Survey, 2021

Note: Cutting of trees within the ROW will be compensated from the road side plantation. In addition to, Buffer zones, protected areas, wetlands, conservation areas and eco-sensitive areas are not affected by the proposed road.

There are only 64 trees that need to be removed in 5 KM road up-gradation work. The details of trees to be removed are listed in annex VII of this report.

1.8. Socio-economic and Cultural Environment

2.3.1. Socio-economic overview

The road project Mangalpur-Kanchibazar is being implemented in Tilottama Municipality of Rupandehi district. The municipality was formed by merging existing seven Village Development Committees (VDCs) namely Shankarnagar VDC, Aanandaban VDC, Karahiya VDC, Makrahar VDC, Tikuligadh VDC and Madhabaliya VDC in May 2014 and Gangoliya VDC in September 2015. The project area of this proposed project is located in Tilottama Municipality of Rupandehi District, Province No 5 that connects Siddhartha Highway to the Rohini Bridge.

The municipality is surrounded by Devadaha municipality in the East, Omsatariya and Siyari rural municipalities in the south, Siyari and Suddhodhan rural municipalities in the west and Butwal sub-metropolitan city and Devadaha municipality in the north.

2.3.2. Details of settlements within the project area

In the settlements falling within the project area, Tilottama Municipality Ward no. 7 karahiya, Ward 9 and 10 Makrahar.

Table 0.5: Details of settlements within the project area and distance from the project site

Name of Local Level and Ward No.	Distance from the Project Site	
Tilottama Municipality	Ward No. 7, Karahiya	The project passes through the ward
	Ward No.9	The project passes through the ward
	Ward No. 10	The project passes through the ward

Source: City profile of Tilottama Municipality, 2075 B.S

2.3.3. Details of households within the project area

The proposed project lies in Tilottama Municipality of Rupandehi District in Lumbini Province of Nepal. The total population of the district, according to the Census of Nepal, 2011 is 880,196 and the number of households is 163,916. The average family size of the district is 5.37, which is higher than that of the national average (4.88). The

total population of Tilotama Municipality is 123836 and total household is 21957. The average household size of the municipality is 4.56 which is lower than that of district household size (5.37). The details of the demographic character of affected district and municipality are shown in **Table 0.6**.

There are different types of houses within the project area. Concrete House, Raw House and Hut Houses are found in this project area. The total numbers of households are 21,957 in Tilotama Municipality.

Table 0.6: Population and Literacy rate in Tilotama Municipality

Description	Population aged 5 years & above	Population			Literacy no stated	Literacy rate
		Can read and write	Can read only	Can't read & write		
Both Sex	92,946	75,055	1488	16282	121	81%
Male	43296	38149	668	4446	33	88%
Female	49650	36906	820	11836	88	74%

Source: Profile of Tilotama Municipality

Table 0.7: Details of total number of households and average number of households within the project area

Local Level	Name and Ward No.	Total Household	Average Households
Tilotama Municipality	Ward No. 7	2124	4.93
	Ward No. 9	1189	5.05
	Ward No. 10	846	6.15

Source: Central Statistics Department, Census B.Sc.2068

2.3.4. Details of the Ratio of Females to Males living within the project area

Table 0.8: Proportion of men and women living within the project area

Local Level	Ward No.	Female Population	Male Population	Average Population of Female and Male
Tilotama Municipality	Ward No. 7	5146	5345	0.96
	Ward No. 9	2969	3038	0.97
	Ward No. 10	2539	2666	0.95

Source: City profile of Tilotama Municipality, Census B.S.2075

2.3.5. Details of castes and religious communities residing within the project area

The project area is inhabited by Brahmins, Chhetri, Tharu, Gurung, Magar, Thakali, Kewat, Muhsar, Yadav, Dhobi, Muslim, Chepang, Jogi, Thakuri, Kami, Damai, Chamar, Harijan, Ram and Hindus. Muslims, Christians, Sikhs, etc. are found living in religious communities. There are also Shiva Temple, Durga Temple, Radhakrishna Temple, Mokshyadham, Buddhist Gumba, Stupa, Mosque and Churches. The indigenous people in project area are Gurung, Chepang, Tamang, Tharu, Sherpa, Sunuwar, Rai.

Table 0.9: Details of ethnic, religious communities and religious sites residing within the project area

Name of Local Level	Name and Ward No.	Caste	Religious denominations	Religious places
Tilotama Municipality	All Tilotama municipality	Ahir, Kumal, Brahmin, Kshetri, Gurung, Chepang, Jogi, Thakuri, Tamang, Thakali, Tharu, Pariyar, Dasnami, Magar, Muslim, Rai, Sherpa, Sunuwar	Hindu, Buddhist, Muslim, Christian	Kotahasmai Temple, Vishwashanti Gumba, Mayadevi Buddhist Gumba, Idgah Masjid etc.

Source: City profile of Tiltorama Municipality, 2075 B.S

2.3.6. Details of cultural practices of the castes living within the project area

There is diversity in the cultural practices of the castes within the project area. Cultural festivals like Dashain, Tihar, Chhath, Ram Navami, Shivaratri, Maghi, Buddha Jayanti, Eid, Moharram, Christmas are celebrated in this region which is inhabited by different castes and religions.

Table 0.10: Details of the cultural practices of the castes living within the project area

Name of Local Level	Name and Ward No.	Cultural Rituals
Tilottama Municipality	All Tilottama municipality	Dashain, Tihar, Teej, Maghi, Holi, Buddha Jayanti, Eid, Moharram, Christmas etc.

Source: City profile of Tilottama Municipality, 2075 B.S

2.3.7. Details of the educational level of the residents within the project area

In the total population (123836) of Tilottama Municipality, 13.84% of the population have obtained Secondary Education Examination level of education. Similarly, the number of male graduates was higher than that of the female graduates. Similarly, the educational level of the population living in the municipal area was higher than that of the population living in the rural Municipalities.

Table 0.11: The educational level of the residents living within the project area

Name of Local Level	Name and Ward No.	Educational Level	Total number of passes Population	Percentage of Educational Level
Tilottama Municipality	All Tilottama Municipality	S.E.E. or Equivalent	19630	15.85%
		+2 or Equivalent	17141	13.84%
		Bachelor's Degree	9915	8%
		Master's Degree	3809	3.07%

Source: Central Statistics Department, Census B.Sc.2068

2.3.8. Details of educational institutions falling within the project area

The number of basic schools is highest in the settlements within the project area while the number of higher secondary schools and colleges is low.

Table 0.12: Details of educational institutions within the project area

Name of Local Level	Types	Number of Schools
Tilottama Municipality	Community	42
	Religious	2
	Institutional/Private	42

Source: City profile of Tilottama Municipality, 2075 B.S

Table 0.13: Schools in and near the road alignment

S.N.	School Name	Location
1	Sree Semara Bazar Secondary School	Tilottama -7
2	Janahit High School	Tilottama -10
3	Namuna Boarding School	Tilottama -10
4	Sree Gautam Buddha High School	Tilottama -9
5	Everest Boarding School	Tilottama -9

Source: Field Survey, 2021

2.3.9. Condition of health, health institutions and sanitation within the project area

The condition of health facilities and sanitation within the affected area of this project has changed satisfactorily. At present there are health posts in all the municipalities and wards and well-equipped hospitals are operating in the Butwal sub-metropolitan area close to the project. There is also a private hospital in the municipality. Also, every household has built a toilet. Diseases like fever, cold, cough, asthma, hypertension and diabetes have been found in this area. The details of health institutions within the project area are as follows.

Table 0.14: Details of Health Institutions within the Project Area

Name of Local Level	Name and Ward No.	Health Post	Clinic/Pharmacy / Polyclinic	Aayurvedic Hospital	Private hospital	Public Hospital
Tilottama Municipality	All Tilottama Municipality	7	5/12/210 (Estimated)	1	1	1

Source: City profile of Tilottama Municipality, 2075 B.S

2.3.10. Employment and income status

The main occupations of the residents living within the project area are agriculture, animal husbandry, trade, government jobs and foreign employment. Although some people have gone to the Gulf countries for employment, most of them have moved to different cities of India. Most of the people are found to be running small and medium enterprises at the local level and working for a daily wage while the income of urban dwellers is higher and those living in rural areas are lower.

2.3.11. Industry and its types

Table 0.15: Details of industries within the project area and its types

Name of Local Level	Name and Ward No.	Name of the Industries	Number of Industries	Type of Industries
Tilottama Municipality	All Tilottama Municipality	Agarbatti Industry, Candle Industry, Sawmill / Furniture Industry, Salt, Sewing-Knitting / Cutting, Dhaka and Tan Industry, Crusher Industry, Brick Making, Grill Industry, Poultry, Animal Farm etc.	Small Industries - 246, Medium Industries - 101, Large Industries - 16	Small and Medium Industries

Source: City profile of Tilottama Municipality, 2075 B.S

2.3.12. Condition of infrastructure

Most of the ward offices in the project affected area are in concrete buildings and some ward offices are under construction. It was found that there were paved roads, gravel roads and unpaved roads, paved bridges connecting one village to another and some bridges were under construction. There are local clubs in different wards. Similarly, access to electricity was extended to all households and poles and trees were used for power transmission lines. Most of the people used mobile phones for communication facilities.

2.3.13. Roads and its types

The project affected areas have paved, unpaved and gravel roads. In the rural areas, road construction and leveling work is being done and concrete bridges are being built on small and big rivers.

2.3.14. Value of land

While there are cheap lands in rural areas within the project affected areas, the price of land is also increasing due to increasing population density in urban areas.

2.3.15. Public facilities

Most of the ward offices in the project affected area are in concrete buildings and some ward offices are under construction. There were paved and unpaved roads, paved bridges connecting one village to another and some bridges were under construction. There are local clubs in different wards. Similarly, access to electricity has reached all the households, most of the people are using mobile phones towards communication facilities.

2.3.16. Migration Status

In order to get basic amenities in urban areas, to trade, to run small and medium scale industries, to find daily employment opportunities and to make a living by farming in the fertile lands of the Terai. There are many people come from Palpa, Baglung, Gulmi, Arghakhachi district.

2.3.17. Market and its position

Butwal and Bhairahawa are the main markets for most of the residents living in the project affected areas and goods are being procured at wholesale prices from the same market and transported from the local bazaars and grocery stores to the rural areas. Locally produced food, vegetables, pulses, oilseeds, goats, chickens, fish, etc. are sold in the local market on a daily and weekly basis.

2.3.18. Potential Development Centers

As various physical infrastructures are being developed around the municipality office and ward office of the municipality in the project affected area and on the right and left side of the road touched by the highway, these same areas are being developed as development centers.

Table 0.16: List of the Mother/Women Group/Co-operative in the project affected area

S.No.	Ward No	Name of Mother/Women group
1.	Ward no: 7	Pragati Sil Mahila Samuha Semara
2.	Ward No 9	Kalayan kari Ama Samuha
3.	Ward No 9	Ram Janaki Ama Samuha (religious group)
4.	Ward no:10	Sirjansil Ama Samuha, Bebari
5.	Ward no:10	Langghali Ama Samuha , Bebari
6.	Ward no:10	Swarga Rohini Ama Samuha , Sagrahawa

Source: Field Survey, 2021

Table 0.17: List of temples, resting areas and other community owned properties

S.No.	Ward No	Name	Type
1.	Ward No7	Durga Temple, Samera Bazar	Temple
2.	Ward No 7	Buddha Temple, Samera Bazar	Temple
3.	Ward No 7	Shiva Mandir , Samera bazar	Temple
4.	Ward No 7	Karahiya Rest area	Waiting Place
5.	Ward No 7	Samera bazar Rest area	Waiting place
6.	Ward No 10	Shiva Temple, Sagrahawa	Temple

Source: Field Survey, 2021

2.3.19. Existing gender status

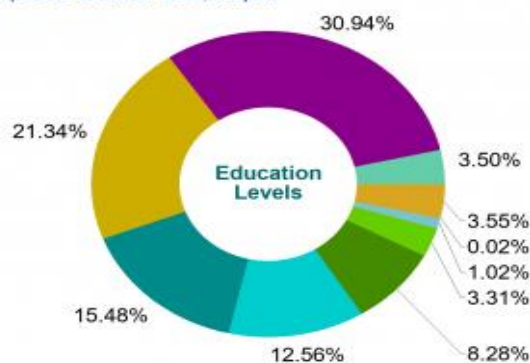
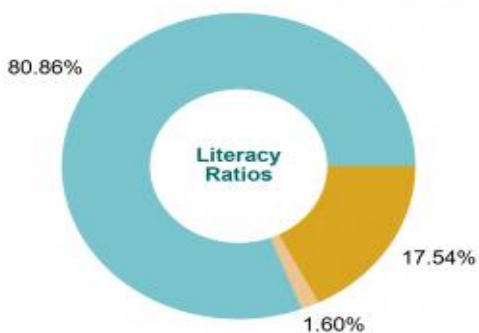
2.3.19.1. Sex Ratio

The average female to male ratio of the affected wards is 97:100 which is considerably higher than national average of 84.55: 100. In 2020, male to female ratio for Nepal was **84.55 males per 100 females**. Male to female ratio of Nepal fell gradually from 98.2 males per 100 females in 1950 to 84.55 males per 100 females in 2020.

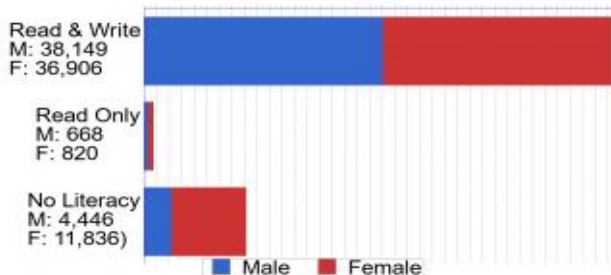
There were only 75,055 people fully literate in Tilottama Municipality as of 2011 who were able to both read and write, while 1,488 people were able to read but not write. Gender wise, the literacy ratio of male to female was 50.82:49.18.

**Tilottama Municipality, Rupandehi District
Literacy Rate, Education Levels & Schooling (2011 Census)**

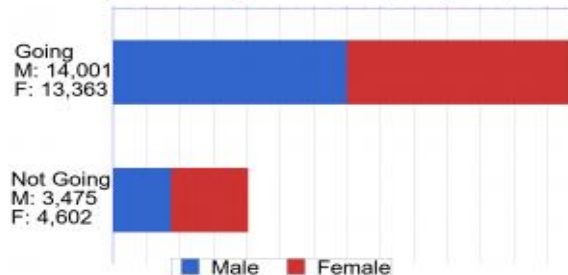
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Literacy Ratio by gender



Going/Not Going to School (5-25 years)



Education Levels by Gender



(Chart Creator/Analyst: Milan Karki | NepalArchives.Com)

2.3.19.2. People with Special Need

In the society even though every citizen is equal. some of them should provide special attention and should provide accordingly. Social security is being considered as a right of the citizens. Social security is linked to enhancing social equity and justice. A universal flat pension of Rs. 100 to all the elderly people above 75 years was first announced in Nepal on December 26, 1994. From 1996-97, the Ministry of Local Development started administering the Old Age Pension (OAP), and the allowances were distributed by the ward offices in the urban areas and by the Village Development Committees in the rural areas. From 2008/2009, the government introduced allowances to single women, endangered races and marginalized communities for education allowances. Currently, the Social Security Allowance is now administered by Department of National Id and Civil Registration (DoNIDCR). The demography of beneficiaries of social security as single women, differently abled person, people from the affected wards 7, 9 and 10 are as follows:

Table 0.18: No. of person, people from marginalized group

Elderly citizens	Single woman Widowed	Schedule caste	Differently abled	Schedule caste child support	Marginalized family
896	436	17	121	21	48

Elderly people and differently abled people will have difficulties while construction period. For the easy movement and proper crossings for children and wheelchair, crutches and white cane users, the proper mechanism should be introduced.

Table 0.19: Violence Reported in Mangalapur Police Station

Gender Based Violence	Lost Women	Lost Men	Lost Girls	Lost Boys
67	31	22	13	6

As reported in Mangalapur police station in the year 2077/78 (one year period) the cases of violence against women are 67 and lost women and girls are 46. Whereas lost men and boy cases are 19. Trafficking is one of the issues where Indian Borders are near and easy to access.

2.3.19.3. Women participation at local committees (women leadership and participation)

The Local Level Election Act 2017 mandates that two among the four ward members elected for each ward must be women and one of the two women must be from marginalized community. Among 87 elected representatives of municipality, 36 are female. The elected female numbers are two in ward 7, three in ward 9 and two in ward 10 including Deputy Mayer of the municipality. Apart from this, woman is active in forming different user's group, religious group and actively participating. Women participation in community level committee looks good as there are more than half dozen active woman and user's groups.

LEGAL AND REGULATORY REQUIREMENT

1.9. Key applicable national environmental and social laws and regulations

A summary of applicable rules and regulations is provided under the Chapter 2 of the NUGIP ESMF. The sectoral and cross-sectoral guidelines and standards promulgated by the GoN in various periods are adequate to mainstream the environmental and social safeguard dimensions in the project preparation and implementation phases. This ESIA has given due attention on the above guidelines and standards in the identification and prediction of the project's impact and in the design of the mitigation actions and monitoring protocols.

The Constitution of Nepal provides local governments the autonomy to enact new laws in areas listed as their sole authority (Schedule-8, Constitution of Nepal). The GoN's applicable laws, regulations, guidelines, standards shall be followed during the construction and operation phases of the project.

1.10. List of National Policies, Rules, Laws, Regulations, Relevant to the Project (if construction activities triggers then it applies)

1. Constitution of Nepal
2. Ancient Monument Protection Act 1956
3. Aquatic Animal Protection Act 1961
4. Environment Protection Act 2019
5. Explosive Act 1961 as Amended
6. Forest Act 2019
7. Labor Act 2017
8. Child Labor Act (CLA) 2001
9. Labor Act 2017
10. Tilottama Municipality's Environmental and Natural Resource Preservation Act 2077
11. Gender Equality Act, 2006
12. Land Acquisition Act, 1977 (and amendments 2010) and Land Acquisition Regulations, 1969
13. Local Government Operation Act 2017
14. Motor vehicle and Transport Management Act, 2049
15. National Foundation for the Development of Indigenous Nationalities Act 2002,
16. Plant Protection Act 2007
17. Public Road Act, 1974 and amendment 2010
18. Road Board Act 2059
19. Soil and Watershed Conservation Act, 1982 and Subsequent Amendment
20. Solid Waste Management Act 2011 and Solid Waste management Rules 2013
21. Water Resources Act 1992
22. Environment Protection Rule 2020
23. Forest Rules 1995
24. Water Resources Regulations 1993
25. 20 Year Road Plan, 2059 –2079BS (2002-2022AD)
26. 2002, National Dalit Commission 2002
27. Forest Policy 2015
28. Land Acquisition, Resettlement and Rehabilitation Policy for Infrastructure Development Project 2014
29. National Biodiversity Strategy and Action Plan (NBSAP) 2014-2020
30. National Environmental Standards Information Booklet 2018
31. National Human Rights Action Plan 2005, National Women Commission
32. Public Works Directive 2002
33. Work Procedure to Provide Forest Area for other Purposes, 2006
34. EIA guidelines for human settlement and Urban Development Sector 1996
35. EIA guidelines for Road Sector 1994
36. National EIA guidelines 1993
37. Operational Guideline for mainstreaming GESI in MoUD
38. GoN Policies supporting vulnerable communities

39. Brief Environmental Study and Preliminary Environmental Examining Procedure

1.11. Environmental Standards of GoN

1. Generic Tolerance Limits for Industrial Effluent Discharged into inland Surface water, 2001
2. Nepal Vehicle Mass Emission Standard, 2012
3. Nepal Ambient Air Quality Standard, 2012
4. Drinking Water Quality Standard, 2005
5. Nepal Noise Level Standard, 2012
6. National Indoor Air Quality Standards, 2009

1.12. Relevant sectoral policies and guidelines prepared by DoR

1. Environmental Assessment in the Road Sector of Nepal, January 2000
2. Environment Management Guidelines, GESU/DoR, July 1997
3. Reference Manual for Environmental and Social Aspects of Integrated Road Development, MPPW/DoR, 2003
4. The National Transport Policy, 2001.
5. Land Infrastructure Development Policy 2004
6. Public Infrastructure Built and Operate Policy, (2000)

1.13. International Obligations Conventions Relevant to the Project

1. Convention on Biological Diversity, 1992)
2. Convention on the International Trade in Endangered Wild Fauna and Flora (CITES), 1975
3. United Nations Framework Convention on Climate Change, 1992
4. Gender-Related International Conventions (including Convention on Elimination of All Forms of Discrimination Against Women, CEDAW)
5. ILO Convention on Indigenous and Tribal Peoples, 1989 (No.169)
6. ILO Convention on Worst Forms of Child Labor (C182)

1.14. The World Bank Safeguard Policies

Table 0.1: represents the World Bank Safeguard policies that are triggered in the sub-project environmental and social assessment.

Table 0.1: World Bank Safeguard Policies relevant to Project

World Bank OP	Objective & Brief Description
Environmental Assessment (EA) OP/BP 4.01	An Environmental Assessment is conducted to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. Any World Bank project that is likely to have potential adverse environmental risks and impacts in its area of influence requires an EA indicating the potential risks, mitigation measures and environmental management framework or plan.
Natural Habitats OP/BP 4.04	The Natural Habitats Policy is triggered by any project (including any subproject under a sector investment or financial intermediary loan) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project). The policy has separate requirements for critical (either legally or proposed to be protected or high ecological value) and non-critical natural habitats. The Bank’s interpretation of “significant conversion or degradation” is on a case-by-case basis for each project, based on the information obtained through the EA.
Forestry OP/BP 4.36	This policy is triggered by forest sector activities and other Bank sponsored interventions, which have the potential to impact significantly upon forested areas. The Bank does not finance commercial logging operations but aims to reduce deforestation, enhance the

World Bank OP	Objective & Brief Description
	environmental contribution of forested areas, promote afforestation, reduce poverty and encourage economic development
Indigenous People OP/BP 4.10	This policy states that any development process under World Bank financing should fully respect the dignity, human rights, economies, and cultures of Indigenous Peoples (IPs). The project should engage in a process of free, prior, and informed consultation with IPs that should result in broad community support to the project by the affected Indigenous Peoples. There is no impact on the indigenous people (no impact due to project). However, it is responsibility of the project to communicate and disseminated the project related information to the indigenous people in the project areas. The project ensures that ensure that the IPs receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive.
Physical Cultural Resources OP/BP 4.11	The Bank seeks to assist countries to manage their physical cultural resources and to avoid or mitigate adverse impact of development projects on these resources. This policy is triggered for any project that requires an EA.
Involuntary Resettlement OP/BP 4.12	Key objectives of the World Bank’s policy on involuntary land acquisition are to avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; assist displaced persons in improving their former living standards, income earning capacity, and production level, or at least in restoring them; encourage community participation in planning and implementing resettlement; and provide assistance to affected people regardless of the legality of land tenure. The policy covers not only physical relocation, but any loss of land or other assets resulting in relocation or loss of shelter; loss of assets or access to assets; loss of income sources or means of livelihood whether or not the affected people must move to another location. When the policy is triggered, a Resettlement Action Plan must be prepared. An abbreviated plan may be developed when less than 200 people are affected by the project. In situations, where all the precise impacts cannot be assessed during project preparation, provision is made for preparing a Resettlement Policy Framework. The Resettlement Action Plan / Resettlement Policy Framework must ensure that all the Bank’s policy provisions detailed in OP 4.12 are addressed particularly the payment of compensation for affected assets at their replacement cost
	<p>NOTE: Upon consultation with the World Bank, it is advisable to use the latest standards of the World Bank to be used in ESMF and hence it will be referred and used in the ESIA and in conducting construction phase monitoring.</p> <p>World Bank Environment and Social Standards</p> <ol style="list-style-type: none"> 1. ESS1 Assessment and Management of Environmental and Social Risks and Impacts 2. ESS2: Labor and Working Conditions 3. ESS3 Resource Efficiency and Pollution Prevention and Management 4. ESS4: Community Health and Safety 5. ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement 6. ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources 7. ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities 8. ESS8: Cultural Heritage 9. ESS9: Financial Intermediaries 10. ESS10: Stakeholder Engagement and Information

ENVIRONMENTAL AND SOCIAL SCREENING, SCOPING, IMPACT IDENTIFICATION, PREDICTION AND MANAGEMENT

1.15. Introduction

This chapter is on environmental and social impacts in terms of magnitude, extent and duration likely to occur during construction and operation phases. The issues are separated as beneficial and adverse environmental impacts, including direct, indirect, and induced impacts in the project influence area. The impacts will be related to activities to be carried out during construction of the project and the operation stage of the project. The operational phase impacts of the project will be associated with the activities carried out within the premises. In addition, closure and decommissioning phase impacts of the project are also highlighted. The impacts of the project during each of its life cycle stages (construction, operation and decommissioning) can be categorized into impacts on the biophysical environment, health and safety impacts and socio-economic impacts. The Environmental and Social Management Plan (ESMP) will have measures to avoid, minimize, mitigate, and compensate the adverse impacts and measures to enhance the beneficial impacts. Based on the Safeguard Policies OP/BP 4.01 and OP/BP 4.12 are triggered.

1.16. Zone of Influence of the Project

Direct Impact area of the project is considered as RoW (40 meter from Mangalapur Junction towards Kanchibazar: 7.7 meters; from 40 meter to 1660 meter: 11 meters; remaining up to 5 KM is: 13 meters) of the subproject. Similarly, the indirect impact is fall within 50 meters from the edge of the RoW.

1.17. Environmental and Social Screening Checklist

Table 0.1: Checklist for Environment Screening

- SN	- Particulars	- Yes	- No	- Remarks
- 1	- Is the site vulnerable to major natural or induced hazards such as landslides flooding storm surge, Severe wind damage, earthquakes, fire, explosion, others (specify)	- Yes		- Possibility of Earthquake Natural Disaster, flooding
- 2	- Is the project area adjacent to or within any of the following environmentally sensitive areas? - Cultural heritage site historical religious traditional or cultural significance - Protected areas national parks wildlife reserves hunting reserve conservation areas buffer zone etc. - Wetland/Ramsar site/Simsar - Forest - Special areas for protecting biodiversity - Breeding/ nesting ground of wildlife occurrence of migratory species - Migration route Wildlife Corridor - Any site of national or International Importance	-	- No	- The project RoW is devoid of such archaeologically and culturally significant areas and national parks

- 3	- Likely impacts on trees including Timber and fruit bearing and vegetable cover	- Yes	-	- During survey 64 trees were found to be removed. Though the trees need to be removed are not from forest land and fall in RoW of road. However, as per forest norms 1:10 Compensatory plantation is recommended
- 4	- Possibility of degradation of land and ecosystem of surroundings	-	- No	- Town Area
- 5	- Is the project area densely populated?	- Yes	-	- ESMP measures applicable
- 6	- Big Industries nearby and Type	-	- No	- Down town area
- 7	- Alteration of surface water hydrology of waterways due to the project resulting in increased sediment in streams affected by increase soil erosion at construction site?	- Yes	-	- ESMP measures applicable
- 8	- Chance of deterioration of surface water due to silt runoff and sanitary waste from worker base camps and chemicals used	- Yes	-	- ESMP measures applicable
- 9	- Does the sub project requires significant extraction of surface or groundwater	-	- No	-
- 10	- Increased risk of water pollution from Oil grease fuel spills and other materials	-	- No	-
- 11	- Impact on water quality due to release of sewage sludge	-	- No	-
- 12	- Possibility of flooding due to sewage	-	- No	-
- 13	- Possibility of increased air pollution during construction and operation phase	- Yes	-	- ESMP measures applicable
- 14	- Other pollution concerns relating to the inconveniences in living conditions that may trigger cases of Upper respiratory problems?	- Yes	-	- ESMP measures applicable
- 15	- Risk and Vulnerabilities related to occupational health and safety due to physical chemical biological hazards during project construction and operation	- Yes	-	- No Biological hazards
- 16	- Noise and vibration due to Civil works	- Yes	-	- ESMP measures applicable
- 17	- Possibility of poor sanitation and solid waste disposal	- Yes	-	- ESMP measures applicable
- 18	- Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents	-	- No	-
- 19	- Accident risk associated with pre construction and operation phases	- Yes	-	- ESMP measures applicable.
- 20	- Large population influx during project construction and operation that causes increased burden on social infrastructure and services such as water supply and sanitation systems	-	- No	-
- 21	- Risks to community health and safety due to transport storage and use of construction materials such as gravel and sand and all other disposable Fuel and other chemicals during construction and operation	- Yes	-	- ESMP measures applicable.

