

**INITIAL ENVIRONMENTAL EXAMINATION (IEE)
FOR
UPGRADING OF BUTWAL-GORUSINGHE ROAD (50 KM)
Kapilbastu and Rupandehi District, Lumbini Province, Nepal**

ANNEXEX



Submitted To:
Ministry of Physical Infrastructure and
Transport
Singhadurbar, Kathmandu, Nepal

Submitted Through
Geo-Environment and Social Unit,
Department of Roads
Chakupat, Lalitpur, Nepal
Email: gesunit@dor.gov.np

Submitted by:
Project Directorate (ADB)
Department of Roads (DoR)
Bishalnagar, Kathmandu, Nepal
Tel: 01-4437492, 4437493, 4414239;
Fax: 4437488
Email: pdadb@dor.gov.np



July, 2023

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Tel: 01-4437492, 4437493, 4414239;
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Email: pdadb@dor.gov.np



July, 2023

**Project Preparatory Consultant Under
SASEC Highway Improvement Project (SHIP- PPC)**

ADB Loan No. 3722 – NEP

Soosung Engineering Co. Ltd. (South Korea)

In association with

ERMC (P) Ltd. - Environment and Resource Management Consultant (Nepal)

and

TSE -Tech Studio of Engineering (Nepal)



Ref No: SS/TSE/ERMC/2020-22/263

Date: 19th June, 2023

To: Mr. Chuda Raj Dhakal
Project Director
Project Directorate (ADB)
Department of Roads

**Project: ADB Loan 3722-NEP: Project Preparatory Consultant, SASEC Highway
Improvement Project**

Subject: Submission of revised IEE Report of Butwal - Goringhe Road (50km)

Dear Sir,

With respect to your letter dated May 21, 2023 (Ref. No PD/SHIP-PPC/079/80/Cha. No. 1200), we would like to submit the revised IEE Report of Butwal – Goringhe Road (50 km). The report incorporates all the comments and suggestion mentioned by your good office.

Thanking you for your co-operation.

Regards,

Dr. CHOI Tae Hwa

Team Leader



- Attachment(s): 1. IEE of Butwal – Goringhe Road (50 km)- Report (Two Copies)
2. IEE of Butwal – Goringhe Road (50 km)- Annex (Two Copies)



Government of Nepal
MINISTRY OF PHYSICAL INFRASTRUCTURE & TRANSPORT
DEPARTMENT OF ROADS
PROJECT DIRECTORATE (ADB)

Phone: { 4537492
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Fax: 977-1-4537488
e-mail: pdadb@dor.gov.np

Bishalnagar
Kathmandu, Nepal

PD/SHIP-PPC/079/80/Cha. No: 1200

Date: May 21, 2023 (B.S. 2080-02-07)

Mr. Choi Tae Hwa

Team Leader

Soosung Engineering Co. Ltd., Korea in association with ERM (P) Ltd., (Environment and Resource Management Consultant), Nepal and Tech Studio of Engineering, Nepal
SASEC Highway Improvement Project-Project Preparatory Consultant (SHIP-PPC)
Bhakta Marga, Baluwatar-4, Kathmandu

Subject: ADB Loan No. 3722-NEP, Project Preparatory Consultant under SASEC Highway Improvement Project (SHIP-PPC): Comments on IEE Report of Butwal-Gorusinghe Road Section

Dear Mr. Choi,

Please find attached herewith the comments and suggestions on IEE report from GESU with cha. no. 763/2.2.2/079/80 dated B.S. 2080/02/07 on the IEE Study of Butwal-Gorusinghe (BG) Road under Project Preparatory Consultant SASEC Highway Improvement Project (SHIP-PPC). So, we request you to update and incorporate the comments in the reports accordingly.

Best regards.


Umesh Bindu Shrestha
Project Director

 Gopal Shrestha



भौतिक पूर्वाधार तथा यातायात मन्त्रालय

सडक विभाग

योजना तथा अनुगमन महाशाखा

भू-वातावरण तथा सामाजिक शाखा

स्थापना नं. ०५२२/०६

फोन नं. ५००५०२०

अवरमहल, काठमाण्डौ

हाल: पाटन ललितपुर

ई-मेल: gesuunit@dor.gov.np

वेब साईट: www.dor.gov.np

चलानी नं. ७६३/२.२.२/०७९/८०

मिति: २०८०/०२/०२

श्री आयोजना निर्देशनालय (ए.डि.बी.),
विशालनगर, काठमाण्डौ।

विषय: प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदनमा रायसुझाव दिईएको सम्बन्धमा।

उपरोक्त सम्बन्धमा तहाँ निर्देशनालय प्रस्तावक रहेको लुम्बिनी प्रदेश, कपिलवस्तु र रुपन्देही जिल्लामा पर्ने बुटवल-गोरूसिङ्गे सडक (५० कि. मि.) को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदनमा श्री भौतिक पूर्वाधार तथा यातायात मन्त्रालयको प.सं. ०७९/८०/२.३ च.नं. १६१ मिति २०८०/०२/०१ को पत्रबाट प्राप्त रायसुझावहरू (पाना २) यसै साथ संलग्न गरी पठाईएको छ। उक्त रायसुझावहरू बमोजिम प्रतिवेदन परिमार्जन गरी परिमार्जन गरिएको खण्ड, पृष्ठ र परिच्छेद देखाईएको तालिका सहितको प्रतिवेदन पेश हुन अनुरोध गरिन्छ।

पुष्पाञ्जली खनाल

शाखा प्रमुख
पुष्पाञ्जली खनाल
शाखा प्रमुख



नेपाल सरकार
भौतिक पूर्वाधार तथा यातायात मन्त्रालय
(वातावरण तथा सामाजिक शाखा)



पत्र सङ्ख्या: ०७९/०८०/२३

चलानी नं: १६१

श्री सडक विभाग,
भू-वातावरण तथा सामाजिक शाखा
चाकुपाट, ललितपुर।

मिति : २०८०/०२/०१

विषय: राय सुझाव समावेश गरी परिमार्जित प्रतिवेदन पठाइदिने सम्बन्धमा।

श्री सडक विभाग, आयोजना निर्देशनालय (ए.डि.बि.) प्रस्तावक रहेको- बुटवल गोरुसिंगे सडक खण्ड (५० कि.मि.) स्तरोन्नति, कपिलवस्तु र रुपन्देही जिल्ला, लुम्बिनी प्रदेशको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदनमा छलफल तथा प्रतिक्रियाको लागी श्रीमान् सह-सचिवज्यूको संयोजकत्वमा मिति २०८०/०१/३१ गते बसेको बैठकले दिएका सुझावहरु समावेश गरी परिमार्जित प्रतिवेदन पठाइदिनु हुन निर्देशानुसार अनुरोध छ। साथै सुझाव पाना १ पनि यसैसाथ संलग्न छन्।

२०८०/०२/०१

(शोभा भण्डारी)
समाजशास्त्री

MA X
212

आयोजना निर्देशनालय (इ. डि. बी.) प्रस्तावक शैको बुटवल - जोमसिङी मडक (५० कि.मी.) स्तरोन्नती, कपिलवस्तु र रूपन्देही जिल्ला, लुम्बिनी प्रदेशको प्राथमिक वातावरणीय परीक्षण प्रतिवेदनमा सुझाव समितिले दिएको सुझावहरू।

- १) Relocation cost and its plan (public utilities) detail मा उल्लेख गर्ने।
- २) source of construction material (quarry site) ROW मित्र ह approved quarry site के-कहाँ हो यो? यो कोटे खुलाउने।
- ३) Agricultural loss/standing crops को loss ले पार्ने प्रकार report मा उल्लेख गर्ने।
- ४) Tourism development को scope due to this road construction कोटे खुलाउने।
- ५) Top soil management को part पनि report मा उल्लेख गर्ने।
- ६) Bridge को part बाट study गर्न अर्को separate chapter बनाएर वातावरणीय विश्लेषण गर्न पर्ने।
- ७) construction period उल्लेख गर्ने।
- ८) Air pollution को content लाई विभिन्न phase of study calculate गर्नु पर्ने। कम हुन दिन mitigation plan के हो उल्लेख गर्नुपर्ने।
- ९) ऋक्को विच्छा पेश गर्न ROW को कति? उनको क्षेत्रको कति यसरी separate गरेर विच्छा उल्लेख गर्न पर्ने।
- १०) landslide prone area कोटे mitigation measures कोटे मा उल्लेख गर्ने।
- ११) PPMC and DLP clear गरेर उल्लेख गर्ने।
- १२) Cutting and fill volume clear गर्ने। Fill material कहाँ कहाँ व्यवस्थापन गर्ने, खुलाउने।
- १३) U-turn कोटे report मा उल्लेख गर्ने (public concern)
- १४) public toilet को व्यवस्थापन पनि कसरी हुन्छ? खुलाउने।
- १५) Training को part लाई need assessment गर्न पर्ने।

Compensatory plantation को लागू चाहिए वज्रा कोटे से
08+ मा उठलेव गर्ने । यसको व्यवस्थापन को उठलेव
गर्ने ।

मौलिक पूर्वाधार तथा आवागमन
मन्त्रालय

ANNEX

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ANNEX I: TOR APPROVAL LETTER



भौतिक पूर्वाधार तथा यातायात मन्त्रालय

सडक विभाग

योजना तथा अनुगमन महाशाखा

भू-वातावरण तथा सामाजिक शाखा

संस्थापन नं. ५५२२१०३

फोन नं. ५००५५२०

गबरमहल, काठमाण्डौ

हाल: पाटन ललितपुर

ई-मेल: gesuunit@dor.gov.np

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चलानी नं. ४७५/२.२/०७८/७९

मिति: २०७८/११/१३

श्री आयोजना निर्देशनालय (ए.डि.बि.)
विशालनगर, काठमाण्डौ।

विषय: प्रारम्भिक वातावरणीय परीक्षणको कार्यसूची स्वीकृत भएको सम्बन्धमा।

प्रस्तुत विषयमा तहाँ निर्देशनालय प्रस्तावक रहेको लुम्बिनी प्रदेश, रुपन्देही र कपिलवस्तु जिल्लाको बुटवल-गोरिसङ्गे सडक (५० कि. मि.) को प्रारम्भिक वातावरणीय परीक्षणको कार्यसूची श्री भौतिक पूर्वाधार तथा यातायात मन्त्रालयको सचीवस्तरीय निर्णयबाट मिति २०७८/०८/२३ मा शर्त सहित स्वीकृत भएको व्यहोरा सोही मन्त्रालयको प.सं. ०७८/७९/२.३ च.नं. १३२ मिति २०७८/०८/२६ को संलग्न पत्रबाट जानकारी हुन आएको व्यहोरा अनुरोध गरिन्छ। साथै स्वीकृत कार्यसूची परामर्शदातासँग पटक पटक माग गरिदा पनि प्राप्त नभएकोले यस शाखालाई १ प्रति स्वीकृत कार्यसूची उपलब्ध हुन समेत यसै पत्रबाट अनुरोध गरिन्छ।

सि.उ.आ.वि. (२११)

११/१३

११/१३

पुष्पाञ्जली खनाल
शाखा प्रमुख

११/१३



नेपाल सरकार

भौतिक पूर्वाधार तथा यातायात मन्त्रालय
(वातावरण तथा सामाजिक शाखा)



URL : www.moppw.gov.np
email : info@moppw.gov.np

फोन नं. ४२११८८०
४२११९३१
४२११६५५

फ्याक्स नं. ४२११७२०
सिंहदरबार, काठमाडौं,
नेपाल

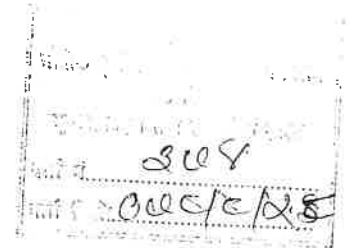
पत्र सख्या : ०७८/०७९/२३

चलानी नं. : १३२

मिति : २०७८/०८/२६

विषय: प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्यसूची (TOR) स्वीकृति भएको सम्बन्धमा ।

श्री सडक विभाग,
भू-वातावरण तथा सामाजिक शाखा,
चाकुपाट, ललितपुर ।



प्रस्तुत विषयमा तह्राँबाट स्वीकृतिको लागि पेश भएको, सडक विभाग, आयोजना निर्देशनालय (ADB) प्रस्तावक रहेको लुम्बिनी प्रदेशको रुपन्देही र कपिलवस्तु जिल्लामा अवस्थित बुटवल-गोरुसिङ्गे सडक (५० कि. मि.), रुपन्देही र कपिलवस्तु स्तरोन्नतिको लागि प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्यसूचीमा उल्लेख गरिएका असर तथा प्रभावहरुका अलावा प्रतिवेदन तयारीका समयमा अन्य असर तथा प्रभावहरु देखा परेमा सो पनि समावेश गर्नुपर्ने शर्तमा उक्त आयोजनाको प्रारम्भिक वातावरणीय परीक्षणको कार्यसूची नेपाल सरकार (सचिवस्तर) को मिति २०७८/०८/२३ को निर्णयानुसार स्वीकृत भएको व्यहोरा अनुरोध छ ।

२०७८/०८/२६

(शोभा भण्डारी)
समाजशास्त्री

१/४ ५
२०७८/०८/२६
८/२६

ANNEX II: APPROVED TOR



Government of Nepal

Ministry of Physical Infrastructure and Transport



TERMS OF REFERENCE OF INITIAL ENVIRONMENTAL EXAMINATION (IEE) FOR UPGRADING OF BUTWAL- GORUSINGHE ROAD (50 KM)

Rupandhehi and Kapilbastu District, Lumbini Province, Nepal



Submitted To:

Ministry of Physical Infrastructure and Transport
Singhadurbar, Kathmandu, Nepal
Ph No: 01-4211732, Email: info@gmail.gov.np

Submitted Through:

Geo-Environmental and Social Unit (GESU)
Department of Roads,
Chakupat, Lalitpur, Nepal
Ph No: 01-5005520
Email: gesunit@dor.gov.np

Proponent:

Project Directorate (ADB)
Department of Roads (DoR)
Bishalnagar, Kathmandu, Nepal
Tel: 01-4437492, 4437493, Fax: 4437488
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Consultant:

Soosung Engineering Consulting In association
with **ERMC-TSE**, Baluwatar, Kathmandu Nepal.
Tel: +977-1-4433384
Email: ship.tse@gmail.com

December, 2021



Government of Nepal

Ministry of Physical Infrastructure and Transport



TERMS OF REFERENCE OF INITIAL ENVIRONMENTAL EXAMINATION (IEE) FOR UPGRADING OF BUTWAL- GORUSINGHE ROAD (50 KM)

Rupandhehi and Kapilbastu District, Lumbini Province, Nepal



Submitted To: Ministry of Physical Infrastructure and Transport Singhadurbar, Kathmandu, Nepal Ph No: 01-4211732, Email: info@gmail.gov.np	Submitted Through: Geo-Environmental and Social Unit (GESU) Department of Roads, Chakupat, Lalitpur, Nepal Ph No: 01-5005520 Email: gesunit@dor.gov.np
Proponent: Project Directorate (ADB) Department of Roads (DoR) Bishalnagar, Kathmandu, Nepal Tel: 01-4437492, 4437493, Fax: 4437488 Email: pdadb@wlink.com.np	Consultant: Soosung Engineering Consulting In association with ERMCTSE, Baluwatar, Kathmandu Nepal. Tel: +977-1-4433384 Email: ship.tse@gmail.com

December, 2021

ABBREVIATION / ACRONYMS

ADB	Asian Development Bank
amsl	Above Mean Sea Level
CF	Community Forest
CFUG	Community Forest Users Group
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DoR	Department of Roads
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environment Protection Act
EPR	Environment Protection Rule
ERMC	Environment and Resource Management Consultant
EWB	East West Highway
GoN	Government of Nepal
Ha	Hectare
IRI	International Roughness Index
km	Kilometer
LPG	Liquefied Petroleum Gases
IEE	Initial Environmental Examination
IUCN	International Union for Conservation of Nature
m	Meter
MoFE	Ministry of Forests and Environment
MoPIT	Ministry of Physical Infrastructure and Transport
NDWQS	National Drinking Water Quality Standards
Nos.	Number
NPHC	National Population and Housing Census
NRs.	Nepali Rupees
SASEC	South Asia Sub-regional Economic Cooperation
SDI	Surface Distress Index
SDFO	Sub Divisional Forest Office
SHIP	SASEC Highway Improvement Project
sq.km.	Square Kilometer
ToR	Terms of Reference
TSE	Tech Studio of Engineering



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1 NAME AND ADDRESS OF THE PERSON/INSTITUTION PREPARING THE REPORT

The project proponent (Project Directorate (ADB), Department of Roads) has assigned Soosung Engineering Co. In association with ERMC-TSE, Baluwatar, Kathmandu Nepal as a Project Preparatory Consultant for SASEC Highway Improvement Project, carry out IEE and prepare the ToR report of the Butwal-Goringhe (50 km) Road Project of East-West Highway is one of the component of the whole services.

1.1 Project Proponent

The proponent of the proposed Butwal-Goringhe Road Section of East-West Highway is Government of Nepal, Ministry of Physical Infrastructure and Transport, Department of Roads, Project Directorate (ADB).

1.2 Detail Address of the Proponent

Department of Roads
Project Directorate (ADB)
Bishalnagar, Kathmandu, Nepal
Telephone Number: 01-4437492, 4437493, 4414239;
Fax Number: 4437488
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1.3 Detail Address of the Consulting Firm

Soosung Engineering Co. In association with
ERMC-TSE, Baluwatar, Kathmandu Nepal.
Tel: +977-1-4433384
Email: ship.tse@gmail.com

2 INTRODUCTION OF THE PROPOSAL

East-West Highway is the main domestic as well as international trade corridor of Nepal forming South Asia Association for Regional Cooperation (SAARC) corridor. Hence, the SASEC Highway Improvement Project (SHIP) will support capacity, quality, and safety improvements of the East-West Highway (EWH).

The Government of Nepal (GON) is working towards accelerating the economic development of the country while redressing regional imbalances and inequalities. Recognizing that access to road transport is from key determinant of economic opportunity and delivery of social service. Asian Development Bank (ADB), which has played a leading role in advancing Nepal's transport sector from early 1970s, has instituted a comprehensive Country Partnership Strategy for Nepal that place, at its core, environmentally and socially responsible development of the road sector. In this context, GON has received a loan from the Asian Development Bank (ADB) for the SASEC Highway Improvement Project (SHIP). It intended to engage international firm in association with domestic consultant (the consultant) to undertake preparatory activities for the processing of new loan or grant project for funding by ADB or other bilateral or multilateral development institutions. For the preparatory activities, the contract was made on August 24, 2020 between Government of Nepal, Ministry of Physical Infrastructure and Transport, Department of Roads, Project Directorate (ADB) (hereinafter referred to The Client) and SOOSUNG Engineering Co. in association with Environment and Resource Consultant (ERMC) and Tech Studio of Engineering (TSE) (hereinafter referred to The Consultant).

The proposed Road under SASEC Highway Improvement Project will upgrade 270.00 Km of East West Highway including bridges among them Butwal -Goringhe road is 50 Km.

The improvement of road and bridges may have environmental impacts depending on the location, size and extent of the project. To address such impacts as well as inclusion of appropriate mitigation measures, an Initial Environmental Examination (IEE) Study is required. The environmental studies has been carried out by the consultant in accordance with the requirements of the Government of Nepal Environmental Protection Act, 2076 and Environmental Protection Rules, 2077 and ADB's Safeguard Policy Statement (2009) and ADB's Environmental Assessment Guidelines (2003), DOR Environmental and Social Management Framework (revision 2013).

2.1 Relevancy of the Proposal

The proposal is of the service delivery type (Transportation service) for upgrading/widening of existing road of the national highway from present two lane road to four lane from Butwal to Goringhe for a total 50.0 km. East West Highway is the main domestic as well as international trade corridor of Nepal forming South Asia Association for Regional Cooperation (SAARC) corridor. The proposed project will support capacity, quality, and safety improvements of the East-West Highway (EWH). It can be further linked with other Asian Highway Network. The proposed East-West Highway is the part of the Asian Highway 2 (AH2). Further, this road section will be upgraded to the Asian Highway Standard.



2.2 Brief Description of the Project

Butawal - Gorusinghe Road Section of East West Highway starts from end of the Tinau Bridge at Butwal and ends at Gorusinghe (Budhi). This road section is 50 km in length. Most of the section the width of existing road is 8.00 m including 6 m wide carriageway and 1m shoulder on both sides. Initial section, the alignment passes through the foot of the hillock, further the road passes through plain area. There are major junctions at Jitgaddhi, Char-number Chowk, Bangai and Gorusinghe and there are twelve minor junctions which need to be upgraded. From 611+800 to 617+900 (Pipara) and from Kaila Khola Bridge (627+200) to Gorusinghe junction (634+900) the alignment passes through dense forest area. Major roadside tree cutting is required in this section while upgrading the road. There are relatively minimum obstacles such as buildings, houses within the ROW. However, there are number of bus waiting shed, resting place (*Chautari*), electrical poles and cables and telecommunication facilities within the ROW have to be relocated during expansion of the road.

Pavement condition is good to fair. Traffic sign, delineator post, road painting, crash barrier are in poor condition. At many places, damage of pavement was found due to the poor surface drainage management. Most of the sections don't have longitudinal drainage facilities. There is drainage system in the city area only.

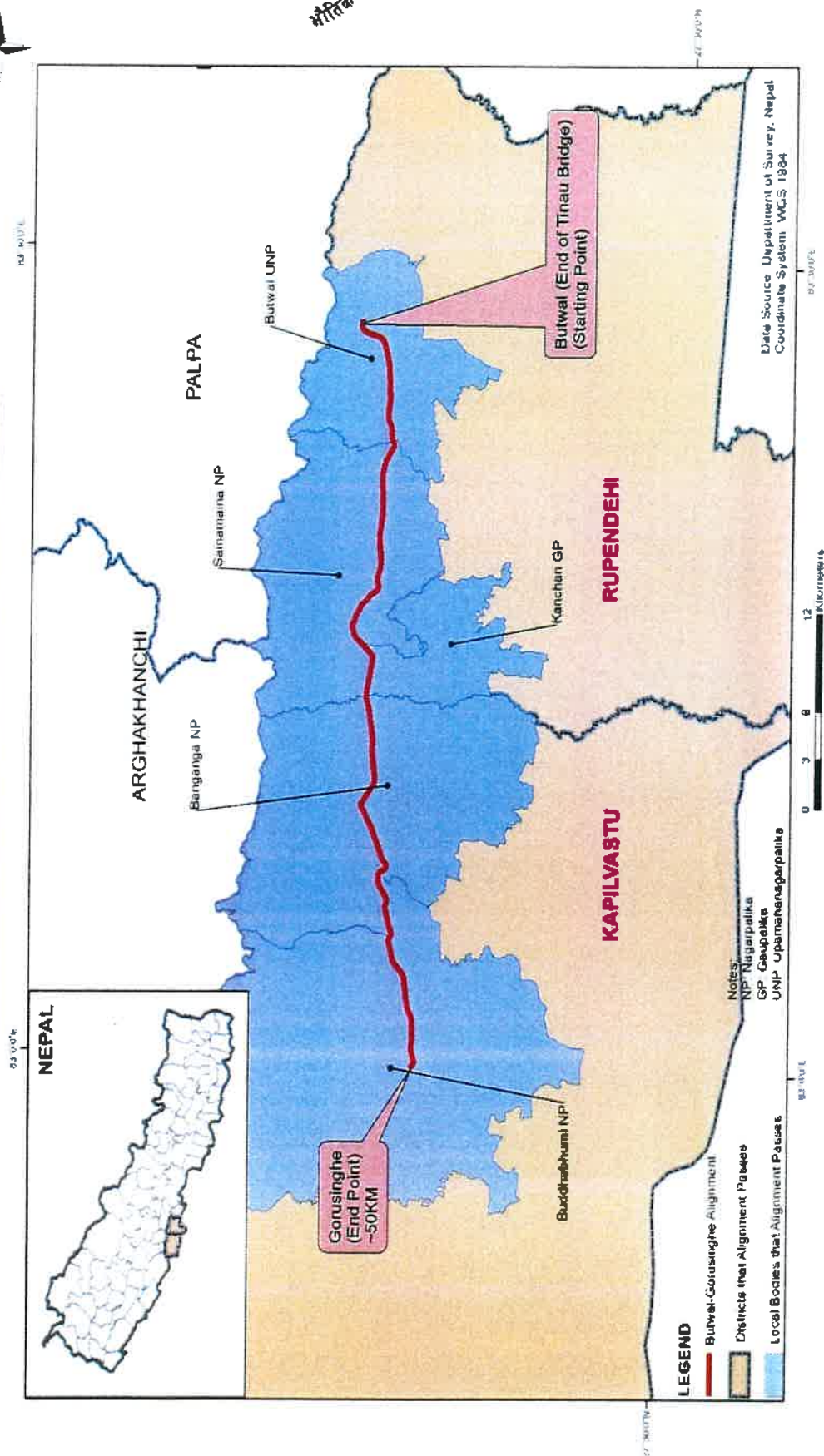
In the road alignment there are 32 existing minor and major bridges. Among them Badganga Bridge is the longest bridge with length of 290 m. Out of 32, 24- numbers are of RC T-beam construction, one number at Kaila Khola (47/H001/310) is of pre-stressed T-Beam construction, 6-Bridges are of solid slab and one box-type construction.