- 22	- Interference with other utilities and blocking of access to resource utility and households with entrances in the ROW	- Yes	-	-
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Table 0.2: Checklist for Social Screening

- SN	- Particulars	- Details
- 1	- Proposed Site Location	-
- 1.1	- Land Requirement for the Project	- It is an up-gradation of existing road so no additional land is required.
- 1.2	- Land ownership of the project area by the government or private Land	- RoW land is in jurisdiction of Municipality
- 1.3	- Does the project require acquisition of government land structures?	- No
- 1.4	- Present use of government land that will be used for the project activities with persons households using	- No
- 1.5	- Does the project required acquisition of private land and structure?	- No
- 1.6	- Present use of government land that will be used for the project activities with persons households using for agriculture residential commercial and other purposes	- The land will be used for the construction of the project only
- 1.7	- Does the project require relocation of encroachers and squatters	- No
- 1.8	- Does the project require relocation of community facilities government establishment or any objects that are out of religious and cultural and historical significance	- No
- 1.9	- Proposed project located in an area where residents are a) All mainstream, b) Indigenous people, c) Majority mainstream are non-indigenous people, d) Majority indigenous people	- The list of indigenous people living in area are mentioned above in subsection 2.3.5. -
- 2	- Potential social impacts of the project	-
- 2.1	- Involuntary resettlement of people? (physical displacement and economic displacement)	- No
- 2.2	- Impacts on the poor, women and children, indigenous people or other for vulnerable groups	- No such impact on poor women and children, indigenous people, and/or economic displacement.
- 2.3	- Will Community facilities require relocation?	- Yes, water supply pipes from the existing road section will be shifted to beneath the footpath of new road section
- 2.4	- Will the sub project disturb any traditional activity on adjoining or nearby	- No
- 2.5	- Poor Sanitation and solid waste disposal in construction camps and work sites	- Yes
- 2.6	- Possible transmission of communicable diseases such as STI and HIV AIDS from workers to local population	-
- 2.7	- Population influx during project construction and operation that causes increased burden on social infrastructure and services such as water supply and sanitation systems	- Yes
- 2.8	- Social conflicts relating to inconveniences in the living condition while the construction interferes with pre-existing roads	- Yes, change in road morphology and disruption in the infrastructure like drinking water, sewer system

		will cause inconvenience
- 2.9	- Describe any other impacts that have not been covered in the screening	- Gender-based violence; road stability and management; - impact on Water Supply System and Electricity Poles; - impact on existing infrastructures
- 2.10	- Describe alternatives if any to avoid or minimize displacement from private and public lands	- No such displacement from private and public lands
- 2.11	- RAP /ARAP requirement	- No, the design has avoided structures and land. It is the reason DPR has varied RoW in 5 KM stretch

1.18. Impact Summary

Table 0.3: Overall Impact Summary

Summary	Proposed Road
- What are the main potential environment and social issues/risks /impacts/ concerns and/or potential positive impacts	<p>- The major positive aspects of road improvement project include easier transportation facility, decreased travel time, decreased travel cost, increased employment opportunities, increased land value, and fostering the community-based tourism industry. The sub project component will most likely create the opportunities for local contractors and suppliers of the construction materials therefore stimulating income generation opportunities for local and employment for the low-skilled local workers. The subproject provides accessibility to schools, health post, ward offices, temples, connection to other villages through village roads, connection to Devdaha.</p> <p>-</p> <p>The proposed road project shows limited adverse social impacts in comparison to the benefits. Mangalapur-Kanchibazar (upgradation up to 5 KM, Bewara Chowk only) road does not need deed transfer. Problems likely to be created during the construction stage can be marginalized with the proper precaution and implementing the measures recommended in ESMP</p> <p>- Of the number of trees affected, none of them are related to have livelihood harvesting use.</p> <p>- The environmental impacts like air, water, noise pollution, obstruction to drainage, issues of waste, issues related to health and safety (accidents), obstruction of natural drainage, issues related to management of traffic, labor camp, spoil disposal area (specific impacts are also spelled out in impact section of report). The site-specific project foot prints like spoil disposal area, camp sites, quarry sites, transportation route and number /type of vehicles, labor camps etc will be included during the preparation of Construction Environment and Social Management Plan (CESMP) by the contractor. The CESMP will be prepared by Contractor within 45 days of commencement of works and submit to the PIU for approval. The contractor will follow ESMP of ESIA and CESMP. Such site-specific details, likely impacts and mitigation measures could be used for compliance monitoring and reporting. The following aspects must be considered for selecting spoil disposal areas: a) away from water bodies, away from settlement, should be in stable area, good compaction and protection of slopes must be maintained. For camps and offices should be substantially away from settlement/school/public buildings, the labor camp must have basic accommodation, toilet and water supply facilities. The transportation routes for spoil disposal and material haulage must not interfere with through traffic (managed properly in off hours and alternative routes), the good and spoil transportation vehicles must cover the materials and maintain road safety standards.</p>

- Expected positive impacts/benefits to the local communities	- The improved economic access to the areas will potentially make them more attractive for business and investments thus stimulating economic growth and employment opportunities. The proposed sub project will help to provide in easy road access, reduce travel time, provide travel and transportation cost saving, promote employment generation, provide easy access to social service facilities, promote market creation for local product, increase land values as beneficial impacts related with the road improvement project. Other positive impacts of this sub-project include socio-economic benefits, environmental benefits, disaster risk management, climate resilience.
- Options Analysis	- The road already exists and only upgrading work is required. The ROW is clear, minor issues can be mitigated and managed through proper mitigation measures outlined in ESMP. As there is no any option of this road, an option analysis was not carried out. However, an alternative route will be used by the road users during the construction phase.

4.4.1. Impacts as per the National EIA Guidelines Numerical Scale

Numerical Scale mentioned as depicted in **Table 0.4** is used to analyze the impact of the proposed subproject. The combine score below 40 shall be termed as insignificant impact (IS). The scores ranging between 40 and 79 shall be termed as significant impact (S), scores ranging between 80 and 99 shall be termed as very significant (VS) and the scores above 100 shall be termed as highly significant impact (HS).

Table 0.4: Impact Quantification

- Magnitude		- Extend		- Duration	
- High (H)	- 60	- Regional (R)	- 60	- Long term (LT)	- 20
- Medium (M)	- 20	- Local (L)	- 20	- Medium Term (MT)	- 10
- Low (L)	- 10	- Site Specific (SS)	- 10	- Short Term (ST)	- 5

Source: National EIA Guidelines, 1993

1.19. Adverse Impacts - Physical Environment (Pre-Construction and Construction Phases)

1.4.29. Land use

The land within RoW is already acquired at the time of Bhairahawa Lumbini Ground Water Irrigation Project (BLGWIP) was initially started in 1970's and was completed in June 1999 with an objective of raising agricultural production through an expansion of the irrigated area of 20,309 ha and thereby raising the living standard of the farmers. Majority of RoW of this road falls on already acquired land area by BLGWIP and some missing land parcels and areas were already under the jurisdiction of municipality. The acquired land is permanently converted within the width of the proposed road. A letter signed by the municipality Mayor confirming that all land within the ROW has been transferred to the jurisdiction of the municipality has been included at Appendix X. Hence, impact from construction will be direct in nature, low in magnitude, site-specific in extent and of long-term in duration. The indirect area of influence adjacent to RoW contains built structures and cultivated lands.

1.4.30. Quarrying material and operation

The upgrading of road will require boulders, sand and aggregates in activities like gravelling, construction of retaining walls and other structures. These construction materials will be brought from the established quarry sites at the Tinau river and Rohini river (which have already received the environment clearance) within the municipality (Figure 4.1).



Figure 4.1: Quarries Location

The Contractor may also obtain required construction materials from the legally operating crusher industries other than proposed quarry sites. So, the direct impact of quarries is not expected in this subproject. However, the quarry sites and amount of quarrying material will be included in Construction Environment and Social Management Plan (CESMP) within 45 days of commencement of works. PIU will check the site requirements and quality of quarrying material and approve it. DSC will also monitor whether the quarry sites has been legally operating or not.

1.4.31. Stockpiling area and construction material

For the upgradation of the road project; sand, stone and aggregates can be obtained from crusher industries. Likewise, reinforcement and cement can be obtained from Butwal at a distance of 2 Km whereas bricks and soil are locally available materials. The construction materials need to be stockpiled on the barren land near to the project site during the construction period. The site is selected after the consultation with local including land owners and their approval to use the land. Locals are informed about the construction works. The impact will be direct in nature, medium in magnitude, site-specific in extent and of short term in duration.

Land for the stockpiling of construction materials must be suitably selected such that it does not occupy private land, affect agricultural land and must obtain written permission from land owners and local bodies. The site should be cleaned promptly after completion. The specific conditions for stockpiling of construction materials are included in the construction contract.

1.4.32. Noise, air and water pollution

The main construction activities that cause air pollution are earthworks (excavation and dredging), asphalt plants operations etc. These activities generate dust, which directly affect the air quality. In addition, vehicles and machinery emit smoke and fine particles. These substances will increase the local air pollution significantly during the construction stage. Burning of fossil fuels will result air pollution due to emission of sulfur oxides (SO_x), nitrogen oxide (NO_x), carbon dioxide (CO₂) and particulates. The anticipated impacts on air will be direct in nature, low in magnitude, local in extent and of short-term in duration.

Water should be sprayed on the road surface as required during construction and protective equipment for the construction workers should be provided. The construction vehicles should be well maintained and should strictly comply with the GoN pollution regulation with compulsion in obtaining green sticker. Similarly, all construction plants should adhere to emission regulation. The vehicles carrying construction materials should ensure that it is well sealed and covered so as to avoid littering. The anticipated cost and specific conditions related to air pollution containment are included in the construction contract.

Noise impacts will be significant in the RoW and vicinity of the proposed subproject upgradation of 5 KM long road during construction periods due to increase of vehicular movements and operation of machinery equipment. The anticipated impacts of noise will be direct in nature, low in magnitude, local in extent and of short-term in duration.

Attempts should be made to operate heavy construction equipment in the day time only. Cracks in buildings caused by vibration need to be monitored closely. If such problems arise, alternative methods should be employed. For the safety of construction workers, earplugs must be provided while on duty. The anticipated cost and specific conditions related to noise and vibration containment are included in the construction contract.

The contaminated soil, oil or bitumen from construction activities if disposed near to river/stream affects aquatic fauna and flora. The construction debris, paints, oil and grease are likely to create water pollution both surface and subsurface. The dust and silt from the construction sites will also create water pollution of the receiving streams. If workers living in tents/camps do not have access to toilet facilities, open defecation may be practiced, which may contaminate water sources, causing health problems. The anticipated impacts on water pollution will be direct in nature, low in magnitude, local in extent and of short-term in duration.

Disposal of construction spoil in and near water bodies should be strictly prohibited. Such spoil should be disposed off at designated spoil sites mentioned in CESMP and approved by PIU and DSC and efforts should be made to minimize such waste as far as possible through reuse, reduction, and recycling concepts. Similarly, the contamination of water by the use of cement and bitumen should be avoided and strongly monitored by contractors, PIU and DSC. The Contractor needs to arrange for sufficient water supplies and proper sanitation facilities for its labour force. Separate arrangements are necessary for work camp and labour camps. The anticipated cost and specific conditions related to water pollution containment are included in the construction contract.

1.4.33. Solid waste generation

Some quantities of solid waste will be generated as a result of clearances, excavations and the final construction of the selected road. Such waste will consist of surplus materials, surplus soil and excavated materials among others. Solid waste will also be generated from the labour camp during construction. Such solid waste materials can cause negative impacts to the environment through blockage of drainage systems and negative impacts on human and animal health.

Construction debris should be disposed at designated spoil site only, far away from water resources and efforts should be made to minimize such waste as far as possible through reuse, reduction, and recycling concepts. The specific conditions for stockpiling of construction materials and debris management are included in the construction contract.

Table 0.5: Environmental Mitigation Plan for the use of construction equipment

- Environmental feature	- Project Activities	- Material/equipment to be used	- Impacts/Waste generated	- Mitigation measures
LAND	Site clearance	Heavy Equipment Power Saws	Cut vegetation Rock debris Noise by power saw	Top soil to be reused for tree, flower plantation, remaining soil to be used for backfilling. Wood to be used for multiple uses by local people
AIR /LAND	Excavation/earthworks	Excavation equipment including	Noise Roots	Top soil to be used for agricultural field, plantation. The photographic

	including removal of top soil	caterpillars and haulers	Soil Vibration	and video evidences of structures will be done by the contractors prior the construction is recommended to find the status of the structures prior the construction. Less noisy and less vibrating equipment selection are recommended.
	Transportation of materials and maintenance of equipment	Trucks	Used oil, lubricants, air fumes etc.	Reuse, regular and periodic maintenance
WATER	Building materials/construction materials	Cement, soil, timber, glass, bitumen, oil paper, piles, water and other wastes	Stone, timber broken glass, waste water, plastic, greases spills	Follow 3 R approach
WASTE	Human consumables	Stationeries, medicines, reagents, waste food and water	Used paper, thrown-away clothing, computers, photo	Sell waste paper to dealers. All obsolete materials should be carefully sorted, stored and sold to dealers. Waste from toilets of camps should be managed properly (septic tank)

1.4.34. Disaster Risk of the subproject

It is envisaged to identify and estimate the risk of disasters in the Mangalapur-Kanchibazar Road alignment and address the associated risks using proactive design incorporations and additional risk management measures that warrant as per site conditions with due consideration to level of exposure of risk to the project. The likely environmental impact or disasters are identified and the exposure risks are classified as Low-Medium-High in magnitude. Climate Change and disaster resilience is studied under the adaptation and mitigations measures offered by the designed project against various possible disasters. Flooding, inundation and clogging of cross drainage and longitudinal drainage are the extreme disasters that usually happen in Terai Region of Nepal. The adverse environmental impacts or disasters (both natural and man-made) those may occur should be kept in mind and certain mitigation measures to avoid and minimize such disasters should be proposed. The risks of disaster in this proposed road project have been identified and addressed the associated risks using proactive design incorporations and additional risk management measures to be adopted in the context of proposed project development during DPR preparation. Flooding, inundation and clogging of cross drainage and longitudinal drainage are the extreme disasters that are likely to happen in this area.

A site specific ESMP is prepared and will be implemented strictly, it is also necessary to monitor whether or not the ESMP applied properly or not during construction and maintenance operation phase of road project. The project is designed to respond to the disasters and it is clearly mentioned in mitigation section of the report.

4.6 Adverse Impacts - Physical environment (Operation Phases)

4.6.1 Road stability and management

During the operation phase, heavily-loaded vehicles may frequently pass through this route to haul raw materials, which may result in the destabilization of the road. On top of that, natural erosion, inadequate or inappropriate drainage work, faulty construction may also damage the road. The impact will be direct in nature, medium in magnitude, site specific in extent and of long term in duration.

4.6.2 Water pollution

The inappropriate driver practices connected with car/truck washing in streams and rivers which can cause local water pollution by leakage of fuel, lubricants and hydrocarbons can cause hazardous to people, animals and crops. The impact will be indirect in nature, low in magnitude, site specific in extent and of long term in duration.

1.20. Adverse Impacts - Biological environment (Pre-Construction and Construction Phases)

The project will have no impact on wild life, avian fauna, aquatic life and reptiles. The project alignment is neither habitat nor biological corridor of the wild animals. Nearest forest (CF) is about 4 KM away from the project alignment. The project will have impact on existing road side plantations and 64 trees (pole and tree size) of different species namely Sissoo (12), Aanp (8), Nim (11), Baikano (8), Amba (6), Ashoka (8) and other species (11) along the project RoW needs to be removed.

1.21. Adverse Impacts- Socio-economic and Cultural (Pre-Construction and Construction phases)**4.7.1. Impact on Physical Resources****a. Effect of Change in Land Use**

The project includes widening and upgrading works of road and drainage structures along the existing RoW, therefore additional land will not be required. Site-specific major works such as intersection improvement, bank stabilization and drainage improvement also will not require additional land. The major component of the sub-project is the earth-filling necessary for road widening, and borrows pits for earth and gravel need to be identified. The extraction of earth from nearby areas will cause depression in the ground surface will result in water logging problems.

b. Obstruction to Structures

The road alignment within the RoW throughout the entire length of project (5 KM) is varied to avoid the structures along the alignment.

As noted below, there are only three structures which will need to be dismantled and relocated, namely three boundary walls. It has been agreed with the municipality mayor that any other structure currently within the ROW will not require dismantling for the purposes of this subproject.

c. Loss of Standing Agricultural Crops due to Construction

There is no encroachment of any standing agricultural crops in the RoW. Therefore, there is no loss of agricultural crops due to construction and no consequential income loss.

4.7.2. Impact on Personal Business/Enterprise, Trade Shop/Fishery

These are structures adjacent to the RoW but no business /enterprise will be affected.

a. Disruption of Water Resources Related Infrastructure

The field survey reveals that 3.7 KM of existing water supply pipelines will be impacted and needs to be replaced. During the interaction, the stakeholders have requested to construct the water supply pipeline along the road in 5 Km of the overall road which will be renovated under this project. As per the meeting of utility groups including Drinking Water Utility Group, It has been decided (Decision number 3) that the design of the drinking water supply works will be conducted according to the DPR with the support and coordination of Drinking Water Utility Group. The meeting with the utility group is provided in Annex XI.

b. Education (School Buildings), Health Facilities and Cultural sites

The schools alongside the ROW are as follows: Shree Gautam Buddha High School. (1+140.00, Right side), Janahit High School (2+350.00, Right Side), Shree Semra Secondary School (3+400.00, left Side), Namuna Boarding School (4+350.00, Right Side), Everest Boarding School. These schools will be impacted through construction noise, and due to traffic-related and community risks associated with the construction. The only school which is physically impacted is a boundary wall of Janahit High School which will need to be dismantled and reconstructed at chainage 2+350.

Separately, the boundary wall of the Semara Health Post at chainage 3+850 and the boundary wall of a Shiva Temple at Chainage 3+290 will also need to be dismantled and reconstructed.

c. Temporary Disturbances in House Owner's Mobility and Shop Consumer

There will be issue of access to some houses and businesses during the construction phase. This is very common in the road construction project in urban area. For a short period of time, the house owner may have

difficulties for the access and there will be temporary structure provided by the contractor or the houseowner themselves make some arrangements. This is common practice for the road projects. Some temporary structures during the construction would be made and permanent ramp is provided for those houses.

d. Road Safety Concerns and Health and Sanitation in Community

During construction phase, increased number of construction vehicles will be plying the road therefore due to pressure and mismanagement accidents may likely occur. Hence, traffic management measures and information signboards need to be placed with the precautionary measures. The haphazard disposal of construction waste will adversely affect the sanitation environment in the area and this problem needs to be minimized through regulatory measures and public awareness. However, the road may pose some adverse impacts on the environment at the operational stage, such as increase in traffic accidents due to higher vehicles speed, which must be controlled by putting up speed limit signs and enforcing them. It is recommended that traffic signs are placed at appropriate locations for road safety purposes. The movement of trucks and other equipment in the project area during the works implementation will cause noise and dust if the works will be in dry weather. This noise and dust may also affect the businesses in the vicinity of the construction works.

e. Occupational Health and Safety

Because of the engineering and construction activities including minor excavations, concrete work, and sub-base stone lying among others, construction workers will be exposed to risks of accidents and injuries. Such injuries can result from the hand tools and construction equipment and risk of vehicular accidents to local residents.

f. Social Disturbance / Risk of SEA/SH and HIV AIDs

The project construction may disturb the local population with interactions of non-local workers with residential communities. Girls and women trafficking may arise during the construction phase. Further, it may lead to GBV at household level and afterwards because the frequency of visitors or tourists may increase. This project may lead to an influx of commercial sex workers into the township or lead to contractor workers and other personnel engage in risky sexual behavior that may lead to infections in HIV-AIDS or other sexually transmitted diseases.

g. Limited access to elderly and differently-able

During the construction phase mobility is going to be very limited for elderly and differently-able people. Their daily routine might get affected. Warning signage of the construction work, temporary access as per need will be provided as far as possible. The people will be aware of the construction work and the alternate route will be provided.

h. Woman and Girl Trafficking

As per the data received from Mangalapur police station, the number of missing women and girls is higher here and with the influx of labor this might spike and could cause some problems. Hiring local people as much as possible for the local work could be the one of the remedies for it but different awareness programs should be implemented for the cause and its prevention.

i. Risk in road crossing of school and hospital

During the construction phase the school going children, elderly and differently abled people might face problems in crossing the roads and walk in the side alignment of the road, especially in rainy season.

j. Risk of Spreading of Diseases

This project may lead to an influx of workers in the area. Influx of labors usually attracts commercial sex workers into the town and that can lead to contractor workers and other personnel engage in risky sexual behavior that may lead to infections in HIV-AIDS or other sexually transmitted diseases. Other than sexually transmitted diseases (STD), in today's time the risk of the spreading of "corona" and its other variants are also the major concern for the community and eventually for all.

k. Child and forced labor

In conformance with Nepali law project will not employ under-aged workers. The Child Labor (Prohibition and Regulation) Act of 2000 establishes the minimum age for work at 14 and the minimum age for hazardous work at

16. The employer/contractor must ensure the age through citizenship certificates. Contractor will be strictly instructed to keep the record of the workers.

1. Traffic Management Issues

The flow of traffic along or near the proposed area will be affected and diversions would require managing traffic. Safety barriers and warning signs need to be erected for safety. Half width working approach with signalized traffic control will be adopted to manage the traffic. Safety barriers and warnings signs will be erected where required ensuring safe movement of traffic. An alternative route will be identified to ease the flow of vehicles especially during the rush hour, peak travel periods to ease road congestion.

1.22. Adverse Impacts – Socio-economic and cultural (Operational Stage)

There are expected to be no adverse impacts on the local economy during the operational stage, and significant long-term benefits are expected to arise from the proposed sub-project. However, the market will be competitive and the urbanization and semi-urbanization effect may contribute to a higher cost of living. The scale and trend of plotting of agricultural land will increase and there are possibilities of converting the agriculture land into residential and commercial areas. Some industries that are located near the road may also have tendency to relocate to other places with the purpose of developing their properties as commercial areas.

1.23. Beneficial Impacts - Social-economic and cultural (Pre-Construction, Construction Phases)

4.9.1. Social beneficial impacts

The main Benefits of the proposed road will be access of highly equipped urban standard road which will be the milestone project leading to economic prosperity and increase in economic and social sector. With the highly facilitated transportation media, improvement in educational sectors (schools, colleges and universities), health sectors (health posts, clinics and hospitals), communication facilities etc would occur. More numbers of hotels, restaurants, groceries, shops, banks and other business-oriented activities will be increased ultimately aiding to the employment generation and economic prosperity of the people.

a. Social Implications

After implementation of this project, people will have access all weather transportation facilities and improve their socio-economic condition. The subproject will support the community to enhance their access on health facilities in low cost, increase attendance of students and teachers in the school and also increase in communication to other people, support to the poor, Dalit and other marginalized people because of employment generation during construction period, Initiation income generating activities like e.g. small business, groceries shop, and commercial agriculture production and off farm activities, increase in land price by using the improved transportation facilities. It contributes for the minimization in transportation cost of all types of goods as well travel cost, time and assists to minimize living cost. It stimulates to farmers to increase agriculture production, livestock commodities etc as well as support for increased in accessibility of villagers to market centers and major cities of the province. The proposed road subproject shows limited adverse social impacts in comparison to the benefits that the people have been able to realize at large.

This is the route that joins Siddhartha Highway with Devdaha Municipality. Thus, the road can be used for connectivity of two municipalities. The most prosperity for the development of the two municipalities and adjoining areas depends on this road. At the same time, the proposed road will bring social justice for the balance development of the entire municipality.

b. Employment, Skill enhancement of workers and staff, Income Increment

As many local people seek interest in doing work in the road project, the contractors can hire them for unskilled laborers. For skilled laborers, they need to give some training which may help the project in the long run to protect and repair the road on a regular basis.

The sub-project will generate skilled and unskilled employment opportunities throughout the project life cycle. Priority will be given on sourcing labor requirements locally, specific ward, municipality, and district. . In cases that skilled workers are not locally unavailable, they will be recruited from other parts of country. Apart from income, locals will get gain experience and training and open door to opportunities everywhere, thereby increasing the quality of life. Undoubtedly, project impacts can be considered significant, positive, long term, and cumulative

people lives changed for the better. The residual impact is the up-lift of the quality of life of the sub-project beneficiaries.

c. Easy Access to different facilities and Mobility

The road is giving proper access for the people planning to migrate in this area for the facilities like hospital, school /college and other required services. The land value itself will grow after the construction of the road. The properly designed sidewalks, enough lights and resting area will make it easy for the people with different needs.

The mobility will be comfortable for women, children and elderly. The school children, differently-able and elderly people will benefit from this road after completion.

d. Increase in Trade and Business

Business opportunities are created during the construction and operation of the road for products and services such as basic building materials, construction equipment, laundry, clothing, food services, cleaning services, excavation, construction material supply, etc. Indirect economic impacts will also occur from increased demand for products and services due to the increased workforce in the area. Business opportunities are a positive impact to host communities which has a multiplier effect. The improved road condition will welcome more tourists into the area, which can help women and persons with disabilities to start their own business.

e. Development of Social Services

Increased employment opportunities, trade and business and other income opportunities will direct considerable amounts of money into the local economy in the area. This will logically increase the income level of the individual household and the local body of the area. In the situation when the increased amount of resources, as well as local bodies, this can help to improve social services such as education/school and health care services.

4.9.2. Beneficial Impacts – Social and cultural (Operation stage)

The qualitative beneficial impacts that are likely to occur when the rehabilitated road is in operation are as follows:

a. Improved Transportation Facilities and Decrease Congestion

The rehabilitation and upgrading of the road will produce benefits through better access and mobility and effective transportation facility. The transportation of goods will make goods cheaper, particularly vegetables and livestock. Importantly, the journey will be more comfortable, the wear and tear of the vehicles will be less, and fuel and maintenance cost of the vehicles also will be less, which will lead to an increase in private savings.

b. Rise of Land Value

Road up gradation often leads to increased land values along the road corridor of Mangalapur–Kanchibazar road and its vicinity and subsequently enhances local peoples/farmers' capability for borrowing loans on collateral. High value lands are acceptable to banks and financial institutions to provide loans. This impact will be an indirect, high, significant, local and long-term in nature.

c. Improvement in Trade and Business

The improved road surface of Mangalapur-Kanchibazar road will ensure continued and smooth flow of products and commodities. It is envisaged that trade and business activities will be further promoted not only in the area but also expanded into others areas having links to this road.

d. Increase in Tourism Sector

Since the project district is connected to the border with India and the Indian tourist and the domestic tourist will pass through this road for getting to the different cities or parts of Nepal. Hence the road improved transportation will help to promote this area as more easily accessible tourism areas also benefit the local economy.

e. Enhancement of the Social Services

This sub-project will increase the availability of safe and quick access to social services, development of the economic center, and increase in economic levels, which will help to improve school education and promote higher education outside the sub-project area. Similarly, local people may spend more on health care, sanitary facilities, education facilities and other social services.

f. Enhancement of Mobility and Reduced workload

The improved mobility will improve comfort for women, children and the elderly. School children, differently-able and elderly people will therefore benefit from this road after completion. The improved road condition can help people walking along the foot paths, and using cycles and wheelchairs along the cycle lane. This can reduce the rate of accidents along this route. The workload of women may decrease after the construction of the road given that women may not have to wash clothes every day because of the reduced dust impacts from the upgraded road. Because of such changes, women will benefit from time saved.

4.9.3. Social Mitigation measures

a. Working conditions and management of worker relationship

The project will provide reasonable working conditions and terms of employment and will conform to requirements for working conditions established by national laws and WB safeguard policies. Nepali law requires equal employment opportunity. The project will give preference to the recruitment of qualified skilled and unskilled local villagers. Migrant workers will likely be engaged by the contractors during construction. The road project will contractually require the contractor to engage migrant workers on substantially equivalent terms and conditions to local workers carrying out similar construction work. During construction, temporary accommodations will be constructed by the contractor and in compliance with national and international standards for quality, security, safety, and professional competency and no forced labor will be used.

b. Occupational Health and Safety (OHS)

The policy applies to employees and contractors, including subcontractors. The project will provide safety equipment with reference to the provisions of Nepali Law and the World Bank Group Occupational Safety Guidelines to ensure the safety of the workers. The project is obligated to report the occupational health and safety conditions to the municipality quarterly. To maintain a healthy environment for the labor force, the project management should put in place suitable measures to clean the environment associated with labor camps. This will include proper disposal of human waste. The contractor needs to put in place mechanisms for the collection of all wastes generated (solid wastes, organic wastes, food remains, garbage etc.), in the labor camps, segregate the various wastes and arrange for subsequent disposal through either efficient incineration or disposal in a sanitary landfill.

c. Child and forced labor

In conformance with Nepali law and the WB policies, the project will not employ children under the age of 16. However, children above the age of 14 can perform some types of labor e.g. non-hazardous/non-harmful.

d. Community health and safety and reduction of incidences of diseases

As a precaution to prevent the spread of HIV/AIDS in the project area, the project municipality and other stakeholders must organize and support education programs to create public awareness regarding HIV/AIDS and other sexually transmitted diseases (STDs). In order to protect the community member especially vulnerable groups such as women, children, infirmed and elderly from project workers, there will be a need for the project contractor to create awareness around STD prevention and contraception.

e. Management of labor force

The labor force engaged in the rehabilitation of the road and construction has the potential to degrade the environment of the project area as discussed in earlier sections of the ESIA. The project management should therefore put in place mechanisms to deter the work force from engaging in cutting of trees for fuel wood, charcoal burning, and building material and for any other purposes. The contractor should use pre-fabricated material (which can later be retrieved at the end of the project) in building the labor camps. This will deter the labor force from unnecessary cutting and trampling of vegetation and enhance the protection of the scanty natural vegetation of the project area.

f. Addressing Gender Issues in Construction, Operation and Monitoring

During project construction and operation, the ESMP should be implemented and activities monitored via the project management system and in accordance with monitoring indicators. In the case of procurement of goods and services, the PCO should ensure that gender-related issues are addressed through terms of contracts and contractor

management monitoring. Stakeholder engagement should be continued throughout the project lifecycle, together with any activities related to capacity-building. Receiving feedback from relevant stakeholders is a valuable monitoring tool and any grievance should be dealt with in a timely manner and efficiently. Progress of implementation of the ESMP including results of monitoring should be described in the annual report to the PCO on environmental and social matters. The PCO should also consider reporting gender-related issues as part of any public reporting.

g. Limited access to elderly people and differently-able during construction

Diversions and proper crossings should be in place along the road for elderly and differently-able people during the construction phase. Elderly people should have access to socialize and meet people and their families to nurture their mental needs and health. The design should incorporate disabled-people's needs and incorporate periodic maintenance of disabled friendly designs. As the mobility of differently-able people will be impacted during construction, this should be addressed properly. After completion of the road improvement, training and using of such facilities should be arranged through the project municipality.

h. Safety to school children and pedestrians

During the construction phase, other roads should be used or diversions established, and should be child, elderly and differently able person-friendly. Crossings near school areas should be safe, and the school area should be highlighted properly. An attendant from the school and/or from the contractor will be present at the school crossing during starting and closing times, or in peak traffic hours. Appropriate signage during construction and implementation should be displayed to enhance the awareness of potential safety hazards. After the completion of the road improvement, awareness should be created amongst school children, members from mother and women groups, and other pedestrians (people using the road every day for work or business) of the road signs, and using the road safely through awareness-raising programs in schools, women groups, local media and FM radio.

RESETTLEMENT ACTION PLAN

1.24. Background and Objectives of the Resettlement Action Plan (RAP)

5.1.1. Aims of the RAP

This Resettlement Action Plan (RAP) aims to provide policy and procedures of land acquisition, compensation and resettlement of affected persons, if required. It has been prepared based on the findings of a resettlement impact assessment undertaken during detail project design and from updated information. The assessment aimed to identify the impacts on property and income sources of affected persons with documentation of loss of land, houses, trees etc. within the construction width of the proposed road. This RAP identifies safeguard measures including compensation, resettlement and rehabilitation assistances to the affected persons, consistent with the provisions of Resettlement Policy Framework (RPF) provided in the NUGIP Environmental and Social Management Framework (ESMF). This RAP particularly addresses the following considerations associated with road improvement and upgrading works. Social considerations have been incorporated into the road design:

- Private and community resources affected by the project (e.g. houses and infrastructures, which require the provision of appropriate entitlements (only, if applicable and triggers))
- Organizational and institutional requirements for the implementation of compensation, resettlement and rehabilitation activities
- Implementation schedules and monitoring mechanisms
- Compensation, resettlement and rehabilitation cost estimate

As of now, for this project only three boundary wall is required to be demolished (dismantling and construction of new boundary wall will take place at chainage 2+350 (government school wall), chainage 3+850 (Semara health post) and at Chainage 3+290 (boundary wall of shiva Temple) There are otherwise no resettlement impacts under this subproject. The RAP has been prepared with policies and principles are mentioned here in situation where there is any potential acquisition in the future that might trigger due to design change or any unavoidable circumstances.

5.1.2. Policy and Principles of the RAP

This RAP is prepared on the following policy and principles of the NUGIP ESMF and RPF, which are in harmony with GoN policies and the World Bank Policy on Involuntary Resettlement (OP 4.12). Both the WB policy and GoN legislation emphasize avoiding or minimizing involuntary resettlement. Where the acquisition of private property is unavoidable, involuntary resettlement should be an integral part of project design and preparation.

The acquisition of private assets and the displacement of people will be avoided or minimized to the extent possible, through the incorporation of social considerations into alignment selection and road design. Where asset acquisition and population displacement are unavoidable, the pre-project living standards of affected persons will be restored. Community consultation ensures people's views; concerns and suggestions are incorporated into implementation procedure. An institutional framework will be developed as an integral part of the sub-project to ensure that appropriate social impact management mechanisms are set up and maintained during implementation. These mechanisms and arrangements will ensure that compensation, resettlement and rehabilitation are carried out timely and effectively.

1.25. Operational framework and Methodology of the RAP

5.2.1. Operational Framework

As the project authority, the PCO within the DUDBC will assume overall responsibility for the management procedures as mentioned in the RAP. Key activities to be undertaken to ensure effective implementation of resettlement, compensation and rehabilitation activities are:

- Implementation of procedures to (i) minimize adverse social impacts including acquisition of land and assets throughout the planning, design and implementation phases and (ii) accurately record all project-affected persons, by means of census and asset verification and quantification exercises, and the issuing of identification;
- Establishment of systems and procedures for the co-ordination of resettlement and compensation activities;
- Establishment or strengthening of grievance redress mechanism at the Ward level or municipal level where it is appropriate and practicable to address the social issues associated with the project. The objectives of this will be to: (a) ensure ongoing dissemination of project information to affected households, (b)

structure, regulate and strengthen communication between roadside communities, (c) involve affected communities and local government structures in social impact management, grievance resolution and monitoring;

- Distribution of copies of the approved Entitlement Policy, and follow-up community meetings to ensure full comprehension of its contents;
- Capacity-building initiatives to create a supportive environment for the implementation of RAP activities, including training on accepted resettlement and rehabilitation practices, training in the establishment of compensation plans for affected household;
- Coordination with relevant government line agencies (as required)
- Collaboration with non-governmental agencies to provide grassroots expertise and resources in areas such as project information campaigns and impact monitoring.

5.2.2. Definitions

The following definition will be applied in the RAP:

- **Compensation:** The payment in cash or kind for private property acquired by the NUGIP/ Metropolitan, based on replacement value as defined by the Compensation Determination Committee (CDC).
- **Compensation Determination Committee (CDC):** The district-level committee established under Section 13 (2) of the Land Acquisition Act 2034 (1977) to determine replacement value and compensation rates for property acquired under the Act.
- **Cut-off Date for Eligibility to Entitlement:** The cut-off date for eligibility to compensation and assistance will be the date of the joint census of affected households and affected assets.
- **Entitled Person:** Any person who is entitled to compensation due to the loss of privately owned assets and other rehabilitation assistance.
- **Project Affected Person (PAP):** Any person directly affected by the project through the acquisition of assets belonging to him/her or his/her household or community. This includes any person whose rights, standard of living, subsistence and income-generating capacity are adversely affected through the acquisition of assets, whether full/partial, or permanent/temporary.
- **Project Affected Family (PAF):** The group of people residing in one house and operating as a single economic unit, who are adversely affected by the project. Major children over the age of 18 years will be entitled to rehabilitation measures as outlined in the Entitlement Matrix but not to compensation for properties held by other members of the household.
- **Rehabilitation:** The measures taken to mitigate identified social impacts, including compensation, resettlement and rehabilitation and transition allowances where required.
- **Replacement Cost:** With regard to land and structures, “replacement cost” is defined as follows: For agricultural land, it is the pre-project or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes. For houses and other structures, it is the market cost of the materials to build a replacement structure with an area and quality similar to or better than those of the affected structure, or to repair a partially affected structure, plus the cost of transporting building materials to the construction site, plus the cost of any labor and contractors’ fees, plus the cost of any registration and transfer taxes.
- **Titleholder:** The person in whose name the project-affected land and/or building is registered and the person who is authorized by law to receive the compensation granted for the acquisition of land.
- **Tenant:** A person occupying/using land of a titleholder according to the stipulations of the Land Act, 2021 (1964).
- **Vulnerable Groups:** Social categories whose livelihoods may be particularly vulnerable to disturbances created by the project. These groups may include tribal groups, Dalits and landless persons who rely on access to local agricultural work and other support systems built up around the agricultural resources base.

5.2.3. Methodology

The methodology includes review of the sub-project DPR report to understand the project foot prints, visit of project sites by team of experts, and verification of physically and economically displaced households and structures.

While reviewing the DPR report of the project it was noted that the structures and additional land acquisition along the proposed up-gradation project is avoided by adjusting RoW of the road in related sections where such needs to be avoided. Hence, there are no structures or private or public land within RoW of road which requires acquisition. This is verified with DPR consultant and PCO. Hence no RAP related issues triggers for the proposed up-gradation activities.

Though RAP related principles are elaborated in this document, it is for reference if it triggers by any means in future then project needs to abide with it and will be updated in line with any expected resettlement impacts.

1.26. Entitlement Matrix

An Entitlement Matrix, as outlined in the ESMF will be followed (if applicable).

SEXUAL EXPLOITATION AND ABUSE (SEA)/SEXUAL HARASSMENT (SH) PREVENTION AND RESPONSE ACTION PLAN

6.1. SEA/SH - National Scenario

The current status of gender inequality and gender-based violence (GBV) in Nepal reveals the serious need to mainstream gender sensitivity and GBV risk mitigation measures, and more specifically, sexual exploitation and abuse, and sexual harassment (SEA/SH) risk mitigation measures at all organization levels and in all phases of project cycles. In Nepal, SEA/SH is prevalent due to unequal gender relations and discrimination towards women in both the public and private sphere. It has direct implications on the reproductive health status of women and on the physical, emotional, and mental health of their children.

Based on the SEA/SH Risk Assessment checklist and assessment carried out for NUGIP by the World Bank, the Project's SEA/SH risks are assessed to be "Low". An SEA/SH Prevention and Response Action Plan has been developed for NUGIP based on this assessment and includes specific measures that aim to prevent and mitigate GBV, in particular SEA/SH risks that the project activities might trigger. The Plan has also addressed "Table – 1: Recommended actions to address SEA/SH Risks in IPF Projects" as per the "Good Practice Note" published by the World Bank in September 2018. The SEA/SH Risk Mitigation Action Plan is included under Chapter 7 of the ESMF for NUGIP. The plan applies to all sub-projects under NUGIP and provides recommended actions for addressing and mitigating SEA/SH risks. The project will refer to the main action plan and contextualize and adapt according to the nature of the project, capacity of the implementer, and the prevalence of GBV in the project areas

6.2. The Purpose of SEA/SH Risk Mitigation Action Plan

The Tilottama subproject draws upon NUGIP SEA/SH Risk Mitigation Action Plan to address and mitigate against any SEA/SH risk during subproject implementation, and will make any adjustments as required to meet subproject specific SEA/SH risks that were identified during ESIA preparation. The purpose of the action plan is to identify the issues, stakeholders, possible service providers, and map existing GBV services and service providers and assess their capacity and document the legal and institutional mechanisms that aid in accessing grievance redressal related to SEA/SH. The subproject will focus on sensitizing the communities and other stakeholders and strengthening institutional capacities. A survivor-centric approach is followed whereby all through the subproject, victim/survivors' care and providing access to different referral mechanisms are considered key aspects of this plan.

6.3. SEA/SH Risk Mitigation Action Plan Principal and Approach

The survivor-centric approach is a human-rights based approach which aims to create a supportive environment in which the survivor's rights are respected and in which he/she is treated with dignity and respect (UNICEF 2010). This approach helps to promote survivor's recovery and ability to identify and express needs and wishes, as well as to reinforce the survivor's capacity to make decisions about possible interventions (GPN – Addressing SEA/SH in civil works, World Bank 2020). The key principals of this approach are:

- To treat survivors with dignity and respect instead of being exposed to victim blaming attitude.
- Do not deal the issue through the feeling of powerlessness.
- To maintain privacy confidentiality and safety of the survivors.
- Do not discriminate survivor based on gender, age, race/ethnicity, ability, sexual orientation, HIV status or any other characteristics.
- Enable timely access to quality services as required by the survivor
- Ensure informed consent of the survivor since the survivor has the right to understand the options and decide whether to talk about the incidence or not

6.4. Additional SEA/SH Risks in relation to Labor Influx

Amongst all required human resource needed for the subproject, skilled labor requirements will be less and unskilled labor will be high. All labor requirements cannot be met through hiring from the local community, for various reasons including worker unavailability and lack of skilled labor, therefore the contractor will hire labor externally according to need. In many cases, labor influx is compounded by influx of other people who appear in the project area along with the development of the project for various reasons including to seeking opportunities to sell goods, and services. The social impacts resulting from labor influx are critical to address, as even a modest

labor influx may lead to negative impacts on the host community. However, SEA/SH risks can be equally triggered by local laborers. Below are potential risks in the subproject area which are associated with labor influx:

- Risk of social conflict due to conflicts like high consumption of alcohol, drug abuse and dispute/fights in the local area
- Increased risk of illicit behavior and crime that includes theft, physical assaults, substance abuse, prostitution and human trafficking.
- Influx of additional population followers like workers families, traders, suppliers, vendors and traders of different types
- Burden on and competition for public service provision due to increased population, increased density of traffic on roads, increased patients and accidents in the workplace
- Increased risk of communicable diseases and burden on local health services
- Child labor and school dropout due to increased job opportunity and forced labor due to poverty
- Increased pressure on accommodations and rents, traffic and inflation of price
- Other SEA/SH related risk

6.5. Mitigating against SEA/SH risks

Mitigation measures against the risk of SEA/SH in the subproject are outlined below:

- Reduce labor influx by using local manpower and prioritizing eccentrically throughout the local ward, municipality, district, province and federal state. Training can be conducted to train or upgrade the awareness on SEA/SH risk.
- Awareness programs related to community and workers, trafficking, sexually transmitted disease etc to be conducted to both workers and community to adjust the workers with the community
- School-Based Awareness Programs about development, environment, social cultures, probable impacts during construction and operation
- Implementation of Code of Conduct on SEA/SH behavior and the provision of punishment for breaching of the code of the conduct
- Communicable diseases like AIDS, COVID etc and to apply strict preventive measures for the same
- Mitigating risk of child labour through well-documented age verification process
- SEA/SH related to female workers by providing female labor-centric facilities such as separate female toilets, separate female camps, separate family camps and mother's rooms on the site.

6.6. SEA/SH Risk Mitigation Action Plan

As noted above, the subproject will draw on the SEA/SH Risk Mitigation Action Plan developed for NUGIP, which is included in the NUGIP ESMF and provided in **Table 0.1**.

Table 0.1: SEA/SH Risk Mitigation Action Plan

- Objective	- Indicator	- Tilottama subproject measures	- Timeline	- Responsibility	- Cost (NPR)
- Include the assessment of SEA/SH risks (as low SEA/SH risk) as part of the social/gender assessment in project's Environmental and Social Impact Assessment (ESIA)	- Low SEA/SH risks highlighted and preliminary mitigation measures identified - Mapping completed of available, quality services in the project affected area	- Consultations have been conducted and identified SEA/SH risks in project areas identified and include the main measure agreed to with the local administrative office - Map out SEA/SH prevention and response services in project area of influence – - reference to be made from the service mapping that already exists at the national level	- Construction Phase (as part of ESIA)	- Local Body /PIU	- Included in ESIA cost
- Reflect SEA/SH risks, and measures to address them, in ESMP and contractor ESMP including the costs	- SEA/SH risk Mitigation Action Plan included in the ESMP - Procurement for SEA/SH-related activities and costs outlined in the contract.	- SEA/SH risk Mitigation Action Plan provided and SEA/SH related costs are included in the ESMP and contract documents to mitigate risks.	- Year 1 (during preparation of ESMP)	Tilottama municipality (local body) /PIU	- SEA/SH costing is included in ESMP
- Incorporate SEA/SH related information and measures into plans for stakeholder engagement	- Number of awareness and consultations held	- The plans for stakeholder engagements during the subproject implementation include awareness raising activities (specialized service providers/contractors/NGOs identified and hired under contract) and awareness and consultations carried out. - This plan will be implemented during the project construction.	- During preparation of ESMP, beginning of construction, and during construction	Local Body /PIU	- ESIA covers stakeholder consultation costs; construction phase stakeholder engagements costs should be inbuilt into overall budget

- Objective	- Indicator	- Tilottama subproject measures	- Timeline	- Responsibility	- Cost (NPR)
during Implementation Status Review (ISR) missions					

Note: The requirements of the SEA/SH Risk Mitigation Action Plan must be included in contractor's management plan.

ENVIRONMENT AND SOCIAL MANAGEMENT PLAN

1.27. Background

This Environmental and Social Management Plan (ESMP) for the project identifies the principles, approach, procedures and methods that will be used to control and minimize the environmental and social impacts of all construction and operational activities associated with the project development that is intended to ensure that commitments made to minimize project's related environmental and social impacts are upheld throughout all project phases. The management and monitoring program will involve the following: a) collection and analysis of appropriate environmental social and cultural data; b) preparation of periodic reports including an annual environmental and social performance report to DUDBC and the WB and liaison with other relevant bodies (e.g. ministries, departments and relevant agencies); c) identification of unexpected environmental and social impacts; and d) formulation of mitigation measures for the unexpected negative impacts.

1.28. Implementation of Environmental and Social Management Plans

The mitigation measures will be integrated into project design and the agreements/contract documents. The project bid documents will include the implementation and reporting of the ESMP and contractor must follow it. The impact of the construction on the environment will be kept to a minimum and appropriate measures as brought out to in the ESMP are taken to mitigate any adverse effects during the construction. The Environment, Health, and Safety requirements of the construction contractor will be clearly spelled out in the contract document and the necessary cost will be included in the BOQ. The contractor is required to submit the Construction Environment and Social Management Plan (CESMP) along with Contractor's Environment, Health, and Safety Management Plan within 45 days of the commencement of the work. The client/consultant will review the Contractors CESMP and EHS plans and provide approval along with necessary improvements. The regular monitoring will be followed by the PIU/Environmental and Social Monitoring team. It is in this context, the construction contractor is required to provide 1) a sound working environment to all employees involved in the design and construction of road as per national legislations, standards, and guidelines. 2) Must ensure HSE objectives are met during the entire construction, 3) Prepare and submit ESMP plan during construction period of the project. The EHSMP should include; policy statement, roles and responsibilities, site regulations, risk management and hazard identifications, HSE trainings, PPE, Inspection and auditing, site security, medical care and first aid, 4) The contractor must ensure Environmental Management and Mitigations addressing ESMP and mitigation management as shown in **Table 0.1**.

As all the ESMP costs and activities are included in the BoQ, the budgetary activities lie within the contractor's responsibility. The DSC within the PIU, Project Management Support Team and Municipality are also responsible for the implementation of the mitigation activities and their monitoring. The public awareness campaign will be done through municipality and oversight by UDST.

Table 0.1: Adverse impacts mitigation measures

Stage	Impact	Mitigation Measure	Responsibility	Cost (Remarks if any)
Physical-Construction				
	Dismantling of boundary wall and construction of new boundary wall at three separate locations: i. Chainage 2+350, Janahit High School's wall; ii. Chainage 3+850, Semara health post; iii. Chainage 3+290) boundary wall of Shiva Temple in RoW of road	<ul style="list-style-type: none"> ▪ Obtain written permission from temple, school, health post prior to commencement of activities related to dismantling (also include in site specific ESMP before construction). ▪ Reconstruct of new boundary wall of Shiva temple, Government School and Health Post. 	Contractor (budget) in coordination with Municipality	Include in BoQ No 12 of DPR
	Impact on property from vibrations due to the use of heavy machinery and other construction activities	<ul style="list-style-type: none"> ▪ Establish photographic and video graphic evidences of structures and properties in and alongside RoW. ▪ Awareness raising, information and dissemination about GRM ▪ Cracks caused by vibration due to construction activities need to be monitored closely and alternative be sought where problem arises. 	Contractor/ Municipality/DSC	- Photography and Videography cost are included in BoQ. From 4% contingency budget allocated to municipality
	Obstruction due to electric and telephone poles in the ROW	<ul style="list-style-type: none"> ▪ Obtain all necessary permits for dismantling and relocation of electric poles from NEA and provide a copy to the Contractor. ▪ Relocate the electric poles along the alignment in coordination with the Nepal Electricity Authority and Nepal Telecom. ▪ The process should be completed prior the beginning of the road construction 	Municipality/DSC and Contractor in coordination with NEA and NTC	(Included in DPR BOQ No:13.01)

Removal and re-construction of Water Supply Pipe lines of the water supply scheme	<ul style="list-style-type: none"> ▪ Obtain permission for dismantling from Water Supply Management Committee. ▪ The project must work in close coordination with the Water Supply Management Committee regarding disruption of water supply system of 3.7 km at chainage of (0+000 – 3+700), ▪ Alternative means of supply during the disruption and reconstruct the system will be done. 	Municipality/DSC and contractor in coordination with water supply management committee	(Included in DPR BOQ 13.02))
Loss of Top Soil	<ul style="list-style-type: none"> ▪ Save all available top soil from ROW sites and re-use it on completed road formation batters approved by Supervising Consultant. ▪ Strip and stockpile topsoil from all ancillary sites that are to be disturbed. ▪ Keep stockpiled topsoil separate from sub-soil material. ▪ Sow a cover crop on each top soiled batter soon after topsoiling. 	Contractor	This will be the part of Contractor's Responsibility under Contractor Cost
Protection of water courses crossing the road and alongside the ROW	<ul style="list-style-type: none"> ▪ Construct silt traps and ripraps to maintain the river channels. Dredge the river bottom to ensure free flow of the water 	Contractor	This will be the part of Contractor's Responsibility under Contractor Cost
Quarrying Material and Operation	<ul style="list-style-type: none"> ▪ Prepare a CESMP and include the details of quarrying activities including required quantity, locations and required mitigation within 45 days of commencement of works and submit to the PIU for approval. ▪ The construction materials will be brought from the established quarry sites located within or outside the municipality. So, the direct impact of quarries is not expected in this Subproject. ▪ The municipality in support of DSC will monitor the quality of quarrying material and state of quarry sites. ▪ The materials will be brought only from licensed vendors having environmental clearance. 	Municipality/DSC, Municipality instructs the quarry operators to reinstate the established quarry sites as per agreed norms during environment clearance	Covers by municipality/PIU DSC monitoring cost

	<p>Road safety, Sewer, Drainage etc</p>	<ul style="list-style-type: none"> ▪ Provide bus laybys and Bus Shelters. Bus laybys are provided at various locations mentioned in Table 1.2 where public buses or micro buses pull out of the traffic to pick and drop off passengers. ▪ Provide ramps in strategic section of roads as detailed in section 1.4.9. ▪ Sewer Drainage: ▪ Manhole: Existing Manholes at existing locations require to be raised to FRLs of the road. ▪ Cross-Roads: Development Stretch of 15 m of each cross-road will be developed under this project. ▪ Installation of Road markings at all major as well as minor intersections. Road Signs and Markings Road Markings has been provided as per Traffic Sign and Marking manual as per DPR ▪ Hand railings: Hand railing to be provided at box culverts and other required section ▪ Retaining/ Breast wall: Stone Masonry Retaining wall has been provided along the alignment where embankment is required as stated in the Section 6.3.20 of the DPR and the related drawings and estimates ▪ Guard Rails and Safety Barriers: Guard Rails and safety barriers must be provided in places where serious damage to vehicle and people may occur when an out-of-control vehicle may leave the roadway or hit other objects. 	<p>Contractor</p>	<p>Already included in project BOQ</p>
	<p>Issues of stockpiling</p>	<ul style="list-style-type: none"> ▪ Locate, peg and seek approval from the supervising consultant for the use of stockpile sites. ▪ Stockpile should not be located on water courses; should not be within 50m of schools, hospitals or public standpipes; and should not affect locals and their properties. ▪ Obtain written permission from landowners and local bodies for stockpiling on their land. ▪ Only barren land will be used for stockpiling and proper insulator cover and proper drain will be managed to store the chemical to avoid the leakage of chemicals. ▪ Stock of sand will be set wet to prevent it from blowing with the wind; water sprinkler will be used for this purpose. ▪ The places used for the stockpiling of construction materials will be cleaned promptly after the completion of the project. ▪ The area could be leased or rented based on price not lower than the prevailing market price. 	<p>Contractor</p>	<p>This will be the part of Contractor's Responsibility under Contractor Cost. This will be included in CESMP</p>