Project Location and Accessibility: The project area lies between 27°42'14.80"N Latitude and 83° 27'36.87"E Longitude at Butwal to 27°39'18.85"N Latitude and 83° 0'2.79"E Longitude at Gorusinghe. Butwal is at the intersection of Nepal's two different National Highways, Mahendra Highway and Siddhartha Highway. It connects western Nepal with the capital Kathmandu through the highway and air links (via the airport at Siddhartha Nagar). The proposed Butawal - Gorusinghe Road is located in Rupandehi and Kapilbastu district of Lumbini Province. The location and topo map of proposed road alignment is shown in the **Figure 1.**



TERMS OF REFERENCE
Initial Environmental Examination (IEE) Study of Butwal- Goringthe Road

Location Map of Alignment Showing Local Bodies



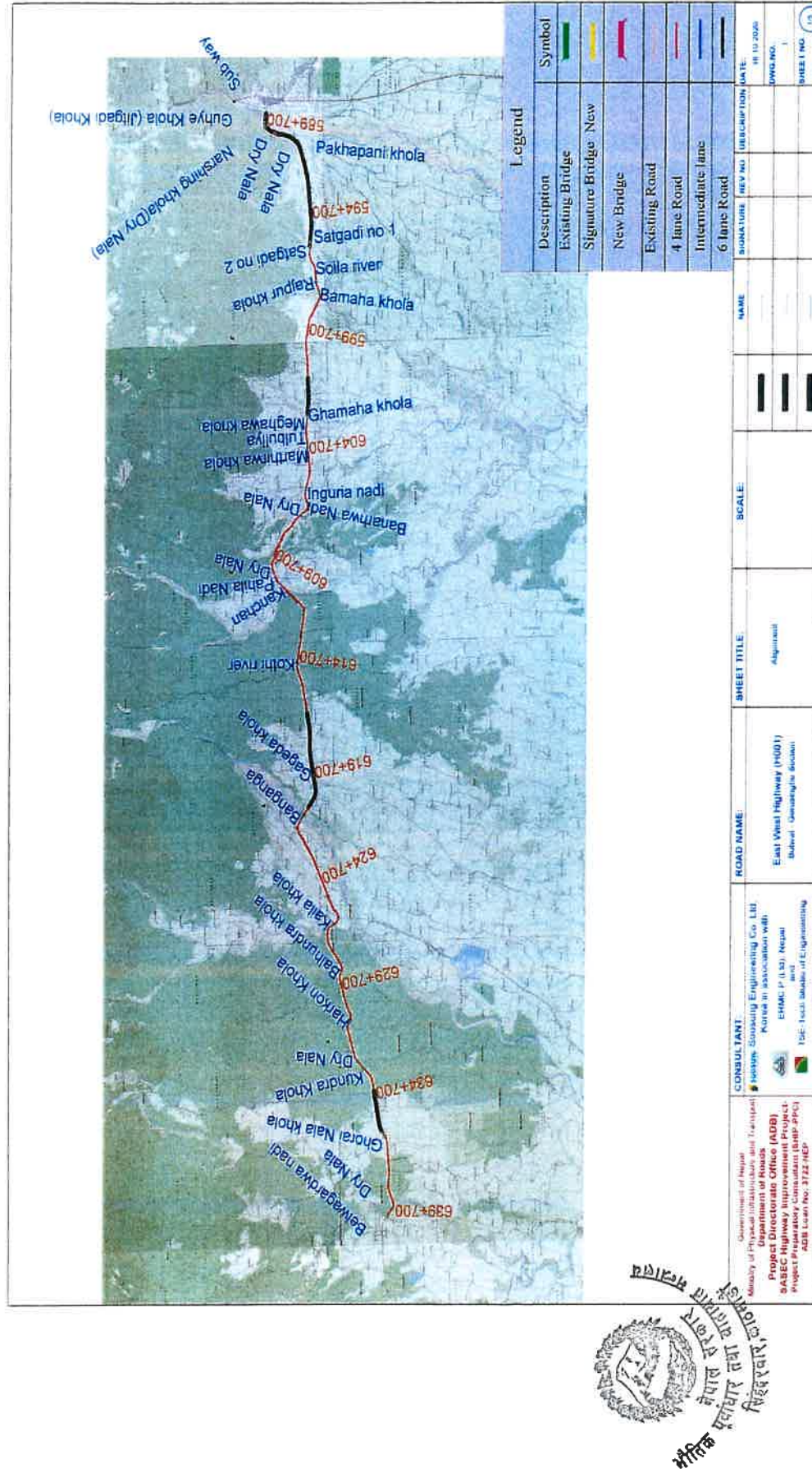


Figure 1: Topo Map of Proposed Road

The detail salient features of the proposed road have been given in **Table 1**.

Table 1: The salient features of the proposed road

Name of the Project	Upgrading in 4 Lane of Butwal – Gorusinghe Road (50 Km)
Province	Lumbini
District	Rupandehi and Kapilbastu
Affected Municipality	Butwal Sub-metropolitan City, Sainamaina Municipality, Kanchan Rural Municipality, Banganga Municipality, Buddhabhumi Municipality
Geographical Feature	Terai
Geology	Plain / Rolling
Climate	Tropical / Sub-tropical
Altitude	118m - 165m amsl
Total Length	50Km
Geographical Location	Starting Point: Latitude: 27°42'14.80"N and Longitude: 83° 27'36.87"E End Point: Latitude: 27°39'18.85"N and Longitude: 83° 0'2.79"E
Starting Point	Tinau Bridge (589+700)
End Point	Gorusinghe (Budhi) – 639+700
Road Standard	National Highway
Right of Way	50 m (25 m on either side from center line of the road)
Carriage way Width, Shoulder	In urban case: 50m for 4-lanes divided with paved shoulders with both way service lane, In semi urban case: 33m for 4- lane divided with paved shoulders with both way additional lane for facilitating mix traffic condition, and In rural case: 24m for 4-lane divided with paved shoulder.
Design speed	100 in plane terrain and 80 in rolling terrain km/hr
Maximum gradient	4% for Plane Terrain and 5% for Rolling Terrain
Surface Type	Asphalt Concrete/ Cement Concrete
Type of work	Upgrading
Side Drain Slope	Min 0.50%
Camber of Carriageway and Service Road	2%



Name of the Project	Upgrading in 4 Lane of Butwal – Gorusinghe Road (50 Km)
Camber of Shoulder	3%
Minimum radius in horizontal curve	350 m for Plane Terrain and 210 m for Rolling Terrain
Minimum 'K' Value in vertical curve (Summit/Valley)	427/ 236 for Plane Terrain and 231/ 111 for Rolling Terrain
Limitation of Maximum Gradient Length of above average gradient	For Plain Terrain: 3%-900 m, 4%-700 m For Rolling Terrain: 4%-800 m, 5%-600,
Minimum Stopping Sight Distance	190 m for Plane Terrain and 130 m for Rolling Terrain
Dimensions (width x length) of Lay-byes / Passing Zones (m x m)	In urban case: Carriageway 6-lane- 2x7.5m Paved Shoulder- 2x2.50m (with Rumble Strip as required) with Central Median - 3.00m, 6.50 m service lane with 3.00 m Side Median and 4.00 m Foot Path. In semi urban case: Carriageway 4-lane- 2x7.5m Paved Shoulder- 2x2.50m (with Rumble Strip as required) with Central Median of - 3.00m and 3.50 m additional lane with 1.00 m lane separator. In rural case: Carriageway 4-lane- 2x7.5m Paved Shoulder- 2x2.50m (with Rumble Strip as required) with Central Median - 3.00m.
Total Bridge	32 minor and major Bridges
Culverts	121 Nos
Approximated Earthworks Quantity	
Cutting volume	482,588.00 Cum
Filling Volume	1,686,694.00 Cum
Total Construction Period	Road Construction Construction period 3 years, DLP 12 months
Preliminary Project Cost	NRs. 12,564,918,143.00

Source: Feasibility Report of Butwal –Gorusinghe Road, 2021

Pavement

Pavement will be design to with stand the traffic volume and axle load for 20 years period. Adequate drainage will be provided below the pavement layers and sub-grade level. Pavement layers in general will consist of granular sub-base, crushed stone base and asphalt concrete. Capping layer of suitable material will also be provided in those areas, where deemed necessary. Pavement will be designed as per Pavement Design Guidelines (Flexible Pavement)-2014 (Second Edition 2021), published by Department of Roads, Overseas Road Note 31 published by Transport Research Laboratory of UK or as per IRC 37: 2001 guidelines published by Indian Road Congress.

The bituminous surface pavement (Asphalt) will be designed to meet the expected traffic level and sub-grade strength. The design of the Intersections for access to approach for other connecting roads will to be provided to ensure the safety of vehicles diverging from or merging into high speed road. Intersection will be considered for major feeder roads, minor feeder roads, district roads. Road furniture will be provided in the form of road signs, crash barriers, road markings, delineators, foot paths, covered side drains.

Depending upon the development of the urban and market area along the road side major three types of cross-sections are proposed to upgrade the existing road.

- Cross-section for urban areas
- Cross-section for semi-urban areas
- Cross-section for rural areas



Cross-section for urban areas: For enhancement of urban environment and drain off the storm water three nos of longitudinal green belt and four nos of longitudinal drain has been proposed in this type of cross-section. In spite of the main dual carriage way of the width of 7.50 m each with central median of 3.00 m and both side shoulder 2.50m, in both side of the main dual carriage way a 6.50 m service lane has also proposed with median between main dual carriage way and service lane. Then after a 4.00 m width is proposed for foot path and cycle lane. Total width of urban area cross-section is 50.00m. (Carriageway 4-lane- 2x7.5m Paved Shoulder- 2x2.50m (with Rumble Strip as required) with Central Median - 3.00m, 6.00 m service lane with 3.00 m Side Median and 4.00 m Foot Path.

Cross-section for semi-urban areas: For accommodation of the semi-urban area traffic like tractors, three wheelers, motorcycles, etc., an additional lane in both side of main dual carriage way of the width of 7.50 m each with central median of 3.50 m and both side shoulder 2.50m, has proposed. Side drain for this cross-section has proposed as per requirement. A 1.00 m width lane separator between main dual carriage way and additional lane also proposed. The total width of the semi urban area cross-section is 33.00m (Carriageway 4-lane- 2x7.5m Paved Shoulder- 2x2.50m (with Rumble Strip as required) with Central Median of 3.00m and 3.50 m additional lane with 1.00 m lane separator and 0.50 m verge).

Cross-section for rural areas: The total width of the semi urban area cross-section is 24.00m (Carriageway 4-lane-2x7.5m Paved Shoulder-2x2.50m (with Rumble Strip as required) with Central Median - 3.00m). Main dual carriage way of the width of 7.50 m each with central median of 3.00 m and both side shoulder 2.50m.

All three types of cross section is shown in the **Figure2, Figure 3, and Figure 4.**

Table 2: Proposed Carriageway for Urban area and Rural Area

Link Road		Butwal-Bamaha Khola	Bamaha Khola-Kothi River	Kothi River-Jitpur	Jitpur-Gorusinghe	Gorusinghe-Chandrauta
		H0146	H0147	H0148	H0149	H0150
Urban Area	Carriageway	4	4	4	4	4
	Service Road	2	2	2	2	2
Rural Area		4	4	4	4	4

Bridges

Different types of superstructures for bridges will be required for design such as RCC T Beam, PSC Girder, IPC Girder, PSC Box Girder, etc. DOR Nepal Bridge Standards — 2067 will be the main guideline for the design of bridges. All bridges shall be designed for a discharge of 100 yrs. return period. For the calculation of design discharge empirical formulas especially developed for other catchments shall not be used. All bridges shall be designed as per IRC loadings.

Culverts

All existing culverts will be tested for capacity adequacy and accordingly inferior culverts will be modified. New culverts will be designed for 50 years return period of flood.

Side Drain

Type and size of side drain will be selected on the basis of 20 years return period of flood. It may be open drain, covered drain, masonry drain or RCC drain as per site requirement and safety guidelines.

Retaining Structures

Different types of retaining walls are proposed in the design of road such as Gabion wall, Stone Masonry wall, Reinforced Concrete wall and Geogrid Reinforced Retaining wall as required at site. Geogrid reinforced retaining wall is also known mechanically stabilized earth wall is the application of geogrid of different strength as per need for the stabilization of high fill embankment. Height of wall may be up to 15 m, so high tensile strength geogrid is used in this structure basically ultimate tensile strength ranging from 192 KN/m to 600 KN/m.

All retaining structures are designed for design life of 50 years.

Protection Works

Protection works will be provided in all vulnerable areas like upstream and downstream areas of culverts, bridges, river banks, road sides and other special structures, all protection structures will be designed for design life of 50 years



TERMS OF REFERENCE
 Initial Environmental Examination (IEE) Study of Butwal- Gorusinghe Road

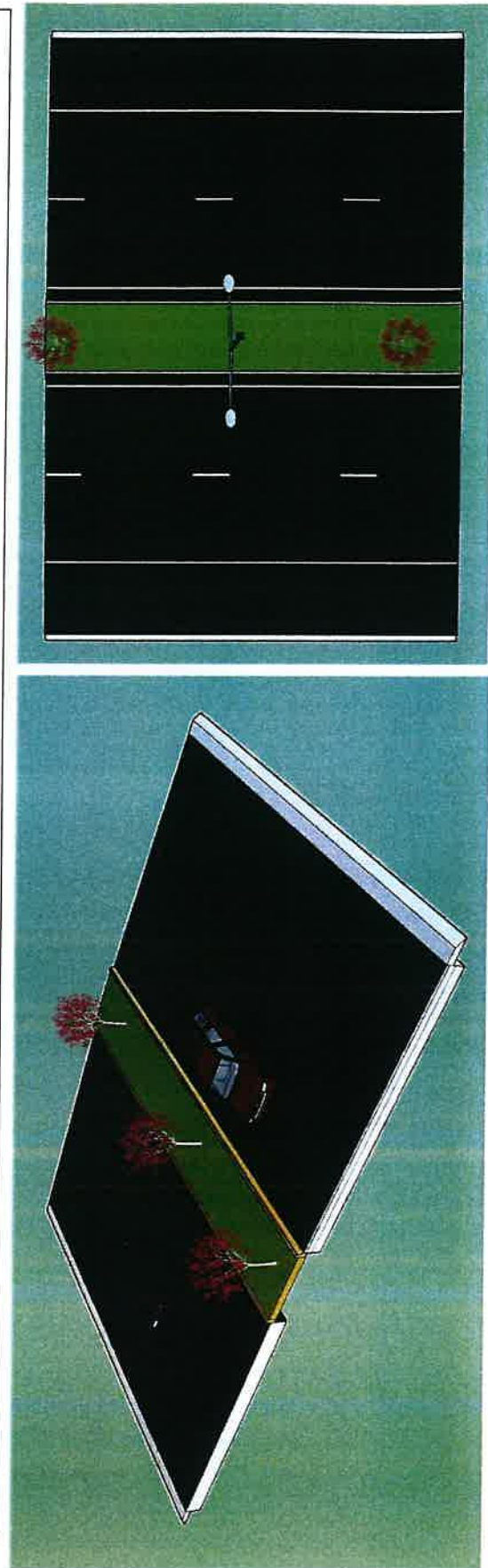
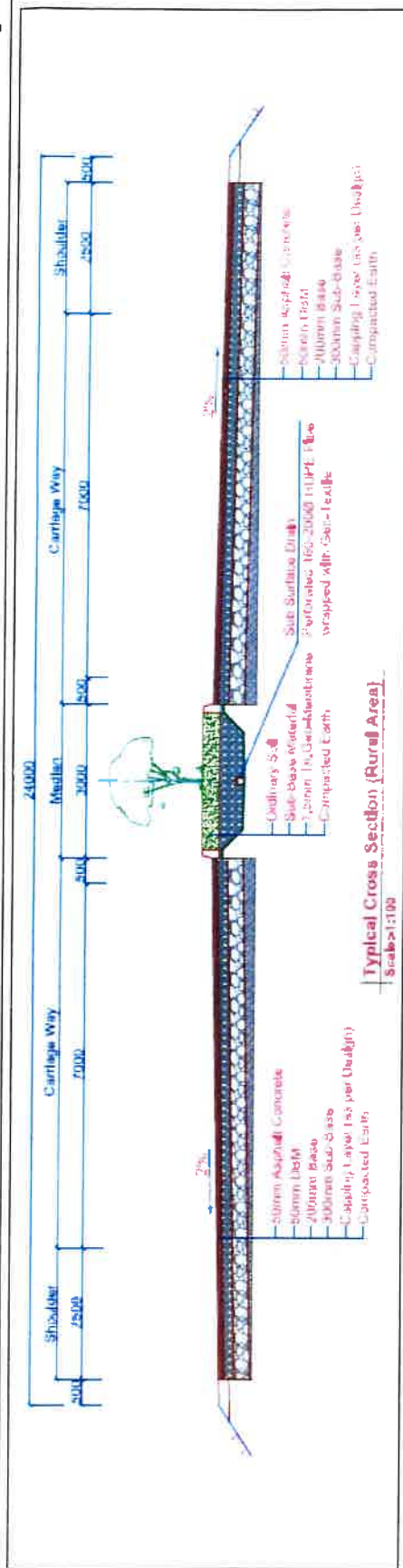


Figure 2: Typical Design of Rural Area (4 Lane Road)

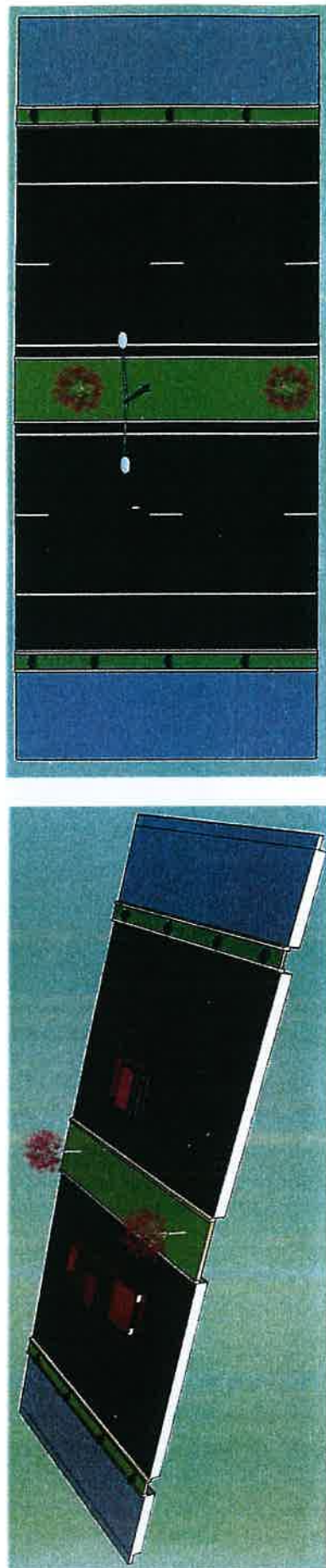
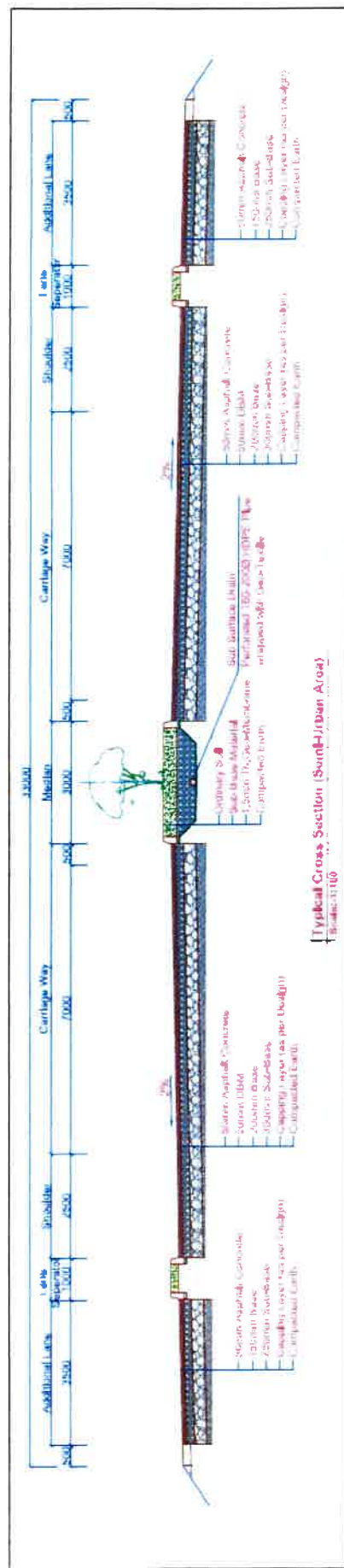


Figure 3: Typical Design of Semi-Urban Area (Intermediate Lane)

TERMS OF REFERENCE
Initial Environmental Examination (IEE) Study of Butwal- Goringhe Road

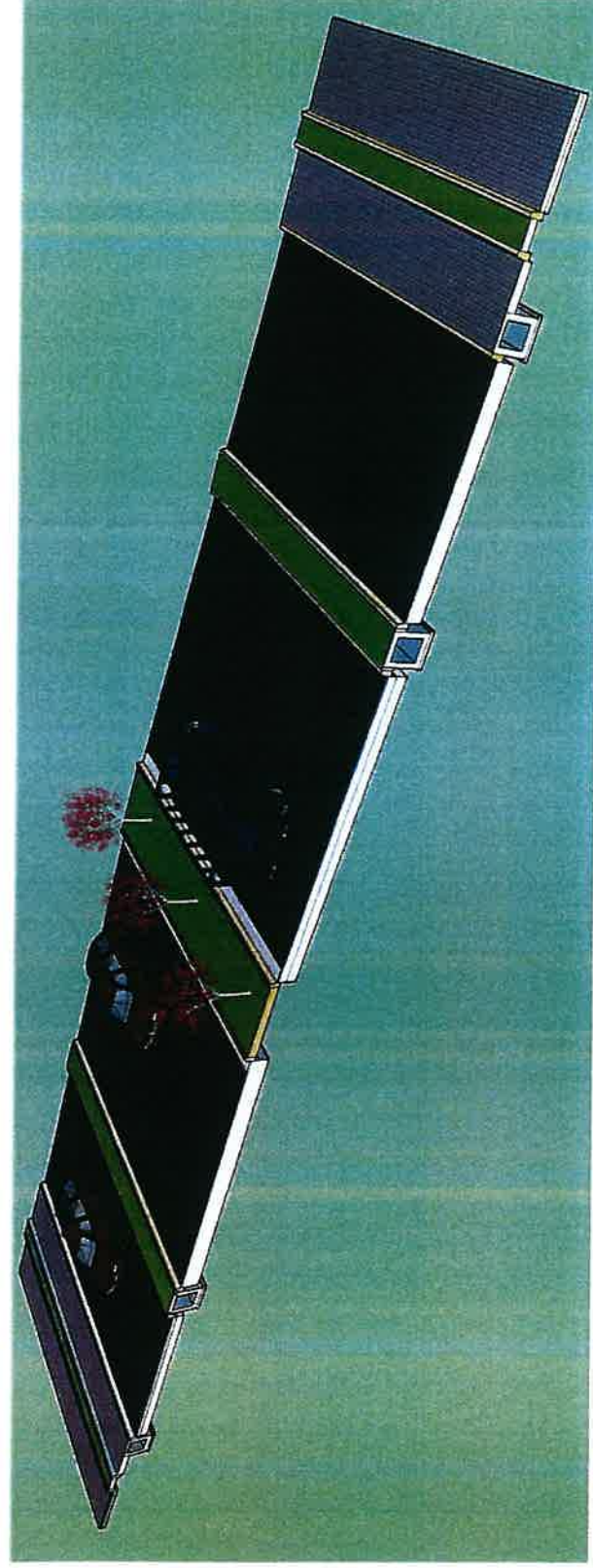
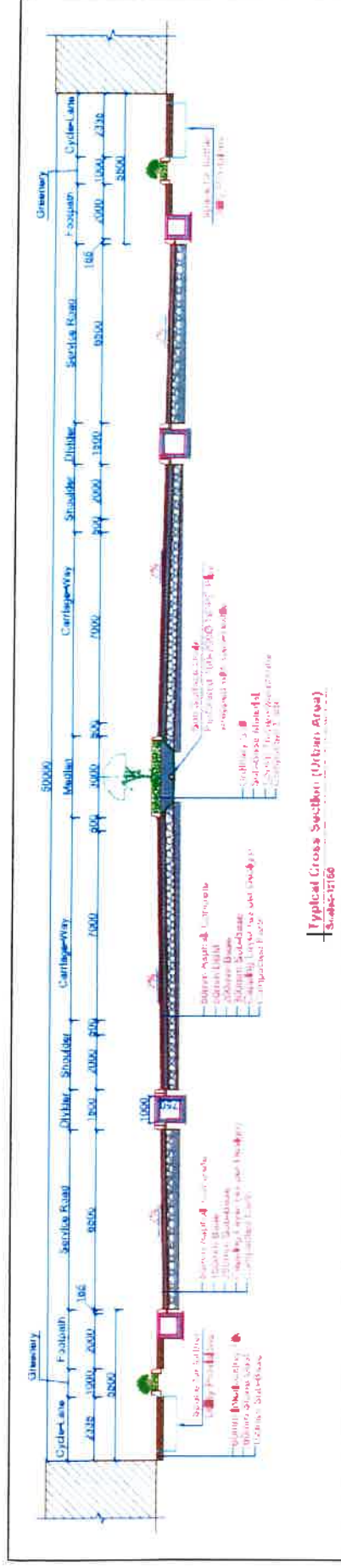


Figure 4: Typical Design of Urban Area (6 Lane Road)

2.2.1 Brief Existing Environment Condition of Proposed Road

Topography and Geology: The project area lies in Terai, with elevation of 118 to 165 m amsl (above mean sea level). Soils along the road section are mostly of residual or old alluvial deposits, represented by boulder and cobble, sands and silts. Soils are mostly stable, but it is possible their erosion mostly along river banks. Due to high embankment, embankment erosion was notice in the project area. River bank erosion also notices in different locations. The Google Map and Topographical Map showing road alignment has been given in Annex-I.

Climate: The road lies in tropical and sub-tropical climate zone. Due to major difference in maximum and minimum temperature summer is very hot whereas winter is more foggy and cold. The average temperatures in winter are around 15 °C (59 °F). By March, the temperature rises considerably and it begins to be hot, while from April to June it's scorching hot, and highs can reach or exceed 40 °C (104 °F), 80% of the net rainfall occurs in rainy season, whereas average annual rain fall is 1699.6 mm.

Land Use Pattern: Within 50 meters of Right of Way (RoW) of the road alignment, there are forest and barren land, agriculture land and settlement land, and river. The detail is given in Table 3.

Table 3 : Land use type along the proposed road alignment

Chainage		Length (m)	Land use Type
From	To		
589+700	591+230	1600	Settlement
591+240	609+500	18260	Settlement
609+500	610+700	1200	Forest + Cultivated land, Settlement
610+700	611+870	1170	Settlement
611+870	617+730	5860	Forest
617+730	617+900	170	Settlement
611+900	618+000	6100	Agriculture Land
618+000	621+200	3200	Settlement
621+200	621+600	400	Agriculture Land
621+600	621+860	260	Forest
622+120	626+840	4720	Settlement
626+840	626+970	130	Agriculture Land
626+970	627+100	130	Forest
627+200	635+200	8000	Forest
635+200	636+420	1220	Settlement
636+420	637+000	580	Agriculture Land
637+000	637+720	720	Agriculture Land
637+720	639+000	1280	Forest
639+000	639+050	50	Settlement
639+050	639+700	650	Forest

Source: Field Survey 2021

Major river of Butwal- Gorusinghe Road Section is Banganga. List of major rivers and rivulets (Kholas and Kholsies) crossed by the road alignment is presented in Table 4. Banganga River is perennial, it is characterized by large floods with heavy suspended loads during the

monsoon from June to September. Some small rivers and streams originated from Siwalik Hills are prone to flash floods during monsoon but have no flow rest of the time.

Catchments of the project area have been delineated by GIS and checked by overlapping them on Google Earth Professional. Following Figure shows the catchment area of the river of proposed road.