	<p>Construction Safety</p>	<ul style="list-style-type: none"> ▪ Reinforced Cement Concrete covered drain must be provided throughout the alignment in integration with footpath. ▪ Storm water collected should be disposed through the nearest culvert sections. ▪ The contractor will assign a safety officer and the PIU’s safeguard specialist will monitor the implementation of the OHS measures. ▪ Adequate lighting and safety signal devices be installed for work safety. ▪ Adequate warning signs, safety barriers, traffic calming measures and persons with flags to control traffic will be provided for work safety. ▪ Protective clothing including helmets, masks, boots, gloves, ear plugs and goggles should be provided for workers safety. ▪ At every work place, a readily available first aid unit including an adequate supply of dressing materials will be provided. ▪ Maintain health care system at construction camps including regular visits by trained medical staff for routine checkup of workers and avoidance of communicable disease. ▪ Temporary diversions will be provided wherever necessary, with proper drainage facilities. ▪ Electrical Equipment will be checked and certified regularly. ▪ Provide and install all road signs as per design. ▪ Impart road safety education to all community, schools, clubs and drivers of construction vehicles. ▪ Hazards will be identified, and workers will correctly wear PPE, will properly use safety equipment, and will follow work safety arrangements. Safety signs and information will be provided and the work space will be barricaded to prevent unauthorized entry. Workers and people at the construction site will be provided with proper training, and to help ensure that workers are trained on what to do in the event that an accident occurs on site. 		
	<p>Traffic Management</p>	<ul style="list-style-type: none"> ▪ Emergency traffic management plan should be included in CESMP by the contractor and approved by the PIU/DSC. This is required to cope up with the restriction on the vehicular movement due to closure of road for reasons including construction. The plan may include informing about the scheduled road closure and the alternative routes identified to divert the normal traffic flow, transport material during off-peak time, ▪ provide advance notice to stop vehicles by erecting indicator signs at a necessary distance in order to reduce congestion at the site of work, thus enabling making of proper security arrangements, or lane wise traffic management 	<p>PMST/DSC and Contractor</p>	<p>Included in BOQ</p>

	<p>Air/Dust Management</p>	<ul style="list-style-type: none"> ▪ Road construction area shall be maintained damp by periodical spray of water. ▪ Delivery vehicles will be covered. ▪ Mixing equipment will be well sealed and equipped as per existing standards. ▪ All construction vehicles should comply with Motor Vehicles and Transportation Management Act as amended – mandatory Green Sticker. ▪ Provide temporary hoardings where required to minimize dust impact on locations of temples, health posts and schools. ▪ Provision of speed control measures in settlement and working areas to limit traffic speed. ▪ Dust emission and air pollution due to construction activities and operation of heavy equipment and movement of transporting vehicles, to mitigate the impacts water will be sprinkled along the proposed road alignment and nearby dust prone area and repair and maintenance of equipment and vehicles regularly. ▪ Air pollutant parameters (TSPM, PM10, Sox, NOx, Cox) will be monitored regularly during construction. Conforming NAAQS of Nepal. 	<p>Contractor/PIU/DSC</p>	<p>The cost for the air pollution monitoring and water sprinkling will be borne by the DSC cost. It is included in the DSC ToR.</p>
	<p>Noise, vibration</p>	<ul style="list-style-type: none"> ▪ Ensure plant and equipment used for construction conforms to best practices. ▪ Vehicles and equipment used will be fitted with silencer and maintained to keep noise at minimum levels. ▪ Workers will be provided with appropriate ear muffs/plugs specially at crusher site ▪ Sensitive locations i.e., schools, hospitals, government offices etc. will avoided while placing the noise generating equipment. ▪ Cracks caused by vibration due to construction activities need to be monitored closely and alternative be sought where problem arises. ▪ Work will be restricted to day hours (not in night time) specifically at urban and sensitive locations. ▪ Select equipment and machinery with lower sound power levels for the use ▪ Restrict activities with significant noise impacts to outside school ▪ Activities involving heavy machinery with significant noise impacts should be restricted to outside school hours. ▪ Noise levels (1 hr Leq dB(A)) levels will be monitored regularly. Conforming WHO standards. 	<p>Contractor/DSC</p>	<p>The cost for Noise level monitoring will be borne by the DSC cost. It is included in the ToR of DSC</p>

Water Pollution	<ul style="list-style-type: none"> ▪ Hazardous materials shall not be stored near surface waters sources ▪ Used lubricants and oils shall be collected and recycled or disposed off site. ▪ Plastic sheeting shall be placed under hazardous material storage area to collect and retain leaks and spills. ▪ Contaminated runoff from storage areas shall be captured in ditches or ponds with an oil trap at the outlet. ▪ Contaminated and worn plastic sheeting shall be packed into drums and disposed off site. ▪ Water Quality (EC, PH, DO, TSS, Oil and Grease). Conforming WHO standards. 		The cost for Water Quality Test monitoring will be borne by the DSC cost. It is included in the ToR of.DSC
Loss of productive soil and agricultural land	<ul style="list-style-type: none"> ▪ Top soil (0-25 cm) from the productive land will be collected and stored for reuse and final dressing of embankment turfing or given back to the farmers upon request 	Contractor	Included in BOQ
Siltation and contamination of rivers	<ul style="list-style-type: none"> ▪ Protect disposal of excavated spoils and debris in to water bodies ▪ All chemicals and oil will be stored away from water and concreted platform with catchments pits for spills collection 	Contractor	Included in BOQ
Hydrology and drainage-risk of increasing sedimentation and siltation of waterways during construction phase	<ul style="list-style-type: none"> ▪ Existing natural drainage system, including irrigation channels will not be disturbed. As per DPR, causeways and structures will be provided in each perennial and seasonal streams and rivulets. As suggested in DPR, adequate cross drainage structures will be provided to facilitate natural flow of water across road embankment. 	Contractor	Included in BOQ
Obstruction of access to structures	<ul style="list-style-type: none"> ▪ Proper engineering measures to provide access to structures as per DPR, including the provision of constructing steps and 118 number of ramps 	Contractor	Cost is included in BOQ
Labour Camp Location and Management	<ul style="list-style-type: none"> ▪ Locate, peg and seek approval from DSC for labor camp sites. ▪ Camps shall not be located near settlements; near water supply intakes; or sites that affect the access by local people to drinking water. ▪ Install sanitary facilities for workers to avoid open defecation by construction of temporary toilet. ▪ Camp shall not be in the vicinity of landslide and flood plains. ▪ Provide and maintain proper drinking water, sewerage and waste disposal facilities at the camps. ▪ Ensure no wood is burnt by any worker on or off site. Camps shall be provided free of cost, with electricity and regulator & adequate fuel supplies of LPG or Kerosene. ▪ After use, sites shall be cleared and restored to near natural or stable conditions with vegetative cover. 	Contractor	Included in Contractor's Cost

	SEA/SH related risks	<ul style="list-style-type: none"> ▪ Have separate, safe and easily accessible facilities for women and men working on site ▪ Establish locker rooms/secured rooms/or latrines for workers, well-lit and include ability to lock from inside ▪ Display signs around workplace on prohibition of SEA/SH 		
	Physical-Operation			
	Road Stability and Drainage Management	<ul style="list-style-type: none"> ▪ Road side tree plantation, construction of gabion wall and drainage system to mitigate possible inundation in the settlements along the project alignment, Ensure proper compaction as per design 	Contractor/Municipality	Included in DPR and subsequently budgeted in BOQ
	Air pollution	<ul style="list-style-type: none"> ▪ There should be a consensus between municipality, District Transportation Office, Transportation Entrepreneur, and the local people regarding the operation of conditioned vehicles 	DTO, transportation entrepreneur, local people	- Municipality Regular program during Operation
	Water pollution	<ul style="list-style-type: none"> ▪ The operation of proposed work doesn't pose serious threat on water bodies; however, washing vehicles on fresh water streams will be avoided. 	Drivers, Ward, local people	Municipality will monitor

	<p>Climate change and Disaster Risk</p>	<ul style="list-style-type: none"> ▪ Nepal lies in Seismic zone-V, hence all the design will be based on IS 1893 to withstand the earthquake. The road is provided with safety features, which likely reduce the chance of accidents in the road alignment. The road assets shall be designed to withstand seismic forces as per IS 1893. ▪ At Mangalapur-Kanchibazzar road (5 KM section from Mangalapur) there will be the problem of drainage system during operation & maintenance. Therefore, provision of proper road side drainage and cross drainage should be made to drain off the storm water from the road so as to mitigate possible inundation along the settlements that exist along the project alignment. ▪ As a mandatory rule, road side tree plantations have been proposed in the ratio of 1:10 to the number of trees that are to be cut down. The project has also proposed tree plantation in foot path areas. This helps in creating a comfortable microclimate, thereby reducing the temperature of the project area by some degrees. The cost of plantation has been included in the cost estimate. ▪ No alteration to the existing drainage channels (natural or artificial) will be done with the thought that they have been well adapted to the existing conditions over a long period of time. ▪ Entire process from project selection up to the project design and implementation prioritize wider settlements along with the social and health institutions like schools, hospitals, health posts and so on. These public institutions are very helpful during disaster to use as temporary shelters as well as centers for rescue and rehabilitation. The projects will incorporate various safety measures that also include signboards, information boards, caution sign, barricades to disaster prone areas and accident-prone areas within construction areas. This is also an attempt to incorporate disaster mitigation in the project. 	<p>PCO/PIU/Municipality</p>	<p>The cost is inbuilt to ESMP -BOQ and in project construction cost</p>
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	Flash floods	<ul style="list-style-type: none"> ▪ Due to surface runoff and presence of natural streams which are fed by rain. A considerable risk (medium to high) is anticipated for floods. Due to heavy rain and surface run off due to improper drainage there will be problem of inundation/water logging and flooding 	Design by DSC, construction phase by the contractor and operation phase by municipality	<ul style="list-style-type: none"> - Provision of adequate drainage and cross drainage measures to prevent water logging Design of storm water drains capable of discharging large flows
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	<p>Road Safety</p>	<ul style="list-style-type: none"> ▪ Road safety components such as rumble strips, visibility improvement at intersections and branch roads, pedestrian crossings and installing proper signs, traffic signs and signals has been incorporated and recommended. Pedestrian crossings (zebra crossing) are proposed in intersections, major junctions, and branch roads and even in road alignment with major places such as schools and commercial establishments in order to cross the road safely across the flow of vehicular traffic. Signalized pedestrian crossings are proposed in order to separate when each type of traffic (pedestrians of road vehicles) can use the crossing. ▪ The objective of the Road Safety Interventions is to assess it for potential shortfalls in safety and recommend corrective strategies to eliminate/reduce risks of crashes. Various road safety interventions are proposed to make the road safer and reduce traffic accidents. ▪ Improvement of intersections, traffic signs installation and improving visibility ▪ Proper Traffic signs and signals and road markings throughout the alignment. ▪ Provision of guard rails, street lights, bollard lights, rumble strips, pedestrian crossings, covered drain throughout the alignment ▪ Provision of separate cycle lane and footpath ▪ Use of Reflective Pavement Marker (RPM) for lane marking and delineation for night-time visibility. Delineators and Object Markers ▪ Roadway delineators are intended to mark the edges of the roadway to guide drivers on the alignment ahead. Object markers are used to indicate hazards and obstructions within the vehicle flow path, for example, channelizing islands close to the intersections. 	<ul style="list-style-type: none"> - DSC and Contractor during construction phase, - Operation phase monitoring and compliance by the municipality or concerned entity - Oversight and advisory role of UDST will be there. 	<ul style="list-style-type: none"> - Costs are included in BoQ
<p>- Biological-Construction</p>				

Vegetation clearing	<ul style="list-style-type: none"> ▪ 64 trees/poles of different species need to be removed and compensatory plantation will be carried out @ 1:10 ration i.e., removal of 1 tree will require plantation of 10 seedlings. In addition to 640 seedlings for compensatory plantation, additional 260 trees will be planted by the project; thus, the total plantation will be of 1000 seedlings. The seedlings will be replanted outside RoW as far as practicable. ▪ Native tree species will be selected for the compensatory plantation as much as possible. In addition, project has proposed road side plantations. 	<ul style="list-style-type: none"> - The cost is included in Contractor Cost. - PIU/Municipality initiation will be required to effective implementation. 	<ul style="list-style-type: none"> - Cost is already included in BOQ - The cost for 1000 seedling and tree guards is estimated @Rs 1500/tree. The total cost for plantation comes around Rs.1500000.00. The cost has been included in BOQ. - CESMP will also include this.
- Biological-Operation Stage			
Impact on Vegetation	<ul style="list-style-type: none"> ▪ Encouraging local people for protection of roadside plantation carried out during construction. 	Municipality	<ul style="list-style-type: none"> - No additional cost
- Social- Construction Stage			
Loss of Land or property (as of design for this road it is not applicable as of), If applicable and trigger then	<ul style="list-style-type: none"> ▪ Compensation for loss of property as per the RAP (not applicable as of now: ref DPR report, field observation) 	PCO	-----

Pedestrian Safety	<ul style="list-style-type: none"> ▪ Diversions should be child and elderly friendly as well as to other general pedestrians. Crossings near school area should be safe and the school area should be highlighted. Appropriate signage will be displayed use during construction and implementation of the project to enhance awareness around the potential safety hazards of the construction. 	Contractor	
Health and Sanitation	<ul style="list-style-type: none"> ▪ Proper awareness of using latrines, construction of latrine for worker, Piyus (a chlorine solution) will be provided to workers to purify drinking water. 	Contractor	- Included in the project design cost
Child labor and forced labor	<ul style="list-style-type: none"> ▪ No child (below 16 years) and forced labor will be employed in project. 	Contractor	No cost
Occupational Health and Safety	<ul style="list-style-type: none"> ▪ Provision of PPE that also includes the protection against COVID pandemic like use of mask, gloves, and distance maintaining wherever possible ▪ Provision of insurance to cover physical damage to workers. ▪ Induction and refresher training to the workers will also be provided with insurance to cover physical damage to workers. ▪ Basic First aid 	Contractor	This will be included in ESMP and contractor's cost during contract Included in HIV-AIDS and COVID Management below.
Traffic and Transport Management	<ul style="list-style-type: none"> ▪ Mobilization of equipment of materials will occur at night (between 6 PM - 9 AM) ▪ A detailed Traffic and Transportation Plan is to be contained in the Contractor Document ▪ Traffic Safety such as street lights, traffic control devices and other features shall be covered through "Traffic Signs Manuals Vol-I and Vol II" and "Road safety manual" published by the DOR. ▪ Conducting the road safety audit during construction and prior to opening for public ▪ Bus bays are one of the most crucial factors to be considered in market areas as well as settlement areas. ▪ Provision of alternative routes to ease the congestion and built up of traffic 	Contractor will submit the Traffic and Transportation Plan and approved by the PIU for effective monitoring	This will be the part of contractor cost.

Community Health, Safety and Security	<ul style="list-style-type: none"> ▪ Carry out site management practice such as the fencing around work area and road signage ▪ Increase public awareness of safety, health and environmental issues by providing information directly and indirectly through campaign ▪ Display appropriate signage for use during construction and implementation of the project to enhance awareness creation on the potential hazards of the project 	<ul style="list-style-type: none"> - Contractor/ - Public awareness campaign by the municipality 	Included in the BoQ
Limited Access for elderly and Differently-able People	<ul style="list-style-type: none"> ▪ Diversions and proper crossings will be available for elderly and differently-able people in the construction phase to ensure their mobility is not impacted during construction. Elderly people should have access to socialize and meeting people and family to nurture their mental need/health. ▪ The design should incorporate the disabled-friendly measures and will incorporate periodic maintenance. 	<ul style="list-style-type: none"> - Municipality/ DSC Contractor (engineer must ensure this in design) 	This will be the part of Contractor's Responsibility under Contractor Cost
Working conditions and management of worker relationship	<ul style="list-style-type: none"> ▪ The contractor shall provide reasonable working conditions and terms of employment, and in conformance to working conditions established by National law. During construction, temporary accommodations will be constructed by the contractor and will comply with national and international standards for quality, security, safety, and professional competency. 	Contractor in support of NGOs	Included in BoQ
HIV-AIDS and COVID Management	<ul style="list-style-type: none"> ▪ Awareness creation and sensitization to workers and other persons post-project to reduce or eliminate chances of infections of HIV-AIDS and other sexually transmitted diseases ▪ Distribute HIV & AIDS awareness materials in collaboration local health related agencies ▪ Ensure protective measures for COVID is followed, prepare and follow SOPs by all workers and staff for COVID (social distancing, immunization, hand washing, using sanitizer, masks etc) including the community health and safety awareness and management 	<ul style="list-style-type: none"> - DSC, Contractor in support of Municipality/NGOs - 	NRs. 900000.00
Girls/Women Trafficking	<ul style="list-style-type: none"> ▪ Awareness program will be developed and implemented ▪ 	DSC in close coordination with Women Development Office, municipality, NGO/Clubs	NRs. 500,000.00

	Impacts on Communities, disease, cultural drain on local resource, etc.	<ul style="list-style-type: none"> ▪ Conduct local cultural awareness orientation training for workforce. ▪ Implement Public Health Awareness Raising Plan to address communicable diseases prevention, hygiene and sanitation, safe sex practices and other community Health issues ▪ Impact Monitoring of Local resources, address gap, and problem as needed 	Contractor in support of Municipality	This will be the part of Contractor's Responsibility under Contractor Cost
	Grievance Redressal	<ul style="list-style-type: none"> ▪ Employ a grievance redress mechanism incorporating a negotiation and/or mediation team or party 	DSC day to day compliance by the contractor	Transportation allowances for project period NRs 300,000.00
	SEA/SH risks	<ul style="list-style-type: none"> ▪ SEA/SH awareness raising activities, trainings and stakeholder engagements such as: <ul style="list-style-type: none"> • Community based-awareness program • School based awareness program • Awareness program for women and against the gender-based violence ▪ Providing female labor-centric facilities such as separate female toilets, separate female camps, separate family camps and mother's rooms on the site. ▪ GRM will include mechanism for referring SEA/SH-related grievances ▪ Formulating and adopting Code of conduct including sections on the safety of women and girls (CoC should be included in all contracts and training on CoC should be provided to all workers) ▪ CoC are understood through orientations and signed by workers 	- Project Office DSC, Project Contractor, municipality, NGO/CBO/Local people, Women Development Office Contractor	- Approx. Rs 1800000.00 - - - NRs. 2,400,000 Contractor responsibility
- Social Operation Stage				
	Encroachment of ROW	<ul style="list-style-type: none"> ▪ The municipality will work with wards and local bazaar committees/groups to discourage encroachment into the RoW. 	Municipality	Cost will be borne by municipality

	Traffic accidents and associated risks	<ul style="list-style-type: none"> ▪ Raise awareness of traffic rules, pedestrian / cycle lanes and installation of speed bumps to control speed near pedestrian crossing areas ▪ Traffic management plan will be developed, especially along congested locations. ▪ Traffic control measures, including speed limits will be enforced strictly. ▪ Further encroachment and squatting within the ROW will be prevented. ▪ No school or hospital will be allowed to be established within 50 m of the road without permission from the planning authorities. 	Municipality	Cost will be borne by municipality
	Limited access for elderly and differently-able people	<ul style="list-style-type: none"> ▪ Provide training on the use of facilities; maintain signboards, lights, instructions in strategic locations. 	Municipality	Cost will be borne by municipality
	Air and Noise Pollution	<ul style="list-style-type: none"> ▪ Maintain signs and speed restrictions on the road section within settlements area to reduce vehicle speed, dust generation, and where horns will not be blown and traffic speed will be regulated. ▪ Strict enforcement of vehicle emission standards. ▪ Maintain road side tree plantation ▪ Air pollutant parameters (TSPM, PM10, SOx, NOx, COx, Pb). Conforming NAAQS of Nepal. ▪ Water quality (EC, PH, DO, TSS, Oil and Grease). Conforming WHO Standards. ▪ Noise levels (1 hr Leq dB(A). Conforming WHO standards. 		Municipality will be responsible during operation stage.

1.29. Impact and Compliance Monitoring

Impact monitoring involves the monitoring of environmental and social changes and estimates inherent variation within the environment, identifies long term trends in the natural system, and derives conclusions by making comparison against a standard or target. Compliance monitoring is carried out to understand the implementation status of environmental and social requirements as documented in the ESMP and is shown below.

Municipalities will report on the implementation of the ESMP(s) and on the status of compliance with the instruments on a regular basis as part of the trimester progress report (to the DUDBC). Information shall include: 1) measures taken in furtherance of the safeguard instrument, ii) conditions, if any, which interfere or threaten to interfere with the smooth implementation of the safeguard instruments; iii) any feedback under the GRM of the ESMF, and iv) remedial measures taken or required to be taken to address such conditions.

Table 0.2: Selected monitoring indicators

- Monitoring Sector	- Parameters selected
- Slope, stream protection	- Effectiveness of slope protection, stream protection works
- Socio-economic development in road alignment and Zol	<ul style="list-style-type: none"> ▪ Number of employment opportunities created ▪ Number of workers received training on enhancement of technical skills ▪ Change in transportation costs and time ▪ Number and type of enterprises, cottage industries established ▪ Change in status of basic services and utilities in the Zol for e.g. education institutions, access to health infrastructures, water supply, energy status, trade and commerce ventures, shift in livelihood strategies among the populace from the Zol ▪ Condition of affected infrastructures (if any) ▪ Occupational health and safety measures provided to workers ▪ Increase in number of people receiving social service facilities (school, health post) ▪ Increase in land value ▪ No. of accidents related to road ▪ State of settlement condition (no. of houses, shops, sanitation condition) ▪ Number and status of porter's livelihood

1.30. Monitoring activities and methods

Table 0.3: identifies the specific compliance monitoring activities. Phase-wise/chronological details are provided for the methods, schedules, responsible implementing agency and the responsible monitoring agency. Compliance monitoring refers primarily to the pre-construction and construction stage of the project. The following government standards will be taken as reference for monitoring.

Table 0.3: Impacts and monitoring of the project

Parameters	Verifiable Indicators	Verification methods	Monitoring locations	Schedule	Monit or agen cy	Cost
- Change in Land Use	- Changing Agricultural land, forest land, settlement area and barren land	- Site observation, photos, discussion with communities	- DIZ, IIZ and project affected wards	- Continuous / construction (Yearly)	- DSC	- Included in DSC Contract
- Quarrying of Construction Materials	- Initiated erosion, changes in river regime, erosion by river systems, degradation of vegetation, water logging, waterborne diseases	- Site observation, photos - Records from local health centres	- Quarry site areas	- construction (Quarterly)	- DSC	- Included in DSC Contract
- Noise and dust pollution	- Total Suspended Solid, Particulates, noise level	- Visual inspection, measurement, and comparing baseline data,	- construction sites and at sensitive spots	- construction / operation (Quarterly)	- DSC	- Included in DSC Contract
- Use of bitumen storage, heating, spreading	- Contamination of bitumen near water sources, land contamination	- Visual inspection, measurement, comparison with baseline data,	- construction sites	- construction (Quarterly)	- DSC	- Included in DSC Contract
- Road safety measures	- Speed controls, traffic signboards, ROW encroachment, Pedestrian/cycle lane and speed bumps	- Observation, photos and interaction with local peoples	- ROW	- Yearly throughout the project cycle	- DSC	- Included in DSC Contract
- Road accidents	- Type and number of accidents occurred Adequacy of occupational safety measures provided	- Observations, photos, spot checks, interview with local peoples	- Road alignment	- Yearly throughout the project cycle	- DSC	- Included in DSC Contract
- Cultural, religious and historical sites	- Cultural and religious infrastructure, people perception, practices	- Records, observations, interview with local people	- Project area	- operation (Yearly for 2 years)	- DSC	- Included in DSC Contract

- Occupational and safety hazard	- Safety equipment like helmets, globes, boots etc., insurance, potable water, basic first aid kit	- Observation, records and interview with workers	- camp and working area	- construction (daily)	- DSC	- Included in DSC Contract
- Possible township/ribbon development along the road	- Congestions to road users - Number of accidents, ROW encroachment	- Records, observations	- Project Area	- operation (Yearly for 2 years)	- DSC	- Included in DSC Contract

The monitoring will be performed in active construction sites (road and other foot prints which details are provided in annex)

1.31. ESMP for Beneficial and Adverse Impact

The measures and actions proposed for augmenting the identified beneficial aspects the Mangalapur-Kanchibazar road upgrading project, as well as proposing a set of mitigation and precautionary measures to minimize or set off the potential adverse impacts is outlined in **Table 0.4:**.

Table 0.4: Beneficial impacts of the project

- Impact	- Enhancement/Mitigation Measure	- Enhancement/Mitigation Mechanism/Responsibility	- Cost / Remarks
- Construction Stage			
- Employment opportunities for local people	- Involve local people as per skills, qualifications (priority-based to the extent possible)	- Contractor (DSC)	- No additional cost
- Employment to the women and disadvantaged groups	- The contractor will coordinate with representative of disadvantaged and women group to employ those people, as many as possible	- Contractor	- No additional cost -
- Skills enhancement on construction, carpentry, masonry etc.	- Organize skills enhancement training targeting the local youths, women, vulnerable, disadvantaged and skills enhancement of project workers	- DSC -	- NRs - 1400000.00 - - (for the people in the direct influence area)
- Operation Stage			
- Improved access and reduced travel time /transport cost	- Fixing the minimum transportation cost in agreement with DTO, transport entrepreneurs and local people	- Municipality, Transport entrepreneurs and local people	- No additional cost
- Environmentally friendly construction	- The upgraded road will have a cycle track which helps to promote the use of non-motorized vehicles and reduces carbon emissions	- Municipality	- No additional cost
- Maintaining open and green areas	- A Green Utility Zone (Greenery) will be provided under the road upgrading, with various trees which will provide shelter from the heat, will create cool surroundings, and will improve the aesthetics of the road. A green area separating the footpath and cycle lane is proposed throughout the alignment. The green area will have tree plantations at certain intervals.	- Municipality	- Include in project cost
- Change in livelihood through the promotion of business and industry	- The municipality will facilitate measures to promote the establishment of new businesses and enterprises - - The PIU will create the suitable environment to promote business and industries based on local resources	- Municipality - - - PIU in coordination with local CBO/NGO/GoN offices	- No additional cost -

- Gender and social empowerment	- The subproject will serve to mainstream women, dalit, and other marginalized people by providing several income generating trainings and programs	- Municipality in consultation with UDST in collaboration with local organizations	- NRs. 1000,000
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1.32. Costs of Executing the Environmental and Social Management Plan (ESMP)

All proposed mitigation measures will be integrated in the project design so that these measures may automatically form part of the construction and operational phases of the project. The cost of executing the suggested mitigation measures such as of slope stabilization, awareness, waste management measures, shall be included in contractor's environmental and social plans, whereas the and tree plantation, etc. comes under the BoQ. The other remaining total cost for the ESMP is outlined in **Table 7.5**.

Table 0.5: Cost of ESMP

- S.N.	- Activities/Measure	- Total Cost (NPR)		- Remarks
1.	- Environment Mitigation (Pre construction phase)	-	-	-
- 1.1	- Electric /telephone Pole removal and reinstatement (as per BOQ)	-	- 30962335.29	- Both sides along the road @ 20 m interval
-	- Dismantling of boundary walls and reconstruction of new boundary wall (Chainage 2+350, Janhit High School wall), Chainage 3+850, Semara health post, Chainage 3+290) boundary wall of Shiva Temple in RoW of road	-	- -	- Included in BoQ
- 1.2	- Relocation cost of existing water supply (as per BOQ) LS	-	- 4878418.54	-
2.	- Construction phase and operation mitigation (specific activities not related to construction related mitigation) including GBV, girl trafficking, COVID, HIV/AIDs awareness, skill training etc - Skill enhancement trainings (construction phase): Operation phase gender and social empowerment - Awareness program in girl trafficking: GBV awareness activities: NRs. HIV/AIDS, COVID Awareness and Management: - Waste management - Tree plantation (1000 no)- Beneficial Impacts (refer table 7.4)	- - - - - - 1500000.00	-	- - - - - - - - - Included in contract BOQ
3.	- Waste Management (Construction Waste and Waste from Labour Camp), - Top Soil Management, - Road Safety, Sewer and Drainage - Stockpiling Management - Traffic Management	-	- -	- Construction waste management by Contractor's package and will be prepared

	- Labour camp Management - Dust Management by water spraying			during CESMP. Waste from camp is considered during camp site management.
4.	- Environment Monitoring and Management Unit	-	- -	- The cost is already built in to DSC contract
5.	- Protection of Water Course Crossing	-	-	- Included in Design (BoQ)
6.	- Roadside Plantation	-	- -	- Included in BoQ
7.	- Capacity Building Trainings to Municipality	-	- -	- The project has allocated this activity under component II UDST contracted
8.	- Construction of Retaining Wall	-	- Included in BoQ	-
9.	- Road safety measures	-	- Included in BoQ	-
10.	- Quarry Sites monitoring and Material Quality Check Up - Air Sampling/ - Noise measurement and management	-	-	- Municipality contingency cost, - PIU/DSC
11.	- Stakeholder consultations, maintaining GRM at project level	-	- 900000.00	-
-	- Total	-	- 36740753.83	- Excluding Vat

1.33. Monitoring Cost

There will be no cost for establishment of Environment and Social Monitoring Unit as the monitoring unit lies within PIU as a DSC. The social, gender and environment expert within the DSC will monitor environment and social components and cost will be provisioned under DSC contract. The DSC will also consider cost requiring items such as air, water and noise monitoring.

1.34. Institutional arrangements

The institutional setup plays a vital role in successful implementation of Environmental and Social Safeguards measures. The Ministry of Urban Development (MoUD), Nepal has setup a Project Coordination Office (PCO) under the Department of Urban Development and Building Construction (DUDBC) for NUGIP in Kathmandu. A Project Management and Support Team (PMST) will support the PCO in project implementation including ensuring compliance with environmental and social safeguards. A Project Implementation Unit (PIU) in each municipality is established for the implementation in the field. To ensure that the investment sub-projects are efficiently implemented, delivered on time, and completed in accordance with environmental and social safeguards requirements, technical assistance will be delivered through a Design and Supervision Consultancy (DSC). DSC will deploy engineering, procurement, E&S safeguards and other technical specialists to work closely with municipal engineers and other technical staff to design and supervise the implementation of the sub-projects in two clusters. The role of PIU/DSC includes implementation of ESMP, RAP, VCDP, etc. The PCO with support from

PMST will review implementation support of environmental and social safeguard studies/ management plan prepared by PIUs/DSCs.

At subproject level, the contractor will be required to comply with the ESMP. Each municipality will need Environmental and Social Development (ESD) expert to review ESIA-ESMP, RAP-ARAP, etc. The E & S safeguard specialists of DSCs will regularly visit the subprojects to ensure project implementation in accordance to World Bank’s safeguard standards and ESMP. The ESD will be a part of PIU. The role of DSC will also include ensuring compliance of pertaining laws, policies, regulation for all subprojects, coordination and liaising with government stakeholders as well as the World Bank with respect to various E&S issues. The PCO will have overall responsibility to ensure compliance with pertaining laws, policies, regulation for all sub projects, and development of sub-projects in sustainable way and allocation of fund for institutional capacity development. The reporting of the PMST on the monitoring and evaluation on the project’s safeguard performance to WB is done internally by the PCO and externally by the WB experts.

Roles and Responsibilities of the Stakeholders in ESMP Implementation

SN	Stakeholder	Roles and Responsibilities	Time Schedule
1	World Bank	<ul style="list-style-type: none"> Review and final approval of ESIA and ESMP Review project design and contract documents, against approved ESMP measures and give comments for corrective actions Review of periodic monitoring reports of project construction and operation and taking of necessary actions in case of non-compliance 	Recommendations and implementation
2	PCO/PMST	<ul style="list-style-type: none"> Review and approval of ESIA and ESMP Give permission for Project Implementation as per ESMP Review project design and contract documents, against approved ESMP measures and give comments for corrective actions Ensure that contractor commitments under the ESMP are reflected in bidding documents Monitoring subproject to ensure the implementation of ESMP Review of periodic monitoring reports of project construction and operation and taking of necessary actions in case of non-compliance Environment and social monitoring Report preparation and submission to the WB 	ESMP approval Before contract bidding As and when required construction and operation phases
3	PIU/Municipality	<ul style="list-style-type: none"> Incorporate ESMP mitigation measures are incorporated in the final project design and tender documents of project construction and operation Acquire necessary permits and approval for project construction and operation Monitoring and record keeping regarding environmental measures and impacts. Compilation of environmental monitoring and performance report and dispatch for review through proponent to stakeholders 	Before construction During construction, and operation phase Monitoring every month during construction
4	DSC	<ul style="list-style-type: none"> Elaborate ESMP, if necessary and assist field engineers on the site inspection before approval of CESMP Supervision of baseline, compliance and impact monitoring of construction contractor's activities as per responsibilities in the contract document and advise the PIU for needed actions 	Pre-construction phase Regularly during construction phase (daily,

SN	Stakeholder	Roles and Responsibilities	Time Schedule
		<p>at the site in regular environmental management meetings.</p> <ul style="list-style-type: none"> • Preparation of monitoring report as mentioned in ESMP with a list of compliance and non-compliance works with recommendations • Monitoring of contractor's performance on meeting the provisions of tender documents and ESMP • Monitoring of the effectiveness of enhancement measures and mitigation measures 	weekly, monthly)
5	UDST	<ul style="list-style-type: none"> • Design Training, prepare training manual to include measures identified in ESMP • Provide training to DSC, PIU or Contractors to implement the training part included in the ESMP • Prepare report 	During Construction Stage As per required
6	Construction Contractor	<ul style="list-style-type: none"> • Prepare a detail CESMP for minimization of construction related impact and seek a prior approval • Provision of Environment Cum Safety Officer • Ensure all preparatory works are carried out as per the tender document • Implement mitigation measures as specified in ESIA, ESMP or as instructed by supervising engineer • First hand monitoring and record keeping of environmental mitigation measures implemented and their performance • Carry out all corrective actions or other instruction given by supervising engineers/DSC/PCO 	Pre-construction phase Daily during construction phase Regularly during construction phase.
7	Affected Stakeholders	<ul style="list-style-type: none"> • Ensure that the local level complaints are adequately address • Assist and provide suggestions to the PIU in the matters related to community 	As and when required

STAKEHOLDER ENGAGEMENT AND CONSULTATIONS

1.35. Stakeholder engagement overview

Regular stakeholder engagement and consultations are necessary to ensure widespread and meaningful participation of key stakeholders with focus on the project affected people. Successful implementation of the subproject requires coordinated efforts of various stakeholders at different levels. Hence, communication and consultations at different levels were used as a tool to inform and educate stakeholders about the proposed project intervention.

There are two key objectives of effective stakeholder engagement and consultations. First, it is to keep all stakeholders informed of the project activities, and any potential beneficial and adverse impacts. Second, it is to ensure that stakeholders actively participate at all levels of the project cycle, to enable sharing of valuable local knowledge involvement in the development of mitigation plans to minimize the potential negative impacts of the project, and so are well equipped to take over the responsibilities of operation and management once the project phases out. These will ultimately contribute towards narrowing down the gaps between the project officials and beneficiaries, and to help create a conducive environment to mitigate against the adverse social and environmental issues through optimal cooperation from the project beneficiaries themselves.

Community participation can be effective if local people are empowered. The method of community participation needs to be planned to reflect the community profile and nature of the project. Different communication methods are integrated together communicates the community as focus group discussions, meetings, and workshop. The plan ensures the following:

- Ensure local ownership
- Include different types of stakeholder's group in participation process
- Generate and respond to feedback

Public consultation and community participation helps to remove such uncertainty and at the same time help the project implementation with its methodology as well as work plan. It is assisted in the identification of the problems associated with the project, as well as the needs of the population likely to be impacted. This participatory process helps in reducing the public resistance to change and enabling the participation of the local people in the decision-making process. The involvement of the various stakeholders ensures that the affected population and other stakeholders are informed consulted and are allowed to participate at various stages of project preparation. Different strategies have been adopted for communication/ consultation during implementation stages. Stakeholder engagement strategy outlines engagement through the project development phases and recommends a set of stakeholders' engagement activities to be carried out throughout the project development phases. This chapter also outlines the disclosure to be made and other communications to be made during the project cycle.

Various stakeholder consultations were held during the design of the subproject to understand project questions and concerns, and to incorporate any concerns and feedback into project design. A table of the stakeholder consultations held to date has been included at Annex 1. Stakeholder consultations including with vulnerable groups such as women's groups, and indigenous groups, and information dissemination will continue through project implementation as detailed further below.

1.36. Stakeholder Engagement Procedures and process

The subproject will draw on existing mechanisms and procedures established at the local level to carry out stakeholder engagements. The municipality forums will be the primary mechanism for engaging with stakeholders and community participation, to ensure that projects identified reflect local needs and priorities. Other mechanisms for community engagement and consultations include community-based user committees in construction supervision and operations and maintenance, as a social accountability and safeguard mechanism. The stakeholder consultations will draw on mechanisms already established at the local level. Where mechanisms for stakeholder engagement do not already exist, a mechanism elaborated below will be followed:

8.2.1. Stakeholder Mapping

The primary objective of stakeholder analysis is to map the stakeholders, their role, operational network, representation requirements and impact on type of activity in the project to strategically prioritize consultations with them. The stakeholder interactions will be through:

- Focused group discussions (FGD)
- Public consultations
- Key informant interview (KII)
- Indigenous and women groups discussion
- Consultation with institutional stakeholders

The stakeholder mapping is undertaken through formal and informal consultations and their interests concerned with the project activities should be identified throughout the project cycle. The stakeholders identified for the subproject are presented in **Table 0.1**.

Table 0.1: Stakeholder roles and responsibilities

Level	Stakeholder	Roles and Responsibilities	
Federal	MoUD DUDBC (PIU)	Facilitate the implementation of the subproject, coordinate with agencies, undertake monitoring and reporting to WB	
	DoR, MoFE, (PIU)	Support coordination, and sectoral policy implementation	
Local	Municipality, Ward Offices Tole Development Committees	Support the process of subproject selection, identify beneficiary and their needs, support coordination, support grievance and dispute resolution	
	NEA, DFO, LRO, DoI DCC, Traffic Police, Water Users Committee	Provide specialized inputs on local conditions, permissions, technical input limitations and needs of the public, provide compensation estimation, provide required assistance during project implementation, and support monitoring	
Subproject Level	Ward representative Associations) and All types of local user groups	Engage and participate in consultations, support in project implementation	
	Extended users of the project		
PCO		Overall Monitoring and Coordination	Executing agency
PMST		To support PCO in monitoring and control, will work as a helping hand to PCO, coordinate with the municipalities and DSCs of municipalities	Executing Agency
DSC (Design and Supervision Consultant)		Design and overall management of UDG contract in municipality Will help PIU of municipalities in overall design, contract management, supervision will coordinate with PMST	Consultant

1.37. Mechanism for Consultation

The consultation process envisages involvement of all the stakeholders' at each stage of subproject planning and implementation. Involvement of the community is not limited to interactions with the community but also disclosing relevant information pertaining to the project tasks. Community participation is and will be ensured at all stages. Dissemination of project information to the community and relevant stakeholders will be carried out by the PIU. The community will be made aware of the project alternatives and necessary feedback will be obtained; other stakeholders will be involved in the decision making to the extent possible.

The outcome of consultations is incorporated as appropriate into the design and ESMP. As part of such consultations, the draft ESMP will be presented and explained to the people on the content and process of the implementation of the plans. Consultations with project affected persons and their profiling are conducted as per the requirements of ESIA, and preparation of the RAP.

8.3.1. Public/Community Consultation Plan

All consultations on social and environmental issues will be carried out during implementation of the project will be done in an inclusive manner, including vulnerable social groups (such poor household, caste, persons with disabilities, among others) and women. Details of the Project Consultation Plan are presented in Error! Reference source not found..

Table 0.2: Project Consultation Plan

- Objective and Target Goal	- Method	- Responsibility
I. Build Local Ownership		
- Introduce Project DPR Report and its components	- Group Meeting/Workshops	- DPR Consultant/ PCO/Municipality
- Maintain efforts for two-way communication with relevant stakeholders through the project	- Face to face meeting with concerned stakeholders	- PCO, Design Supervision Consultant, Ward Level Authority
II. Start Consultation Process with Potentially Affected Communities by construction and operation of road		
- Identify communities to be potential affected by project	- Electronic and face to face communication with relevant stakeholders and implementing agencies	- PCO, DPR Consultant Municipality Ward Authority
- Consult with community representatives and ensure that their concerns with the proposed project are addressed	- Face to face meeting with community representative (includes social officer of Municipality, women's representative etc.) Meeting will take place following protocol for meeting (social distancing , wearing of masks by all the participants, use of hand sanitizers, conducting meeting in a open and ventilated places)	- PCO, DPR Consultant Municipality Ward Authority
- Ensure that the views and needs of vulnerable segment (if required) of communities, including but not limited to poor, women, elderly, and are addressed by the subproject	- Face to face meeting with affected communities' representative (including social officer of Municipality, women's representative etc.)	- PCO, Design and Supervision Consultant Municipality Ward Authority
III. Implementation Phase		
- Maintain effective communication with PIU	- Electronic and face to face communication with representative of relevant agency /organization	- PCO, Design and Supervision Consultant Municipality Ward Authority
- Raise awareness of project activities among potential beneficiaries	- Media advertisements and targeted campaign	- PCO, Consultant/ Municipality
- Maintain consultation process with a potential affected communities and beneficiaries	- Face to face meeting with affected communities' representative (including social officer of Municipality, women's representative etc.)	- PCO, Design and Supervision Consultant Municipality Ward Authority
- Monitoring and evaluation	- Face to face meeting with	- PCO, Design and

- Objective and Target Goal	- Method	- Responsibility
community involvement	affected communities' representative	Supervision Consultant - Municipality Ward Authority
Reports outlining progress of activities related to engagement and communication	Collation of progress report, self-evaluation by PCO	- PCO
Agreement on operation and maintenance system	- Electronic or face to face communication with relevant stakeholder - Face to face meeting with local authority	- PCO, Design and Supervision Consultant - Municipality Ward Authority

- Implementation of ESIA	- The contractor will prepare the various stand alone plans to comply with ESIA requirements. By including all the stand alone plans, the contractor will prepare Contractor's Environmental and Social Management Plan (ESMP) and submit it to PIU. This requirements will be included in the contract BOQ	- The requirements stipulated in ESIA shall be included in bid document of the contractor. The contractor will prepare the stand alone plans and submit it to the PIU before the construction begins and obtain approval. The standalone plan includes ; environment, health and safety management plan, traffic management plan, grievance redress plan, spoil management plan, emergency preparedness plan, camp management plan, labor management plan, air/water/noise management plan to name a few.
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1.38. Information Disclosure

For the success of the project, all information about the proposed activities and their expected results will be publicly shared with the affected people and interested stakeholder. In collaboration with the relevant local authorities, NGOs and other community groups, the project will disclose all the relevant information in the various stages of project cycle. Agencies working for environmental and social aspects will also be informed about the ongoing and planned activities, to identify jointly appropriate protective or corrective measures. The following approaches will be adopted to make information accessible to all the concerned stakeholders throughout the project cycle.

- Mass Media: Use local media like newspaper, radio and TV.
- Meeting/Workshops
- Distribution of project documents: Certain project documents will be disclosed in Nepali (or other relevant local language). Project-related information materials will be distributed prior to each construction work to

local officials, local people, stakeholders and other concerned offices like municipality, Ward, Tole Committee etc.

An Information Centre will be established at the municipality office during implementation to disseminate all the documents related to the project activities. Based on the public information disclosure policy, PCO and the municipality will unveil the information through its website. The information dissemination plan for Mangalapur-Kanchibazar Road project is presented in **Table 0.3**.

Table 0.3: Information dissemination plan

- Means of Communication	- Timeline & Frequency	- Responsibility	- Resources
- Municipality Website (project details, grievance mechanism)	- At the start of the project which will be maintained throughout the project	- PIU/ Information Officer	- Information Officer
- Newspaper and local Radio (project salient features, dates, grievance mechanism etc.)	- Project implementation phase - Weekly basis	- PIU, municipality Information Officer	- Radio-program/Talk show, FM Radio Clip
- Project leaflets and Fact Sheet	- Project details, Implementing agencies, project period - 2 times	- PIU, Information Officer	- Doubled sided color A4 - 500 copies
- Face to face engagements - meetings, focus group discussion with relevant stakeholders including vulnerable groups such as women's groups and indigenous groups.	- Project Main Activities, Financial Assistance, Implementing agencies, project period etc. 2 time in year	- PIU, Information Officer	

1.39. Grievance redress

As part of the implementation stage the PIU, the project municipality, project engineers and Environment and Social staffs will directly interact and consult with the project affected persons. These would comprise of consultations towards relocation of the PAPs, relocation of cultural properties, and towards addressing the impacts on common property resources such as places of religious importance, community buildings, trees, etc. Since such type of resettlement and rehabilitation are not envisaged in this project, there is no need to include such aspects in this project. The information provided here are for understanding purpose and if applicable in future (if it triggers) The stakeholders may raise any grievances related to the impacts on them or any other grievances. Such types of grievances need to be addressed through grievance redress mechanism (GRM) for timely response on stakeholders' query and concerns.

A grievance redress mechanism is established to allow stakeholders including PAPs to raise any concerns or complaints, or to appeal any disagreeable decisions, practices and activities arising from the project including compensation for land and assets (if applicable). Stakeholders will be made fully aware of their rights and the procedures.

1.39.1. Grievance Redress Processes – existing mechanisms at the local level

At the municipality level, community disputes including environmental and social disputes and property disputes are directly submitted to the municipality's Judicial Committee. The Judicial Committee is a three-member body chaired by the Deputy-mayor of the LG. By design, it is meant to mediate and/or resolve disputes between community members of the municipality. Grievances can also be submitted to District Administrative Officer (DAO) at District level or to Ward Chairman at Ward Level. Besides the Judicial Committee, the municipality also

has a separate desk to register gender-based grievances/cases. These mechanisms and procedures are not fully operational so need to be strengthened further to perform its role more effectively. The Tilottama municipality has approved a Public Accountability Procedure 2077 which has the provision for a grievance management committee headed by the Deputy Mayor.

1.39.2. Grievance Redress Mechanism under the subproject

Existing mechanisms for grievance redress at the local level will be drawn upon under the project to enable grievants to lodge issues, complaints and requests for information, where feasible, to help support and build the capacity of local governments. Component 2 of NUGIP on institutional strengthening will support the strengthening of existing grievances mechanisms at the municipality level. For this subproject, a project-based mechanism will be established in the interim to facilitate the uptake and resolution of grievances related to the subproject.

1.39.3. Structure of the GRM

The grievant should first raise any project-related grievances with the project site office, which will decide whether the grievance can be resolved at project level or other mechanism. A dedicated person will be placed as a grievance officer to look after grievances, who may include the project manager or other assigned person. The person will either resolve on site or refer the case to the grievance redress committee (GRC) according to the nature of grievances. Records shall be kept properly. The grievant may also raise their complaint with the ward chairperson. The GRC in the municipality will include each Ward Chair from the project affected area and include an engineer from the sub project and the focal point from the PIU. Grievances that can't be resolved by the GRC will be escalated to the PCO level, comprising members from the PCO. Those engaged as the monitoring unit for ESMP, RAP related issues (as of no issues and implications that RAP will trigger for this project but if triggers due to some circumstances, it could be part of the committee. Special project grievance mechanisms such as on-site provision of complain hearings allows project affected persons to get fair treatment on time. The subproject will also handle issues regarding the compensation damages done during construction.

1.39.4. Processes of the GRM

Grievances shall be submitted through various mediums, including in person, in written form to a noted address, through a toll-free phone line or through direct calls to concerned officials, and emails. The PCO will appoint a person (Operator) at PCO- Kathmandu to receive such calls and online messages. The person (Operator) based on nature of complaint, will forward the same to the information office or ward committee. A ticket or a unique number will be generated for all such call, messages and letters. The complainant will follow up based that unique number with Operator at PCO-Kathmandu. All complaints will be responded within two weeks at any level. In case response is not received from 1st level within 15 days, the complaint will be escalated to next level. If complaint remains unaddressed at 1st and 2nd within maximum 30 days after registering the compliant, it will be elevated to 3rd level at PCO level. The PCO within 7 days of time should instruct the concerned person at PMC level to arrange for a hearing within maximum 5 days of time. Effort will be given by all levels of GRCs to conduct hearing and resolve the concern at their level up to the satisfaction of complainant within the stipulated timeframe. In case 1st and 2nd level GRCs are unable to resolve the concern up to the satisfaction of complainant, these GRCs' or Complainant may approach to 3rd level of GRC at PCO Level. After conducting hearing at any level of GRC, the decision will be communicated to complainant within maximum 30 Days of time.

All local contact information and options for complaint submission will be available on site, on Toles, Wards, municipality office, PCO on information boards and the project municipality websites. A half yearly report on Grievance Redress by the subproject project will be prepared and will be sent to the project municipality's GRCs by Wards' GRCs and ultimately to GRC of PCO. The PCO will forward the same to the World Bank.

1.39.5. Further details of the GRM

The functions of grievance mechanism include redressing grievances of community / beneficiaries /project affected persons in all project respects, providing rehabilitation and resettlement assistance and related activities, and hearing grievances from workers involved in the project at any level or phase. The system should be established to report back to the concerned community or persons regarding the decision on the complaint. The grievances related to women should be dealt by women officer. As required, the social mobilizers will be recruited. GRC will deal/hear the issues related to Environment, R&R and individual grievances and will give its decision/verdict within 30 days after hearing the aggrieved person. The final verdict of the GRC will be given by the Head of GRC in consultation with other members of the GRCs and will be binding to all other members. Potential grievances which may need to be addressed are listed below:

- Rehabilitation & Resettlement and Compensation issue
- Loss of livelihood
- Access to resource /utility/facility
- Ambient air and noise Quality
- Impact on water quality/resource
- Grievance from vulnerable community
- Gender related issues
- Grievances from workers
- Safety and risk repeated to project development

1.39.6. Other Mechanisms for Grievance Redress

All complainants have the option to approach court/judiciary or the World Bank's Grievance Redress Service in case he or she is not satisfied with the verdict provided.