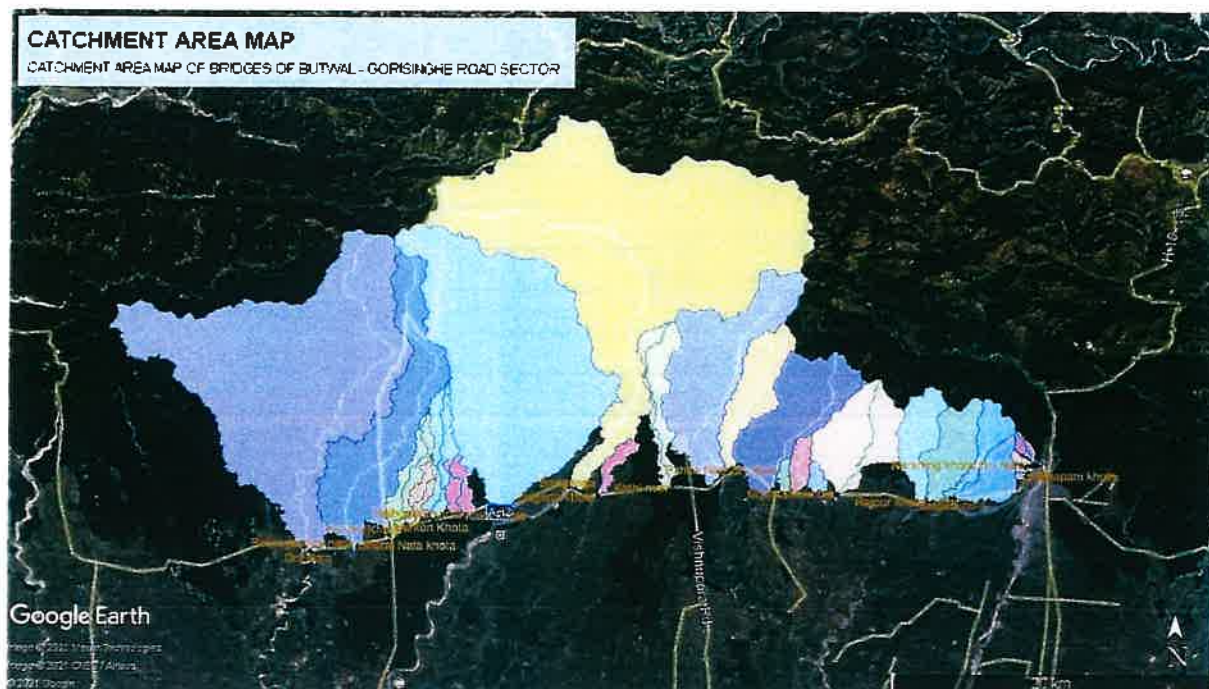


Figure 5: Catchment area of River of Butwal-Gorusinghe Road

The detail list of rivers is given in Table 4.

Table 4: List of Rivers along the road

SN	Bridge Identification	Existing Bridge Parameters		
		Name of Bridge	Type of Bridge	Total Length
1	46-H001-286	Sub way	RCC slab	6.70
2	46-H001-287	Guhye Khola (Jitgadi Khola)	RCC Girder	21.30
3	46-H001-288	Narshing khola (Dry Nala)	RCC Girder	16.30
4	46-H001-289	Dry Nala	RCC Girder	7.24
5	46-H001-290	Dry Nala	RCC slab	8.30
6	46-H001-291	Pakhapani khola	RCC slab	9.60
7	46-H001-292	Satgadi no 1	RCC slab	64.29
8	46-H001-293	Satgadi no 2	RCC slab	28.60
9	46-H001-294	Soila river	RCC slab	13.14
10	46-H001-295	Rajpur khola	RCC slab	26.35
11	46-H001-296	Bamaha khola	RCC slab	32.36
12	46-H001-297	Ghamaha khola	RCC slab	50.60
13	46-H001-298	Tulbuliya	RCC slab	42.90



SN	Bridge Identification	Existing Bridge Parameters		
		Name of Bridge	Type of Bridge	Total Length
14	46-H001-299	Marthirwa khola	RCC slab	16.35
15	46-H001-300	Meghawa khola	RCC slab	21.20
16	46-H001-301	Inguria nadi	RCC slab	51.10
17	46-H001-302	Banarhwa Nadi	RCC slab	39.60
18	46-H001-303	Dry Nala	RCC slab	11.20
19	46-H001-304	Pahila Nadi	RCC slab	46.20
20	46-H001-305	Dry Nala	RCC slab	10.62
21	46-H001-306	Kanchan	RCC slab	63.84
22	47-H001-307	Kothi river	RCC slab	43.00
23	47-H001-308	Gageda khola	RCC slab	8.60
24	47-H001-309	Banganga	RCC slab	289.68
25	47-H001-310	Kaila khola	RCC slab	93.60
26	47-H001-311	Balhundra khola	RCC slab	20.95
27	47-H001-312	Harkon Khola	RCC slab	20.90
28	47-H001-313	Dry Nala	RCC slab	21.45
29	47-H001-314	Kundra Khola	RCC slab	29.00
30	47-H001-315	Ghorai Nala khola	RCC slab	21.50
31	47-H001-316	Dry Nala	RCC slab	13.15
32	47-H001-317	Belwagardwa nadi.	RCC slab	63.75

Source: Feasibility Report of Butwal –Gorusinghe Road, 2021

Landslides and Slope Stability: Slope stability depends on the existing geological structures, lithology of the rock units, soil type, topography, and hydrological condition (active seepage and spring). Failures have occurred in the in the colluvial deposits because of the highly active seen from Tinau river area specifically along the 1 km stretch of the project road. Furthermore, embankment erosion will be occurred due to flood in the Terai. The Badganga basin frequently suffers from flash floods as the catchment response to high intensity and short duration precipitation is swift, leading to flooding and water-logging downstream. In addition, there have been numerous instances where heavy rainfall in the downstream areas has led to water logging.

Flora and Fauna: The road does not fall under any protected or buffer zone area. The road crosses mainly three blocks of forests of Saljhandi, Banganga and Gorusinghe. The detail of chainage is given in Table 3.

Flora and Fauna:

The Project area lies along the subtropical region of western terai. Sal (*Shorea robusta*) as the dominant forest species and some of the associated tree species include Asana/Saj (*Terminalia alata*), Khair (*Acacia catechu*), Sindure (*Mallotus phillipensis*), Bot Dhayero (*Lagerstroemia parviflora*), Karma (*Adina cordifolia*), Kusum (*Schleichera oleosa*), Jamun (*Syzygium cumini*), Lampate (*Duabangagrandidifolia*), Gayo (*Bredeliaretusa*), Phaledo (*Erythrina suberosa*), Khirro (*Sapium insigne*), Mauwa (*Engelhardiaspicata*), Tooni

(*Cedrelatona*), Kutmero (*Litsea monopetala*), Bhalayo (*Semecarpus anacardium*), Bijayasal (*Pterocarpus marsupium*), Datiwan (*Achyranthes aspera*), etc.

Major shrub species in the proposed project area include Dhairo (*Woodwardia fruticosa*), Dhursul (*Colebrookia oppositifolia*), Aasuro (*Adhatodavasicia*), Bilaune (*Maesachisia*), Jhadibanmara/Kande (*Lantana camara*), Jhingani (*Eurya acuminata*), Bansuli (*Dichroa febrifuga*), Aiselu (*Rubus ellipticus*), (*Rubus paniculatus*), Rudhilo (*Pogostemon benghalensis*), Gineri (*Premna integrifolia*), etc.

Herb or ground vegetation include Banmara (*Eupatorium adenophorum*), Kukure (*Blumea* spp.), Bukiphool (*Osbeckia nepalensis*), Datiwan (*Achyranthes aspera*), Gandhe (*Ageratum conyzoides*), Kuro (*Bidens pilosa*), Titepati (*Artemisia* spp.), Sisno (*Utricularia* spp.), Urenalobata, *Eubhorbia* spp. and Grass species like *Imperata cylindrica*, *Brachiaria* spp., *Echinochloa* spp., *Pennisetum* spp., *Cynodon dactylon*, etc.

Grass species like *Imperata cylindrica*, *Brachiaria* spp., *Echinochloa* spp., *Pennisetum* spp., *Cynodon dactylon*, etc.

Mammal: In the project area mammals found are Golden Jackal (*Canis aureus*), Wild Cat (*Felis chaus*), Wild boar (*Sus scrofa*), Yellow-throated Marten (*Martes flavigula*) and Common Leopard (*Panthera pardus*), Nilgai (*Boselaphus tragocamelus*), Rato Bandar (*Macaca mulatta*), (*Rhesus Macaque*), Common Langur (*Semnopithecus entellus*) and rodents like Northern Palm Squirrel (*Funambulus pennanti*), Porcupine (*Hystrix indica*), Grey Mongoose (*Herpestes edwardsii*) and various species of bats (*Pteropus* spp.) etc. Barking deer (*Muntiacus muntjak*) and Golden Jackal are commonly seen in the project area. Common Leopard is an infrequent visitor.

Avifauna: Kaliz Pheasant (*Lophura leucomelanos*), Great Barbet (*Megalaima virens*), Blue-throated Barbet (*Magalaima asiatica*), House Crow (*Corvus splendens*), Jungle Crow (*Corvus macrorhynchos*), Rock Pigeon (*Columba livia*), House Sparrow (*Passer domesticus*), Black Kite (*Milvus migrans*), Common Mayna (*Acridothera tristis*), Oriental Turtle Dove (*Streptopelia orientalis*), Grey-hooded Warbler (*Seiurus xanthoschistos*), Red-vented Bulbul (*Phycnonotus cafer*), Himalayan Bulbul (*P. leucogenys*), Red-billed Blue Magpie (*Urocissa erythrorhynchos*), White-breasted Kingfisher (*Halcyon smyrnensis*), Oriental Magpie Robin (*Copsychus saularis*), Long-tailed Shrike (*Lanius schach*), Plumbeous Water Redstart (*Rhyacornis fuliginosus*), Black Drongo (*Dicrurus macrocercus*), Cattle Egret (*Bubulcus ibis*), Spot-bellied Eagle Owl (*Bubo nepalensis*), *Glaucidium radiatum* (Jungle Owl) and Warbler (*Orthotomus* spp.) were recorded by direct sighting during the field visit in the area.

Herpetofauna: The common herpetofauna reported in the project area were Common Rat Snake (*Ptyas mucosus*), Buff-striped Keel back (*Amphiesma stolatum*), White Lipped Pit Viper (*Trimeresurus albolabris*), Himalayan Rock Lizard (*Laudakia tuberculata*), Common Garden Lizard (*Calotes versicolor*), House Gecko (*Hemidactylus* spp.), Sikkim skink (*Scincella sikkimensis*), Asian Toad (*Bufo melanostictus*), Pani Bhyaguta (*Hoplobatrachus rugulosus*) and Paha (*Bufo* spp.).

Socio-economic and cultural: According to the National population census 2011, the population of affected municipality is given in **Table 5** with male and female population and total households (HHs).

Table 5: Population Composition of Project Municipalities

Province	Municipality	District	Total HHs	Male Population	Female Population	Total population
Lumbini	Butwal Sub-metropolitan City	Rupandehi	34087	68288	70454	138742
	Sainamaina Municipality	Rupandehi	15063	29733	32912	62645
	Kanchan Rural Municipality	Rupandehi	7084	14865	18207	33072
	Banganga Municipality	Kapilbastu	15894	34833	40309	75142
	Buddhabhumi Municipality	Kapilbastu	11501	31583	33366	64949
			83629	179302	195248	374550

Source: National Data Profile 2011 and Municipality Profile 2076

The project area has multi-ethnic composition. Brahmin, Chhetri, Dalit, Janajati, Muslim, Tharu, Kurmi, Yadav, Newar are major groups in the project area. In Kapilbastu district, Muslims are the predominant religious group. The literacy rate of project influence area is about 79% male and 61 % Female. Major agriculture production is cereal crops (Paddy, Maize and wheat). Production of seasonal and non-seasonal vegetable is very potential in this areas.

The road will be upgraded within the 25m RoW. Therefore, no additional land will be acquired along the alignment. Only encroached structures will be shifted during construction. The local government is also trying to shift these encroached structures. However, new bridge construction site may go beyond the present RoW, in this situation, additional land will require.

Drinking Water and Sanitation: Majority of the households in the project area have deep well/tube well as the major source of drinking water. It is found that more than 70 percent households have toilet facility.

Energy: For household lighting, electricity predominates this road corridor. Most of the people in the

project area use LPG and fire wood for cooking purpose

Affected Infrastructures and Other Amenities: There are electric pole, gate, optical fiber, public toilet, tap, telephone pole/cabinet, transformer, water tank, well, irrigation canals, resting places (Chautara), waiting place for public vehicle, access road along, small roadside temple, which may affect during road construction.



2.2.2 Project Activities

Pre- construction Phase

- Land acquisition and clearing RoW
- Relocation of Public Utilities
- Forest area clearance approval from concern ministry
- Clear-felling of forests within the RoW

Construction Phase

- Cutting-filling works, earthwork and formation of embankment.
- Construction of miscellaneous road structures including retaining structures and drainage structures.
- Traffic safety structures
- Road pavement structure construction works
- Bridge construction
- Bio-engineering
- Road painting and establishment of traffic sign
- Road side plantation, median plantation along with compensatory



Operation and Maintenance Phase

- Maintenance of road surface
- Plantation along the road

2.2.3 Construction Planning

After completion of pre-implementation works such as land acquisition, vegetation clearance, etc., mobilization of contractors will be done. Construction of roads, Major and minors bridges project is planned to start on April 2023 and completion is estimated on 3 years. However, this date will be different as per the time consumed during pre-implementation phase.

2.2.4 Land and Man Power Required

Approximately 236.12 ha land is needed to be acquired for the implementation of the project road and bridges. This land includes the forest land and barren land (28.46 ha), agriculture land (35.32 ha) and settlement area and agriculture land (132.67 ha), river. The agriculture and forest land and other land are within ROW (within 50m). The ROW's land has already transfer to DoR/GoN name.

Total of 7,313,027 labors including 658,859 (man days) skilled and 6,654,168 (man days) unskilled worker are needed during construction work of the project. Unskilled and skilled manpower will be required to carry out the work during the construction period. Depending on the expertise, experience and knowledge priority will be given to the local people for the required human resources. Numbers of skilled and unskilled manpower required for this project are as follows.

2.2.5 Construction Material

Construction of road and bridges following material will be required. Various materials will be purchased from market. The major construction material with quantity is given in **Table 6**.

Table 6: Estimation of Quantities of Construction Materials

Type of Material Required	Quantity of Material Required
Cement	143,687.00 Mt
Sand	286,136.00 Cum
Aggregate	760,501.00 Cum
Stone	255,371.00 Cum
Reinforcement	28,975.00 Mt
Structural Steel	1075.00 Mt
Subbase	506,081.00 Cum
Base	356,399.00 Cum
Bitumen	14,477.00 Mt
Gabion Box	25,290.00 Sqm

Source: Feasibility Report of Butwal –Gorusinghe Road, 2021

Construction materials such as stone, coarse aggregates, sand, sub base, base course, and surface dressing/asphalt concrete chips are available in locally. The potential sources of construction materials are given in **Table 7**.

Table 7: Sources and tentative quantities of the construction material

S.n.	Name of the Source	Location	Available Materials	Remark
1	Banganga River		Stone, Sand and aggregates, Chips for Asphalt Concrete	
2	Tinau River		Sand and aggregates, Chips for Asphalt Concrete	
3	Dano River		Sand and aggregates	
4	Saljhundi		Sand and aggregates	
5	Surahi River		Stone, Sand and aggregates, Chips for Asphalt Concrete	

Source: Feasibility Report of Butwal –Gorusinghe Road, 2021

2.2.6 Energy, Technology and Resources Required

Gasoline and electrical energy will be used during the construction phase of the project. The energy required for the construction works is mainly kerosene, diesel and petrol. Diesel will be used for transportation of materials. Kerosene will be used for bitumen heating. Vehicles will use diesel or petrol supplied by the contractor from outside the project area. The required quantity is given in **Table 8**.

Table 8: Type and quantity of fuel required

Type of fuel	Quantity (litre)
Diesel	2,400,000 ltr
Petrol	480,000 ltr
Kerosene	2,050,000 ltr

Source: Feasibility Report of Butwal –Gorusinghe Road, 2021

The technology used for the construction work will be both machine and labor based. Machine based method is mainly used for specialized works like material extraction from borrow/ quarry sites with use of heavy equipment like excavator, bulldozer, etc. Heavy equipment like excavator will also be used for earthwork excavation, vibrator for surface laying and compacting, use of distributor for laying and use of compactor for finishing bituminous seal, etc.

Project Cost for the construction of the Road and Bridges are based on an evaluation of the unit rates and quantities obtained from the designs, drawing and inventory. Costing has been carried out in the format using District rates and Norms approved by DoR. The total project cost for construction of road and bridges has been estimated to NRs. 12,564,918,143.00 including VAT.

2.3 Rationale of the Proposal

During implementation of project, environmental assessment is required for increase beneficial impact and minimization adverse impact. According to Environment Protection Act (EPA) 2076, and Environment Protection Rule (EPR), 2077 (addendum 2078); Schedule 2, Rule 3, Transport sector E (8); Initial Environmental Examination (IEE) is required for upgrading of national highways or feeder roads of length 10-50 km.

The road does not pass through any protected areas (National Parks, Conservation areas, Wildlife Reserve, Hunting Reserve and Wetland). There is no need to cleared forest area beyond ROW.

As for Environmental Protection Rule (EPR), 2077; Section 2, Rule 7, Sub-rule 8 this report is prepaid in English Language since the project is donor funded, (refer by **Annex V**).

2.4 Objectives of IEE

The main objective of this IEE is to identify the impacts of proposed project implementation on physical, biological, socio-economic and cultural environment of the project area and propose mitigation measures to avoid or mitigate such impacts.

The specific objectives of the proposed IEE include to:

- To identify the major issues that may arise as a result of proposed works on bio-physical, socio-economic and cultural environment of the project area,
- To identify the critical environmental problems that requires further studies and/or monitoring.

- To analyze and determine the potential positive and adverse impacts of the project in terms of both direct and indirect impacts, including definition of their extent in the context of areas affected and whether these are temporary or permanent.
- To suggest mitigation measures for adverse impacts and enhancement measures for beneficial impacts
- To formulate and propose practical mitigation measures for adverse impacts, enhancement measures for positive impacts and to incorporate necessary safeguards in project design, construction and operation plans.
- To make sure that IEE is sufficient or not for the proposed road project.

2.5 Objectives of IEE's ToR

The main objective of ToR is to provide guidelines to conduct IEE of proposed road project. The specific objectives are as follows:

- To identify and describe., analyse the pertinent issues on physical, chemical, biological and socio-economic and cultural environment,
- Delineate the direct impact, indirect impact and zone of influence for the specific activities to be undertaken in the assessment,
- To determine methodology of IEE,
- Clarify the responsibilities of the different institutions involved in the project cycle,
- Set out a time frame with required expert/ human resource for carrying out the IEE,
- Fit the IEE into the context of existing policies, rules and administrative procedures.

2.6 Delineation of the Project Area

Direct Impact Zone (DIZ)

DIZ for the proposed project is the area where all the construction activities related to project road and bridges will take place. The Right of Way (RoW), as well as project utilities locations where project activities take place and from which direct impact on the surrounding environment is expected are also included under the DIZ. The RoW of the project is 50m (25 m on both side from the centerline of the road).

Indirect Impact Zone

Indirect Impact Zone(IIZ) for the proposed project will be 200 m aerial distance beyond DIZ of the project area.

Zone of Influence

The Zone of Influence of the project includes all the affected wards of Butwal Sub-metropolitan City, Sainamaina Municipality, Kanchan Rural Municipality, Banganga Municipality, Buddhabhumi Municipality.



3 DATA PROCEDURES TO BE ADOPTED WHILE PREPARING THE REPORT

The IEE approach, methodology and procedure shall generally follow the provisions of the EPA, 2076 and EPR, 2077. Following approach and methodology will be adopted during the IEE report preparation.

3.1 Data Requirement for Preparation of the IEE Report

The following data related to physical and chemical environment, biological environment, socio-economic and cultural environment of the project area will be collected.

3.1.1 Physical and Chemical Environment

- Land Use pattern
- Topography and geomorphology
- Climate, Meteorology, hydrology and drainage
- Geology, soil, erosion and land instability, flood
- Seismological data
- Air quality
- Water quality
- Noise Level



3.1.2 Biological Environment

- Local flora and fauna of the project area
- Loss of Forest and vegetation status and types
- Fish and other aquatic life
- Non-timber forest products found in the project area.
- Vegetation biodiversity and significance
- Wildlife, wildlife habitat, Movement/migration corridor of wildlife affected by the project
- Habitat in terms of Degradation/Fragmentation/Human encroachments.
- Rare/Endangered/ Protected flora and fauna species of the area

3.1.3 Socio-economic and Cultural Environment

- Land/ property acquisition
- Damage to structures
- Loss of production
- Population, caste/ ethnicity and employment facilities,
- Agriculture, income expenditure, and occupation,
- Education, Health and Sanitation condition in the area,

- Migration trend
- Services and facilities in the project area,
- Trade/ business
- Historical and cultural sites of the area (major temples, religious area)
- Indigenous and vulnerable groups in project area
- Settlement

3.2 Data Collection Methods

Project relevant reports and documents will be reviewed to the extent they are available, such as road alignment map, topographical maps, project feasibility study reports, district profile of Rupandhi and Kapilbastu prevailing policies, acts, rules, guidelines, manual, review of proposal related published documents.

Initial interaction and consultation will be carried out with the local level and district level stakeholders for collecting the baseline information of the project area. Questionnaires and checklists will be prepared to collect information on physical, chemical, biological, socio-economic and cultural environment of the project area. Training of enumerators will be provided prior to field survey.

The project area will be delineated tentatively on the topography map published by the department of survey and will be verified during field survey through consultation with local people. Further Following data collection method will be applied.

Table 9: Methods Used for Data Collection

Type of Environment	Parameters	Methods of data Collection
Physical	Lans use, Topography and geomorphology, Slope instability	Direct observation, Google Map, Topo Map 1:25000
	Rain fall and temperature	DHM, CBS (Environmental statistics of Nepal)
	Hydrological analysis	Hydrological Study and Detailed Design of Road
	Water quality	Portable Water Analysis Kit/ Lab Test analysis and observation of water quality monitoring
	Air and Noise quality	Air quality monitoring 24 hour PM 10, PM 2.5, measurement With High Volume Sample, Sound Level Meter (Lutron SL-4023SD)
	Construction Material Type, sources, quantity	Field survey, from DPR Report
	Storage yard and Camp Sites	Site observation, Design Engineering, Interview with Stakeholders
	Traffic Condition	Traffic survey, Site observation, information from Stakeholders



Type of Environment	Parameters	Methods of data Collection
	Information on Public Utility	Site observation/Interaction with local stakeholders
	Topography, Types of Rocks, soil, Earthquake classification, stability	Direct Observation, survey and soil reports, Geographical map 1:25,000 published by survey department
	Geological investigation	Geological Report of Road, Soil investigations, Direct Observation
	Flora, Fauna	Direct Observation, Transect survey,
	Vegetation Information	Counting in Field/Census survey, GPS record,
	Wildlife species - Mammals, Birds and Reptiles	Direct Observation of Signs (e.g., scats/droppings, scratches, calls, pugmarks, carcasses, scales) Direct Observation of indirect indicators such as nests, dens, burrows Key Informants Interview showing color photographs of different mammals, birds and reptiles Key Informants Interview on movement of animals
	Fish	In consultation with local people residing near by the river, Direct observation
Socio-economic and Cultural	Demography, Economic and Social facility	Direct Observation, information collection from key informant, collection information through chelist, questionnaires, National Population and Housing Census 2011, Public consultation and Discussion with affected Municipalities
	Cultural and historical sites	Direct observation and Key Informants Interview, household survey, Focus Group Discussion

3.2.1 Literature Review

Prior to the mobilization of study team to the project areas, desk study was carried out by using topographical maps (Scale 1:25,000) published by the Government of Nepal (GoN), NPHC 2011, Survey Department. Information include existing laws, rules, guidelines and manuals, IEE reports of similar projects, Environmental and Social Management Framework published by DoR, GESU Relevant information from various sources will be collected and reviewed to understand the nature of the project and to identify the pertinent issues to be considered for the IEE. Feasibility study, Detailed Design Report of the road section will be reviewed to determine the nature and scope of activities of the project. Similarly, pertinent sources of secondary information will be identified and reviewed to build acquaintance with the environmental settings of the project area under physical, biological, socio-economic and cultural environment of project affected areas.

3.2.2 Field Survey

Field study will be conducted in the proposed project area by multi-disciplinary team of experts. A walk through survey along the proposed road alignment will be carried out by the IEE team, observing the significant environmental features in the probable influence corridor, and make necessary measurements, inspect/observe and discuss it with local stakeholders. The information collection will be done covering physical, biological, socio-economic and cultural aspects of the environment. Survey of DIZ and IIZ area will be done during the IEE regarding physical, biological, socio-economic and cultural environment.

Key Informant Interview

Key informant interview will be conducted in project affected municipalities. Local people, government officials, teachers, entrepreneurs, etc. will be included in the discussion and their responses will be included in the IEE report. Government officials from the affected municipalities will be interviewed. Likewise, teachers from affected school, authorized personals from affected community forest will be interviewed during the IEE.

Household Survey

Structured Questionnaires will be used to evaluate the socio-economic status of the households located in the project area and whose land and property lying along the road alignment or within the 200m aerial distance from the center line of existing road section and which may be temporarily or permanently affected by the project. During household survey, each affected household families along the road alignment will be enumerated and interviewed. While, a random sampling method will be used to select 20% households from the project influence area within 200m aerial distance.

Walk Through Survey

Walk through survey of the proposed project area will be done by IEE team based on the structured questionnaires, checklists prepared during desk study. The proposed project area will be observed and necessary information will be collected on the socio- economic and cultural environment, physical environment, biological environment and chemical environment by interaction with local stakeholders, district level stakeholders and project affected personals. The significant features of the probable ZoI will be collected by making necessary measurement, inspection and observation and by consulting with the local people. Samplings for studies and measurement related to air, water and noise quality will be collected from the proposed project site and will be taken to the laboratory for analysis.

3.2.3 Physical Environmental Survey

Information on physical environment will be collected from visual observation, field investigation, laboratory analysis, maps, standard format and checklist etc. Extensive observation on topographical features and drainage characteristics will be observed and documented. Physical features comprising soil characteristics, slope stability will be observed and recorded during walk through survey. Key informant interview, consultation with local communities will be carried out to know the history on natural disasters like landslides, earthquakes, etc.



Topographical maps, satellite images will be analysed carefully along the road alignment together with field verification, analysing direct and indirect impact zones in the project area and finalizing the highway alignment.

Review of geological map, hydrological map, Engineering Geological log along the road alignment will be prepared to keep the information on landslide, major gully erosion, debris flow, soil and rock. Information in the log will include depth, rock type, geological structures and weathering grade.

Baseline data on air quality, water quality, and noise level will be carried out at the major settlements of the project area and the laboratory results will be checked with the Nepal standard for their analysis. Climatic information of the project impact area will be obtained from the meteorological station close to the project area.

3.2.4 Biological Environmental Survey

The information on the biological environment will be obtained primarily from project area survey and field observations. Vegetation types, especially quantitative information along the alignment will be recorded. Plants of medical and cultural value, if any, will be recorded. The trees which are likely to be felled or removed will also be recorded following a census method (Total count of trees). Regarding other floral composition a sampling technique will be followed, as guided by the MOFE forest sampling guidelines. Similarly, wild habitat and species, including wild mammals and bird, will be observed, discussed based on a checklist prepared and documented.

The methods described will document all the floral and faunal population of the project area following a census and sampling technique, including available protected species and the animal passes. Based on the species behaviour, corridor or crossing points will be accessed, recorded and studied.

Vegetation/ Forest Resources

District level data of forests will be collected by reviewing of reports published by Division Forest Office of the project districts. A walkthrough survey will be done by group of experts related to biodiversity to make general observation of the forest along the alignment. Likewise, information about the forest loss, roadside tree, and private trees on the farm land will be collected through forest survey.

The information on composition, distribution patterns and characteristics of vegetation and forest types and sensitive habitat in the project area will be assessed from direct field observations, transect survey, interaction with forest user groups, and collection of information from division forest offices (DFO). A detailed survey will be conducted in affected forests for the identification of species, analysis of vegetation and bio-diversity status. In general, possible impact on forest area will be discussed.

All the trees, poles, sapling and regenerations of the forest trees, including other plants (NTFP, etc) within the ROW will be measured properly. A tree census of all affected trees along the proposed alignment will be counted individually and location recorded using a hand held GPS.

All the individual trees will be numbered and recorded in a standard data sheet with DBH and height of all the affected trees.

The volume of the affected tree species will be quantified together with the loss of forest. Of the total length of proposed Butwal Gorusinghe Section (50 Km. Tree species having more than 10cm diameters at breast height (DBH) will be counted and measured and recorded as trees. Remaining growing stock will be sampled and recorded, as seedling and saplings. Diameter at breast height (dbh) will be measured at 1.3 meter from the ground level. Data collection format is given in Annex III.

the data from tree measurements will be quantitatively analyzed for basal area and to calculate the wood volume. Basal Area is the trunk cross-sectional area. The basal area of each of trees will be calculated on the basis of diameter at breast height. These parameters will be calculated by using following formulae:

Consultation with CFUGs

All community forest falling along the alignment will be consulted. The representative of concerned community forest will be pre-informed about the meeting. The meeting will mainly focus on availability of flora, dependency of local people on forest resources, availability of Non-Timber Forest Products (NTFPs), species to be planted, possible plantation sites and assistance required to community forest.

Interview

Local people from project area, members of Community Forest User Groups (CFUGs), officials from concerned Range Post and Division Forest Offices will be interviewed in order to collect information on wild fauna, their distribution, behaviors, movement pattern, etc. Wildlife species found in the project area will be grouped into different threat categories based on IUCN (1978), CITES (1985) and GoN's act such as Forest Act, 1993 and National Parks and Wildlife Conservation Act, 1973. A walkthrough survey will be done by group of experts related to biodiversity to make general observation of the forest along the alignment. Likewise, information about the forest loss, roadside tree, and private trees on the farm land will be collected by making census survey.

The information on composition, distribution patterns and characteristics of vegetation and forest types and sensitive habitat in the project area will be assessed from direct field observations, transect survey, interaction with forest user groups, and collection of information from division forest offices (DFO). A detailed survey will be conducted in affected forests for the identification of species and numbering, analysis of vegetation and bio-diversity status. In general, possible impact on forest area will be discussed.

Calculate volume of affected tree: Volume of affected standing trees will be calculated using following equation.

$$\text{Volume} = (\pi * DBH^2 / 4) * Ht * FF \quad (i)$$

Where,

DBH : diameter at breast height,
Ht : height of tree
FF : form factor of the tree



FF of a tree is the ratio of its volume to the volume of specified geometric solid of similar basal diameter and height. In case of insufficiency of proper species data national tree volume tables will be used (Sharma and Pakula, 1990).

Biomass and Carbon Estimation:

Biomass of a trees or shrub will be calculated using biomass table for the tree species. Above ground biomass will be calculated using the equation below:

$$\text{Above Ground Biomass (AGB)} = \text{SB} + \text{BB} + \text{LB} \quad (\text{ii})$$

Where,

SB: is Stem Biomass and is calculated as Stem Volume multiplied by Wood Density

BB: is Branch Biomass and

LB: is Leaves Biomass.



Root biomass and corresponding carbon will be calculated using a standard procedure.

Estimation of compensatory nos. and plantation cost will be calculated according to existing regulation of GON.

Wildlife Survey

Data on wildlife will be collected by direct observation and consultation with local people. Major habitat types will be identified by direct field observation and using topographic maps. Different signs (e.g. droppings, scratches, calls, pugmarks, carcasses, scales) will be considered as a form of identification of mammals, birds and reptiles. Other indirect indicators such as nests, dens, burrows will also be observed in the area. The information about the fish will be collected in consultation with local people and direct observation.

Wild animals: Data on wildlife will be collected by direct observation and consultation with local people. Major habitat types will be identified by direct field observation and using topographic maps. Different signs (e.g. droppings, scratches, calls, pugmarks, carcasses, scales) will be considered as a form of identification of mammals, birds and reptiles. Other indirect indicators such as nests, dens, burrows will also be observed in the area. The information about the fish will be collected in consultation with local people and direct observation.

The mammal species presence and impact study in the project area is carried applying direct observation methods such as i) Surveying of animal tracks and signs; ii) road kill survey and iii) indirect methods as discussion and interviewing with Local Forest Management Group (LFMG), including the Division and Sub-Division Forest Office and other stakeholders. Tracks and sign survey will gather pugmark/footprint/hoof mark, scats/pellets/dung, and scratch on the tree trunks while road kill data will be gathered through direct observation of road kills and in consultation with LFMG.

Avifauna Study: For Avifauna study, line transects method will be used with unlimited radius to record all heard/s or seen birds (Bibby et al, 2000). Bird monitoring will be done along the highways as well as visiting nearby forests. The walking speed should not be approximately 1km an hour. Bird observations will be conducted during morning dusk, between 7:00am to 6:30 pm in evening with a break in the afternoon. Opticor Binoculars of 10x42 and Canon 90D with 55-250mm lens will be used to locate and photograph birds respectively.

Identification of birds will be carried following Birds of Nepal (Grimmett et al, 2016), in case of confusion. Migratory pattern and global status of each migratory species will be noted following the IUCN Redlist (IUCN, 2021). Similarly, national status will also be listed as per the National Red list of Birds (Inskip et al, 2016).

Herpetofauna and Fish diversity: Proposed alignment traverses through largely settlements and farmland and rivers with annual flow while other are ephemeral streams those may require studied, such as Kothi Khola, Kaila Khola, Balbagadevi Khola, Kanchan Khola for fish study.

Net fishing and indigenous ways of fishing (trapping and angling) will be used for fish sample collection with the help of local anglers. In case of confusion, fish species will be identified following "Ichthyology of Nepal - A Study of Fishes of the Himalayan Water" and "Fish, Fisheries and Farmers in Nepal". Consultation with experts will also be made for precision in species Identification. Institutional Animal Care and Use Committee and Animal Welfare Act will be referred to for humane collection of sample.

The information on the biological environment will be obtained primarily from project site survey and field observations. Vegetation types, especially quantitative information along the alignment will be recorded. Plants of medical and cultural value, if any, will be recorded. The trees which are likely to be felled or removed will also be recorded. Similarly, wild habitat and species, including wild mammals and bird, will be discussed and documented.

3.2.4.1 Socio-economic and Cultural Environmental Survey

Information on socio- economic and cultural environment of the project area will be collected and documented through literature review, key informant interviews, household survey, and walk through survey in the project affected area. Demography and Settlement data of Project district, Municipalities will be collected by reviewing District Development profile of Nepal. Likewise, population distribution at ZoI will be enumerated 20% from household survey – "Poverty and Social Analysis of Butwal –Gorusinghe road, occupation of the Project area within 200 m aerial distance along the road alignment will be collected from household survey– "Poverty and Social Analysis of Butwal –Gorusinghe Road". Data related to project affected structures, public utilities, indigenous and vulnerable groups along the Project alignment will be collected from household survey - "Resettlement Plan of Butwal –Gorusinghe road". Further, the project affected structures such as religious and community structure, waiting shed, chautaras, temple, gumba, grave yards, etc. if any along the road alignment will be enumerated through census and walk through survey.

3.3 Public Hearing and Stakeholder Consultation

The role of public consultation and participation is to ensure the quality, comprehensiveness, effectiveness of the IEE as well as to ensure that the public views are adequately taken into consideration in the decision making process. It is done during the preparation of an IEE. In order to ensure the public involvement, the following procedure will be followed during IEE report preparation.

- **Public Hearing** will be done during the IEE report preparation according to the EPR 2077 Rule 6, Sub-rule 4.



- **Publication of Notice** - Accordance with Rule 7 (Sub-Rule 3) of the Environment Protection Rules, 2077, seven days public notice will be published in Local/National Level Daily Newspaper seeking written opinion from concerned Municipality, school, health posts, forest users groups and related local organization.
- Recommendation letter from concerned Municipality will also be obtained.

3.4 Identification, Assessment and Evaluation of Environmental Impacts

The information collected from different sources will be processed and analysed according to the physical, biological, socio-economic and cultural environment. The generated information from the primary source will be analysed and tabulated. The likely impact will be assessed covering both adverse and beneficial ones. Based on identification of the impacts, their predictions will be done to forecast the changes in local environment. The methods to be adopted in impact predictions will be by using National environmental impact assessment guidelines (1993) and expert judgment.

Impact Categorization and Evaluation

After assessment, each impact will be categorized and quantified into following categories:

- Nature: direct or indirect
- Magnitude: High, Moderate, Minor
- Extent: Site Specific, Local, Regional
- Duration: Short term, medium-term, long-term

An impact matrix shall be developed and used to identify project impacts on physical, biological and socio-economic and cultural environment during construction and operation phase of the project. The following numerical scale is proposed in the National EIA guidelines (1993).

Magnitude	Numerical Scale	Extent	Numerical Scale	Duration	Numerical Scale
High	60	Regional	60	Long term	20
Moderate	20	Local	20	Medium term	10
Minor	10	Site Specific	10	Short term	5



4 POLICIES, ACTS, RULES, MANUALS & GUIDELINES, INTERNATIONAL CONVENTION TO BE TAKEN INTO ACCOUNT WHILE PREPARING THE REPORT

The study team of Butwal -Gorusinghe Road Project will review the policies, acts, guidelines, regulations, manuals and standards of Government of Nepal (GoN) listed below during the preparation of the IEE report.

4.1 Constitution of Nepal

- Constitution of Nepal

4.2 Policies

- National Environment Policy, 2076
- National Forest Policy 2075
- National Wetland Policy, 2059
- Policy on Land Acquisition, Resettlement, and Rehabilitation for Infrastructure Development Projects, 2071
- Policy document of DoR on Environmental Assessment in the strategic road network, 2000
- ADB Safeguard Policy Statement, 2009
- National Transport Policy, 2058
- Environmental Assessment in the Road Sector of Nepal: A Policy Document, GESU/DoR, 2056
- National Climate Change Policy, 2076

4.3 Plans

- 15th five years plan (2076/2077-2080/2081)
- 20 Year Road Plan, 2002-2022
- National Biodiversity Strategy and Action Plan, 2071-2077

4.4 Act

- Environment Protection Act, 2076
- Forest Act, 2076
- Labor Act, 2074
- Local Government Operation Act, 2074
- Ancient Monument Preservation Act, 2013
- Public Road Act, 2031
- Soil and Watershed Conservation Act, 2039
- Land Acquisition Act, 2034
- Control of International Trade of Endangered Wild Fauna and Flora Act, 2076



- Child Labor (Prohibition and Regularization) Act, 2056
- Motor Vehicles and Transport Management Act, 2049
- Road Board Act, 2058
- Mines and Minerals Act, 2042
- Solid Waste Management Act, 2068
- Aquatic Animal Protection Act, 2017 (1960)

4.5 Rules/Regulations

- Environment Protection Rule, 2077
- Forest Rule, 2051
- Solid Waste Management Rule, 2070
- Labor Regulation, 2075
- Public Roads Regulations, 2033
- Soil and Watershed Conservation Rules, 2042
- Control of International Trade of Endangered Wild Fauna and Flora Regulation, 2074
- Vehicle and Transportation Management Rules, 2054
- Plant Protection Rules, 2066
- Water Resources Regulations, 2050
- Child Labor (Prohibition and Regulation) Rules, 2062



4.6 Manuals, Guidelines, and Work Plans

- National Environment Impact Assessment Guidelines, 2050
- Environment Management Guidelines (Road), 2054
- Working Procedure to Use National Forest area for National Priority Projects, 2074 B.S.
- Government trees removal Guideline 2071
- Handbook on Road Bioengineering, 2056
- Public Road Management and Land Acquisition Guidelines, 2059
- Environmental Impact Assessment Guidelines for Forest Area, 2051
- Working Procedure to Use National Forest area for National Priority Projects, 2076
- CITES Convention and related laws in Nepal 2075
- ADB Environmental Assessment Guidelines, 2003
- Environmental and Social Management Framework, DOR, 2007 (Amendment 2013)

4.7 Standards

- National Bridge Standard, 2067
- National Road Standard, 2070

- National Ambient Air Quality Standards for Nepal, 2069
- Nepal Vehicular Mass Emission Standards, 2069
- Nepal Noise Standards, 2069
- National Drinking Water Quality Standards, 2062

4.8 International Conventions

- Convention on Biodiversity, 1992
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973
- Convention (No 169) Concerning Indigenous and Tribal People in Independent Countries, 1989
- United Nations Framework Convention on Climate Change, 1992



5 REQUIREMENTS FOR PREPARATION OF THE REPORT

5.1 Time Schedule

The IEE report of the project will be completed within a period of 9 months, which includes the time required for the approval of the document by the MoPIT. The detailed project schedule for the study is given in Table 10.

Table 10: Proposed Schedule for IEE Report Preparation and Approval

Activities	Tentative Date	Remarks
TOR		
Field visit, Interaction with Stakeholders	August, 2021	
TOR Submission to MoPIT	October.15, 2021	
Approval of TOR from MoPIT	October, 2021	
IEE Study		
Field Study and Investigation, Interaction with Stakeholders and Collection of Suggestions and Comments	November, 2021	
Analysis and Prediction of Impacts	December, 2021	
Draft Report Submission	February, 2021	
Public Hearing	February, 2021	
Seven days' notice Published by Proponent	November, 2021	
Draft Final Report Submission	March, 2022	
Approval of IEE Report	April, 2022	

5.2 Estimated Budget

The budget for the IEE Study is a part of consulting services for Project Preparatory Consultant under SASEC Highway Improvement Project (SHIP-PPC). The Proponent has allocated amount of NRs 3 million for the conduction of the study.

5.3 Study Team

A multi-disciplinary team of subject matter specialists with good orientation on environmental aspects will be involved in the Study. The composition will be as follow:

- Team Leader/Environmental Specialist;
- Sociologist/Socio-Economist;
- Environmental Engineer;
- Wildlife Specialist;
- Engineering Geologist;

- Hydrologist
- Civil engineer/Road Engineer
- Bridge Expert
- GIS/Database Expert/ Analyst.

Field level assistants and other support staffs will be engaged to collect field level data, verify secondary information, and conduct data analysis.

SN	Name of Expert	Designation	Qualification and Experience
1	Rajan Kumar Shrestha	Team Leader/Environmental Specialist	Master In Environmental Protection and Nature Conservation, Involved for preparation of more than 13 IEE EIA
2	Abhisek B. C.	Environmental Engineer	Environment Engineer, Involved for preparation of more than 10 IEE EIA
3	Rabin Dhakal	Sociologist/Socio-Economist	Master in Sociology, Involved for preparation of more than 12 IEE EIA
4	Prayag Raj Tamrakar	Biologist/Wildlife Specialist	Master in Forestry, Involved for preparation of more than 3 IEE EIA
5	Ananta Prasad Gajurel	Engineering Geologist	Master in Geology, have more than 5 years experience on Environmental Assessment
6	Suresh Babu Shrestha	Civil engineer/Road Engineer	Master in Transport and Road, Involved for preparation of more than 4 IEE EIA, more than 10 years experience on Environmental Assessment
7	Sanjaya Adhakari	Hydrologist	Master in Hydrology and drainage have more than 10 years experience
8	Saroj Bhattaria	Bridge Expert	Master in Transport and road have more than 10 years experience on Environmental Assessment



TERMS OF REFERENCE

Initial Environmental Examination (IEE) Study of Butwal- Goringhe Road

SN	Name of Expert	Designation	Qualification and Experience
9	Nemi Bhattarai	GIS/Database Expert/ Analyst	Engineer, have more than 5 years experience on Environmental Assessment



6 SPECIFIC IMPACT OF THE IMPLEMENTATION OF THE PROPOSAL ON THE ENVIRONMENT

The possible impacts of the proposed road on socio-economic, cultural, physical, chemical and biological aspect for construction and operation in the following areas:

6.1 Beneficial Issues/Impacts

General beneficial impacts include, but are not necessarily limited to the following

- **Construction Phase**
 - Employment generation to local people
 - Economic increment of local people due to increase in income
 - Skill enhancement
- **Operation Phase**
 - Improved transportation facilities
 - Saving travel time and cost
 - Enhancement in Economic Activities, Trade and Business
 - Increase in land value
 - Industrial development
 - Increase in sale of local products
 - Improve traffic safety



6.2 Adverse Issues/Impacts

The likely adverse impacts during construction and subsequent operation and maintenance in terms of physical, chemical, biological, socioeconomic, cultural during implementation. Based on the identified impacts, appropriate mitigation measures will be recommended.

6.2.1 Physical Environment

Pre-Construction Phase

- Temporary disruption and relocation of existing services and public utilities

Construction Phase

- Landscape disturbance
- Change in Land Use Pattern
- Impact/Issues due to quarry/borrow site operation
- Impact/Issues due to construction camps
- Transportation of construction materials (stock piling/muck/spoil/waste Disposal)
- Drainage, soil erosion and Sedimentation problem in the river
- Impact/Issues due to solid waste generation
- Impact/Issues on air quality, water quality and noise level

- Disruption of public utilities
- Pollution of water sources
- Water logging
- Slope instability
- Impact associated with establishment and operation of crusher plant, batching plant, asphalt plant

Operation Phase

- Road slope stability and management
- Issues due to air, noise and water pollution
- Traffic safety and accident

6.2.2 Chemical Environment

Construction phase

- Issues related to the use and storage of bitumen and hot mix plant
- Use and leakage of fuels, lubricants, acids and other chemical
- Issues related to the use of oil / grease, fluids, vehicles and equipment

6.2.3 Biological Environment

Pre-Construction Phase

- Permission for Clearance of road side trees

Construction Phase

- Loss of forest land and vegetation
- Loss of plants of ethno-botanical, medicinal value including several NTFPs
- Loss of biodiversity
- Disposal of Construction waste nearby forest area
- Forest fragmentation and disturbance to wildlife habitat
- Disturbance on wildlife corridor
- Reduction in effective grazing and browsing land
- Issue on forest fire
- Impact on wetland
- Impact on aquatic habitat

Operation Phase

- Depletion of forest resources
- Forest encroachment
- Disturbance to the roadside vegetation
- Disturbance to wildlife route and habitat



6.2.4 Socio-economic and Cultural Environment

Pre-Construction Phase

- Land Acquisition (Private, Public and Community);
- Property Acquisition (Private, Public and Community).

Construction Phase

- Issues of relocation of physical infrastructure
- Loss of agricultural land/production and productivity
- Loss of property/assets
- Health, sanitation and safety of workers
- Pressure on social services (drinking water, health, school, bank, electricity etc.)
- Issues on infrastructures such as stone spout, irrigation channel, transmission lines, telephone lines etc.
- Conflict on or with nearby local community
- Availability of local construction workers, employment opportunities and mobilization of local people for road construction
- Possible township/ ribbon development along the road
- Issues on occupational health and safety
- Disruption of traditional occupation and livelihood
- Issues related to community resources
- Occupation and safety hazards
- Issues on public health and sanitation

Operation Phase

- New settlement along the project alignment
- Change in social behaviour
- Increased traffic congestion
- Issues related to road safety

6.2.5 Any other seen/arisen issues during study



7 ALTERNATIVES FOR THE IMPLEMENTATION OF THE PROPOSAL

As per the EPR 2077 following alternative will be studies.

7.1 Design

Different alternate design will be assessed for upgrading of existing road along with the extension or replacement of the cross- drainage structures, bridges. Use of alternative surfacing methods like Asphalt/DBST or any other design will be analyzed and justified. The present road alignment is based among all alternative assessment. The detail of the alternative road alignment will be included in IEE study.

7.2 Project Site

Different alternative routes for the design will be assessed to avoid some significant environmental impacts like acquisition of land and property, trees felling, minimal forest loss, etc.

7.3 Technology, Implementation Procedure, Time-schedule and Raw materials

Technology-Assessment of the proposal implementation technology (mechanized, labor based) and its process of implementation (contractors, local labor groups etc.).

Procedure of Operation- Procedure of operation will be assessed in terms of round a year operation, seasonal operation. Types of vehicle and their specifications that are allowed to operate on the road will also be assessed in terms of need as well as demand in the area.

Time Schedule- Schedule of implementation of the proposal works will be assessed, including agriculture off-season, monsoon season, day and night time, etc.

Raw Materials to be Used- Assessment of alternative resources required for the proposal works will be assessed including cement, steel, gabion, boulders, gravel, earth, sand, plants from local nurseries, etc.

7.4 Other Matters

Analysis of the Consequences of the Non-Implementation of the Project: Positive and negative impacts when the Project if not implemented, will be analyzed in the IEE study.



8 MATTERS CONCERNING THE PREVENTION OF IMPACTS DUE TO IMPLEMENTATION OF THE PROPOSAL ON THE ENVIRONMENT (MITIGATION MEASURES).

The proponent shall propose mitigation measures to prevent or reduce significant adverse impacts to acceptable levels. Measures to enhance beneficial project impacts shall also be presented. The mitigation measures shall be proposed separately for physical, biological, socio-economic and cultural environment for construction and operation phases.

The cost required for each and every mitigation measure and enhancement measures shall be identified in detail and incorporated in IEE report. The enhancement and mitigation measures shall be categorized in terms of the physical, biological, socio-economic and cultural environment for the construction and operation phases.

To overcome any adverse impact by the project, the proposed mitigation measures shall be categorized as

- i) Avoidance/Preventive
- ii) Corrective and,
- iii) Compensatory Measures

Summary of cost for IEE which will include the following

- Cost for environmental mitigation measures
- Cost for enhancement measures
- Cost for other social support programs
- Cost for environmental monitoring



8.1 Environmental Management Plan (EMP)

The environmental management plan will be prepared to ensure proper implementation of measures to maximize the beneficial impacts and minimize adverse environmental impacts and to make the proposed project environmentally friendly and sustainable. The Environmental Management Plan (EMP) systematically outlines mitigation measures and assigns roles and responsibilities of management, and provides a framework for monitoring the implementation of mitigation measures for all identified impacts. It highlights about the mitigation measures to be implemented, the location and time of implementation, method of implementation and the body responsible for implementation during the pre-construction, construction and operation phase of the project.

Environmental Management Plan of Road and bridges will be separately prepared. The format of EMP is given in **Table 11**.

Table 11: Environmental Matrix showing the mitigating measures, mitigation cost and responsibility of implementation

S.No.	Issues	Beneficial Impacts	Enhancements Measures	Location to be Implemented	Timing of Action	Mitigation Cost	Institutional Responsibility	
							Implement	Monitor
Construction Phase (Physical, Chemical, Biological and Socio-economic and Cultural Environment)								
1.								
2.								
Operation Phase (Physical, Chemical, Biological and Socio-economic and Cultural Environment)								
1.								
2.								
S.No.	Issues	Adverse Impacts	Mitigation Measures	Location to be Implemented	Timing of Action	Mitigation Cost	Institutional Responsibility	Monitor
Pre-construction Phase (Physical, Chemical, Biological and Socio-economic and Cultural Environment)								
1.								
2.								
Construction Phase (Physical, Chemical, Biological and Socio-economic and Cultural Environment)								
1.								
2.								
Operation Phase (Physical, Chemical, Biological and Socio-economic and Cultural Environment)								
1.								
2.								



9 MATTERS TO BE MONITORED WHILE IMPLEMENTING THE PROPOSAL

Environmental monitoring will form part of an Initial Environmental Examination as it generates useful information and improves the quality of implementation of mitigation measures. Environmental Monitoring Plan will be prepared with respect to the environmental parameters, monitoring indicators, and monitoring methods, location of monitoring, schedule of monitoring and responsible agencies or persons for monitoring. The monitoring plan will also include the estimated cost for monitoring. The monitoring plan will be prepared covering Compliance Monitoring and Impact Monitoring and if necessary, Baseline Condition of Monitoring. The monitoring methods may include observation, photograph, inspection, interview, measurement, sampling analysis and record inspection. Environmental monitoring will be done in following format.

Table 12: Format of Environmental Monitoring Management Plan

S.N	Monitoring Indicator	Monitoring Method	Monitoring Location	Monitoring Frequency	Responsibility of Monitoring	Monitoring Cost (NRs.)
1.	Baseline Monitoring					
2.	Impact Monitoring					
3.	Compliance Monitoring					



10 OTHER NECESSARY MATTERS

IEE report of the project will include all relevant information, Nepali summary, references, annexes, maps, photographs, tables, charts, graphs and questionnaires, as relevant and applicable in the final IEE report. The IEE report will be finalized based on the inputs received from the public notice/consultation with proofs documented for the same. The proponent will submit required copies of the report of the proposal prepared under Rule 7 along with the recommendation of concerned Municipality to the concerned body for the approval of proposal.

IEE Report Format: IEE report will be prepared as per Schedule 11 of EPR, 2077 (pertaining to rule 7) and will also be adapted to project specific situation. The chapters will be planned in accordance to the contents of the schedule.