ANNEXES

**ANNEX I: CONSULTATION WITH THE MEMBERS RESIDING IN
DIFFERENT LOCATION OF TILLOTAMA MUNICIPALITY**

Stakeholder Consultations held during subproject preparation

Date	Consultation type	Composition of participants	Issues raised	Response from project
Aug 4 to Aug 6, 2021	Individual consultations with women	Consultations with 15 women members residing in different location of Tillotama Municipality ward # 7,9 & 10 along the road side	<ul style="list-style-type: none"> • Quite positive and enthusiastic to support the Govt. /Pjt to construct the road. • We are in trouble due to the delay for road construction. • Increasing the number of accidents. 2/3 accidents per day. • No single person is against the road project. • The trees need to be planted by the project • Road is our priority. Facing the troubles due to the poor condition of road for last 4 years, hence they are excited that road will be finally built • There is no serious conflict, all are in favor of road construction • Expect that road construction will begin soon 	The project will carefully design the road considering the mitigation measures. The process of preparing the safeguard documents will be expedited.
July 23, 2021	Key Informant Interview	Byas man Tharu Ward 10, Ward Chairman	<ul style="list-style-type: none"> • All ready to clear ROW in Ward 10 in writing and some have demolished • One Tharu family and one Kurmi family will be totally displaced due to ROW extension, and resettlement may be needed • Health post compound wall of Semara, 1 house, with female headed is affected up to 10 houses have partial loss to property of house • 1 temple in Sagraha needs relocation, and have promised to relocate to local site • Municipality Ward 10 is positive and looking forward to making project successful request to go to tender soon 	There will be no impact on structures except 3 boundary walls belonging to school, health post and Shiva Temple. Tharu and Kurmi family will not be displaced.
July 23, 2021	Key Informant Interview	Durga Prasad Pandya Ward 7, Ward chairman	<ul style="list-style-type: none"> • Road section is best for Buddha circuit and has good agriculture land • Public are positive for construction, and reconstruction of road needs to tender fast • Public is okay to make ROW clear and some are already demolished • It is likely that 2 temples and 1 gumba need relocation, public are okay and will look for appropriate place to relocate • Municipality will be liable for all rehabilitation issues • Samara Mavi, Gatam Buddha compound wall affected 	Dismantling of boundary wall and construction of new boundary wall (Chainage 2+350, Government school wall), Chainage 3+850, semara health post, Chainage 3+290) boundary wall of Shiva which falls Temple in RoW of road. Besides these no other structures will be impacted

Date	Consultation type	Composition of participants	Issues raised	Response from project
July 23, 2021	Key Informant Interview	Mr. Basu Dev Ghimire Mayor, Tilotama Municipality	<ul style="list-style-type: none"> The mayor was briefed about the project details and environmental and social issues and proposed mitigation measures by ESIA team The mayor informed the team that there are no such issues in RoW and all the RoW land belongs to municipality. He has committed to provide a written letter mentioning that RoW land is in jurisdiction of Tilotamma Municipality The mayor requested the project team for starting the project at the earliest. He further mentioned that municipality will extend the required support and cooperation to the project. 	Preparation of the safeguard documents will be expedited hoping to get approved.
July 23, 2021	Key Informant Interview	Mr. Narayan Neupane Ward No 9, Ward chairman	<ul style="list-style-type: none"> Mr Neupane mentioned that all the public utilities like water supply, electric poles, telephone poles needs to be shifted away from the RoW of the road prior the construction phase. He has emphasized that job opportunities should be provided to the local people 	The project assured that all the public infrastructures will be shifted prior the construction of road. The project informed that based on the skills and qualifications the workers/staff will be recruited. The local will get priority in hiring based on skills and qualifications
July 23, 2021	Key Informant Interview	Mr. Madhav Pokharel Section Officer, Tilotama Municipality	<ul style="list-style-type: none"> The awareness on road safety to pedestrians, drivers should be provided. Adequate safety, warning and informative signs needs to be kept in strategic places along the road alignment 	ESIA has captured these requirements and shall be implemented
July 23, 2021	Key Informant Interview	Mr.Om Prakash Yadav Bebara, ward No: 10 Tilotama Municipality Mobile: 9847015186	<ul style="list-style-type: none"> During the construction phase the control of dust, vehicle speed must be maintained. He has advise to maintain the quality control of the construction. 	These issues of construction phase dust control and speed control are addressed in ESIA
July 23, 2021	Key Informant Interview	Mr. Khilawan Yadav Student, Bebara , Ward No 10	<ul style="list-style-type: none"> The project should display the board providing all the details of the construction activities, start date, name of the contractor, consultant including their phone number, total budget etc like in other project 	This will be prepared and displayed upon the finalization of contractor by the project.
July 23, 2021	Key Informant Interview	Mr. Salin Chaudhari Labor, Bebara, Ward No: 10	<ul style="list-style-type: none"> 	
July 23, 2021	Key Informant Interview	Mr. Indra Prasad Basel	<ul style="list-style-type: none"> He is curious to know the start and ending date of the road 	

Date	Consultation type	Composition of participants	Issues raised	Response from project
2021	Interview	Rikshaw Driver, Ward NO: 7	<p>construction.</p> <ul style="list-style-type: none"> • He has shown the quality of the construction work 	
July 23, 2021	Key Informant Interview	Ms. Chandra kala Neupane, Manyata Hotel, house Owner	<ul style="list-style-type: none"> • She is more concerned about the construction and operation phase impact like road safety. The strict implementation of speed and responsible driving is essential as structures are built close to RoW 	This will be addressed in ESIA
July 23, 2021	Key Informant Interview	Mr. Min Raj Bhusal, Owner of the house of Pradip Kirana store	<ul style="list-style-type: none"> • The Bhirahawa Lumbini Ground water project has already acquired 13 meter of RoW long time ago in this proposed road section. However due to encroachment the RoW is varied along the proposed road alignment. He is in opinion that Tilotamma municipality must clear land and structures with the 13 meter RoW already acquired by the government. 	The municipality has already acquired the required RoW.
July 23, 2021	Key Informant Interview	Mr, Babu Ram rana House owner, (A.B. Tailor) Mangalapur	<ul style="list-style-type: none"> • The project has demarcated 13 meter RoW with red mark which has created confusion to local household 	In order to avoid impacts on land and structures, the project has maintained different RoW (i.e The project is divided in to three different cross sections viz type –A, type B, and type C. Type A proposed road width is 7.7 meter (from Chainage CH 0+000 to 0+0380), total length of type A is 0.038 Km, ii) type B: proposed road width is 11 meter (at different chainage of settlement area), total length of type B is 0.942 Km. iii) Type C-proposed road width is 13 meter (at different chainage). The total length of type C is 4.02 Km.
July 23, 2021	Group discussion	Ward no 7 (5 participants of which 4 Indigenous people, 2 women)	<ul style="list-style-type: none"> • Road should equally measure from centre point in both side • Irrigation canal of bhailabhujha should manage before the construction of road • The road has to be made. 	The measures will be taken during design. The cost will be included in DPR if needed.

Date	Consultation type	Composition of participants	Issues raised	Response from project
			<ul style="list-style-type: none"> • Reasonable compensation should be provided • If the Bhailbhuja (Bhairahawa Lumbini Ground Water Project's) canal affects the house after the relocation, then the project should provide compensation to the affected families too. 	
July 23, 2021	FGD – Ward 10	Ward no 10 Sagrahuwa (8 participants, Indigenous)	<ul style="list-style-type: none"> • It's been a long time we heard this road will be widen, it should be done fast. • The compensation should be paid to affected people • Proper compensation should provide for tree cutting and demolished structures. 	The trees will be planted on either side of the road.
July 23, 2021	FGD – Ward 10	Ward no 10 Sagrahawa (11 participants, Indigenous)	<ul style="list-style-type: none"> • Any physical displacement or economical loss should be informed prior by the project • We are ready to clear ROW • The project should accomplish as soon as possible. 	The infrastructures if needed to dismantle, the meeting will be conducted and included in the project cost if relevant.

Mangalapur -Kanchhibazar Road Section,
 KII with Women
 Tillotama Municipality ward # 7, 9 &10
 Rupandehi

Date: 2021/08/04 till 2021/08/06

Consultation with the women members residing in different location of Tillotama Municipality ward # 7,9 &10 along the road side

S.N.	Name of the Participant	Address/Location	Contact #	Remarks
01	Sarasoti Pandey	Tillotama -7, Semara	9804439835	Quite positive and enthusiastic to support the Govt. /Pjt to construct the road.
02	Yamkala Pandey	Tillotama -7, Dada Bazar, Semara	9867145337	We are in trouble due to the delay for road construction.
03	Rima Karki	Tillotama -7, Semara	9847066254	Increasing the number of accidents. 2/3 accidents per day.
04	Sita Bhandari	Tillotama -7, Pragati Tole, Semara	9847023569	No single person is against the road project.
05	Parbati Pandey	Tillotama -7, Semara	9847016613	
06	Mishu Sashi	Tillotama -9, Mangalapur	9815465405	
07	Sakuntala Thapa	Tillotama -9, Tulsipur	9847131806	The trees needs to be planted by the project
08	Bhagawati Kanel	Tillotama -9, Tulsipur	9847023161	
09	Puspa Subedi	Tillotama -9, Tulsipur	9806909346	Road is our priority. Facing the troubles due to the poor condition of road for last 4 years , hence they are excited that road will be finally built
10	Rama Rana	Tillotama -9, Keuleni	9804467511	There is no serious conflict, all are in favor of road construction
11	Sabitra Tharu	Tillotama -10, Sagrahawa	9806955091	
12	Om Kumari Kunwar	Tillotama -10, Sagrahawa	9825484557	
13	Ratrani Tharu	Tillotama -10, Sagrahawa	9821930006	
14	Tapewari Tharu	Tillotama -10, Sagrahawa	9819400219	Expect that road construction will begin soon
15	Shanti Tharu	Tillotama -10, Sagrahawa	9827590677	

ANNEX II: KEY INFORMANT INTERVIEW (KII)

Key Informant Interview (KII)

1. Mr Basu Dev Ghimire- Mayor, Tilotamma Municipality
2. Mr. Narayan Neupane, Ward Chairman, ward no 7
3. Mr. Madhav Pokharel, Section Officer, Tilotamma municipality
4. Mr Om Prakash Yadav- Bebara, Tilotamma 10, 9847015186
5. Mr. Khilawan Yadav, - Student, Bebara, Tilotamma 10
6. Mr. Shalin Chaudhary-Labor, Bebara, Tilotamma 10
7. Mr Indra Prasad Basel, Rikshaw Driver
8. Ms. Chandra Kala Neupane, Manyata Hotel house owner
9. Mr Min Raj Bhusal, Owner of house of Pradip Kirana Pasal
10. Ms Prem Kala Neupane, Mangalapur
11. Mr. Babu Ram Rana, House owner (AB tailor), Mangalapur

Stakeholders Consultation
Nepal Urban Governance and Infrastructure Project (NUGIP)
ESIA and ESMP of Mangalapur-Kanchibazar Road of Tilottama Municipality, Rupandehi
Attendance Sheet

Date: 20.21.07.23 Venue: Tilottama - 10, Ward office

Name: Byas Mun Tharu

Occupation/Organization: Ward Chairman, Tilottama - 10,

Comments/Suggestions

- 1) It is main road and set to make exemplary road to make ROW 43 feet & to connecting road to Paras with many bridges made.
- 2) All ready to clear ROW in Ward-10 in writing & some have demotivated to
- 3) One Tharu and one Kurmi family will be totally displaced due to ROW extension & resettlement may be needed & land for land is expected by these families -
- 4) Health post compound wall, of Semara, 1 house with female house head ~~is~~ is affected & up to home have partial loss to property & house.
- 5) 1 temple in Sagraha, need relocation & have promise to relocate to local circle
- 6) Municipality Ward-10, is positive & looking forward to working to make the project success & request to make & go to tender soon
- 7)



Signature:

Stakeholders Consultation
Nepal Urban Governance and Infrastructure Project (NUGIP)
ESIA and ESMP of Mangalapur-Kanchibazar Road of Tilottama Municipality, Rupandehi
Attendance Sheet

Date: 22/07/22..... Venue: Tilottama Municipality, Ward-07 office.....

Name: Durga Prasad Pandaya.....

Occupation/Organization: Ward-07, Tilottama Municipality, (NUGIP).....

Comments/Suggestions

- 1) This road section is best for Buddha Circuit & has good agriculture land.
- 2) The public are positive for construction & reconstruction of road & needs tender fast
- 3) Public are ok to make ROW clear & some are already demolished
- 4) 2 temples & 1 gumba needs relocation & public ok for it & will look appropriate place if needed to relocate
- 5) Municipality will be liable for all rehabilitation & issues on the project
- 6) Senara Ma.Vi, Gatan Buddha Ma.Vi compound wall affected
- 7) Senara Health post affected -


 Signature:

Stakeholders Consultation
Nepal Urban Governance and Infrastructure Project (NUGIP)
ESIA and ESMP of Mangalapur-Kanchibazar Road of Tilottama Municipality, Rupandehi
Attendance Sheet

Date: 2074/07/23 Venue: Sagahawa, Tilottama-70

S.N.	Name	Organization/Title	Contact No.	Signature
1)	दुपताय कुशी			दुपताय
2)	पञ्चमति गाउँ	Sagahawa, (OLC)	9804442924	[Signature]
3)	कायस्थ/साविकी/काँ	"	9803023440	[Signature]
4)	मंगलदास गाउँ	"	9825455201	मंगलदास
5)	हनुम गाउँ	"	9843133444	[Signature]
6)	बुध नाथपो गाउँ	"	9804447925	[Signature]
7)	प्रथुवाया साविकी	"	9826425488	मधुमाया
8)	मंगल गाउँ	"	9806905191	मंगल
9)	मनिषा कुशी	"	9821931291	manisha
10)	पुष्प गाउँ	"	9800703674	पुष्प
11)	पञ्चमति गाउँ	"	-	पञ्चमति

Suggestions

- दुपताय कुशी: ६ वटा जग्गा ठोका गरि मल्काउनु पर्ने विस्थापित हुने हुदा जग्गाको एउटा पट्टा दिने प्रस्ताव.
- ROW clear गर्नुपर्ने गरिबिन हाडी तथा (ट्रेक)
- चाँडै बाटो बनाउनुपर्ने)

FGD

Stakeholders Consultation
Nepal Urban Governance and Infrastructure Project (NUGIP)
ESIA and ESMP of Mangalapur-Kanchibazar Road of Tilottama Municipality, Rupandehi
Attendance Sheet

Date: 2074/07/12 Venue: Sagrahua (S.P. 15.31), Tilottama-10,

Attendees

S.N.	Name	Organization/Title	Contact No.	Signature
१)	हरिसाम थापा	Sagrahua, Tilottama-10	98 00921840	हरिसाम
२)	बुद्धिमान थापा	"	"	बुद्धिमान
३)	फिरोज थापा	"	9825404586	फिरोज
४)	मनोज थापा	"	9806974690	manoj
५)	शालिकु शर्मा	"	-	शालिकु
६)	अनिल थापा	"	-	अनिल
७)	लक्ष्मी थापा	"	-	लक्ष्मी थापा
८)	मीन कुमारी थापा	"	-	मीन कुमारी

Suggestions

- १) बाटो बढाउन भनेर धेरै भयो भनेको तर बढेन, चाँडै बढाउन पर्छो।
- २) बाटो बढाउँदा मुसलाब्दा दिनु पर्ने
- ३) पर्ने रुख ट संचनालाई मनासिक सतिशति दिनु पर्ने।

Stakeholders Consultation
Nepal Urban Governance and Infrastructure Project (NUGIP)
ESIA and ESMP of Mangalapur-Kanchibazar Road of Tilottama Municipality, Rupandehi
Attendance Sheet

Date: 2021/07/23 Venue: Tilottama-7, Semarabazar

S.N.	Name	Organization/Title	Contact No.	Signature
1)	गणेश पाण्डे	Tilottama-7	9817042613	
2)	सुदिपक शर्मा	"	9867617157	Bun
3)	राज शर्मा	"	98031-510142	arise
4)	रुपा शर्मा	"	9847050267	Rupa
5)	रिमा शर्मा	"	9801477808	Rima

Suggestions

- बाटो बनाउदा (walk) बाटो काट्दा छिन्दा गेट विस्तार गर्नुपर्ने।
- भैलभुजाको नहरलाई व्यवस्थित गर्ने पत्र पत्र सार्दा मात्र एक विस्तार गर्ने।
- बाटो पक्की गरेपनि बना पर्ने।
- क्षतिपूर्ति भन्दासित दान पर्ने।
- भैलभुजाको नहर सार्दा भन्दा धेरै दिन पछि वा शोशित रूपमा क्षतिपूर्ति भन्दा पनि व्यापारिक क्षतिपूर्ति दिनु पर्ने।

ANNEX IV: LABORATORY REPORTS

NS Accreditation No. Pra. 01/053-54

Date of Monitoring : 25 – 07 – 2021

Sample : Ambient Noise

Client : NUGIP

Location : Ward 10, Tilotama

Monitored By : NESS

Community Sound Pressure Level, Tilotama

Sampling Point : Road Side Community, Kanchibazar road ward 10, Tilotama

Monitoring Date : 25-07-2021

Geographical Coordinates : 27°35' 00''N; 83°32'1.18'E

Height from the Floor : 1.5m

Starting Time : 18:00

Ending Time : 15:00

Distance from Road : 45 (appr.)

Noise Descriptors	Monitoring Hours					dB(A)
	07:00 ~ 10:00	10:00 ~ 13:00	13:00 ~ 15:00	17:00 ~ 19:00	19:00 ~ 22:00	
L _{min}	53	50	44	40	39	
L ₉₅	55	51	47	46	42	
L ₉₀	56	52	48	46	43	
L ₅₀	63	57	54	49	47	
L ₁₀	66	64	60	58	54	
L ₅	68	66	61	62	56	
L _{max}	78	99	68	73	59	
L _{eq}	65	77	57	57	53	

Notes: L_{min}: Minimum Sound Pressure Level; L₉₅: Ninety-five Percentile Sound Pressure level; L₉₀: Ninety Percentile Sound Pressure Level; L₅₀: Fifty Percentile Sound Pressure Level; L₁₀: Ten Percentile Sound Pressure Level; L₅: Five Percentile Sound Pressure Level; L_{max}: Maximum Sound Pressure Level; L_{eq}: Equivalent Sound Pressure level; L_d: Daytime average Sound Pressure Level; L_n: Nighttime Average Sound Pressure level; dB(A): Decibel A-Weighted; GoN: Government of Nepal;

Remarks: The daytime and nighttime observed sound pressure level at the monitoring site were 66dB(A) and 67dB(A) respectively. Similarly, the observed day and night sound pressure level was about 69dB(A). The observed daytime and nighttime average sound pressure levels complied the prescribed limits of GoN 2012{L_d: 75dB(A); L_n: 70dB(A)} for industrial area.



Nepal Environmental & Scientific Services (P.) Ltd.

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Email: ness@mos.com.np, Website: www.nesspltd.com

Page 1 of 1

NESS/Lab, M-03/QSR2.3

QSM Test Report / Certificate

NS Accreditation No. Pro. 01/053-54

Entry No. : NCL - 24(W) (1) - 07 - 2021 Date Received : 25 - 07 - 2021
Sample : Boring Water Date Completed : 13 - 08 - 2021
Client : Mangalapur- Kanchibazar Road Project Sampling Date : 24 - 07 - 2021
Sampled By : Dwarika Adhikari (NESS) Location : Tilottama-10,
Coordinates : 27°35'00"N; 85°32'18"E Sagrahawa
Altitude : 120m

S. N.	Parameters	Test Methods	Observed Values	NDWQS, Nepal
1.	pH at 22 °C	Electromeric, 4500 - H ⁺ B, APHA	7.6	6.5 - 8.5
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	386	1500
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	4	5
4.	Total Hardness as CaCO ₃ , (mg/L)	EDTA Titrimetric, 2340 C, APHA	200	500
5.	Total Alkalinity as CaCO ₃ , (mg/L)	Titrimetric, 2320 B, APHA	237	-
6.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl ⁻ B, APHA	1.93	250
7.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH ₃ C, APHA	<0.05	1.5
8.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO ₃ ⁻ B, APHA	1.99	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	47.3	200
11.	Magnesium, (mg/L)	- Mg B, APHA	19.9	-
12.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	0.23	0.3
13.	Manganese, (mg/L)	APHA	<0.02	0.2
14.	Arsenic, (µg/L)	SDDC, 3500 - As, C, APHA	N.D. (<0.01)	0.05

N.D.: Not Detected

Note:

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

Remarks: All observed values complied the prescribed NDWQS.

(Analyzed By)

(Checked By)

(Authorized Signatory)

- Note:
1. This report/certificate is in reference to Laboratory Quality System Manual, QSM (2021).
 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 should not be reproduced wholly / partially for any advertising media without our permission.
 6. The clients are requested to take back their hazardous samples along with the report/certificate.

ANNEX V: PICTORIAL HIGHLIGHTS OF FIELD SURVEY WORK



List of Home owners whose house falls adjacent to
RoW



Rohini bridge



Shiva Temple at Tilottama-10



School gate and fence adjacent to RoW of road



Physical condition of the road



Hand pump near road RoW



FGD with project affected families at Tilottama-7



FGD with project affected families at Tilottama-10



Gate and fence of Siddharth Gumba adjacent road RoW in Semara



Waiting station near RoW at Semara



Shiva Temple adjacent to RoW of road



Gate and wall near RoW of road in Semara Bazaar School



Pole at RoW



Public consultation at Tilottama-10



FGD at Tilottama-10



Structure at RoW on Tilottama-10



Bridge near Tilottama-7 ward office



Gate at RoW



Gate at RoW



Semara Bazar Health post



Condition of existing road



Consultation with women's group



Condition of existing road



Bridge Structure at RoW



Tree under RoW



Condition of existing road



REDMI NOTE 9 PRO MAX
AI QUAD CAMERA



Consultation with local stakeholders



ANNEX VI: CADASTRAL MAPS OF ALIGNMENT

ANNEX VII: LIST OF TREES TO BE REMOVED

List of Affected Trees to be removed

SN	Local Name	Common Name	Botanical Name	No of Trees to be Removed	Remarks
1.	Sissoo	Sissoo	<i>Dalbergia Sissoo</i>	12	
2.	Aap	Mango	<i>Mangifera Indica</i>	8	
3.	Nim	Neem	<i>Azadirachta indica</i>	11	
4.	Bakaino	chinaberry tree	<i>Melia azedarach</i>	8	
5.	Amba	Guava	<i>Psidium gaujava</i>	6	
6.	Ashoka	Ashok	<i>Saraca asoca</i>	8	
7.	Katahar	Jackfruit	<i>Artocarpus heterophyllus</i>	3	
8.	Kadam	Bur-flower tree	<i>Neolamarckia cadamba</i>	4	
9.	Litchi	Lychee	<i>Litchi chinensis</i>	2	
10.	Parijat	Night Jasmine	<i>Nyctanthes arbor-tristis</i>	2	
	Total			64	

ANNEX VIII: CULVERTS

Government of Nepal Ministry of Urban Development
 Department of Urban Development and Building Construction
 Urban Governance and Infrastructure Improvement Project (UGIIP-II)
 Babar Mahal, Kathmandu
 Project Coordinate Office

Quantity Estimate of Pipe Culvert (90 cm dia) with earth cushion
 SUMMARY OF COST OF ROAD WORK INCLUDING CULVERTS

Project Name: Upgradation of Mangalagar – Kanchibazar Road, Tribhuvan Municipality

S. No.	Description of Works	Unit	Nos.	Length (m)	Width (m)	Height (m)	Quantity	Rate	Amount	Remarks
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials all complete as per drawing, specification and instruction in ordinary soil depth upto 3m									
	Head wall	cum	2	3.35	1.75	3.02	35.43			
	Pipe portion	cum	1.00	10.05	1.20	2.22	26.76			
	Apron	cum	2	1.50	4.03	0.30	3.62			
	Apron cut	cum	2	4.70	0.60	0.30	1.69			
	Total =						67.50			cum
	Total quantity for	3	nos =				202.49	140.58	28,466.76	
2	Providing and laying Random Rubble Stone Masonry work in cement mortar MM7.5 all complete as per drawing, specification and instruction									
	Head wall	cum	2	3.13	1.13	2.92	20.54			
	Deduction for pipe	cum	-2.00	1.13	0.95		-2.14			
	Apron	cum	2	1.50	4.03	0.30	3.62			
	Apron cut	cum	2	4.70	0.45	0.30	1.27			
	Wing Wall	cum	4	1.73	0.13	1.55	1.34			
	Total =						24.63			cum
	Total quantity for	3	nos =				73.85	9979.92	737,349.83	
3	Providing and laying of hand pack Stone soling with 150 to 200mm thick stones and packing with smaller stone on prepared surface all complete as per drawing, specification and instruction									
	Below head wall	cum	2	3.35	1.75	0.15	1.76			
	Below hume pipe	cum	0.00	12.50	1.20	0.15	0.00			
	Total =						1.76			cum
	Total quantity for	3	nos =				5.28	5609.70	29,621.86	
4	Providing and laying of Plain Cement Concrete Grade M 15 all complete as per drawing, specification and instruction.									
	Below head wall	cum	2	3.35	1.75	0.10	1.17			
	Below hume pipe	cum	1.00	12.50	1.20	0.36	5.40			
	Deduction for pipe portion		-1.00	12.50	Area	0.09	-1.07			
	Total =						5.50			cum
	Total quantity for	3	nos =				16.51	10299.37	170,084.51	
5	Providing and laying weep holes in Brick dry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 110 mm dia HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face Complete as per Drawing and Technical Specifications: (Section 20.7)									
	Head Wall	m	6	1.13			6.75			m
	Wing Wall	m	8	0.38			3.00			
	Total =						9.75			
	Total quantity for	3	nos =				29.26	902.55	26,419.84	
6	Providing and Laying Reinforced Cement Concrete NP3 Flush jointed pipe for culverts including fixing with cement mortar 1:2 all complete as per drawing, specification and instruction (SS 701) - 900 mm Internal Diameter.									
		m	1.00	12.50			12.50			m
	Total =						12.50			
	Total quantity for	3	nos =				37.50	16378.09	614,178.23	
7	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving, placing, laying sides and diaphragms with binding wire and filling boulders all complete as per drawing, specification and instruction. Mesh wire- 10 Swg(0.0615 kg/m), Seldedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m									

		cum	4	2.92	1.73	0.50	10.11				
	Total =						16.11			cum	
	Total quantity for	3 nos =					36.34	5845.83	177,334.06		
8	Providing and laying of Filter media with granular Material/stone crushed aggregates to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition all complete as per drawing, specification and instruction										
	Head wall	cum	2	3.13	0.20	2.92	3.65				
	Wing Wall	cum	4	1.73	0.20	1.16	1.61				
	Deduction for pipe	cum	-2	Area	1.90	0.20	-0.76				
	Total =						4.50				
	Total quantity for	3 nos =					13.49	3547.13	47,838.09		
9	Providing and laying of a geotextile filter in weephole as per complete as per drawing, specification and instruction.										
	Weephole	sqm	14		0.20	0.20	0.56				
	Total =						0.56				
	Total quantity for	3 nos =					1.68	141.58	237.36		
10	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure R.C.C. Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.3-3)										
	Each Bar	cum	0	12.50	1.7	0.25	0.00				
	Total =				0.3		0.00				
	Total quantity for	3 nos =					0.00	14515.08	0.00		
11	Providing and laying Reinforcement including cutting, bending, binding, fixing in position and lead etc. all complete as per drawing, specification and instruction										
	For: side drain and cover of drain	MT	1% of total concrete volume				0.00				
			3	Total Quantity			0.00	117048.40	0.00		
	Grand Total									1,831,523.04	

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Department of Urban Development and Building Construction
Urban Governance and Infrastructure Improvement Project (UGIIP-II)
Babur Mahal, Kathmandu
Project Coordinate Office

Quantity Estimate of Pipe Culvert (90 cm dia) without earth cushion
SUMMARY OF COST OF ROAD WORK INCLUDING CULVERTS

Project Name: *Upgradation of Mangalapur – Kanchibazar Road, Tapatama Municipality*

S. No.	Description of Works	Unit	Nos.	Length (m)	Width (m)	Height (m)	Quantity	Rate	Amount	Remarks
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials all complete as per drawing, specification and instruction in ordinary soil depth upto 3m									
	Head wall	cum	2	3.35	1.23	2.15	17.72			
	Pipe portion	cum	1.00	10.75	1.90	1.55	31.74			
	Apron	cum	2	1.50	4.03	0.30	3.62			
	Apron cut	cum	2	4.70	0.60	0.30	1.69			
	Total =						54.77			cum
	Total quantity for	4	nos =				219.10	146.58	30,801.28	
2	Providing and laying Random Rubble Stone Masonry work in cement mortar M/M7.5 all complete as per drawing, specification and instruction									
	Head wall	cum	2	3.13	0.87	2.05	11.08			
	Deduction for pipe	cum	-2.00	0.87		0.95	-1.64			
	Apron	cum	2	1.50	4.03	0.30	3.62			
	Apron cut	cum	2	4.70	0.45	0.30	1.27			
	Wing Wall	cum	4	1.73	0.13	1.10	0.95			
	Total =						15.28			cum
	Total quantity for	4	nos =				61.13	9979.92	619,086.96	
3	Providing and laying of hand pack Stone soiling with 150 to 200mm thick stones and packing with smaller stone on prepared surface all complete as per drawing, specification and instruction									
	Below head wall	cum	2	3.35	1.23	0.15	1.24			
	Below hume pipe	cum	0.00	12.50	1.90	0.38	0.00			
	Total =						1.24			cum
	Total quantity for	4	nos =				4.94	5609.70	27,737.72	
4	Providing and laying of Plain Cement Concrete Grade M 15 all complete as per drawing, specification and instruction.									
	Below head wall	cum	2	3.35	1.23	0.10	0.82			
	Below hume pipe	cum	1.00	12.50	1.90	0.36	8.55			
			1.00	12.50	1.70	0.35	11.69			
	Deduction for pipe portion		-1.00	12.50	Area	0.56	-7.01			
	Total =						14.05			cum
	Total quantity for	4	nos =				56.21	10299.37	578,942.19	
5	Providing and laying weep holes in Brick dry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 110 mm dia HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face Complete as per Drawing and Technical Specifications: (Section 20.7)									
	Head Wall	m	6	0.87			5.19			m
	Wing Wall	m	4	0.38			1.50			
	Total =						6.69			
	Total quantity for	4	nos =				26.76	902.85	24,160.36	
6	Providing and Laying Reinforced Cement Concrete NP3 Flush jointed pipe for culverts including fixing with cement mortar 1:2 all complete as per drawing, specification and instruction (SS 701) - 900 mm Internal Diameter.									
		m	1.00	12.50			12.50			m
	Total =						12.50			
	Total quantity for	4	nos =				50.00	16378.09	818,904.31	
7	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving, placing, laying sides and diaphragms with binding wire and filling boulders all complete as per drawing, specification and instruction Mesh wire- 10 Swg@0.0615 kg/m), Seldedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m									

		cum	4	2.05	1.75	0.50	7.10				
		Total =					7.10			cum	
		Total quantity for	4	mas =			28.41	5845.83	166,054.50		
8	Providing and laying of Filter media with granular Material/stone crushed aggregates to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind slatment, wing wall and return wall to the full height compacted to a firm condition all complete as per drawing, specification and instruction										
	Head wall	cum	2	3.13	0.20	2.05	2.56				
	Wing Wall	cum	4	1.73	0.20	0.83	1.14				
	Deduction for pipe	cum	-2	Area	1.90	0.20	-0.76				
	Total =						2.95				
	Total quantity for	4	mas =				11.78	3547.19	41,791.23		
9	Providing and laying of a geotextile filter in weephole as per complete as per drawing, specification and instruction.										
	Weep hole	sqm	10		0.20	0.20	0.40				
	Total =						0.40				
	Total quantity for	4	mas =				1.60	141.50	276.53		
10	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)										
	Block Bar	cum	1	12.50	1.7	0.25	5.31				
	Total =				0.3		5.31				
	Total quantity for	4	mas =				21.25	14518.08	305,909.28		
11	Providing and laying Reinforcement including cutting, bending, binding, fixing in position and lead etc. all complete as per drawing, specification and instruction.										
	For side drain and cover of drain	MT	1% of total concrete volume				1.67				
			Total Quantity				1.67	117028.40	195,318.09		
			Grand Total						2,307,532.45		