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11 ANNEXES

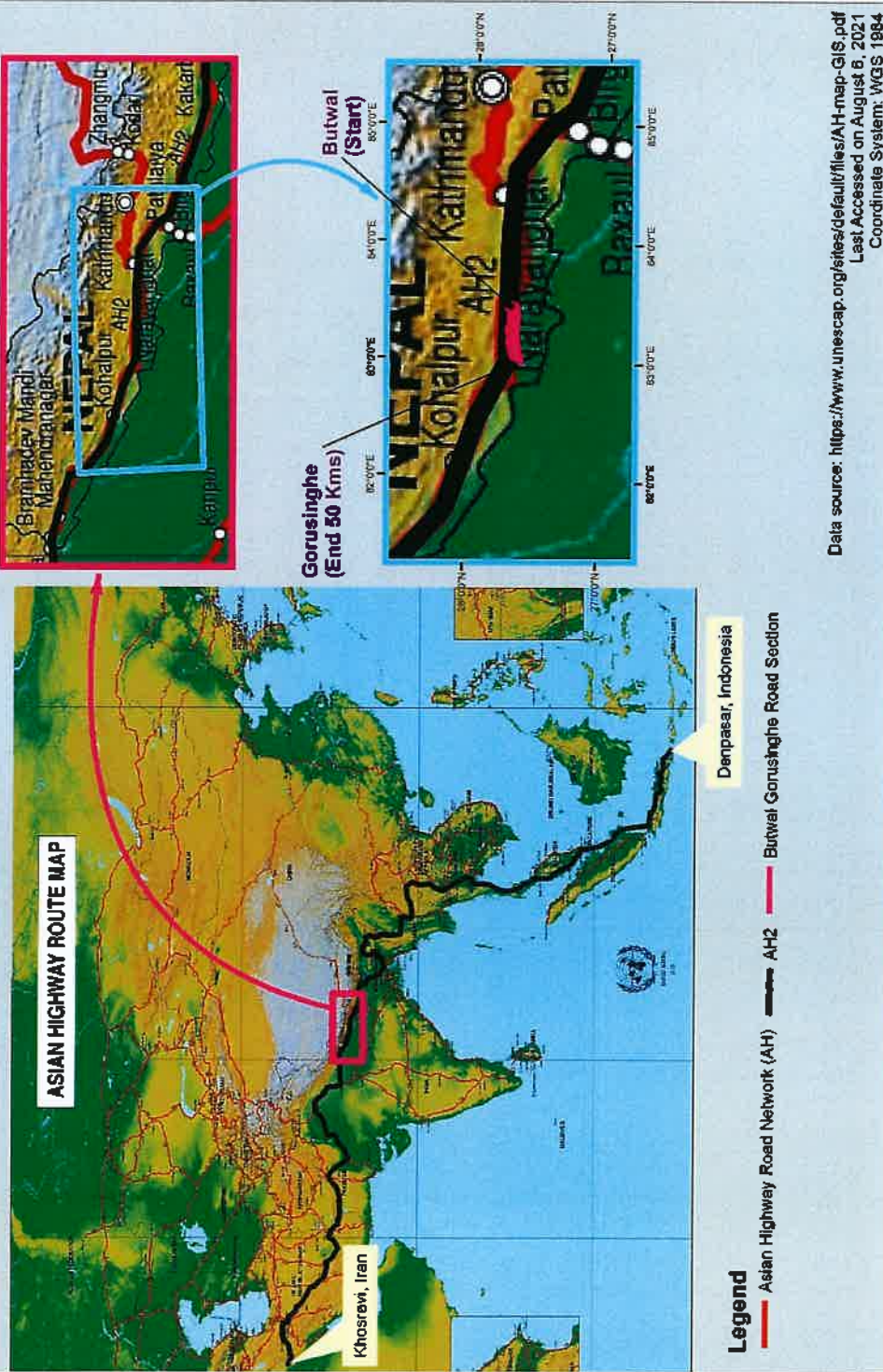
- Annex I: MAP/ (LOCATION MAP, TOPOGRAPHICAL)
- Annex II: FIGURE/ TYPICAL DRAWINGS OF ROAD AND BRIDGES
- Annex III: SURVEY QUESTIONNAIRES AND CHECKLISTS/FORMAT
- Annex IV: RAJPATRA NEPAL GUZZATE MENTIONING ROW OF THE EXISTING HIGHWAY 25 METER BOTH SIDES
- Annex V: MENTIONING DONOR FUNDATED PROJECT (ToR FOR DETAIL STUDY OF SASEC HIGHWAY IMPROVEMENT PROJECT FUNDATED BY ADB)
- Annex VI: SAMPLE NOTICE FOR PUBLIC HEARING
- Annex VII: PHOTOGRAPHS



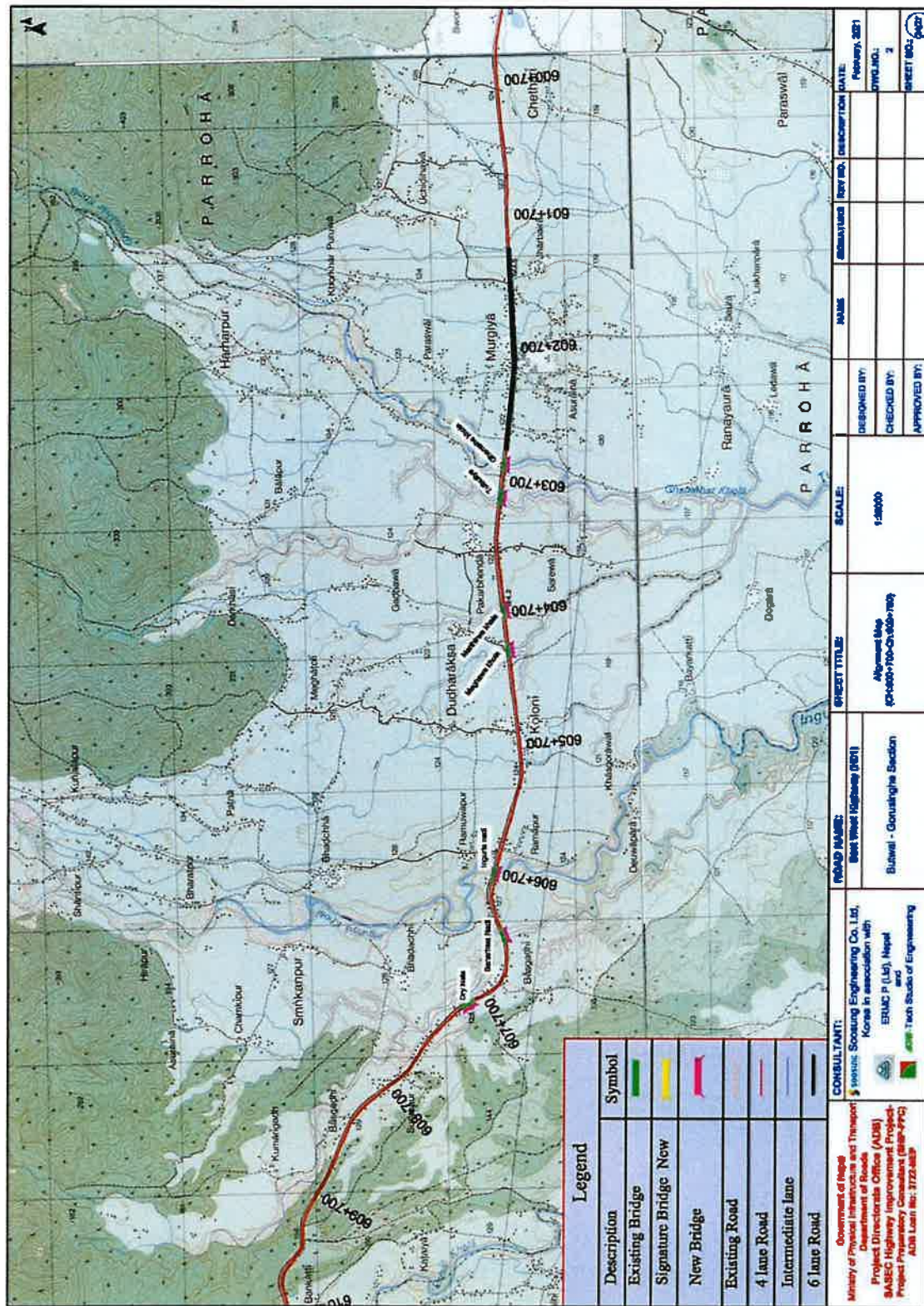
ANNEX I:
MAP/ (LOCATION MAP, TOPOGRAPHICAL)



Location Map Showing Butwal Gorusinghe Section in Asian Highway Context (AH2)

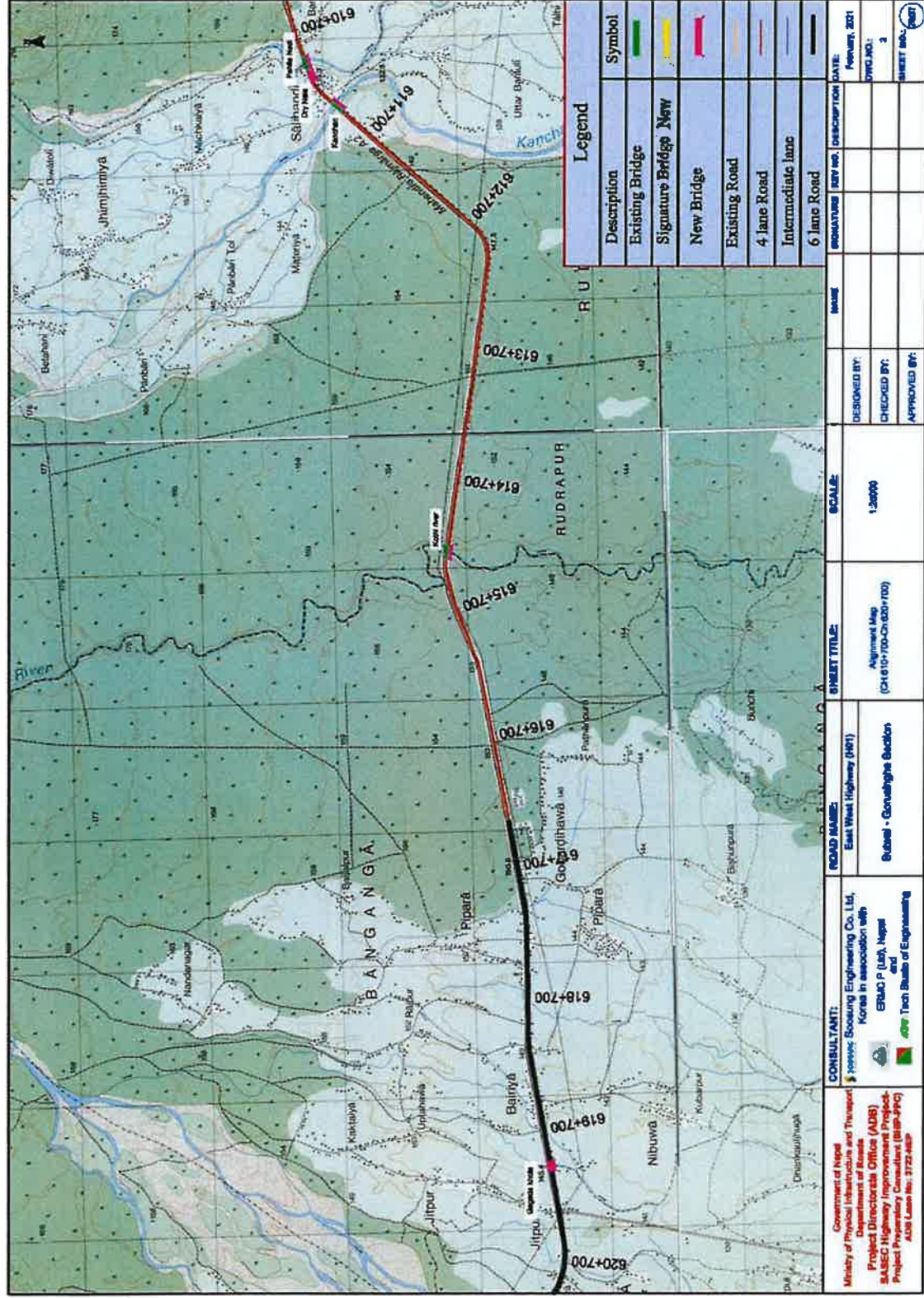


TERMS OF REFERENCE
Initial Environmental Examination (IEE) Study of Butwal- Gorusinghe Road

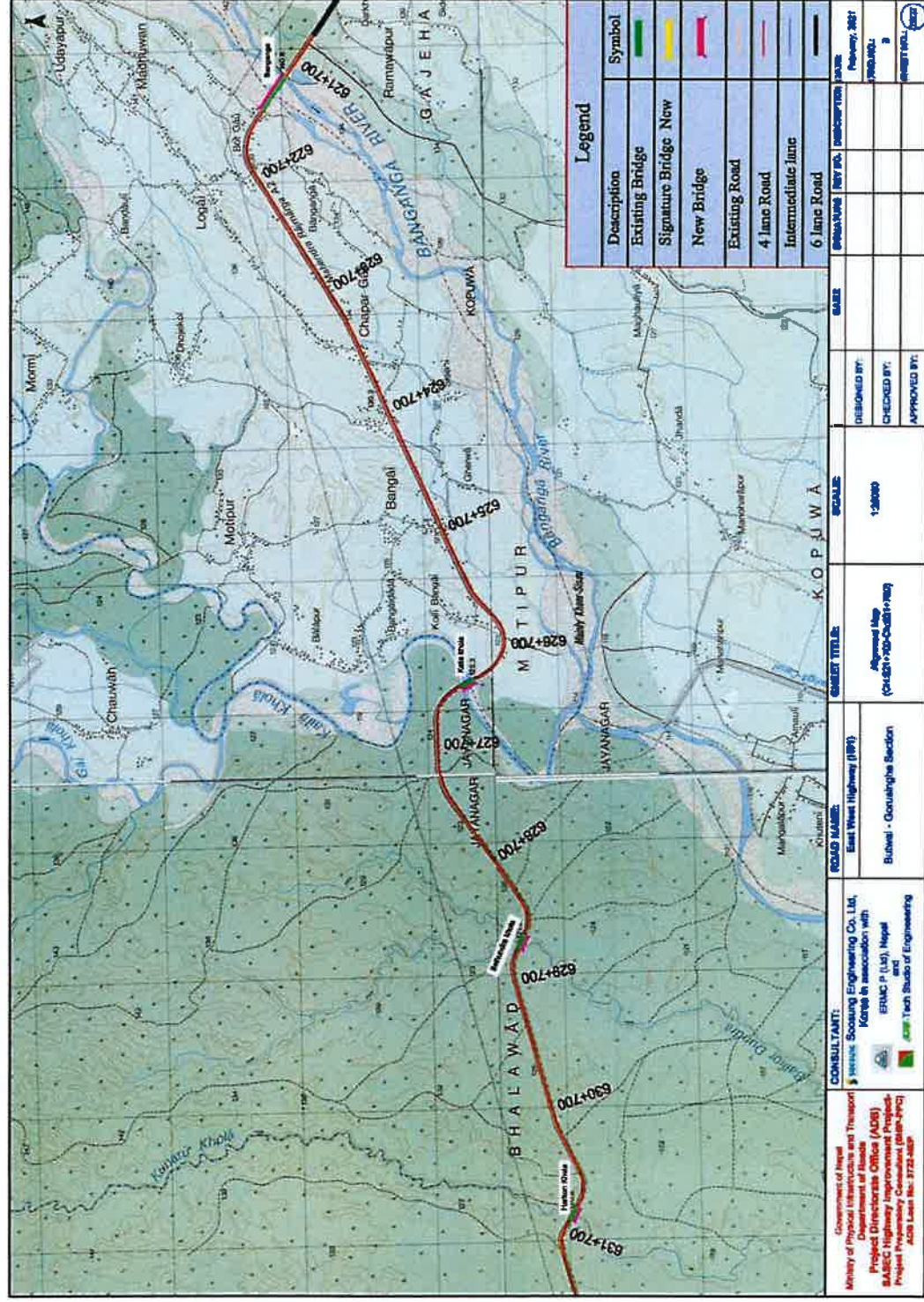


CONSULTANT: Government of Nepal Ministry of Physical Infrastructure and Transport Department of Roads Project Directorate Office (AUS) SASEC Highway Improvement Project- Project Preparation Consultant (B&P-PPC) AUS Lot No: 1722-007		ROAD NAME: Butwal - Gorusinghe Road (BGR)		PROJECT TITLE: Alignment Map 600+000-700+000-700		SCALE: 1:40000		DESIGNED BY: CHECKED BY: APPROVED BY:		DATE: February, 2021 DWG NO.: 2 SHEET NO.: 007	
REVISIONS: NAME: _____ NO: _____ DATE: _____											

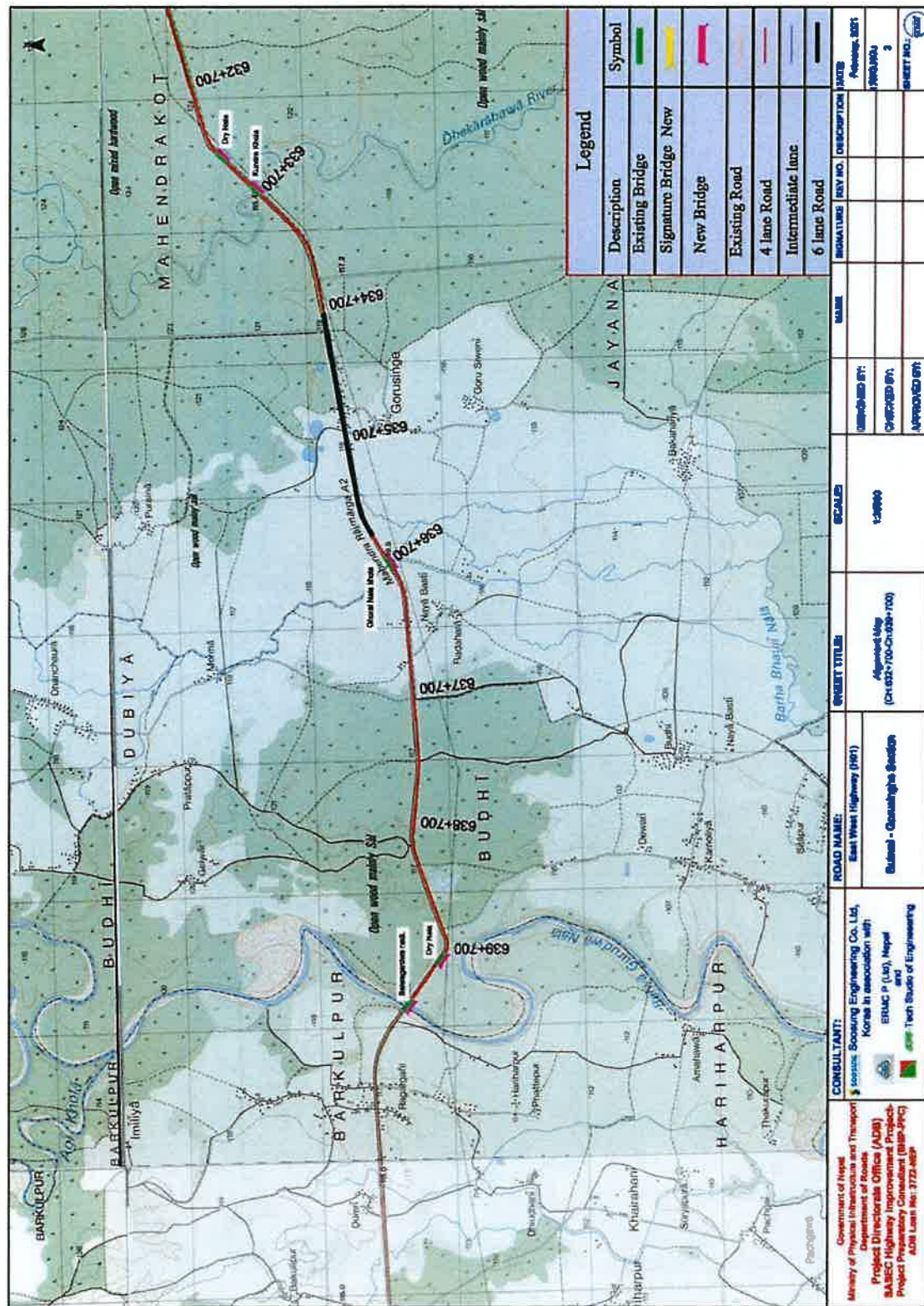
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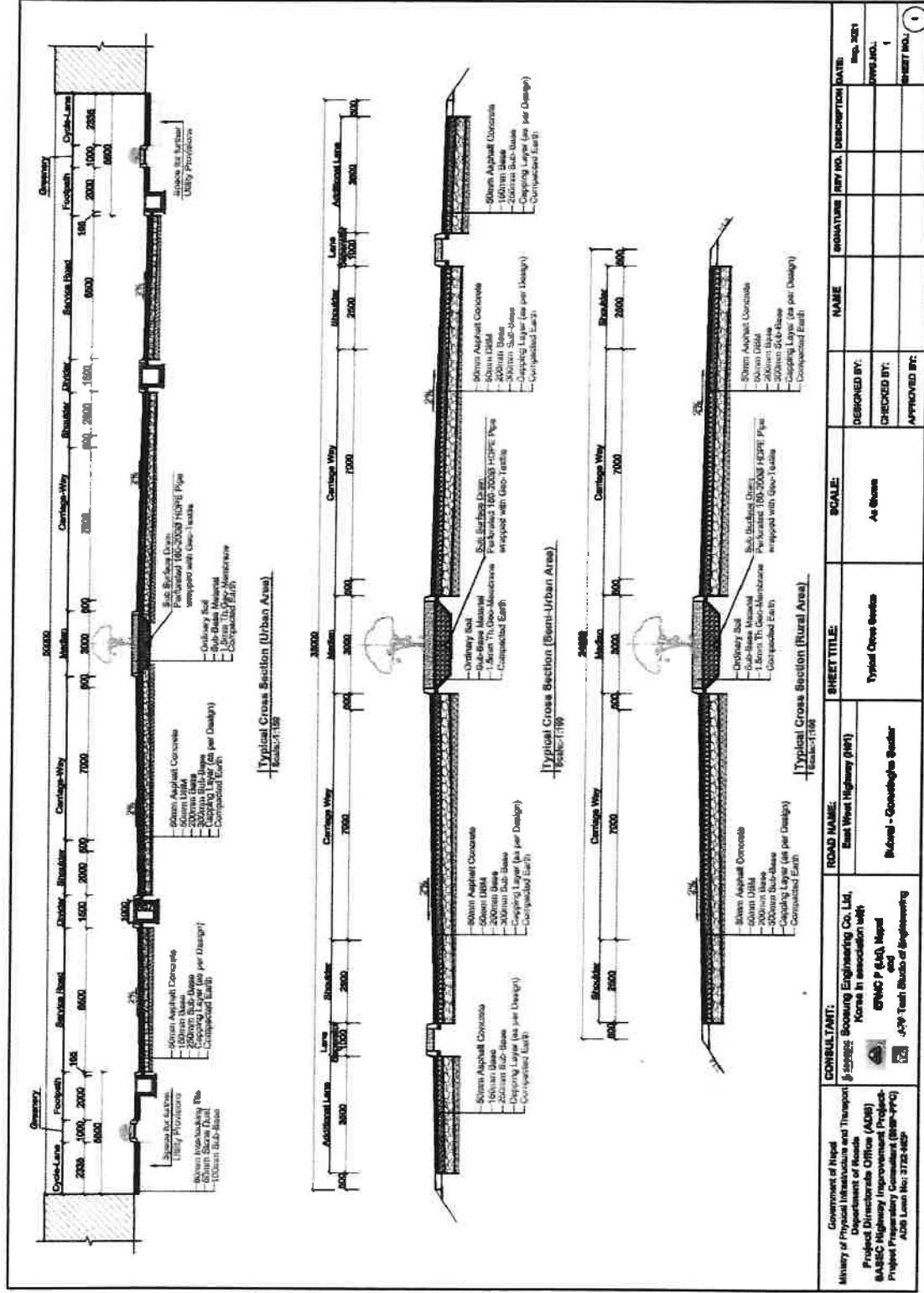
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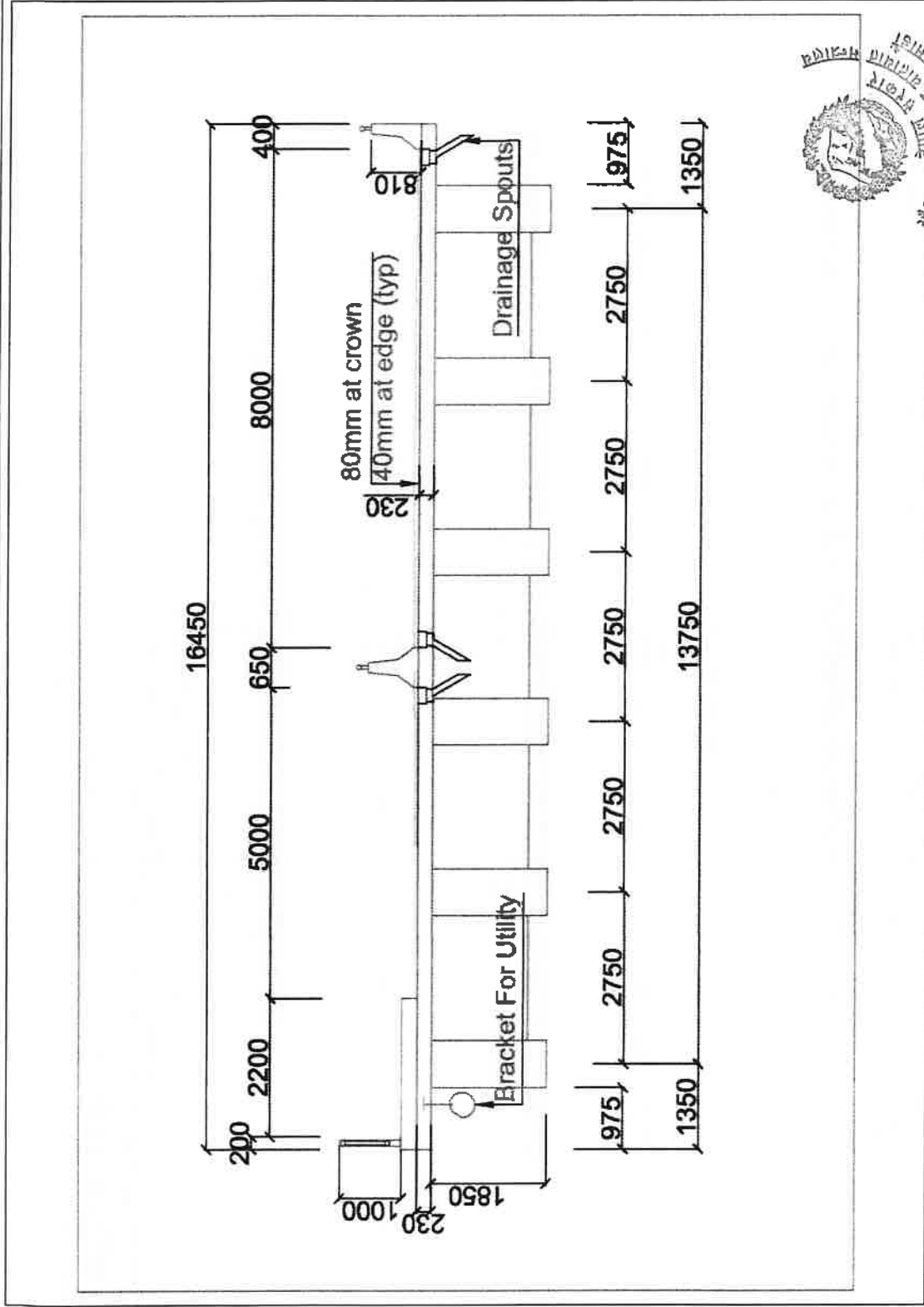


ANNEX II:
FIGURE/ TYPICAL DRAWINGS OF ROAD AND
BRIDGES

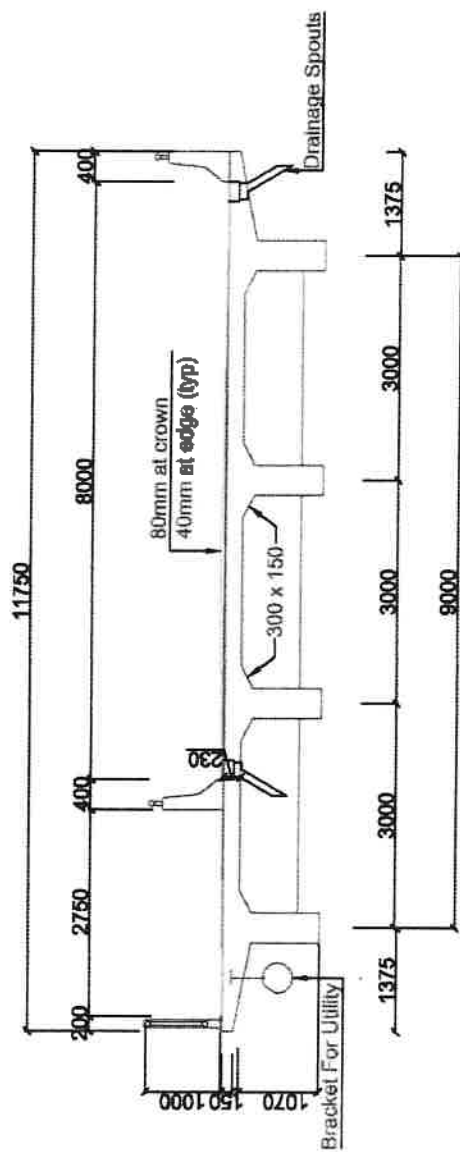


TERMS OF REFERENCE
Initial Environmental Examination (IEE) Study of Butwal- Gorusinghe Road





Urban Area



Semi-Urban Area

ANNEX III:
SURVEY QUESTIONNAIRES AND
CHECKLISTS/FORMAT



Questionnaire for interview, interaction and discussion

- 1) In your view; what are the major adverse environmental impacts in Physical, Biological and Socio-economic and cultural aspects with the construction and operation of road alignment?
- 2) What could be the major beneficial impacts with the implementation of the Highway?
- 3) In your view, what should be done to mitigate the adverse environmental impacts that you have mentioned?
- 4) Are there any other likely impacts with its implementation?
Do you have any suggestions to safeguard social and environmental condition of the project area with its implementation and operation?

Physical Environment

Checklist to be filled during walkover survey:

Chainage/ location	Description of Features observed	
	Right side	Left side



Land use pattern along the road alignment

Type of Land	Chainage		Length (m)	Existing Width(m)	Additional Width (m)	Existing area (ha)	Additional Area (ha)
	From	To					
Built up area							
Sub total							
Agricultural land							
Sub total							
Forest							
Sub total							
Barren land							
Sub total							
Total							

Landslide/ Embankment erosion prone areas

S.N	Chainage and Location (left / right)	Type and Size of Failure	Cause of failure (Water seepage, quarry, cattle, toe cutting, deforestation etc)	Protection Measure	
				Bioengineering	Retaining Wall
1					
2					

Potential drainage management sites

S. N	Chainage	Name of Khola / Kholsi	Type of Structure and size	New structure needed and size	Remark
1					
2					
3					

Potential Spoil Disposal Sites

S. N	Chainage	Location	Mitigation Measure
1			
2			
3			
4			

Potential Camp Sites

S. N	Chainage	Location	Mitigation Measure
1			
2			
3			

Quarry/Borrow Sites

S.N	Chainages	Places of recommended quarry sites
1		
2		
3		
4		



Public Services and Infrastructures along the Road Alignment

Type of Public Service and Infrastructure	Chainage/ Location and side of road (left / right)	Distance from CL of Road (m)	Potential Impact	Mitigation Measure



Biological Environment
Checklist for Wildlife/Biodiversity Baseline study
Vegetation and Wildlife

Vegetation in the project area

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

Mammals in the project area

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

Birds Sighted in the project area

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

Herpeto-fauna in the Project Area

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

Fish in the Project Area

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



Checklist for Technical Field Study - Wildlife

- **Mammals**

- i) Mammals direct sighting and indirect signs (Pugmark/Footprint/Hoofmark, Scats, scratch on tree trunk) on the roadside
(300m direct impact zone and 2 km x 2 km indirect impact zone)
- ii) Road kill (species, location, habitat note)
- iii) Scenario analysis of animal movements (road avoidance, barrier effect and increased overlapping of home ranges)
- iv) Potential impact and mitigation measures (expert opinion– identify and recommend)
- v) Listing of global and national status

- **Avifauna**

Potential sites: Wetland and CF/Forests with wetland and river side.

- i) Bird listing through Transect of 1 kilometer walk per hour
- ii) Bird nest status at the road side or nearby – tree or bush etc
- iii) Potential impact and mitigation measures (expert opinion– identify and recommend)
- iv) Listing of global and national status

- **Aquatic and Herpetofauna**

- i) Enumeration of water bodies (rivers, wetland, ponds, ditches, water logged area) at the road side
- ii) Net fishing, capture and release (for fish and amphibians), direct sighting and photograph (reptiles)
- iii) Potential impact and mitigation measures (expert opinion – identify and recommend)
- iv) Listing of global and national status



Socio-Economic and Cultural Environment

उप-आयोजनाको नाम :

क. स.

घरघुरी सं.

नेपाल सरकार
भौतिक पूर्वाधार तथा यातायात मन्त्रालय
सडक विभाग
आयोजना निर्देशनालय (ए.डी.बी.) विशालनगर, काठमाडौं
पूर्व पश्चिम राजमार्ग स्तरोन्नति आयोजना काँकडभित्ता-लौकही सडक खण्डको
एकिकृत सामाजिक सर्वेक्षण फारम



(प्रभावलेन घरघुरी सर्वेक्षण, सामाजिक सम्भाव्यता, सामाजिक भावनात्मक, प्रभावित घरघुरी सर्वेक्षण,
प्रभावित घरघुरी सामाजिक-आर्थिक सर्वेक्षणका लागि)

१. अन्तरवार्ता लिनेको नाम : २. अन्तरवार्ता मिति :
३. सुपरिवेक्षकको नाम : ४. सुपरिवेक्षण मिति :

१. परिचयात्मक र साधारण जानकारी

१.१ उत्तरदाताको नाम :
१.२ जिल्ला : प्रदेश : १.३ गा.पा. / न.पा. :
१.४ वार्ड नं. : १.५ गाउँ/टोल :
१.६ जग्गाधनी संघको नाता :
१.७ जग्गाधनीको नाम :
१.८ नागरिकता नं. :
१.९ जग्गाधनीको बाबु/आमा वा पति/पत्नीको नाम :
१.१० जग्गाधनीको ससुरा/बाजे को नाम :
१.११ जात/जाति :

अन्तरवार्ताकार र सुपरिवेक्षकको विचारमा प्रभावित व्यक्तिलाई के कस्तो पुनर्वास सहयोग आवश्यक पर्ने हो, सो बारेमा आफ्नो धारणा उल्लेख गर्नुहोस् ।

सामान्य प्रभाव पर्ने
प्रभाव पर्ने र सामान्य सहयोगको आवश्यकता
धेरै क्षति हुने र पुनर्वासको आवश्यकता

संक्षेपः प्रभावलेखन घरेलु सवैक्षणका लागि प्रश्न नं. १-६ सम्म, सामाजिक आधार रेखा सर्वेक्षण तथा सामाजिक सम्भाव्यता अध्ययनका लागि प्रश्न नं. १-१६ सम्म र प्रभावित घरेलु सवैक्षणका लागि प्रश्न नं. १-६ र १७-२२ सम्म तथा प्रभावित घरेलु सामाजिक-आर्थिक सर्वेक्षणका लागि १-२१ सम्म सबै प्रश्नहरू सोझै पर्नेछ ।



२. जम्मा परिवार संख्या

क्र. सं.	परिवारका सदस्यको नाम	लिंग	उमेर	शिक्षा	वार्षिक गतिविद्धी	गत १ वर्ष भित्र रक सहितमा बन्दा बढी समय घर छोडी बाहिर गएको भए		बरमुनीसँगको नाता	कैफियत
						घर छोडी जानुको उद्देश्य	घर छोडी गएको छ/ई		
१								बरमुनी	
२									
३									
४									
५									
६									
७									
८									
९									
१०									
११									
१२									
१३									
१४									
१५									



संकेत:
लिंग : १= पुरुष, २= महिला, ३= तेस्रो लिंगी

शिक्षा : १= निरक्षर, २= साक्षर, ३= विद्यालय जाने उमेर नभएको, ४= प्राथमिक तह (कक्षा १ - ५ पुरा), ५= आधारभूत : ६-८
६ = नि मा वि/मा वि. तह (कक्षा ६-१० पुरा), ७= एस.एल.सी उत्तीर्ण, ८= प्लस टु उत्तीर्ण, ९= स्नातक उत्तीर्ण ९
स्नातकोत्तर र सो भन्दा माथि

वार्थिक १= खेती आफ्नै जमिनमा, २= खेती आफ्नै जमिनमा र अधियाँ, समेत, ३= खेती अधियाँ मात्र, ४= कृषि मजदुरी,
गतिविधि/पेशा : ५= सरकारी जागिर, ६= निजी जागिर, ७ = केटाकेटी, ८= व्यापार/व्यवसाय, ९= पशुपालन,
१०= वनजङ्गलको उत्पादन सङ्कलन, ११= विद्यार्थी, १२= केही पनि छैन, १३= वैदेशिक रोजगार, १४= बेरोजगार १५) अन्य

घरमूलीको १= घरमूली २= श्रीमती, ३= श्रीमान, ४= छोरा, ५= छोरी, ६= दाजुभाई, ७= दिदीबहिनी, ८= नातीनातिनी,
नाता : ९= छोराबुहारी, १०= भाउजु/बुहारी, ११= भतिजा/भतिजी, १२= बुबाबामा, १३= अन्य (कोही भए)

घर छोडी जानुको १= कामको खोजीमा, २= अन्यत्र जागिरे, ३= व्यापार/व्यवसाय, ४= औषधी उपचार, ५= शिक्षा,
उद्देश्य : ६= नातेदार/साथी भेट्न, ७= तीर्थ/धर्म, ८= अन्य (उल्लेख गर्नुहोस्)

घर छोडी गएको ठाउँ : १= जिल्ला भित्र गा. पा. वा न. पा. भित्र/अन्य वडाहरू..... | २= जिल्ला बाहिर ३= भारत, ४= अन्य भए (उल्लेख गर्नुहोस्).....

३. जीविकोपार्जनको स्थिति

३.१ तपाईंको कति जग्गा छ वा कतिमा खेती गर्नुहुन्छ ? सबै प्लट र उपभोगको बारेमा उल्लेख गर्नुहोस् ।

क्र. सं.	जग्गाको नाम	विश्व	प्लट नम्बर नाम वा स्थान	क्षेत्रफल/ ईकाई	जग्गाको प्रकार	विचाई सुविधा	जग्गाको किसिम	जग्गाको उपयोग	संकेत
१									
२									
३									
४									
५									
६									
७									
जम्मा क्षेत्रफल (प्रचलित ईकाईमा)				जम्मा क्षेत्रफल (व.मी.)					
संकेत:									
जग्गाको प्रकार : १= घरबारी, २= खेत, ३= बारी, ४= व्यापारीक क्षेत्र, ५=खरबारी/बुड्यान, ६= बाँझो/चरिबन, ७= निजी									



सिचाई सुविधा :	वन, ८= अन्य भए उल्लेख गर्ने,
जग्गाको किसिम :	१= छ, २= छैत
उपभोगको तरीका :	१= जग्गा, २= दोयम, ३= सीम, ४= चाहार
	१= आफ्नो जग्गा आफैले कमाएको, २= आफ्नो जग्गा अरुलाई अधियामा दिएको, ३= बन्दकी दिएको,
	४= ठेक्का वा भाडामा दिएको, ५= अन्य प्रयोजन भए उल्लेख गर्नुहोस् ।

३.२ तपाईंको आफ्नो जग्गाको उत्पादनले वर्षको कति महिना खान पुग्छ ? महिना (जग्गा भए मात्र)

३.३ तपाईंको परिवारले कसैको जग्गा अधियाँ/ ठेक्कामा लिएको भए सोको विवरण दिनुहोस् ।

क्र.सं.	बानीको नाम	लिंग	पसलको नाम वा स्थान	क्षेत्रफल/ ईकाई	जग्गाको प्रकार	सिचाई सुविधा	जग्गाको उपभोग	उपभोगको तरीका	कैफियत
१									
२									
३									
४									
जम्मा क्षेत्रफल (पञ्चलित ईकाईमा)				जम्मा क्षेत्रफल (व.मी.)					

संकेत:

जग्गाको प्रकार : १= घरबारी, २= छेत, ३= बारी, ४= व्यापारीक क्षेत्र, ५=खरबारी/बुट्ट्यान, ६= बाँझो/सरिचरत, ७= निजी वन, ८= अन्य भए उल्लेख गर्ने,

सिचाई सुविधा : १= छ, २= छैत

जग्गाको किसिम : १= अज्जल, २= दोयम, ३= सीम, ४= चाहार

उपभोगको तरीका : १= आफ्नो जग्गा आफैले कमाएको, २= आफ्नो जग्गा अरुलाई अधियामा दिएको, ३= बन्दकी दिएको, ४= ठेक्का वा भाडामा दिएको, ५= अन्य प्रयोजन

३.४ अधियाँ जमिनबाट कति महिना खान पुग्छ ? नगदे बाली भएमा (कति आम्दानी).....

३.५ तपाईंको परिवारलाई खाद्यान्न किनेर खानुपर्ने भयो भने सरदर एक महिनामा कति रुपैया खर्च गर्नु पर्ला ? रुपैया ।

३.६ खाद्यान्न नभएको समयमा तपाईंले कुन स्रोतबाट खाद्यान्नको लागि आवश्यक व्यवस्था गर्नुहुन्छ ?

- | | |
|---|---|
| (१) गाउँमा ज्यालामजदुरी गरेर । | (२) गाउँ भन्दा बाहिर गएर ज्याला मजदुरी गरेर । |
| (३) कृषिजन्य उत्पादन र विक्रीबाट | (४) पशुपक्षी विक्री गरेर । |
| (५) सम्पत्ती बेचेर । | (६) जागिरबाट आएको तलबभत्ताबाट । |
| (७) पेन्सन तथा विदेशबाट पठाएको रकमबाट । | (८) व्यापार/व्यवसायबाट । |
| (९) सापट वा स्रुण लिएर । | |



४. पारिवारीक आम्दानी तथा खर्चका विवरण

४.१ परिवारका आम्दानीका स्रोतहरू

क्र.सं.	क्षेत्र	वार्षिक आम्दानी (रु.)	क्र.सं.	गैर क्षेप क्षेत्र	वार्षिक आम्दानी (रु.)
१	अन्नबाली विक्रीबाट		१	कृषि मजदुरीबाट	
२	नगदेबाली विक्रीबाट(हरियो तरकारी तथा फलफूल, विउविजन तथा मागबानी समेत)		२	ज्याला मजदुरीबाट	

३	जडिमुटी बिक्रीबाट		३	नोकरीबाट	
४	पशु/पक्षि बिक्रीबाट		४	पेशागत शुल्क	
५	दुध उत्पादनबाट		५	नघुउद्यमबाट	
६	मीरी पालन		६	व्यापार / व्यवसायबाट	
७	माछा पालन		७	पेन्सन/विदेशबाट पठाएको	
८	अन्य (खुलाउने)		८	भ्राडा/व्याज	
९	अन्य		९	सम्पति बेचबिखनबाट	
१०	अन्य		१०	अन्य	
जम्मा			जम्मा		
कुल जम्मा (कृषि क्षेत्र र गैर कृषि क्षेत्रबाट भएको कुल वार्षिक आयदानी)					

४.२ वार्षिक पारिवारिक खर्च

क्र.सं	खर्चको किसिम	वर्षिक खर्च हुने महिनाको नाम	वार्षिक खर्च (रु.)
०१	खागेकुरा		
०२	बलाकपडा		
०३	स्कूल शुल्क, किताब कापी आदि		
०४	औषधी, डाक्टर सम्पत्तिले आदि		
०५	बत्ति बाल्ने, प्रखडने इन्धन आदि		
०६	सुनचर्दी, घरगहना आदि		
०७	बस्तुभाउ / मनसाद आदि		
०८	बातायाल / सञ्चार आदि		
०९	धार्मिक, चाडपर्व, पुजा आदि		
१०	नामाजिक कार्यमा चन्द्र / दान दिन		
११	जाँड, रक्सी, भुषा, ताल आदिमा		
१२	आयआर्जन सम्बन्धी कार्यमा		
१३	शुण/व्याज तिर्न		
१४	कर/विभिन्न शुल्क/जरिवाना आदि		
१५	अन्य		
जम्मा वार्षिक खर्च			

४.३ यदि आम्दानी भन्दा खर्च बढी आएमा त्यसो हुनाको कारणहरु उल्लेख गर्नुहोस् ?

५. सीप र तालिम

५.१ तपाईंको परिवारका सदस्यहरूमा कस्तो प्रकारको सीप र कुन प्रकारको घरलु उद्योगको अनुभव छ ?
(प्र.२को पारिवारिक विवरण थपि राख्नुहोस्)

गतिविधि	पुरुष	महिला	दुवै	कैफियत
१. बाँसको काम				
२. गुन्द्रि बुन्ने				
३. काठको काम				
४. गान्नी लगाउने				
५. घर बनाउने				
६. ज्यामी काम				
७. खास प्रशोधन				
८. अन्य				



५.२ तपाईंको परिवारको कुनै सदस्य कुनै पनि प्रकारको सीपमूलक वा अन्य किसिमको तालिममा सहभागी हुनुभएको छ ? (प्र.२ को पारिवारीक विवरण याद राख्नुहोस्)

सीप / तालिम	वर्षादि	आयोजक संस्था	सहभागी संस्था	
			पुरुष	महिमा

उत्केत आयोजक संस्था

१. जिल्हा स्तरीय कार्यालय २. गा. पंच। नं. पा. कार्यालय ३. गैरसरकारी संस्था

४. अन्तर्राष्ट्रीय गैर सरकारी संस्था ५. निजी तालिम प्रदान गर्ने संस्था

५.३ उनीहरूले प्राप्त गरेको सीपलाई आयआर्जन गर्ने कार्यमा प्रयोग गरेका छन् ?

(१) छन् ।

(२) चैनन् ।

यदि छान् मने, कस्तो कितिमले

છેનન્, ધને, કિન

५.४ तपाईंको गा.पा./न. पा. मा निम्न बमोजिमका सामाजिक परिचालन सम्बन्धी कार्यक्रम सञ्चालित छन् ?

चेतना अभिवृद्धि कार्यक्रम	जन्	जैनन्	वाचकावर्जन कार्यक्रम	जन्	जैनन्
१. शशक्तिकरण			१. बचत तथा ऋण		
२. स्वास्थ्य तथा सरसफाई			२. सहकारी		
३. महिला तथा प्रजनन स्वास्थ्य			३. कृषि प्रसार		
४. महिला साक्षरता			४. पशुपालन		
५. ग्रीड शिक्षा					
६. सडक नाटक					
७. वेलिवेटी बैठकिलेखन					

६. पूर्वाश्रार सम्बन्धी योजनामा कामको वनस्पत

६.१ तपाईंको परिवारका कुनै सदस्य कुनै पूर्वाधार निर्माण सम्बन्धी काममा यस अधि सहभागी हुनु भएको शाह छ ?
(१) छ । (२) छैन ।

यदि क्व भने, कृपया ठिक चिनो लगाउनुहोस् ।

(१) सडक । (२) पुल । (३) खानेपानी । (४) गोरेटो । (५) वृक्षारोपण (६) अन्य ।

६.२ सो काम गरे बापत कसैले रकम पाएको थियो ?

(१) वियो । (२) विएन, त्यो अमघान वियो ।

बदि नियो भने, दैनिक कति पाउनु भएको थियो ? रुपैयाँ ।

६.३ तिनीहरूले समूहमा काम गरेका थिए कि व्यक्तिगत रूपमा ?

(१) समुहमा । (२) व्यक्तिगत रूपमा ।

६.४ तपाईंको विचारमा, के समुदायका मानिस सडक, पुल आदि पूर्वाधार निर्माण सम्बन्धी योजनामा काम गर्न चाहन्छन् ?

(१) चाहन्छन्। (२) चाहदैनन्।

६.५ तपाईंको परिवारका सदस्यहरूमा पूर्वाधार निर्माण सम्बन्धी कुनै प्रकारको सीप/ज्ञान छ ?

(१) छ। (२) छैन।

६.६ यदि छ भने, तलको विवरण दिनुहोस्।

क्र.सं.	नाम	लिंग	वयस	व्यवसाय	कुन कुन महिनामा काम गर्न समय उपलब्ध हुन्छ ?
१.					
२.					
३.					

संकेत
संख्या : १= गाढो लगाउने, २= ढुङ्गा काट्ने, ३= सिकारी, ४= जाली बुन्ने, ५= पाईप जोड्ने, ६= फोल्डिङ्ग सम्बन्धी काम गर्ने, ७= विमेन्टको काम गर्ने, ८= मायोर्टिफिकेसनको काम गर्ने, ९= साधारण मेसिन चलाउन जान्ने, १०= अन्य भए उल्लेख गर्ने।
अक्षर : १= व्यामी/हेल्पर, २= अन्य भए उल्लेख गर्ने।

६.७ तपाईंको परिवारलाई काममा आउनको लागि कस्तो खालको सहयोग आवश्यक पर्दछ ?

.....

६.८ तपाईंको घरबाट उप-आयोजनासम्म पुग्न कति समय लाग्दछ ?

..... मिनेट।

६.९ सडक निर्माण क्षेत्रवरपर बिगत तीन-चार वर्षमा जग्गाको मूल्यमा घटबढ भएको छ ?

(१) बढेको छ। (२) घटेको छ। (३) उस्तै छ।

६.१० यदि घटबढ छ भने त्यसो हुनाका मुख्य कारणहरु के के हुन् ?

१.
 २.
 ३.



७. रूखबिरुवा र बस्तुभाउ

७.१ तपाईंको परिवारको स्वामित्वमा विभिन्न प्लटमा गरी जम्मा कति जति बोटबिरुवा छन् ?

क्र.सं.	रूखका प्रकार	जम्मा संख्या	धरावसी उपयोग	बाबु बाबुनमा प्रयोग
१	बाउरा योग्यरुख			
२	काठयोग्य रुख			
३	फलफूलको रुख			
४	घाँसका रुख			

५	बाँसका गाँज			
६	जडिबुटी / वनस्पति			

७.२ वस्तुभाउको संख्या

क्र.सं.	वस्तुभाउको विवरण	जम्मा संख्या	कस्तो स्तमित छ ?	
			महिला	पुरुष
१	बेसी/रंगा/पाडा/पाडी			
२	गाइ/ गोरु / बाख्रा/ बाख्री			
३	दाक/फोपा			
४	नाखा/ पाठा/ खनी/बोक			
५	खेडा			
६	छोडा			
७	हाँस / कुखुरा			
८	सुङ्गुर/ बङ्गुर			
९	सोरी घर			
१०	अन्य			



८. अन्य शैतिक साधन

८.१ तपाईंको घरमा निम्न वस्तुहरु छन् ?

- (१) रेडियो (२) टि.वि. (३) झलकट्टे मिला (४) सिउने मेसिन (५) बुल्ने लाम
(६) स्वामरा (७) टेलिफोन/मोबाइल (८) सोलार (९) सवारीका साधन
(१०) गोबर ग्यास/एल.पी.जी. (११) अन्य कुनै

८.२ तपाईंको घर कस्तो छ ?

- (१) कच्चा र फुत्को (२) पक्का र ढलान गरेको (३) मध्यम र टिनको छाना भएको
(४) अन्य भए खुलाउने

९. कृषि कार्यमा हुने समय विभाजन

९.१ खेतबारीमा निम्न कामहरु धेरै जसो कसले गर्ने गर्दछ ?

गतिविधि	बर्षा ऋतुमा		हिउँद ऋतुमा		केटाकेटीले गर्ने भएमा	
	पुरुष	महिला	पुरुष	महिला	छोरा	छोरी
१. जग्गा तयारी						
२. पिउ छर्ने						
३. बेना सार्ने						
४. रोप्ने						
५. गोहने						
६. सिचाई गर्ने						
७. मलछर्ने						
८. बानी काट्ने						
९. बानी बोक्ने / डुवानी गर्ने						

१०. सफा गर्ने / केनाउने						
११. अप्ठार गर्ने						
१२. बजार गर्ने						

संकेत : १ = छरे २ = कम ३ = बराबर

१.२ निम्न कार्य प्रायः कसले गर्ने गर्दछ । ठिक चिन्ह लगाउनुहोस् ।

बराबरी कामकाजहरू	केटाकेटी			वपस्क		
	छेरा	छेरी	बराबर	पुरुष	महिला	बराबर
१. पानी ल्याउने						
२. दाउरा सङ्कलन गर्ने र ल्याउने						
३. घाँस काट्ने ल्याउने						
४. जन्म दिन्ने						
५. कपडा धुने						
६. खाना पकाउने / सफा गर्ने						
७. केटाकेटीको स्नाहार गर्ने						
८. बुढाबुढीको हेरचाह गर्ने						
९. गाईबस्तु चराउने						
१०. बजार गएर समान किनमेल गरि लेउने						
११. अन्य						

१०. स्रोतको उपयोग

१०.१ निम्न स्रोतको प्रकार र उपयोगका लागि लाग्ने समय बताईदिनुहोस् ।

स्रोत	प्रकार	जान लाग्ने समय	कहाँ छ	कैफियत
१. चरिचरम	बन/चौर/तिजी क्षेत्र/घरमै बाधिर			
२. खाना पकाउने ईन्धन	दाउरा/गोबरगोस/ग्याँस/मृदुलेल/बिजुली			
३. प्रकाशको व्यवस्था	टुकी/बिजुली/सौर्य उर्जा/ग्याँस			
४. पिउने पानी	धारा/कुवा/खोन्सी/खोला			
५. नजिकको सडक सुविधा	गोरेटो/घारेटो/धुले/ग्राभेल/कालोपत्रे			

संकेत : कहाँ छ ? १ = गाँउमा, २ = गा.वि.स.मा ३ = गा.वि.स. बाहिर ४ = जिल्ला बाहिर

१०.२ तपाईंले कतैवाट घाँस दाउरा बाहेक अन्य विरुवा सङ्कलन गर्नुहुन्छ ? यदि गर्ने भए, कहाँबाट

(१) गर्छु। (२) गर्दिन।

१०.३ पानी, बन जस्ता साभ्ना स्रोतमाथि कसको स्वामित्व छ ?