Government of Nepal Ministry of Urban Development
Department of Urban Development and Building Construction
Urban Governance and Infrastructure Improvement Project (UGIIP-II)
Babur Mahal, Kathmandu
Project Coordinate Office

Quantity Estimate of Pipe Culvert (120 cm dia) without earth cushion
SUMMARY OF COST OF ROAD WORK INCLUDING CULVERTS

Project Name: Upgradation of Mangalpur – Kanchibazar Road, Tribhuvan Municipality

S. No.	Description of Works	Unit	Nos.	Length (m)	Width (m)	Height (m)	Quantity	Rate	Amount	Remarks
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of slumps and other deleterious matter and backfilling with approved Materials all complete as per drawing, specification and instruction in ordinary soil depth upto 3m									
	Head wall	cum	2	4.28	1.53	3.28	42.96			
	Pipe portion	cum	1.00	10.56	2.23	1.85	42.73			
	Apron	cum	2	1.50	4.96	0.30	4.46			
	Apron cut	cum	2	5.63	0.60	0.30	2.03			
	Total =						92.18			cum
	Total quantity for	8	nos =				737.41	148.58	103,667.25	
2	Providing and laying Random Rubble Stone Masonry work in cement mortar M/M7.5 all complete as per drawing, specification and instruction									
	Head wall	cum	2	4.06	1.02	3.18	26.18			
	Deduction for pipe	cum	-2.00	1.02		1.61	-3.26			
	Apron	cum	2	1.50	4.96	0.30	4.46			
	Apron cut	cum	2	5.63	0.45	0.30	1.52			
	Wing Wall	cum	4	1.73	0.13	1.20	1.13			
	Total =						26.02			cum
	Total quantity for	8	nos =				248.17	9979.92	2,396,918.75	
3	Providing and laying of hand pack Stone soling with 150 to 200mm thick stones and packing with smaller stone on prepared surface all complete as per drawing, specification and instruction									
	Below head wall	cum	2	4.28	1.53	0.15	1.96			
	Below main pipe	cum	0.00	12.50	2.23	0.45	0.00			
	Total =						1.96			cum
	Total quantity for	8	nos =				15.72	5609.70	85,162.94	
4	Providing and laying of Plain Cement Concrete Grade M 15 all complete as per drawing, specification and instruction.									
	Below head wall	cum	2	4.28	1.53	0.10	1.31			
	Below main pipe	cum	1.00	12.50	2.23	0.36	10.64			
		cum	1.00	12.50	2.03	0.72	18.14			
	Deduction for pipe portion		-1.00	12.50	Area	0.90	-11.27			
	Total =						18.22			cum
	Total quantity for	8	nos =				145.75	10299.37	1,501,158.78	
5	Providing and laying weep holes in Brick dry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 110 mm dia HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face Complete as per Drawing and Technical Specifications: (Section 20.7)									
	Head Wall	m	8	1.02			8.12			m
	Wing Wall	m	4	0.38			1.50			
	Total =						9.62			
	Total quantity for	8	nos =				76.96	902.85	69,483.50	
6	Providing and Laying Reinforced Cement Concrete NPS Flush jointed pipe for culverts including fixing with cement mortar 1:2 all complete as per drawing, specification and instruction (SS 701) - 1200 mm Internal Diameter.									
		m	1.00	12.50			12.50			m
	Total =						12.50			
	Total quantity for	8	nos =				100.00	21357.50	2,135,750.02	
7	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving, placing, laying sides and diaphragms with binding wire and filling boulders all complete as per drawing, specification and instruction Mesh wire- 10 Swg(0.615 kg/m), Selvedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm, Box size 2 X 1 X 1 m									

		cum	4	3.18	1.73	0.50	11.02				
	Total =						11.02			cum	
	Total quantity for	₹	nos =				₹8.13	5945.83	515,173.97		
8	Providing and laying of filter media with granular Material/stone crushed aggregates to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition all complete as per drawing, specification and instruction										
	Head wall	cum	2	4.06	0.20	3.18	5.16				
	Wing Wall	cum	4	1.73	0.20	0.98	1.35				
	Deduction for pipe	cum	-2	0.00	3.21	0.20	-1.28				
	Total =						5.22				
	Total quantity for	₹	nos =				41.79	3547.18	148,246.69		
9	Providing and laying of a protective filter in weep hole as per complete as per drawing, specification and instruction.										
	Weep hole	sqm	12		0.20	0.20	0.40				
	Total =						0.40				
	Total quantity for	₹	nos =				3.94	141.50	543.68		
10	Providing and laying of Reinforced/Pre-stressed concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)										
	Back fill	cum	1	12.50	2.0	0.25	6.51				
	Total =						6.51				
	Total quantity for	₹	nos =				50.75	14513.05	736,792.74		
11	Providing and laying Reinforcement including cutting, bending, binding, fixing in position and lead etc. all complete as per drawing, specification and instruction										
	For side drain and cover of drain	MT	1% of total concrete volume				3.95				
			Total Quantity				3.95	117031.40	466,465.55		
	Grand Total								₹,162,364.05		

Government of Nepal Ministry of Urban Development
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 Babar Mahal, Kathmandu
 Project Coordinate Office

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Tilottama Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (1.5M X 1M)

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Tilottama Municipality

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
A									
Deck slab									
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deteriorious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m								
	Base	cum	1	10	2.75	0.90	24.75		
	Cutoff wall	cum	2	2.6	0.60	1.35	4.21		
	wing wall	cum	4	1.81	0.50	1.50	5.43		
		cum	4	1.81	1.70	1.50	18.43		
	curtain wall type 1	cum	1	4.40	1.85	2.50	20.35		
	curtain wall type 2	cum	1	4.40	1.50	2.00	13.20		
	For	2	nos			Total	172.73	140.58	24,283.47
2	Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)								
	culvert	cum	1	10	2.75	0.5	13.75		
	Wing Wall								
	At Min Height		4.00	0.50	1.81	0.5	1.81		
	At Maximum		4.00	1.70	1.81	0.5	6.14		
	Floor apron		2.00	1.20	3.20	0.5	3.84		
	Flexible apron								
	Up stream		1	3	4.40	0.5	6.60		
	down stream		1	6	4.40	0.5	13.20		
	For	2	nos			Total	90.68	132.91	12,052.56
3	Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M15 (Section 20.2 (A))								
	Base	cum	1	10	2.75	0.15	4.13		
	Wing wall								
	Tappered portion	cum	4	0.5	2.01	0.15	0.60		
	Rectangular portion	cum	4	1.6968	2.01	0.15	2.05		
	Floor apron	cum	2.00	1.20	3.20	0.15	1.15		
	Type 1 curtain wall	cum	1	4.40	1.85	0.15	1.22		
	Type 2 curtain wall	cum	1	4.40	1.5	0.15	0.99		
	For	2	nos			Total	20.27	10299.37	206,807.83
4	Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20								
	Wing wall								
	Tappered portion	cum	4	1.70	Area=	1.89	12.85		
	Rectangular portion	cum	4	0.5	Area=	1.72	3.44		
	Curtain wall								

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	4.40	AREA=	1.97	8.68		
	Type 2 curtain wall	cum	1	4.40	AREA=	1.47	6.46		
	For	2	nos			Total	62.86	13361.16	839,943.05
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)								
	Deck slab								
	Base Slab	cum	1	10	2.6	0.25	6.50		
	Wall	cum	2	10	0.25	1	5.00		
	Top Slab	cum	1	10	2	0.25	5.00		
	Fillet	cum	4	10	Area =	0.02	0.80		
	cut off wall	cum	2	2.6	1.10	0.3	1.72		
			4	1.10	1.10	0.3	0.73		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	2	nos			Total	81.48	14518.08	1,182,991.53
6	Providing and laying, fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2% of total concrete volume			40.74	6.40		
	For	2	nos			Total	12.79	117088.40	1,497,910.50
7	Providing and laying of plum Concrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	1.20	3.19982	0.45	3.46		
	For	2	nos			Total	6.91	8871.35	61,306.05
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	4.40	0.75	9.90		
	down stream		1	6	4.40	0.75	19.80		
	For	2	cum			Total	59.40	3373.36	200,361.19
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving, placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Seldedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	2	nos			Total	32.00	5845.83	187,066.56
10	Tubular Steel Railing on Prest RCC posts 1.2m High above ground Level; Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above GL) with 3 holes 50mm dia for pipe, fixed 2 meter center to, complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	18				18.00		
	For	2	nos			Total	36.00	2488.88	89,599.68

Government of Nepal Ministry of Urban Development
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 Project Coordinate Office

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Thlottama Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (2MX1M)

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
A	Deck slab								
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m								
	Base	cum	1	10	3.35	0.96	32.16		
	Cutoff wall	cum	2	3.2	0.60	1.20	4.61		
	wing wall	cum	4	1.81	0.50	1.50	5.43		
		cum	4	1.81	1.84	1.50	19.96		
	curtain wall type 1	cum	1	5.20	1.85	2.50	24.05		
	curtain wall type 2	cum	1	5.20	1.50	2.00	15.60		
	For 1	nos				Total	101.81	140.58	14,312.54
2	Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)								
	culvert	cum	1	10	3.35	0.5	16.75		
	Wing Wall								
	At Min Height		4.00	0.50	1.81	0.5	1.81		
	At Maximum		4.00	1.84	1.81	0.5	6.65		
	Floor apron		2.00	1.30	3.90	0.5	5.07		
	Flexible apron								
	Up stream		1	3	5.20	0.5	7.80		
	down stream		1	6	5.20	0.5	15.60		
	For 1	nos				Total	53.68	132.91	7,134.98
3	Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M 15 (Section 20.2 (A))								
	Base	cum	1	10	3.35	0.15	5.03		
	Wing wall								
	Tappered portion	cum	4	0.5	2.01	0.15	0.60		
	Rectangular portion	cum	4	1.8382	2.01	0.15	2.22		
	Floor apron	cum	2.00	1.30	3.90	0.15	1.52		
	Type 1 curtain wall	cum	1	5.20	1.85	0.15	1.44		
	Type 2 curtain wall	cum	1	5.20	1.5	0.15	1.17		
	For 1	nos				Total	11.98	10299.37	123,369.66
4	Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20								
	Wing wall								
	Tappered portion	cum	4	1.84	Area=	1.91	14.03		
	Rectangular portion	cum	4	0.5	Area=	1.72	3.44		
	Curtain wall								

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	5.20	AREA=	1.97	10.26		
	Type 2 curtain wall	cum	1	5.20	AREA=	1.47	7.63		
	For	1	nos			Total	35.36	13361.16	472,464.98
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)								
	Deck slab								
	Base Slab	cum	1	10	3.2	0.3	9.60		
	Wall	cum	2	10	0.3	1	6.00		
	Top Slab	cum	1	10	2.6	0.3	7.80		
	Fillet	cum	4	10	Area =	0.02	0.80		
	cutoff wall	cum	2	3.2	0.90	0.3	1.73		
			4	0.90	0.90	0.3	0.49		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	1	nos			Total	47.41	14518.08	688,360.42
6	Providing and laying , fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2% of total concrete volume			47.41	7.44		
	For	1	nos			Total	7.44	117088.40	871,605.82
7	Providing and laying of plumConcrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	1.30	3.8998037	0.45	4.56		
	For	1	nos			Total	4.56	8871.35	40,471.83
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	5.20	0.75	11.70		
	down stream		1	6	5.20	0.75	23.40		
	For	1	cum			Total	35.10	3373.36	118,396.06
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Selvedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	1	nos			Total	16.00	5845.83	93,533.28
10	Tubular Steel Railing on Prest RCC posts 1.2m High above ground Level: Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above GL) with 3 holes 50mm dia for pipe , fixed 2 meter center to , complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	19				19.00		
	For	1	nos			Total	19.00	2488.88	47,288.72

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 Project Coordinate Office

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Thottana Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (2.5MX1M)

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
A	Deck slab								
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m								
	Base	cum	1	10	3.85	0.96	36.96		
	Cutoff wall	cum	2	3.7	0.60	1.48	6.55		
	wing wall	cum	4	1.81	0.50	1.50	5.43		
		cum	4	1.81	1.84	1.50	19.96		
	curtain wall type 1	cum	1	5.70	1.85	2.50	26.36		
	curtain wall type 2	cum	1	5.70	1.50	2.00	17.10		
	For	2	nos			Total	224.72	140.58	31,592.38
2	Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)								
	culvert	cum	1	10	3.85	0.5	19.25		
	Wing Wall								
	At Min Height		4.00	0.50	1.81	0.5	1.81		
	At Maximum		4.00	1.84	1.81	0.5	6.65		
	Floor apron		2.00	1.30	4.40	0.5	5.72		
	Flexible apron								
	Up stream		1	3	5.70	0.5	8.55		
	down stream		1	6	5.70	0.5	17.10		
	For	2	nos			Total	118.16	132.91	15,705.39
3	Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M 15 (Section 20.2 (A))								
	Base	cum	1	10	3.85	0.15	5.78		
	Wing wall								
	Tapered portion	cum	4	0.5	2.01	0.15	0.60		
	Rectangular portion	cum	4	1.8382	2.01	0.15	2.22		
	Floor apron	cum	2.00	1.30	4.40	0.15	1.72		
	Type 1 curtain wall	cum	1	5.70	1.85	0.15	1.58		
	Type 2 curtain wall	cum	1	5.70	1.5	0.15	1.28		
	For	2	nos			Total	26.35	10299.37	271,379.96
4	Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20								
	Wing wall								
	Tapered portion	cum	4	1.84	Area=	1.91	14.03		
	Rectangular portion	cum	4	0.5	Area=	1.72	3.44		
	Curtain wall								

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	5.70	AREA=	1.97	11.24		
	Type 2 curtain wall	cum	1	5.70	AREA=	1.47	8.36		
	For	2	nos			Total	74.16	13361.16	990,892.35
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)								
	Deck slab								
	Base Slab	cum	1	10	3.7	0.3	11.10		
	Wall	cum	2	10	0.3	1	6.00		
	Top Slab	cum	1	10	3.1	0.3	9.30		
	Fillet	cum	4	10	Area =	0.02	0.80		
	cutoff wall	cum	2	3.7	1.18	0.3	2.61		
			4	1.18	1.18	0.3	0.83		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	2	nos			Total	103.27	14518.08	1,499,336.94
6	Providing and laying , fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2%	2%	of total concrete volume	51.64	8.11		
	For	2	nos			Total	16.21	117088.40	1,898,468.83
7	Providing and laying of plumConcrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	1.30	4.3998037	0.45	5.15		
	For	2	nos			Total	10.29	8871.35	91,321.57
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	5.70	0.75	12.82		
	down stream		1	6	5.70	0.75	25.65		
	For	2	cum			Total	76.94	3373.36	259,562.32
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Selvedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	2	nos			Total	32.00	5845.83	187,066.56
10	Tubular Steed Railing on Prest RCC posts 1.2m High above ground Level: Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above GL) with 3 holes 50mm dia for pipe , fixed 2 meter center to , complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	20				20.00		
	For	2	nos			Total	40.00	2488.88	99,555.20

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount	
11	Providing and laying weep holes in Brick dry/Ptain/ Reinforced concrete abutment, wing wall/ return wall with 110 mm dia HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face Complete as per Drawing and Technical Specifications.: (Section 20.7)									
		m	2	15.00			30.00			
		For	2	nos			Total	60.00	902.85	54,171.20
Grand Total									5,399,052.70	

Government of Nepal Ministry of Urban Development
 Department of Urban Development and Building Construction
 Urban Governance and Infrastructure Improvement Project (UGIIP-II)
 Babar Mahal, Kathmandu
 Project Coordinate Office

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Thlottana Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (2.5MX 1.6M)

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
A	Deck slab								
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m								
	Base	cum	1	10	3.85	1.32	50.82		
	Cutoff wall	cum	2	3.7	0.60	1.20	5.33		
	wing wall	cum	4	1.81	0.50	1.50	5.43		
		cum	4	1.81	3.54	1.50	38.39		
	curtain wall type 1	cum	1	8.10	1.85	2.50	37.66		
	curtain wall type 2	cum	1	8.10	1.50	2.00	24.30		
	For	2	nos				Total	323.45	140.58
									45,471.80
2	Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)								
	culvert	cum	1	10	3.85	0.5	19.25		
	Wing Wall								
	At Min Height		4.00	0.50	1.81	0.5	1.81		
	At Maximum		4.00	3.54	1.81	0.5	12.80		
	Floor apron		2.00	2.50	5.60	0.5	14.00		
	Flexible apron								
	Up stream		1	3	8.10	0.5	12.15		
	down stream		1	6	8.10	0.5	24.30		
	For	2	nos				Total	168.60	132.91
									22,409.22
3	Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M15 (Section 20.2 (A))								
	Base	cum	1	10	3.85	0.15	5.78		
	Wing wall								
	Tapperend portion	cum	4	0.5	2.01	0.15	0.60		
	Rectangular	cum	4	3.535	2.01	0.15	4.26		
	Floor apron	cum	2.00	2.50	5.60	0.15	4.20		
	Type 1 curtain wall	cum	1	8.10	1.85	0.15	2.25		
	Type 2 curtain wall	cum	1	8.10	1.5	0.15	1.82		
	For	2	nos				Total	37.82	10299.37
									389,525.66
4	Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20								
	Wing wall								
	Tapperend portion	cum	4	3.54	Area=	2.08	29.42		
	Rectangular	cum	4	0.5	Area=	1.72	3.44		
	Curtain wall								

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	8.10	AREA=	1.97	15.98		
	Type 2 curtain wall	cum	1	8.10	AREA=	1.47	11.89		
	For	2	nos			Total	121.45	13361.16	1,622,770.53
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8 B)								
	Deck slab								
	Base Slab	cum	1	10	3.7	0.3	11.10		
	Wall	cum	2	10	0.3	1.6	9.60		
	Top Slab	cum	1	10	3.1	0.3	9.30		
	Fillet	cum	4	10	Area =	0.02	0.80		
	cutoff wall	cum	2	3.7	0.90	0.3	2.00		
			4	0.90	0.90	0.3	0.49		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	2	nos			Total	108.57	14518.08	1,576,199.30
6	Providing and laying , fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2% of total concrete volume		54.28	8.52			
	For	2	nos			Total	17.05	117088.40	1,995,792.39
7	Providing and laying of plum Concrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	2.50	5.599622	0.45	12.60		
	For	2	nos			Total	25.19	8871.35	223,509.23
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	8.10	0.75	18.22		
	down stream		1	6	8.10	0.75	36.45		
	For	2	cum			Total	109.34	3373.36	368,842.74
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Selvege Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	2	nos			Total	32.00	5845.83	187,066.56
10	Tubular Steel Railing on Preast RCC posts 1.2m High above ground Level; Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above GL) with 3 holes 50mm dia for pipe , fixed 2 meter center to , complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	20				20.00		
	For	2	nos			Total	40.00	2488.88	99,555.20

Government of Nepal Ministry of Urban Development
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 Babar Mahal, Kathmandu
 Project Coordinate Office

Project Name: Upgradation of Mangalapur – Kanchibaazar Road, Tilottama Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (SINGLE CELL 3.5M X 1M)

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount	
A	Deck slab									
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m									
	Base	cum	1	10	5.29	1.09	57.77			
	Cutoff wall	cum	2	5.14	0.60	2.70	16.65			
	wing wall	cum	4	1.81	0.50	1.50	5.43			
		cum	4	1.81	2.12	1.50	23.03			
	curtain wall type 1	cum	1	7.30	1.85	2.50	33.76			
	curtain wall type 2	cum	1	7.30	1.50	2.00	21.90			
	For	1	nos				Total	158.54	140.58	22,288.66
2	Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)									
	culvert	cum	1	10	5.29	0.5	26.45			
	Wing Wall									
	At Min Height		4.00	0.50	1.81	0.5	1.81			
	At Maximum		4.00	2.12	1.81	0.5	7.68			
	Floor apron		2.00	1.50	5.80	0.5	8.70			
	Flexible apron									
	Up stream		1	3	7.30	0.5	10.95			
	down stream		1	6	7.30	0.5	21.90			
	For	1	nos				Total	77.48	132.91	10,298.68
3	Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M 15 (Section 20.2 (A))									
	Base	cum	1	10	5.29	0.15	7.94			
	Wing wall									
	Tappererd portion	cum	4	0.5	2.01	0.15	0.60			
	Rectangular portion	cum	4	2.121	2.01	0.15	2.56			
	Floor apron	cum	2.00	1.50	5.80	0.15	2.61			
	Type 1 curtain wall	cum	1	7.30	1.85	0.15	2.03			
	Type 2 curtain wall	cum	1	7.30	1.5	0.15	1.64			
	For	1	nos				Total	17.37	10299.37	178,935.67
4	Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20									
	Wing wall									
	Tappererd portion	cum	4	2.12	Area=	1.94	16.43			
	Rectangular portion	cum	4	0.5	Area=	1.72	3.44			
	Curtain wall									

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	7.30	AREA=	1.97	14.40		
	Type 2 curtain wall	cum	1	7.30	AREA=	1.47	10.71		
	For	1	nos			Total	44.99	13361.16	601,084.89
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)								
	Deck slab								
	Base Slab	cum	1	10	5.14	0.42	21.59		
	Wall	cum	2	10	0.4	1	8.00		
	Top Slab	cum	1	10	4.3	0.4	17.20		
	Fillet	cum	4	10	Area =	0.02	0.80		
	cutoff wall	cum	2	5.14	2.28	0.3	7.03		
			4	2.28	2.28	0.3	3.12		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	1	nos			Total	78.74	14518.08	1,143,133.00
6	Providing and laying , fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2% of total concrete volume			78.74	12.36		
	For	1	nos			Total	12.36	117088.40	1,447,441.41
7	Providing and laying of plumConcrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	1.50	5.799773	0.45	7.83		
	For	1	nos			Total	7.83	8871.35	69,449.48
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	7.30	0.75	16.42		
	down stream		1	6	7.30	0.75	32.85		
	For	1	cum			Total	49.27	3373.36	166,212.09
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Selvege Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	1	nos			Total	16.00	5845.83	93,533.28
10	Tubular Steel Railing on Preast RCC posts 1.2m High above ground Level: Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above GL) with 3 holes 50mm dia for pipe , fixed 2 meter center to , complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	23				23.00		
	For	1	nos			Total	23.00	2488.88	57,244.24

Government of Nepal Ministry of Urban Development
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 Babar Mahal, Kathmandu
 Project Coordinate Office

Project Name: Upgradation of Mangalpur – Kamchibazar Road, Tilottama Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (DOUBLE CELL 2.25M X 1.63M)

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount	
A	Deck slab									
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m									
	Base	cum	1	10	6.5	1.38	89.70			
	Cutoff wall	cum	2	6.35	0.60	1.30	9.91			
	wing wall	cum	4	1.81	0.50	1.50	5.43			
		cum	4	1.81	3.68	1.50	39.93			
	curtain wall type 1	cum	1	10.75	1.85	2.50	49.72			
	curtain wall type 2	cum	1	10.75	1.50	2.00	32.25			
	For	1	nos				Total	226.92	140.58	31,901.91
2	Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)									
	culvert	cum	1	10	6.5	0.5	32.50			
	Wing Wall									
	At Min Height		4.00	0.50	1.81	0.5	1.81			
	At Maximum height		4.00	3.68	1.81	0.5	13.31			
	Floor apron		2.00	2.60	8.15	0.5	21.19			
	Flexible apron									
	Up stream		1	3	10.75	0.5	16.12			
	down stream		1	6	10.75	0.5	32.25			
	For	1	nos				Total	117.18	132.91	15,574.20
3	Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M 15 (Section 20.2 (A))									
	Base	cum	1	10	6.5	0.15	9.75			
	Wing wall									
	Tapered portion	cum	4	0.5	2.01	0.15	0.60			
	Rectangular portion	cum	4	3.6764	2.01	0.15	4.43			
	Floor apron	cum	2.00	2.60	8.15	0.15	6.36			
	Type 1 curtain wall	cum	1	10.75	1.85	0.15	2.98			
	Type 2 curtain wall	cum	1	10.75	1.5	0.15	2.42			
	For	1	nos				Total	26.54	10299.37	273,386.08
4	Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20									
	Wing wall									
	Tapered portion	cum	4	3.68	Area=	2.10	30.81			
	Rectangular portion	cum	4	0.5	Area=	1.72	3.44			
	Curtain wall									

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	10.75	AREA=	1.97	21.20		
	Type 2 curtain wall	cum	1	10.75	AREA=	1.47	15.77		
	For	1	nos			Total	71.23	13361.16	951,733.59
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)								
	Deck slab								
	Base Slab	cum	1	10	6.35	0.35	22.23		
	Wall	cum	3	10	0.35	1.6	16.80		
	Top Slab	cum	1	10	5.55	0.35	19.43		
	Fillet	cum	8	10	Area =	0.02	1.60		
	cutoff wall	cum	2	6.35	0.95	0.3	3.62		
			4	0.95	0.95	0.3	0.54		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	1	nos			Total	85.21	14518.08	1,237,100.42
6	Providing and laying , fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2% of total concrete volume			85.21	13.38		
	For	1	nos			Total	13.38	117088.40	1,566,423.49
7	Providing and laying of plumConcrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	2.60	8.149607	0.45	19.07		
	For	1	nos			Total	19.07	8871.35	169,151.84
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	10.75	0.75	24.19		
	down stream		1	6	10.75	0.75	48.37		
	For	1	cum			Total	72.56	3373.36	244,761.69
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Selvedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	1	nos			Total	16.00	5845.83	93,533.28
10	Tubular Steel Railing on Prest RCC posts 1.2m High above ground Level: Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above GL) with 3 holes 50mm dia for pipe , fixed 2 meter center to , complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	25				25.00		
	For	1	nos			Total	25.00	2488.88	62,222.00