(१) महिला (२) पुरुष (३) घरमूली (४) समुदाय

११. सामुदायिक सहभागीता सम्बन्धी

११.१ तपाईंको परिवारका कुनै सदस्य समाजका सामुदायीक समुहसँग आवद्ध हुनुहुन्छ ?

(१) छैन। (२) छैन।

११.२ यदि आवद्ध हुनुहुन्छ भने तपाईंको समुदायमा भएको र तपाईं आवद्ध हुनु भएको उपभोक्ता समुह / सामाजिक संस्थाको नाम बताईदिनुहुन्छ कि ?

१.
२.
३.



४.

५.

आवद्ध भएकोमा, तपाईं र तपाईंको परिवारको सदस्य तलका मध्ये कुन समूहमा आवद्ध हुनुहुन्छ ?

क्र.सं.	आवद्ध समूह	लिंग	साधारण सदस्य	कार्यकारी सदस्य
०१	बन उपभोक्ता समूह	पुरुष		
		महिला		
०२	जल उपभोक्ता समूह	पुरुष		
		महिला		
०३	बचत तथा ऋण समूह	पुरुष		
		महिला		
०४	युवा क्लब	पुरुष		
		महिला		
०५	महिला / जामा समूह	पुरुष		
		महिला		
०६	बाल समूह	छेडा		
		छेटी		
०७	अन्य समूह	पुरुष		
		महिला		

११.३ तपाईं वा तपाईंको परिवारका कुनै सदस्य गत एक वर्षमा कुनै सामाजिक क्रियाकलापमा सहभागी हुनुभएको थियो ?

(१) थियो ।

(२) थिएन ।

यदि थियो भने, तपाईंको सबै परिवारले गरेर के के सामाजिक कार्यमा कति पटक भागलिन गयो ?

क्र. सं.	सामाजिक क्रियाकलाप	लिंग	कति जना	पटक संख्या
०१	सामाजिक/धार्मिक कार्य	पुरुष		
		महिला		
०२	सामुदायिक बैठक/सभा	पुरुष		
		महिला		
०३	राजनैतिक सभा/बैठक	पुरुष		
		महिला		
०४	प्यारिटी/क्लब	पुरुष		
		महिला		
०५	सामुहिक नीतिक निर्माण	पुरुष		
		महिला		
०६	अन्य (केहि भए उल्लेख गर्नुहोस्)	पुरुष		
		महिला		

यदि सहभागी नभएको भए, किन ?

११.४ के महिलाले बैठकमा भाग लिने गर्दछन् ।

(१) गर्छन् ।

(२) गर्दैनन् ।

११.५ महिलालाई बैठकमा भाग लिन कुनै अफ्टेरा/समस्या छ कि ?

(१) छ ।

(२) छैन ।

यदि छन भने, कस्ता समस्याहरू छन् उल्लेख गर्नुहोस्।



१२. महिला बेचबिखन

१२.१ गत वर्ष (२०७६/७७) मा तपाईंको गाउँघरमा महिला बेचबिखनको घटना घटेको थियो छ ?

१३. लागू पदार्थ

१३.१ तपाईंलाई लागू पदार्थको बारेमा जानकारी छ ?

(१) छ (२) छैन

१३.२ यदि जानकारी छ भने

यो न.पा./गा.पा. मा के कस्ता उमेर समूहका बढी मात्रामा लागू पदार्थमा फसेको छ ?

(१) १५-२५ उमेर समूह (२) २५-३५ उमेर समूह (३) ३५-४० उमेर समूह (४) ४०-४५ उमेर समूह

(५) ४५ उमेर समूहदेखि माथि

१४. बाल विवाह

१४.१ यो न.पा./गा.पा. मा गत वर्षमा (२०७६/७७) बाल विवाह भएको छ कि छैन ? यदि छ भने कति जनाको बाल विवाह भएको छ ?

१५. बाल बालिका घरेलु मजदुरी

१५.१ हाल यस न.पा./गा.पा. मा मजदुरी गर्ने बाल बालिका छन् ?

(१) छन् । (२) छैनन् ।

यदि छन् भने कुन कुन बढाया छन् ? विवरण दिनुहोस् ।



१६. भौतिक सुविधाको उपबोध

१६.१ शिक्षा, स्वास्थ्य, बजार जस्ता सुविधा कहाँ छन् र ती स्थानमा जानआउन कति समय लाग्दछ ।

सुविधा	कहाँ छ (संकेत)	याग यात्रा जाने समय	सामान्यको यात्रा (घं)	एक तर्फ जाने वर्ष	सामान्य को जाल				नैफिन
					जोड	कोरी	पुन	यसि	
१. प्राथमिक विद्यालय कहाँ छ?									
२. माध्यमिक विद्यालय कहाँ छ?									
३. कलेज कहाँ छ ?									
४. टेलिफोन									
५. स्वास्थ्य सुविधा धामिकाती									
६. आयुर्वेदिक केन्द्र									
७. उप-स्वास्थ्य चौकी									

८. स्वास्थ्य चौकी									
९. अस्पताल									
१०. पशुस्वास्थ्य सेवा केन्द्र									
११. कृषि सेवा केन्द्र									
१२. स्थानीय बजार									
१३. जिल्ला बजार									
१४. जिल्ला सदरमुकाम									
बस्नेत : कहाँ छ ?	१ गाँउमा,	२ गा पा/ न. पा. मा	३ गा पा/ न. पा. बाहिर						
	४ जिल्ला बाहिर								
यातायातको साधन:	१. पैदल,	२. टेम्पो/ रिक्सा,	३. बस/माईक्रो,						
	४. मोटरसाईकल,	५. जीप,	६. जहाज						
	७. अन्य								

१६ २ तपाईंको परिवारका कुनै पनि सदस्य जिल्ला सदरमुकाम कतिको जानुहुन्छ ?

- (१) प्रत्येक दिन (२) प्रत्येक हप्ता (३) १५ दिनमा एक पटक
(४) महिनामा एकपटक (५) ३ महिनामा एक पटक (६) ६ महिनामा एक पटक
(७) बर्षमा एक पटक (८) अन्य भए, उल्लेख गर्ने

१६ ३ बजारको सूचना प्राप्त गर्न के तपाईं टेलिफोन प्रयोग गर्नुहुन्छ ?

- (१) गर्छु। (२) गर्दिन।

यदि गर्ने भए, कतिको ?

- (१) प्रत्येक दिन (२) प्रत्येक हप्ता (३) १५ दिनमा एक पटक
(४) महिनामा एकपटक (५) ३ महिनामा एक पटक (६) ६ महिनामा एक पटक
(७) बर्षमा एक पटक (८) अन्य भए, उल्लेख गर्ने

१६ ४ तपाईंको घरमा भएको उत्पादन बिक्री गर्नुहुन्छ ?

- (१) गर्छु। (२) गर्दिन

१६ ५ त्यसलाई कहाँ बिक्री गर्नुहुन्छ ?

- (१) घरमै। (२) स्थानीय बजारमा। (३) जिल्लाको मुख्य छुट बजारमा नगरेर। (४) जिल्ला सदरमुकाममा नगरेर।

१६ ६ बजारमा बिक्री गर्ने भए, त्यसलाई बजारसम्म कसरी पुर्याउनुहुन्छ ?

- (१) आफैले बोकेर। (२) अरुलाई बोकाएर। (३) कुनै सवारी साधनबाट

१६ ७ बजारसम्म पुर्याउन कति समय लाग्दछ ? मिनेट।



१६ ८ यस्तो उत्पादन कतिको लगातार बिक्री गर्नुहुन्छ ?

- (१) प्रत्येक दिन (२) हप्तामा एकदुई पटक
(३) महिनामा एकपटक (४) महिनामा दुईपटक
(५) अन्य भए उल्लेख गर्ने

१६ ९ यस्तो उत्पादन मौसम अनुसार कति परिमाण (इकाई) मा बजार लानुहुन्छ र कति रकम कमाउनु हुन्छ ?

क्र.स.	विवरण (संकेत)	परिमाण (इकाई)	प्राप्त रुपैया	कैफियत
१				
२				
३				
४				
५				
संकेत	१ = पशु / चौपाया बिक्री, बिक्री, ४ = जडिबुटी,	२ = छाछ्यान्त / खाद्य पदार्थ, ५ = घरेलु प्रयोगका सामग्रीहरु,	३ = फलफूल / तरकारी, ६ = अन्य	

१६ १० यदि सामान बेच्न लेजादा भाडा बापत पैसा तिर्नुपर्ने भए, सो बापत कति खर्च हुन्छ ? रुपैया ।

१७. स्वास्थ्य सम्बन्धी

१७.१ गर्भवती भएको बेलामा गर्भावस्था (एन्टिनेटल) जचाउन स्वास्थ्य संस्था जाने गर्नुहुन्छ ?

- (१) जाने गर्छु । (२) जाँदैन ।

१७.२ सुत्केरी कहाँ गराउनुहुन्छ ?

- (१) घरमा (२) स्वास्थ्य सस्थामा (३) हस्पिटलमा

१७.३ तपाईंका केटाकेटीलाई खोप (सुई) लगाउने गर्नुभएको छ ?

- (१) छ । (२) छैन ।

१७.४ तपाईंका बालबालिकालाई कुन कुन रोगले सताउने गरेको छ ?

- (१) निमोनिया (२) ज्वरो (३) फाडा पखाला (४) रुघाखोकी
(५) बाल्ता हुने (६) जुका पर्ने (७) खडुरा (८) कमलपिल (अन्डीस)
(९) अन्य भए उल्लेख गर्ने

१७.५ तपाईंको परिवारका कुनै सदस्य गत वर्ष बिरामी पर्नुभएको थियो ?

- () थियो । () थिएन ।

परेको भए,

- () जचाउनु भयो/उपचार गराउनुभयो । () जचाउनु भएन ।

१७.६ उपचार गराउन जानु भएको भए कहाँ जानु भएको थियो ?

- (१) स्वास्थ्य केन्द्र (२) अस्पताल (३) घाँसीकर्कोकी
(४) घरेलु औषधि (५) अन्य भएको भएमा उल्लेख गर्ने



१७.७ तपाईंको परिवारमा गत वर्ष कसैको मृत्यु भएको थियो ?
() भएको थियो । () थिएन ।

क्र.सं.	विषय	मृत्यु हुनुको उमेर	सम्भव भएको मृत्युको कारण
१.			
२			
३			

१८. एड्स सम्बन्धी प्रश्नावली

१८.१ एड्स भनेको के हो, थाहा छ ?

यदि छ भने कति जनालाई भएको छ ?

१८.२ खानेपानीको स्रोत

(१).पाइप (२) कुवा (ठाकिएको) (३)कुवा (नछाकिएको) (३).ट्यूबवेल (४)कोरिङ्ग
(५) ट्याण्ड पम्प (६).नदी/खोला (७)अन्य भए खुलाउने

१८.३ तपाईंको चरमा चर्पी छ ?

(१) छ (२) छैन

यदि छ भने कस्तो प्रकारको उल्लेख गर्नुहोस्

(१).फुस चर्पी (२) पक्की चर्पी (सेप्टी टकी) (३).खाल्टे चर्पी (४).अन्य भए खुलाउने

१८.४ डल व्यवस्थापन

(१) छ (२) छैन

१८.५ फोहोर मैला व्यवस्थापन

(१) ..छ (२) छैन

यदि छ भने कस्तो प्रकारले फोहोरमैला व्यवस्थापन गर्नु हुन्छ, उल्लेख गर्नुहोस् ।

(१) आफ्नै घरमा (२) .कम्पाउण्ड बाहिर जलाउने/गाहने (३) घरमै लिन आउँछ (४).कम्पोष्ट मल बनाउने
(५) .सडकमा वा नदीनालामा फाल्ने (६).अन्य भए खुलाउने

१९ विद्युत तथा बैकल्पिक ऊर्जा

इन्धन उपयोग गर्ने घरधुरी (खाना पकाउने इन्धन)



(१).काठमाडौं (२) गोर्खा/गुईठा (३).सोलार (४) वायोग्यास (५) विद्युत (६).मट्टितेल (८).ग्यासको प्रयोग (एल पि जी) (९) अन्य भए खुलाउने ।

१९.१ बत्ती बाल्ने इन्धन प्रयोगको आधारमा घरधुरी

(१).विद्युत जडान भएको (२).मट्टितेल (३) सोलार (४).वायोग्यास (५).अन्य भए खुलाउने ।

१९.२ घरको प्रकार/कनाक्टको आधारमा घरधुरी (बबलोकन गरी चिन्ह लगाउने)

(१) आर.सी.सी. (पिल्लर भएको) (२) आर.सी.सी. (पिल्लर नभएको) (३) माटो र ढुंगाको जडान (४) काठको घर(५) अन्य भए खुलाउने ।

१९.३ घरको स्वामित्वमा महिलाको पहुँच

(१) नीजि घर (२) भाडाको घर (३) व्यापार (४) अन्य भए खुलाउने ।

१९.४ बसाई सराई (यदि गरेको भए मात्र) आधारमा घरधुरी

(१) रोजगारी (२).शिक्षा (३)आर्थिक अवसर (४) सुरक्षाकर्मी (५).नोकरी (६).पेशा/व्यवसाय (७)अन्य भए खुलाउने ।

२०. भविष्यका प्राथमिकताहरु ।

२०. १ तपाईंको परिवारका प्रमुख आवश्यकताहरु के के हुन् ? (मुख्य प्राथमिकताको आवश्यकतालाई पहिचान गरी पहिले लेख्नुहोस्)

आवश्यकता	प्राथमिकता
१.	१.
२.	२.
३.	३.
४.	४.
५.	५.

१७.२ उपरोक्त पारिवारिक आवश्यकता परिपूर्तीका लागि तपाईंको भावी योजना के छ ?

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२०.२ प्रस्तावित उप-आयोजनाका कारणले तपाईंको परिवारको सम्पति (रुखबिरुवा, घर/टहरा, खेतीपाती, जग्गा तथा कुनै आम्दानीको स्रोत) क्षति हुन्छ ?

(१) हुन्छ । (२) हुँदैन ।

हृदय गर्ने कस्तो नामको सम्पत्ति थियो ?

१८.१ माथिका सबालमा नपरेका तर तपाईंलाई भन्न मन लागेका केही रोचक सूचनाहरू भएमा उल्लेख गर्नुहोस् ।

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TERMS OF REFERENCE
Initial Environmental Examination (IEE) Study of Butwal- Gorusinghe Road

यदि आवश्यक परेको बेमावा मुक्तता आउन सक्यो भने (१) यस्तो हुन्छ (२) यस्तो हुनेछ

२२ कम्पना विगत तीन वर्षको अवधिमा प्रभावित पटमा टहरा लगाई व्यापार गरेको छ भने विवरण दिनुहोस् ।

क्र.सं.	प्रभावित पटको		आजा/आना /मिवा पसल	टहराको क्षेत्रफल	कम्पना व्यापार (धति गहिना इ....)	कंसिद्वय
	पट नं.	फिज नं.				

२२ १ तपाईंको कारोबारको मुख्य खान्दान के हो ? , तपाईंको परिवारलाई एक गरीगमा मुक्त खान्दान कति चाहिन्छ ? ईकाइ वा के हो

२३ योजनाबाट प्रभावित हुने घर / संरचनाको पूर्ण विवरण दिनुहोस् ।

क्र.सं.	वर्ग	वर्ग नं.	फेस	कम्पनाबाटको दुरी (मि.)	पिठ नं. / फिज नं.	वर्गको नाम	संरचनाको प्रकार	समा कम्पना	विशेष बर्ण दिनु	उपयोग
१										
२										
३										
४										
५										

संरचनाको प्रकार १= बस्ने घर, २= व्यापारीक भवन, ३= सामुदायिक भवन, ४= गोठ, ५= शौचालय, ६= पक्खी, ७= अन्य भएमा उल्लेख गर्नुहोस् ।
 हावाको उपयोग १= आफ्नो बस्नेघात गरिनेको, २= व्यापार/ व्यवसायमा उपयोग भएको, ३= बस्नेघात वा व्यापार व्यवसाय दुवैमा उपयोग भएको, ४= अन्य कुनैमाई बाह्यमा लिएको ।
 (सधन वा संरचनाको छतीको पूर्ण विवरणको निम्ती अर्को फारम भरिने समय गरिनु पर्नेछ)



२३.१ यदि घर/सरचना हटाउनु पर्ने छ भने, के यो सरचना तपाईंको आफ्नै जमिनमा बनेको हो?

(१) हो (२) होईन

यदि होईन भने, यो जमिन कस्को हो नाम ठेगाना बताइदिनुहोस् ।

२३.२ (बसोबास गरिरहेको घर हटाउनु पर्ने भएमा) तपाईं बसोबास गर्नको लागि यो बाहेक कुनै अर्को बस्ने ठाउँ वा घर छ ?

(१) छ (२) छैन भने १९.६ प्रश्नमा जानुहोस् ।

२३.३ यदि छ भने कहाँ छ ?

(१) यति पल्टको अर्को स्थानमा (२) दोस्रो कुनै पल्टमा, कति टाढा छ ?मि.

२३.४ नयाँ बसोबास सम्म सामान सैजान कस्तो प्रकारको साधन प्रयोग गर्नुपर्दछ ?

(१) पैदल (२) बस (३) रिक्सा
(४) ट्र्याक्टर (५) तिजी कुनै सवारी साधन (६) अन्य कुनै

२३.५ सामान सैजान अनुमानित कति जति खर्च लाग्दछ ? रूपैयाँ ।

२३.६ यदि अर्को बस्ने घर छैन भने, बसोबासको व्यवस्था कसरी गर्नुहुन्छ ?

(१) नयाँ घर बनाएर (२) बसाई सरी नयाँ ठाउँमा गएर
(३) भाडामा लिएर (४) अन्य कुनै सोच भएमा

२३.७ नयाँ घर बनाउनलाई कसरी योजना गर्नु भएको छ ?

(१) यसैको बाँकी पल्टमा (२) अन्य पल्टमा
(३) नयाँ जमिन किन्नु पर्ने (४) अन्य कुनै सोच भएमा

२१.८ यी कुनै पनि योजना अनुरूप, सडकबाट कति पर सन्नु पर्दछ ? मि

२३.९ यदि नयाँ घर किन्ने वा बनाउने योजना छ भने, यसै प्रकारको घर बनाउन कति जति रकम खर्च होला ?

..... रूपैयाँ ।

२३.१० सडक आयोजनामा पर्ने यो घरमा तपाईंको बाहेक अन्य कुनै परिवारका सदस्य पनि बसोबास गर्दछन् ?

(१) छन् (२) छैनन् ।

२३.११ यदि छन् भने, पूर्ण विवरण दिनुहोस् ।

घर नं.	परिवारमुखीको नाम	ठेगाना	जात/जाति	जम्मा परिवार संख्या	मुख्य पेशा	कति सम्बन्धित बसोबास गरिरहेको	उपयोग गरेको कोठा संख्या	माछा प्रति महिना



२४ . प्रभावित पल्टबाट कुनै रुखविरूवा हटाउनु पर्दछ ।
(१) पछि । (२) पर्देन ।

२४ .१ आयोजनामा पर्ने पल्टबाट कुनै फलफूलका विरूवा/नगदेवाली हटाउनु पर्ने भएमा निम्नानुसारको विवरण दिनुहोस् ।

क्र.सं.	प्रकार	नामहरू	फल दिनेको संख्या	फल नदिने जुधो बोटको संख्या	फल नदिने विरूवा बोटको संख्या
१	फलफूल				
२	गैह्र काष्ठ वन पैदावर				
३	बसि/निगालो				
४	अन्य				
५					
(यहाँ उल्लेखित बोट विरूवाको क्षतीको पुर्ण विवरणको निम्ती अर्को फारम भरेर संलग्न गरिनु पर्नेछ ।)					



२४ .२ यदि प्रभावित पल्टबाट कुनै रुखविरूवा हटाउनु पर्ने भएमा निम्नानुसारको विवरण दिनुहोस् ।

क्र.सं.	प्रकार	नामहरू	रुखको संख्या	विरूवा संख्या (१० सेमी नर्ध मुनी)	कैफियत
१	काठ				
२	हाउरा				
३	घाँस				
४	बहु प्रयोग				
५	गैर काष्ठ				
६	अन्य				
(यहाँ उल्लेखित बोट विरूवाको क्षतीको पुर्ण विवरणको निम्ती अर्को फारम भरेर संलग्न गरिनु पर्नेछ ।)					

२४ .३ प्रभावित रुखविरूवा भएको पल्टबाट तपाईंको बसोबास भएको घरसम्म रुखविरूवा दुरानी गर्न कति समय लाग्छ/दुरी छ ? समय मिनेट, दुरी मिटर

२५ . स्वामीत्व हस्तान्तरण र यसका लागि प्रभावित परिवारको प्राथमिकता

२५ .१ यदि तपाईं बसोबास गरिरहेको घर योजनाले लिएमा, कस्तो प्रकारको क्षति महशुस गर्नुहुन्छ/
(१) दैनिक श्रामदानीको क्षति (२) घर/जग्गाको क्षति
(३)अर्को घर/जग्गा खरिद गर्न सकिदैन (४)अन्य भएमा (उल्लेख गर्ने)

२५ .२ तपाईंले हाल सडकले चर्चिरहेको जमिन सडकलाई छोडिसक्नु भएको कुरा साँचो हो ?

(१) हो । (२) होईन ।

यदि हो भने, कहिलेबाट र कति क्षेत्रफल

२५.३ यस आयोजनामा पर्ने जमिन क्षतिपूर्ती बिना दानको रुपमा दिन ईच्छुक हुनुहुन्छ ?

(१) छ । (२) छैन ।

(२) छैन ।

छैन भने तयतकट्टाका लागि कुनै शर्त ?

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२५.५ योजनामा पर्ने परिवारका हैसियतले योजनाबाट कस्तो प्रकारको अवसर/सहयोगको अपेक्षा राख्नुहुन्छ ? बहुउत्तरे

(१) रोजगारीको अवसर

(२) सीप विकास तालिम

(३) बचत तथा श्रृण कार्यक्रम

(४) अन्य धेरै

२५.६ समता अभिवृद्धी सम्बन्धी तालिममा इच्छु हुनुहुन्छ भने :

प्राथमिकता	इच्छावाझएको तालिम	तालिम तिने व्यक्ति नाम, उमेर, शिक्षा	कैफियत
१			
२			
३			

२५.७ तालिम पश्चात तपाईले सोच्नु भएको केली योजना छ ?

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ANNEX IV:
RAJPATRA NEPAL GUZZATE MENTIONING ROW
OF THE EXISTING HIGHWAY 25 METER BOTH
SIDES



००५३१००

नेपाल सरकार (मह)

वी.पी. को सरकार

निर्माण तथा यातायात मन्त्रालयको सूचना

सार्वजनिक सडक ऐन, २०३१ को दफा ३० दिएको अधिकारसिद्धान्तको अन्तर्गत सरकारले देहायको सार्वजनिक सडकहरूलाई देहायबमोजिमसार्वजनिकरूपमा खोला सडकको रूपमा देखाई दायो-बायाँ देहायबमोजिमको सडक सिमा तोकिएको छ।

(क) राजमार्गहरू:-

१. महेन्द्र राजमार्ग (वनवासा-काठरुमिता)
२. प्रशान्तको राजमार्ग (काठमाडौं-कोदारी)
३. सिद्धार्थ राजमार्ग (गुर्जाली-पोखरा)
४. विमल राजमार्ग (काठमाडौं-रक्सौल)
५. गेयबनी-बराह-धनकुटा राजमार्ग
६. नेपालगञ्ज-काठमाडौं-सुर्खेत राजमार्ग
७. हुम्लो-इलाम राजमार्ग
८. हुम्लो राजमार्ग (तोबिसे-पोखरा)
९. पोखरा-सुर्खेत राजमार्ग
१०. दोलखामाट-धनकुटा राजमार्ग
११. पोखरा-नारायणगञ्ज राजमार्ग

(ख) सहायक मार्ग:-

१. कुनौली-हुम्लानगर-भादी-फलेपुर
२. काठमाडौं-विमली
३. खनवा-तोबिसेवा-म. रा. मा.
४. म. रा. मा.-परासी
५. फलेपुर-सुम्बिनी
६. फलेपुर-चाप्राली-इलाम
७. फलेपुर-खेली-सापा
८. फलेपुर-सापा-म. रा. मा.
९. फलेपुर-फिदिम
१०. फलेपुर-सिपहा
११. फलेपुर-सुम्बिनी-तोबिसेवा-बराहगञ्ज
१२. फलेपुर-सुम्बिनी-विमलीमाट

०२२१

सचिव



[illegible][illegible]

ANNEX V:
MENTIONING DONOR FUNDATED PROJECT (TOR
FOR DETAIL STUDY OF SASEC HIGHWAY
IMPROVEMENT PROJECT FUNDATED BY ADB)



LOAN NUMBER 3722-NEP(COL)

LOAN AGREEMENT
(Ordinary Operations [Concessional])
(South Asia Subregional Economic Cooperation Highway Improvement Project)

(

between

NEPAL

and

(

ASIAN DEVELOPMENT BANK

DATED 20 November 2016



NEP 52097

Environment

11. The Borrower shall, through MOPIT, ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project and all Project facilities comply with (a) all applicable laws and regulations of the Borrower relating to environment, health and safety; (b) the Environmental Safeguards; and (c) all measures and requirements set forth in the IEE, the EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.

Resettlement

12. The Borrower shall, through MOPIT, ensure that all land and all rights-of-way required for the Project are made available to the Works contractor in accordance with the schedule agreed under the related Works contract and all land acquisition and resettlement activities are implemented in compliance with (a) all applicable laws and regulations of the Borrower relating to land acquisition and involuntary resettlement; (b) the Involuntary Resettlement Safeguards; and (c) all measures and requirements set forth in the RP, and any corrective or preventative actions set forth in the Safeguards Monitoring Report.