Government of Nepal Ministry of Urban Development
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Babar Mahal, Kathmandu
Project Coordinate Office

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Thlottama Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (DOUBLE CELL 2MX 1.8M)

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount	
A	Deck slab									
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m									
	Base	cum	1	10	6	1.50	90.00			
	Cutoff wall	cum	2	5.85	0.60	1.20	8.42			
	wing wall	cum	4	1.81	0.50	1.50	5.43			
		cum	4	1.81	4.24	1.50	46.07			
	curtain wall type 1	cum	1	11.05	1.85	2.50	51.10			
	curtain wall type 2	cum	1	11.05	1.50	2.00	33.15			
	For	1	nos				Total	234.17	140.58	32,920.72
2	Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)									
	culvert	cum	1	10	6	0.5	30.00			
	Wing Wall									
	At Min Height		4.00	0.50	1.81	0.5	1.81			
	At Maximum height		4.00	4.24	1.81	0.5	15.36			
	Floor apron		2.00	3.00	8.05	0.5	24.14			
	Flexible apron									
	Up stream		1	3	11.05	0.5	16.57			
	down stream		1	6	11.05	0.5	33.15			
	For	1	nos				Total	121.03	132.91	16,086.74
3	Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M 15 (Section 20.2 (A))									
	Base	cum	1	10	6	0.15	9.00			
	Wing wall									
	Tappererd portion	cum	4	0.5	2.01	0.15	0.60			
	Rectangular portion	cum	4	4.242	2.01	0.15	5.12			
	Floor apron	cum	2.00	3.00	8.05	0.15	7.24			
	Type 1 curtain wall	cum	1	11.05	1.85	0.15	3.07			
	Type 2 curtain wall	cum	1	11.05	1.5	0.15	2.49			
	For	1	nos				Total	27.51	10299.37	283,382.31
4	Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20									
	Wing wall									
	Tappererd portion	cum	4	4.24	Area=	2.15	36.53			
	Rectangular portion	cum	4	0.5	Area=	1.72	3.44			
	Curtain wall									

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	11.05	AREA=	1.97	21.79		
	Type 2 curtain wall	cum	1	11.05	AREA=	1.47	16.21		
	For	1	nos			Total	77.98	13361.16	1,041,887.00
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)								
	Deck slab								
	Base Slab	cum	1	10	5.85	0.35	20.48		
	Wall	cum	3	10	0.35	1.8	18.90		
	Top Slab	cum	1	10	5.05	0.35	17.68		
	Fillet	cum	8	10	Area =	0.02	1.60		
	cutoff wall	cum	2	5.85	0.85	0.3	2.98		
			4	0.85	0.85	0.3	0.43		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	1	nos			Total	83.07	14518.08	1,205,973.65
6	Providing and laying , fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2% of total concrete volume			83.07	13.04		
	For	1	nos			Total	13.04	117088.40	1,527,010.59
7	Providing and laying of plumConcrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	3.00	8.049547	0.45	21.73		
	For	1	nos			Total	21.73	8871.35	192,778.86
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	11.05	0.75	24.86		
	down stream		1	6	11.05	0.75	49.72		
	For	1	cum			Total	74.58	3373.36	251,590.00
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Seldedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	1	nos			Total	16.00	5845.83	93,533.28
10	Tabular Steel Railing on Preast RCC posts 1.2m High above ground Level: Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above G.L.) with 3 holes 50mm dia for pipe , fixed 2 meter center to , complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	24				24.00		
	For	1	nos			Total	24.00	2488.88	59,733.12

Government of Nepal Ministry of Urban Development
 Department of Urban Development and Building Construction
 Urban Governance and Infrastructure Improvement Project (UGIIP-II)
 Babar Mahal, Kathmandu
 Project Coordinate Office

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Tilottama Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (DOUBLE CELL 3.75M X 2.3M)

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
A									
Deck slab									
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m								
	Base	cum	1	10	9.81	1.90	186.59		
	Cutoff wall	cum	2	9.66	0.60	2.45	28.40		
	wing wall	cum	4	1.81	0.50	1.50	5.43		
		cum	4	1.81	5.85	1.50	63.57		
	curtain wall type 1	cum	1	17.04	1.85	2.50	78.80		
	curtain wall type 2	cum	1	17.04	1.50	2.00	51.12		
	For	1	nos			Total	413.91	140.58	58,189.21
2									
Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)									
	culvert	cum	1	10	9.81	0.5	49.05		
	Wing Wall								
	At Min Height		4.00	0.50	1.81	0.5	1.81		
	At Maximum height		4.00	5.85	1.81	0.5	21.19		
	Floor apron		2.00	4.14	12.90	0.5	53.40		
	Flexible apron								
	Up stream		1	3	17.04	0.5	25.56		
	down stream		1	6	17.04	0.5	51.12		
	For	1	nos			Total	202.12	132.91	26,864.54
3									
Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M 15 (Section 20.2 (A))									
	Base	cum	1	10	9.81	0.15	14.72		
	Wing wall								
	Tappered portion	cum	4	0.5	2.01	0.15	0.60		
	Rectangular portion	cum	4	5.85396	2.01	0.15	7.06		
	Floor apron	cum	2.00	4.14	12.90	0.15	16.02		
	Type 1 curtain wall	cum	1	17.04	1.85	0.15	4.73		
	Type 2 curtain wall	cum	1	17.04	1.5	0.15	3.83		
	For	1	nos			Total	46.96	10299.37	483,642.62
4									
Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20									
	Wing wall								
	Tappered portion	cum	4	5.85	Area=	2.32	54.24		
	Rectangular portion	cum	4	0.5	Area=	1.72	3.44		
	Curtain wall								

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	17.04	AREA=	1.97	33.61		
	Type 2 curtain wall	cum	1	17.04	AREA=	1.47	25.00		
	For	1	nos			Total	116.30	13361.16	1,553,912.63
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M25/20 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)								
	Deck slab								
	Base Slab	cum	1	10	9.66	0.45	43.47		
	Wall	cum	3	10	0.42	2.3	28.98		
	Top Slab	cum	1	10	8.76	0.42	36.79		
	Fillet	cum	8	10	Area=	0.02	1.60		
	cutoff wall	cum	2	9.66	2.00	0.3	11.59		
			4	2.00	2.00	0.3	2.40		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	1	nos			Total	145.83	14518.08	2,117,230.21
6	Providing and laying , fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2% of total concrete volume			145.83	22.90		
	For	1	nos			Total	22.90	117088.40	2,680,848.75
7	Providing and laying of plumConcrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	4.14	12.89937	0.45	48.06		
	For	1	nos			Total	48.06	8871.35	426,320.00
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	17.04	0.75	38.34		
	down stream		1	6	17.04	0.75	76.67		
	For	1	cum			Total	115.01	3373.36	387,975.62
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Selvedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm,. Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	1	nos			Total	16.00	5845.83	93,533.28
10	Tubular Steel Railing on Preast RCC posts 1.2m High above ground Level: Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above GL) with 3 holes 50mm dia for pipe , fixed 2 meter center to , complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	32				32.00		
	For	1	nos			Total	32.00	2488.88	79,644.16

Government of Nepal Ministry of Urban Development
Department of Urban Development and Building Construction
Urban Governance and Infrastructure Improvement Project (UGIP-II)
Babar Mahal, Kathmandu
Project Coordinate Office

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Thlottama Municipality

DETAILED QUANTITY ESTIMATE OF BOX CULVERT (DOUBLE CELL 3MX 1.3M)

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
A	Deck slab								
1	Earthwork in excavation in foundation of structures including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m								
	Base	cum	1	10	8	1.20	96.00		
	Cutoff wall	cum	2	7.85	0.60	1.90	17.90		
	wing wall	cum	4	1.81	0.50	1.50	5.43		
		cum	4	1.81	2.83	1.50	30.71		
	curtain wall type 1	cum	1	11.05	1.85	2.50	51.10		
	curtain wall type 2	cum	1	11.05	1.50	2.00	33.15		
	For	1	nos			Total	234.29	140.58	32,937.63
2	Compacting original ground supporting sub-grade Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers as per Drawing and Technical Specifications. (Section 10.4)								
	culvert	cum	1	10	8	0.5	40.00		
	Wing Wall								
	At Min Height		4.00	0.50	1.81	0.5	1.81		
	At Maximum		4.00	2.83	1.81	0.5	10.24		
	Floor apron		2.00	2.00	9.05	0.5	18.10		
	Flexible apron								
	Up stream		1	3	11.05	0.5	16.57		
	down stream		1	6	11.05	0.5	33.15		
	For	1	nos			Total	119.87	132.91	15,931.81
3	Providing and laying of Plain/Reinforced Cement Concrete complete including formwork as per Drawing and Technical Specifications. PCC Grade M15 (Section 20.2 (A))								
	Base	cum	1	10	8	0.15	12.00		
	Wing wall								
	Tappered portion	cum	4	0.5	2.01	0.15	0.60		
	Rectangular	cum	4	2.828	2.01	0.15	3.41		
	Floor apron	cum	2.00	2.00	9.05	0.15	5.43		
	Type 1 curtain wall	cum	1	11.05	1.85	0.15	3.07		
	Type 2 curtain wall	cum	1	11.05	1.5	0.15	2.49		
	For	1	nos			Total	26.99	10299.37	278,030.43
4	Providing and laying of Plain Cement Concrete all complete as per Drawing and Technical Specifications. M20								
	Wing wall								
	Tappered portion	cum	4	2.83	Area=	2.01	22.73		
	Rectangular	cum	4	0.5	Area=	1.72	3.44		
	Curtain wall								

S. No.	Description	Unit	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount
	Type 1 curtain wall	cum	1	11.05	AREA=	1.97	21.79		
	Type 2 curtain wall	cum	1	11.05	AREA=	1.47	16.21		
	For	1	nos			Total	64.18	13361.16	857,493.24
5	Providing and laying of Reinforced/Pre-stressed cement concrete in sub structure RCC Grade M2520 with Formwork and all complete as per Drawing and Technical Specification (Section 20.8-B)								
	Deck slab								
	Base Slab	cum	1	10	7.85	0.35	27.48		
	Wall	cum	3	10	0.35	1.3	13.65		
	Top Slab	cum	1	10	7.05	0.35	24.68		
	Filler	cum	8	10	Area =	0.02	1.60		
	cutoff wall	cum	2	7.85	1.55	0.3	7.30		
			4	1.55	1.55	0.3	1.44		
	Approach slab								
		cum	2	3.5	10	0.3	21.00		
	For	1	nos			Total	97.14	14518.08	1,410,315.68
6	Providing and laying , fitting and placing HYSD bar reinforcement as per drawing and technical specifications								
	Reinforcement	MT	2%	2%	2%	2%	97.14	15.25	
	For	1	nos			Total	15.25	117088.40	1,785,749.61
7	Providing and laying of plumConcrete (boulder mixed concrete) complete as per Drawing and Technical Specifications. 60% M15 and 40% boulder /stones as per drawing and technical specification.								
	Floor apron	cum	2.00	2.00	9.049698	0.45	16.29		
	For	1	nos			Total	16.29	8871.35	144,487.67
8	Providing and laying stone boulder apron on river bed for protection against scour with boulders/stone weighing not less than 40 kg each complete as per drawing and technical specification								
	Flexible apron								
	Up stream		1	3	11.05	0.75	24.86		
	down stream		1	6	11.05	0.75	49.72		
	For	1	cum			Total	74.58	3373.36	251,596.88
9	Providing and laying Gabion structure for retaining earth with diaphragm including rolling, cutting weaving , placing, laying sides and diaphragms with binding wire and filling boulders all complete as per Drawing and Technical Specification. Mesh wire- 10 Swg(0.0615 kg/m), Selvedge Wire 8 Swg (0.1057 kg/m), binding wire 12 Swg (0.0409 kg/m) Hexagonal mesh Type 100 mm X 120 mm., Box size 2 X 1 X 1 m								
	Flexible apron								
	Up stream	cum	4	2	1.00	1	8.00		
	down stream	cum	4	2	1.00	1	8.00		
	For	1	nos			Total	16.00	5845.83	93,533.28
10	Tubular Steel Railing on Prest RCC posts 1.2m High above ground Level: Providing, fencing and erecting 50mm dia painted steel pipe in railing in 3 rows on precast M20 grade RCC vertical posts 1.8m high (1.2m above GL) with 3 holes 50mm dia for pipe , fixed 2 meter center to , complete as per Drawing and Technical Specifications. (Section 31.7)								
		m	28				28.00		
	For	1	nos			Total	28.00	2488.88	69,688.64

ANNEX IX: RAMPS

**Government of Nepal Ministry of Urban Development
Department of Urban Development and Building Construction
Urban Governance and Infrastructure Improvement Project (UGIIP-II)
Babar Mahal, Kathmandu
Project Coordinate Office**

**RAMP
CHAINAGE 0+000 - 5+000**

Project Name: Upgradation of Mangalapur – Kanchibazar Road, Tilottama Municipality

S.No	Description	Unit	Nos	Length	Breadth	Height	Quantity	Rate	Amount
1	Earthwork in excavation for structural works, including construction of shoring and bracing, removal of stumps and other deleterious matter and backfilling with approved Materials as per Drawing and Technical specifications in ordinary soil depth upto 3m all complete as per drawing, specification and instruction								
	3 m width ramp	Cum							
	1 m width ramp		79	1.50	1.00	0.28	32.59		
			39	1.50	1.00	0.28	16.09		
			Total Quantity				48.68	140.58	6,842.92
2	Providing and laying of hand pack Stone soling with 150 to 200mm thick stones and packing with smaller stone on prepared surface all complete as per drawing, specification and instruction								
	3 m width ramp	Sqm	79	1.50	1.00	0.2	23.70		
	1 m width ramp	Sqm	39	1.50	1.00	0.2	11.70		
			Total Quantity				35.40	5609.70	198,583.38
3	Providing and laying of Plain Cement Concrete M 10 all complete as per Drawing, technical specifications and instructions.								
	3 m width ramp	Cum							
	1 m width ramp		79	1.50	1.00	0.08	8.89		
			39	1.50	1.00	0.08	4.39		
			Total Quantity				14.60	9633.81	140,677.67
4	Providing and laying of Plain/Reinforced Cement Concrete complete as per Drawing and Technical Specifications. PCC M20 (Section 20.2-B)								
	3 m width ramp	cum	79	3.00	1.62	0.10	38.29		
	1 m width ramp		39	1.00	1.62	0.10	6.30		
			Total Quantity				44.59	13361.16	595,762.86
5	Providing and laying of Stone Masonry Work in Cement Mortar MM5 complete for structural works as per Drawing and Technical Specifications and directed by the Engineer								
	3 m width ramp	cum							
	1 m width ramp		79	1.50	1	0.6	35.55		
			39	1.50	1	0.6	17.55		
			Total Quantity				35.55	9058.83	322,041.43
Grand Total									1,263,908.25

ANNEX X: LETTER



तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय



मणियाम, सुनसिरी, सुनसिरी प्रदेश, नेपाल

प.सं. : ०७८/०७९

च.नं. : २२७५

मिति २०७८/१९९

श्री नेपाल शहरी शासकीय तथा पूर्वाधार योजना,
आयोजना समन्वय कार्यालय,
बबरमहल, काठमाण्डौ।

श्री प्रशासन
को
००२/०३/१९९

विषय: जानकारी सम्बन्धमा।

उपरोक्त सम्बन्धमा यस नगरपालिका र तार्हा शहरी विकास तथा भवन निर्माण विभागबीच भएको Participation Agreement अनुसारको आयोजना अन्तर्गत यस नगरपालिकाको मंगलापुर कान्तिबजार सडक अन्तर्गत पर्ने मंगलापुर रोड बेबरा चाक जोड्ने सडक खण्ड निर्माण सम्बन्धि योजनामा पर्ने सडकको मापदण्ड भित्र परेको (Right of Way) को जग्गा पूर्णतः खास गरिजाफिएको र उक्त सडकको क्षेत्राधिकार भित्र कुनै विवाद नरहेको र मापदण्ड भित्र पर्ने सम्पूर्ण जमिन नगरपालिका मातहत जाइसकेको व्यहोरा जानकारी गराउदछौं। यदि काम गर्ने शिलशिलामा कुनै विवाद सिर्जना भएमा त्यसलाई नगरपालिकाले सहजिकरण वा समन्वय गरी समाधान गरीने व्यहोरा जानकारी गराइन्छ।

०७/०६/१९९
वासुदेव शिवा
नगर प्रमुख




तिलोत्तमा नगरपालिका
नगर कार्यपालिकाको कार्यालय

कार्यपालिका बैठक संख्या ४/०७८/०७९ (१९४) मिति २०७८/०७/३० गते

प्रस्तावहरू:

१. कार्यपालिका बैठक समीक्षा सम्बन्धमा ।
२. देहायका कार्यविधि स्वीकृत सम्बन्धमा ।
 - क) तिलोत्तमा नगरपालिकाको मेयर जनता आवास कार्यविधि, २०७८,
 - ख) तिलोत्तमा नगरपालिकाको एकीकृत पार्क व्यवस्थापन तथा संचालन कार्यविधि, २०७८ ।
३. वडास्तरको योजना समझौता गर्न वडा कार्यलयको समय तालिका निर्धारण गर्ने सम्बन्धमा ।
४. जग्गा आवास योजना (Land Poling) कार्य अगाडि बढाउने सम्बन्धमा ।
५. जेष्ठ नागरिक घरदैलो स्वास्थ्य सेवा अभियान सम्बन्धमा ।
६. बालमैत्री स्थानीय शासन (CFLG) वडास्तरको प्रगती तथा आगामी कार्ययोजना तथा सूचक लेखाजोखाको जानकारी सम्बन्धमा ।
७. नदीजन्य पदार्थको कार्यसूची (TOR) स्वीकृत सम्बन्धमा ।
८. सम्मान तथा पुरस्कार वितरण गर्ने सम्बन्धमा ।
९. योजनाहरू संशोधन सम्बन्धमा ।
१०. विविध ।
 - क) जापन पत्र सम्बन्धमा ।
 - ख) "घ" वर्गको इजाजतपत्र प्रदान गर्न स्वीकृती सम्बन्धमा ।
 - ग) जग्गा सिफारिस सम्बन्धमा ।
 - अ) गौतमबुद्ध मा.वि., वडा नं.-९,
 - आ) मोही जग्गा, वडा नं.-७ ।
 - घ) मंगलापुर कान्छी बजार सडकको योजना कार्यान्वयन सम्बन्धमा ।
 - ङ) वारुण यन्त्र खरिद सम्बन्धमा ।
 - च) म्याद थप सम्बन्धमा ।
 - छ) नदीजन्य पदार्थको जफत प्रक्रिया अगाडी बढाउने सम्बन्धमा ।
 - ज) धान बालीको क्षतिको विवरण उपलब्ध गराउने सम्बन्धमा ।
 - झ) फोहरमैला व्यवस्थापन गर्ने सम्बन्धमा ।


प्रकाश प्रसाद
प्रमुख प्रशासकीय अधिकृत

१


बासुदेव घिमिरे
नगर प्रमुख




निर्णय नं.-१० विविध (ग)

अ) तिलोत्तमा नगरपालिका, वडा नं.-९ केवलानी स्थित कि.नं.२८६, १-८-६ क्षेत्रफलको सार्वजनिक जग्गा वि.सं. ~~२०१६~~^{२०२१} साल देखि श्री गौतम बुद्ध माध्यमिक विद्यालयको नाममा रही भोगचलन गर्दै आएको र उक्त जग्गाको जग्गा धनी प्रमाणपुर्जा नभएकोले सोही विद्यालयको स्वामित्वमा ल्याउन जिल्ला प्रशासन कार्यालय, रुपन्देही र नेपाल सरकारको "सार्वजनिक प्रकृतीको जग्गा प्रयोग गर्न उपलब्ध गराउने सम्बन्धी मापदण्ड, २०७७" लमायत प्रचलित कानून बमोजिम नेपाल सरकार मन्त्रिपरिषदबाट निर्णय गराउन सम्बन्धित निकायमा सिफारिस गर्ने निर्णय गरियो ।

आ) ज.घ. जीव कुमारी पाण्डेको नाउँमा दर्ता कायम रहेको जि. रुपन्देही तिलोत्तमा नगरपालिका वडा नं. ७ (साविक करहिया गा.वि.स. वडा नं. ५)का कि.नं. ७५ ज.वि. ३-१-३ को कित्ता जग्गा र उक्त जग्गामा सोही ठाउँ बस्ने भगवान दत्त दुबेले मोहियानी हक दावी गरेको र मोही भगवानदत्त दुबे भई श्रेस्ता पुर्जा कायम भएकोमा मालपोत कार्यालय बैरहवाको मिति २०७६/०१/२९ को निर्णय बाट उक्त कि.नं. ७५ ज.वि. ३-१-३ मध्ये उत्तर तर्फबाट ज.वि. १-५-१९ मोही भगवानदत्त दुबेको नाउँमा कायम हुने र दक्षिणतर्फ ज.वि. १-५-१९ को कित्ता जग्गा नेपाल सरकारको नाउँमा कायम हुने गरी निर्णय भएकोमा मालपोत कार्यालय, बैरहवा को मिति २०७६/०१/२९ को निर्णयबाट हाल नेपाल सरकारको नाउँमा कायम गरेको दक्षिणतर्फको जग्गा ज.वि. १-५-१९ को जग्गा मोही भगवान दत्त दुबेलाई कमाउन खान दिइएको भनि निर्णय भई सो को जानकारी नगरपालिका कार्यालयलाई मालपोत कार्यालय बैरहवाको मिति २०७६/०१/२९ को पत्रबाट प्राप्त भएकोले ज.वि. १-५-१९ को जग्गा नेपाल सरकारको नाउँमा लालपुर्जा ल्याउने प्रक्रियाको लागि प्रचलित नियमअनुसार सम्बन्धित निकायमा सिफारिस गर्ने निर्णय गरियो ।

निर्णय नं.-१० विविध (घ)

- नगरपालिकाको मंगलापुर कान्छी बजार सडक अन्तर्गत पर्ने मंगलापुर देखि त्रैबग चौक सम्म जोड्ने सडक खण्ड निर्माण सम्बन्धी आयोजना Urban Development Grant मार्फत निर्माण गर्ने गरी नेपाल शहरी शासकीय तथा पूर्वाधार आयोजना मार्फत डि पी आर बमोजिम आवश्यक कार्यान्वयन प्रक्रिया अगाडि बढाउन शहरी विकास तथा भवन निर्माण विभागलाई अनुरोध गर्ने निर्णय गरियो ।


२०७७/०१/३०
नगरपालिका प्रशासकीय अधिकारी


२०७७/०१/३०
नगरपालिका प्रशासकीय अधिकारी

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ANNEX XI: MEETING WITH UTILITY GROU



आज मिति २०७८/८/१९ को दिन World Bank को सहयोगमा निर्माण प्रस्तावगरिएको तिलोत्तमा नगरपालिकाको मंगलापुर देखि वेवरा सडक स्तर उन्नती सम्बन्धी योजनाको नेपाल विद्युत प्राधिकरण, नेपाल टेलिकम, खानेपानी उपभोक्ता संस्था लगायत सम्बन्धीत सरोकारवाला संस्थाहरु, तिलोत्तमा नगरपालिका, शहरी शासकीय तथा पुर्वाधार योजना कार्यालय तथा World Bank का प्रतिनिधी समेतको Virtual Meeting बसी देहाय बमोजिमको निर्णय गरियो ।

उपस्थिती:-

श्री बासुदेव घिमिरे	नगर प्रमुख, तिलोत्तमा नगरपालिका	
श्री प्रदिप पौड्याल	प्रमुख प्रशासकीय अधिकृत तिलोत्तमा नगरपालिका	
श्री दुर्गा प्रसाद पाण्डे	वडा अध्यक्ष, वडा नं.-०७	
श्री नारायण न्यौपाने	वडा अध्यक्ष, वडा नं.-०९	
श्री यज्ञ गैरे	अध्यक्ष, मकहर करहिया खानेपानी उपभोक्ता संस्था	
श्री प्रदिप वन	इन्जिनियर, तिलोत्तमा नगरपालिका	

प्रस्तावहरु:-

प्रस्ताव नं.१ योजना सञ्चालन तथा कार्यान्वयनमा समन्वय तथा सहजिकरण सम्बन्धमा ।
प्रस्ताव नं.२ विद्युत पोलको लम्बाई सम्बन्धमा ।
प्रस्ताव नं.३ खानेपानी सम्बन्धी कार्यक्रम सञ्चालन सम्बन्धमा ।

निर्णयहरु:-

निर्णय नं.१

प्रस्ताव नं.१ माथि छलफल गर्दा World Bank को सहयोगमा सञ्चालन हुन लागेको तिलोत्तमा नगरपालिका वडा नं.-०७, ०९, र १० मा पर्ने मंगलापुर वेवरा सडक निर्माण तथा स्तर उन्नती सम्बन्धी योजनाको यथा शिघ्र टेण्डर प्रक्या अगाडी बढाउन को लागि शहरी विकास विभाग अन्तरगत NUGIP Project सम्बन्ध एकाई समक्ष अनुरोध गर्ने साथै योजना सञ्चालनको क्रममा आवश्यक सहयोग, समन्वय तथा सहकार्य यस नगरपालिका, सम्बन्धीत वडा कार्यालय, नेपाल विद्युत प्राधिकरण, नेपाल टेलीकम, खानेपानी उपभोक्ता समिति लगायतबाट गर्ने प्रतिवद्धता समेत रहेको जानकारी गराउने निर्णय गरियो ।

प्रदिप पौड्याल
प्रमुख प्रशासकीय अधिकृत

बासुदेव घिमिरे
नगर प्रमुख

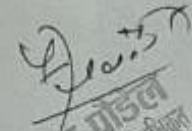


निर्णय नं. २

प्रस्ताव नं. २ माथि छलफलगर्दा उक्त योजनाको लागि तयार गरिएको DPR मा सडक बत्तिको पोलको लम्बाई ८ मीटर रहेको बुझिएकोले ८ मी. को लम्बाई प्रयाप्त नगर्ने हुँदा ११ मी. लम्बाई नघटनेगरी DPR संशोधन गर्न अनुरोध गर्ने निर्णय गरियो ।

निर्णय नं. ३

प्रस्ताव नं. ३ माथि छलफल गर्दा DPR मा समावेश भएको सम्पूर्ण खानेपानी सम्बन्धी कार्य डिजाइन अनुसार नै सम्बन्धीत खानेपानी उपभोक्ता समितिको सहयोग तथा समन्वयमा निर्माण कार्य गराउने निर्णय गरियो ।


प्रद्युम पौडेल
नगर प्रशासकीय अधिकृत


वासुदेव घिमिरे
नगर प्रमुख

**ANNEX XII: ALTERNATIVE ROUTE FOR DIFFERENTLY ABLE
PERSON DURING CONSTRUCTION**