13. Without limiting the application of paragraph 5 above, the Involuntary Resettlement Safeguards or the RP, the Borrower shall, through MOPIT, ensure that no physical or economic displacement takes place in connection with the Project until:

- (a) compensation and other entitlements have been provided to affected people in accordance with the RP; and
- (b) a comprehensive income and livelihood restoration program has been established in accordance with the RP.

Indigenous Peoples

14. The Borrower shall, through MOPIT, ensure that the Project does not have any indigenous peoples impacts, all within the meaning of SPS. In the event that the Project does have any such impact, the Borrower shall take all steps required to ensure that the Project complies with the applicable laws and regulations of the Borrower and with SPS.

Human and Financial Resources to Implement Safeguards Requirements

15. The Borrower shall make available or cause MOPIT to make available necessary budgetary and human resources to fully implement the EMP and the RP.

Safeguards – Related Provisions in Bidding Documents and Works Contracts

16. The Borrower shall, through MOPIT, ensure that all bidding documents and contracts for Works contain provisions that require contractors to:

- (a) comply with the measures relevant to the contractor set forth in the IEE, the EMP and the RP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in a Safeguards Monitoring Report;



Environment

11. The Borrower shall, through MOPIT, ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project and all Project facilities comply with (a) all applicable laws and regulations of the Borrower relating to environment, health and safety; (b) the Environmental Safeguards; and (c) all measures and requirements set forth in the IEE, the EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.

Resettlement

12. The Borrower shall, through MOPIT, ensure that all land and all rights-of-way required for the Project are made available to the Works contractor in accordance with the schedule agreed under the related Works contract and all land acquisition and resettlement activities are implemented in compliance with (a) all applicable laws and regulations of the Borrower relating to land acquisition and involuntary resettlement; (b) the Involuntary Resettlement Safeguards; and (c) all measures and requirements set forth in the RP, and any corrective or preventative actions set forth in the Safeguards Monitoring Report.

13. Without limiting the application of paragraph 5 above, the Involuntary Resettlement Safeguards or the RP, the Borrower shall, through MOPIT, ensure that no physical or economic displacement takes place in connection with the Project until:

- (a) compensation and other entitlements have been provided to affected people in accordance with the RP; and
- (b) a comprehensive income and livelihood restoration program has been established in accordance with the RP.

Indigenous Peoples

14. The Borrower shall, through MOPIT, ensure that the Project does not have any indigenous peoples impacts, all within the meaning of SPS. In the event that the Project does have any such impact, the Borrower shall take all steps required to ensure that the Project complies with the applicable laws and regulations of the Borrower and with SPS.

Human and Financial Resources to Implement Safeguards Requirements

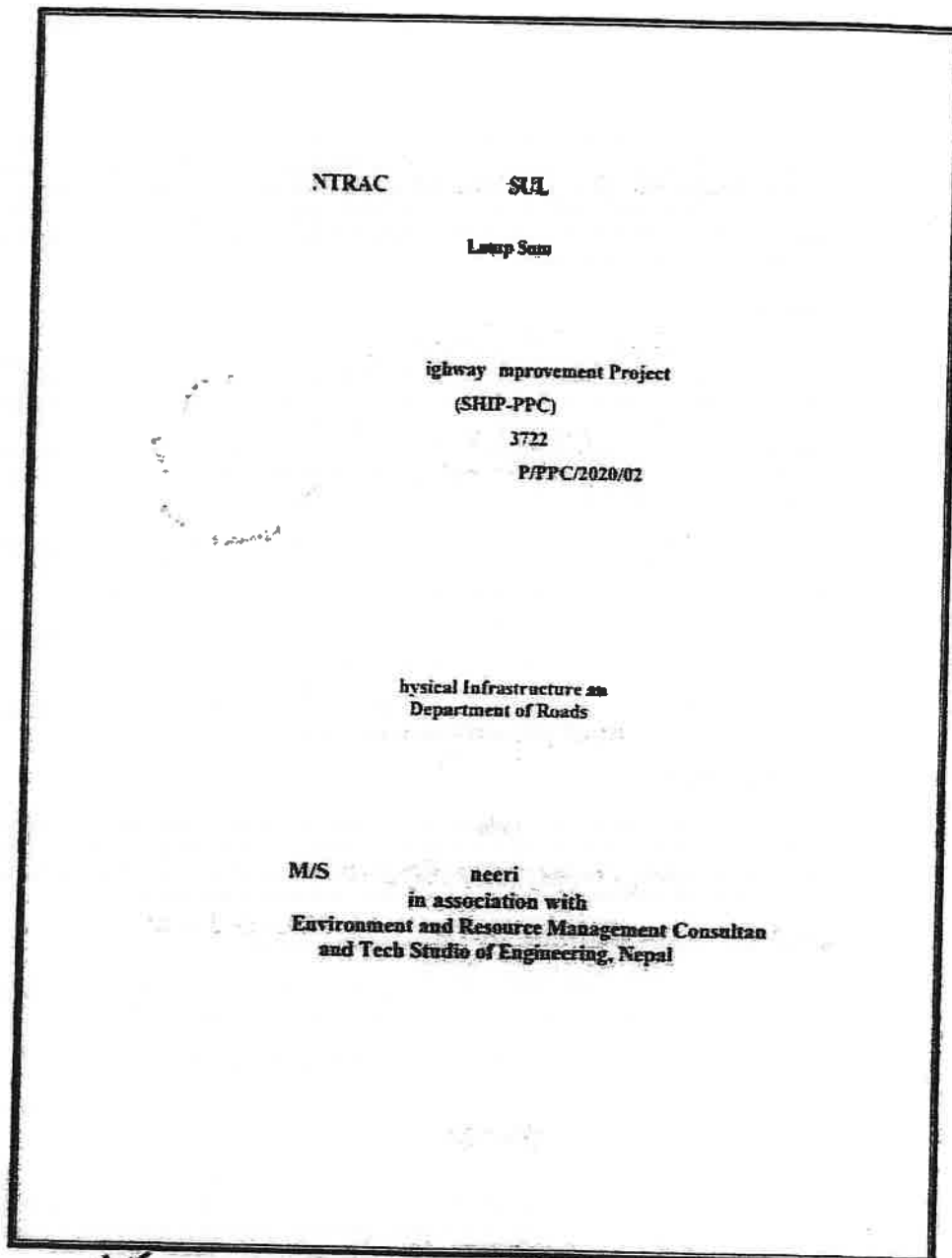
15. The Borrower shall make available or cause MOPIT to make available necessary budgetary and human resources to fully implement the EMP and the RP.

Safeguards – Related Provisions in Bidding Documents and Works Contracts

16. The Borrower shall, through MOPIT, ensure that all bidding documents and contracts for Works contain provisions that require contractors to:

- (a) comply with the measures relevant to the contractor set forth in the IEE, the EMP and the RP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in a Safeguards Monitoring Report;





SIC



[Signature]
Dipak Shrestha
Project Director



For the Department of Roads, Project Directorate (ADB) (Client)

Shrestha
Mr Suresh Poudel
Mr Rakesh Maharja
Mr Murari Niraula
Pradeep Raj S
Shova Giree
Manda Paria

Project

ecutive

Opening remarks

Scope of work and terms of reference



ANNEX VI
SAMPLE NOTICE FOR PUBLIC HEARING





ANNEX VII PHOTOGRAPHS

	
Butwal- Goringhe Road alignment	Butwal- Goringhe Road alignment
	
Road cross the forest area	Badganga river bridge





Roadside Public/Private structures within ROW



Roadside Public/Private structures within ROW



Roadside Temple at Goringhe



Agriculture land along the road



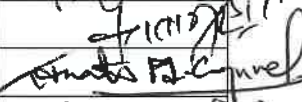
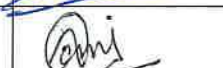
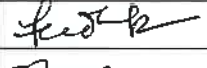
	
Resting place along the road	Transmission line cross the road
	
Junction at Goringhe way to Arghakhanchi	Irrigation canal crossing



**ANNEX III: SELF-DECLARATION FORM OF
EXPERTS**

SELF-DECLARATION FORM

Department of Roads, Project Directorate (ADB), Ministry of Physical Infrastructure and Transport is proponent of Upgrading of Butwal-Gorusinge Road project in 22 wards of Butwal Sub-Metropolitan City, Sainamaina, Banganga and Buddhabhumi Municipalities and Kanchan Rural Municipality of Rupandehi and Kapilvastu districts, Lumbini Province. It is true that in the entire phase of the Initial Environmental Examination of project, we have prepared this report involving the following study team members. In the course of examination, all the collected primary information are true and we express our gratitude to the creator for the information and data from the secondary source. We self-declare that we are ready to face the offence in accordance with the law if anything is found to be false in this report or if all or any part of any other report has been used.

SN	Team member	Specialization	Mobile No	Signature and Date
1	Rajan Kumar Shrestha	Environmental Specialist	9851011605	
2	Abhisek B.C	Environmental Engineer	9851077446	
3	Rabin Dhakal	Sociologist/Socio-economist	9851023494	
4	Prayag Raj Tamrakar	Biologist/Wildlife Expert	9851123278	
5	Ananta Prasad Gajurel	Engineering Geologist	9841888116	
6	Suresh Babu Shrestha	Civil Engineer/Road Engineer	9851082909	
7	Sanjaya Adhikari	Hydrologist	9851160103	
8	Saroj Bhattarai	Bridge Expert	9851043390	
9	Nemi Bhattarai	GIS/Database Expert/Analyst	9841388562	
10	Pranil Pradhan	Environmentalist	9851215923	
11	Bharat Regmi	Forest Expert	9858061911	

Consultant Soosung Engineering Co. In association with ERMCTSE, Baluwatar, Kathmandu Nepal Tel: +977-1-4433384 Email: ship.tse@gmail.com	Stamp and Signature  
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प्रारम्भिक वातावरणीय परिक्षण प्रक्रियामा संलग्न अध्ययन टोली सदस्यको स्वःघोषणा

प्रतिवेदनको मुख्य शिर्षक: बुटवल - गोरूसिंगे (५० कि मी) सडकखण्डको स्तरोन्नति

प्रस्तावकको नाम: आयोजना निर्देशनालय (ए.डी.बी), सडक विभाग

ठेगाना: विशालनगर, काठमाण्डौ

फोन नं: ०१-४४३७४९२, ४४३७४९३

फ्याक्स नं: ४४३७४८८

ईमेल: pdadb@wlink.com.np

म निम्न घोषणा गर्दछु

- म यस आयोजनाको वातावरणीय प्रभाव मूल्यांकन अध्ययन प्रतिवेदनमा संलग्न छु ।
- मैले यो अध्ययन स्वीकार्य अध्ययन विधि प्रयोग गरि तयार गरेको छु ।
- यस प्रतिवेदनमा समावेश गरिएको विवरणहरु सत्य र सही रहेका छन् ।
- मैले यस प्रतिवेदनमा समावेश भौतिक, जैविक, सामाजिक तथा आर्थिक वातावरणीय विवरण तथा सामाग्रीको अध्ययन र जाँच गरेको छु ।
- म संलग्न यस आयोजनाको वातावरणीय अध्ययनसँग सम्बन्धित प्रतिवेदनमा समावेश कुनै पनि भ्रामक जानकारी वा विवरणको म नैतिक तथा कानूनी जवाफदेहीता बहन गर्दछु ।
- माथि बुदाँ नम्बर १ म उल्लेखित अध्ययन कार्यको सिलसिलामा प्रस्तावित आयोजना क्षेत्रमा डिसेम्बर २०२१ देखि मार्च २०२२ सम्म म स्वयम् उपस्थित भै तथ्यांक संकलन गरेको घोषणा गर्दछु ।
- यो अध्ययन प्रतिवेदनमा बौद्धिक चोरी लगायत कार्यको जिम्मेवारी बहन गर्दछु ।

दस्तखतः



परामर्शदाता संस्थाको छापः

विषय विज्ञ सदस्यको नाम, थरः राजन कुमार श्रेष्ठ

टोली प्रमुख, भौतिक वातावरण विज्ञ

मिति: २०७९/९/२१



CURRICULUM VITAE (CV)

1. **Proposed Position:** Environment Specialist/EIA Team Leader
2. **Name of Firm:** Tech Studio of Engineering
3. **Name of Expert:** Mr. Rajan Kumar Shrestha
4. **Current Residential Address:** Nepal
Telephone No.: 9851011605
E-mail Address: rkshrestha11@gmail.com, rajan_s11@yahoo.com
5. **Date of Birth:** August 22, 1970
Citizenship: Nepali
6. **Education:**
 - Master, Specialization with Environment Protection and Nature Conservation (Forestry Engineering), St. Petersburg, Forest Technical Academy, St. Petersburg, Russia, 1997
7. **Membership in Professional Association:**
 - Member of Nepal Engineers' Association, Regd. No. 6325
 - Member of Nepal Engineering Council, Regd. No. 02B
8. **Other Trainings:**
 - Advanced Environmental Safeguard training on August 2019, by ADB NRM
 - Environmental and Social Safeguard training on November 2017 (5days) by ADB NRM and Staff Collage.
 - Occupational Health and Safety training organized by ILO, Nepal (One day), 2016
 - GESI Regional workshop organized by ADB, MoPIT, Dec 03, 2016.
 - Safeguard Orientation training Organized by NRM, ADB, June 11, 2014.
 - Automated Safeguard Monitoring Training, organized by NRM, ADB 2013.
 - National Workshop on Local Environmental Policy and related Guidelines and Manual finalize (Support Environment Management Section of MLD to prepare Environmental Policy Guideline and Manual) for the development of Environment friendly local infrastructures, organized by Ministry of Local Development (MLD), December 2010.
 - Workshop on Climate Change in Nepal an Based on Integrated ECD Methodology, organized by DFID March 07-08, 2009
 - Environmental Assessment training (2 weeks), organized by Envirotech Engineering Consultancy Pvt. Ltd., 2005
 - Participate in Environmental Management Action Plan (EMAP) Training Workshop (7 days) held for Contractors' and Consultant's staff, organized by Road Maintenance and Development Project (RMDP), 2002
 - Bio-engineering Training (5 weeks) in Kurintar, organized by Geo-Environment Unit, Department of Roads, 1998
9. **Countries of Work Experience:**
Nepal

10. Languages:

LANGUAGES	Speaking			Reading			Writing		
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor
Nepali	O			O			O		
English	O			O			O		
Hindi	O			O			O		

Employment record relevant to the assignment:

Period	Employing organization and your title / position. Contact information for references	Country
October 2020 to date	Employer: KSE-ERMC JV Position held: Environmental Specialist/Environment Team Leader For references: Prakash Upadhaya, DTL Email: p.upd568@gmail.com	Nepal
August 2018 to Dec 2020	Employer: Yooshin Engineering Corporation, Korea in association with Environment and Resource Management Consultant (ERMC) P.Ltd., Nepal Position held: Environmental Specialist For references: Mr. Shim Myung Seob (TL) Email: rcipcsc@gmail.com	Nepal
Aug 2017-Dec 2018 (Intermittent 6 months)	Employer: JV with Pyunghwa Engineering Consultants Ltd. (PEC, KOREA), Dong Myeong Engineering Consultant Co., Ltd (DMEC, KOREA) and SILT Consultants (P) Ltd. (SILT, Nepal) Position held: Environmental Expert/Environment Team Leader For references: Mr. Keshab Kunwar, Managing Director, Silt Email: info@silt.com.np	Nepal

Jul 2017 –Jul 2018 (10 months)	Employer: Tanahu Hydropower Project, Nepal Position held: Environmental Monitoring Specialist For references: Mr. Pradip Thike, Managing Director Email:pthike@yahoo.com	Nepal
May 2016 to Dec 2019 (Intermittent 10 months)	Employer: SMEC, MWH in association with Udaya Consultancy (P) Ltd. Position held: Environmental Specialist / Forest Expert For references: Mr. Rakesh Regmi, Director Phone: +977-01-4489393 E-mail: udayaconsultancypvtltd@gmail.com	Nepal
Oct. 2014 – Jun 2017	Employer: Geo-Environment and Social Unit (GESU), Department of Roads, Bridge Improvement and Maintenance Program, Nepal Position held: Environmental Safeguard Expert For references: Mr. Shiva Prasad Nepal, GESU, Unit Chief, DoR e-mail: gesunit@dor.gov.np, spn_1980@yahoo.com	Nepal
Oct. 2013 – Sep 2014	Employer: Environment and Resource Management Consultant (ERMC) (P) Ltd, financed by ADB Position held: Environmental Specialist For references: Mr. Hem Nidhi Sarma, Director ERMC e-mail: hemnidhi@gmail.com	Nepal
Dec 2009 to Sep 2013	Employer: Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP)/Department of Local Infrastructure Development and Agriculture Road(DoLIDAR) Position held: Environmental Management Specialist/Environment Team Leader For references: Mr. Rod Stickland, Team Leader email: rjstickland@gmail.com Mr. Ram Krishna Sapkota, Project Coordinator Email: rk.sapkota@yahoo.com	Nepal
Feb 2012 to Dec 2012 (Intermittent 4 months)	Employer: ERMC (P) Ltd. Position held: Environmental Expert For references: Mr. Uddab Raj Chaulagain – MD Email:uddabchaulagain@gmail.com	Nepal
March 2012 to April 2012	Employer: MMM Group Ltd. (Canada) in JV with SAI Consulting Engineers (P) Ltd. (India) in association with ITECO Nepal (P) Ltd. (Nepal) & Total Management Services (Nepal) Position held: Environmental Specialist/Environment Team Leader For references: Mr. Prajol Lal Shrestha – MD of TMS e-mail: prajol.shrestha@tms.com.np	Nepal
Dec 2008 to Nov 2009	Employer: CEMAT Consultant P. Ltd Position held: Bio-Environmentalism For references: Mr. Bal Sundar Malla, MD of CEMAT e-mail: cemat@wlink.com.np	Nepal
Oct 2007 to Nov 2008	Employer: MMM Group Limited Canada, in association with CEMAT Position held: Environmental Engineer/Bio-engineer For references: Mr. Bal Sundar Malla, MD of CEMAT e-mail: cemat@wlink.com.np	Nepal
Dec 2006 to Jan 2007	Employer: DRUK Consultancy, Thimpu, Bhutan in association with GEOCE Position held: Bio-engineer For references: Mr. CK Pradhan, Project Manager, DoR, Thimpu, Bhutan	Bhutan

Oct 2005 to Sep 2007 (Intermittent)	Employer: CEMAT Consultants (P) Ltd. SchEMS JV Position held: Bio-engineer/ Environmental For references: Mr. Bal Sundar Malla, MD of CEMAT e-mail: cemat@wlink.com.np	Nepal
Feb 2005 to Dec 2005 (Intermittent)	Employer: Rural Access Improvement and Decentralization Project (RAIDP)/DoLIDAR Position held: Environmental Expert/Environment team leader For references: Mr. Ram Krishna Sapkota, Project Coordinator e-mail: rk.sapkota@yahoo.com	Nepal
Feb 2001 to Jan 2005	Employer: SMEC International Pty Ltd, Australia in association with CEMAT Consultants (P) Ltd Position held: Bio-engineer/ Environmental Engineer For references: Mr. Ahsam Arshad, Central Residence Engineer, RMDP-NRDUC e-mail: ahsam_smec@dsl.net.pk	Nepal
Nov 1998 to Jan 2001	Employer: Highway Nepal Pvt. Ltd. Position held: Environmental Engineer/Bio-engineer For references: Mr. Gun Bahadur Magar e-mail: gbmagar@gmail.com	Nepal

Reference to Prior Work/Assignments that Best Illustrates Capability to Handle the Assigned Tasks

Name of Assignment or Project: SASEC Highway Improvement Project – Kakarbhitta-Laukai Road Funding Agency: ADB

Year: October 2020 to date

Location: Nepal

Client: DoR

Main Project Features: Feasibility study and detail design, Environmental study of Kakarbhitta Laukai road

Position Held: Environmental Specialist/Environment Team Leader

Activities Performed: Responsible for review of previous study report, Field survey, preparation, TOR and Scoping document for EIA, preparation of Environmental Management Plan (EMAP) including mitigation and monitoring measurements, Environmental Impact Assessment Study (EIA) study, conduct public hearing, EIA report preparation of Kakarbhitta-Laukahi (120KM) road section of East West Highway.

Classification and categorization of areas of road passing; Preparation of Terms of Reference, Scoping document and approval; Carry out Climate risk and vulnerability assessment(CRVA); Carry out a baseline wildlife study; Analyze greenhouse gas emission levels including climate change impacts and recommend technically and financially feasible and cost-effective options; Carry out Initial Environment Examination (IEE) and Environmental Impact Assessment (EIA); Final approval of EIA or IEE report including EMPs from the Government;

Name of Assignment or Project: Rural Connectivity Improvement Project , financed by ADB, (Number: 48218-003 NEP, US\$135.7m) ;

Year: August 2018 to Dec 2020,

Location: Different part of Nepal;

Client: Department of Local Infrastructure;

Main Project Features: Improve road conditions(blacktop standard) of about 388 kilometers (km) rural roads of the selected rural communities, productive agricultural areas and socioeconomic centers will be improved to allweather standards with safety features, Capacity development trainings on safeguards, road safety awareness, road asset management, environmenta and natural resource management and development of detailed design for future pipeline, Awareness training of road users will include road safety, and prevention of human trafficking, and sexually transmitted infection.

Position Held: Environmental Specialist;

Activities Performed: Responsible for undertaking following activities:

- Prepare road-specific Environmental Management Plans(EMP) and Environmental Monitoring Plans (EMoP), guided by the general EMP of IEE.
- Conduct environmental site induction training for all contractors and Pproject Implementaion Units(PIU) to ensure understanding of the EMP, donor and domestic environmental laws and regulations requirements particularly on the required clearances and permits, occupational and community health and safety, timely mobilization of the Contractor's Environmental focal person.
- Support to project CoordintionUnit to get clearance of forest and tree cutting, prepare afforestation plan
- Support to form Grievance Redress Committees (GRCs) in all roads to address overall safeguard related issues (environment, social and resettlement)
- Conduct environmental safeguard orientation training to Project staffs.
- Establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the EMP;
- Conduct regular compliance monitoring of all roads
- Review the environmental monitoring reports prepared by the Contractor's

Consolidate all information and prepare monthly and semi-annual environmental compliance monitoring report and submittetd to ADB.

Name of Assignment: Detailed Engineering Survey and Design of Electrified Railway Line for Lamahi-Kohalpur Section of Mech-Mahakali Railway and Kohalpur-Nepalgunj Link (Package II); Funding Agency: GON

Year: August 2017 to December 2018 (Intermittent 6 Months);

Location: Mid-Western Region,

Client: Department of Railway, Government of Nepal,

Main project features: Detail Survey, detail design, EIA study, cost estimate and bid documents of project for the construction of proposed Electrified Railway line, soil investigation, hydrological study, geological and geotechnical study, detail report preparation etc.;

Position held: Environmental Expert/Environment Team Leader;

Activities performed: Responsible for review of previous study report, Field survey, prepare, TOR and Scoping document, preparation of Environmental Management Plan (EMAP) including mitigation and monitoring measurements, Environmental Impact Assessment Study (EIA) study, conduct public hearing, EIA report preparation of Lamahi-Kohalpur Section of Mech-Mahakali Railway and Kohalpur-Nepalgunj Link.

Name of Assignment or Project: Tanahu Hydropower Project, financed by ADB, (IDA Credit Number: 2991 NEP);

Year: July 2017 to July 2018 (10 Months),

Location: Tanahu Nepal; **Client:** Tanahu Hydropower Limited; **Main Project Features:** 140MW Hydropower Plant, with Dam and spillway on the Seti River - a 140 m high concrete gravity dam with a crest length of 175 m ; A reservoir with a total surface area of 7.26 km² at FSL (EL 415 m), Transmission line alignment: The transmission line will have a length of 36.9 km., Power Transmission and Rural Electrification, Community Development Plan, Environmental and Social Safeguards

Position Held: Environmental Monitoring Specialist;

Activities Performed: Responsible for undertaking following activities:

- Review the Environmental Management Framework (EMF) of Project,
- Support for preparation of Updated IEE of transmission line, Updated EIA of Tanahu hydropower project, get approval from GON and ADB,EIB,JICA;
- Update Environmental and Social Management Plan, Occupation health and safety plan, prepare cost estimate for mitigation measures,
- Planning and conduct baseline survey of physical, biological socioeconomic, information updating and new information collection through field survey;
- Prepare/establish comprehensive environment monitoring plan to match with the detailed activities during pre-construction and outline activities for the construction phase;
- Support Environmental and Socail Management Unit to timely obtain all government clearance and approvals so that the actual construction work does get affected by absence of any legal approval related with environmental and socail safeguards;

- Prepare Forest Management Plan including forest clearance and afforestation plan with close cooperation of District Forest Office.
- Provide capacity development training and local levels
- Develop additional initiatives to promote good soil and water conservation in the watershed of the reservoir area
- Support THP and the involved stakeholders on the issues of environment and social management
- Design and implement public awareness program addressing environmental and social management by project.

Consolidate all information and prepare monthly and semi-annual environmental compliance monitoring report and submitted to ADB, EIB and JICA.

Name of Assignment or Project: Detail Study, EIA of Nalgad Hydropower Project; Funding Agency: GoN

Year: May 2016 to December 2019 (10 Months);

Location: Jajarkot District, Nepal;

Client: Nalgad Hydropower Limited/Department of Electricity Development (DoED), Government of Nepal (GoN);

Main Project Features: Detail design and Environmental Impact Assessment (EIA), Preparation of EMP and Social Impact Assessment (SIA) Study of Nalgad Reservoir Hydropower Project (417 MW);

Position Held: Environmental Specialist/Forest Expert;

Activities Performed: Responsibility included followings:

- Prepare Scoping Document and Terms of Reference and get it duly approved by Ministry of Environment, Science and Technology (MoEST), GoN. Prepare questionnaire, checklist and interview formats for baseline survey
- carryout baseline survey of physical, biological, socio-economic and cultural environment of project area
- conduct public consultation through FGD, sample survey, household survey, interview with local stakeholders, NGOs, CBOs, conduct public hearings
- prepare database and analysis for evaluation of impact
- Identify and predict environmental impacts
- develop mitigation measures
- Prepare and submit EIA Report following Environment Protection Act and Environment Protection Rules of GoN.

prepare monitoring plan and prepare Environment Management Plan, Forest Management Plan/Natural Resource Management Plan

Name of Assignment or Project: Bridge Improvement and Maintenance Program (BIMP), financed by World Bank ;

Year: October 2014 to June 2017 (28 Months) ,

Main Project Features: Technical Support to Geo-environmental and Social Unit (GESU) for Implementation of Environmental Safeguard to Bridge Improvement and Maintenance Program (BIMP);

Position Held: Environmental Safeguard Expert;

Activities Performed: Responsible for undertaking following activities:

- Refining guideline and procedures of Environmental Safeguard, develop standard format of screening of sub project, monitoring, Initial Environmental Examination(IEE), Environmental impact assessment [EIA] and Environmental management action plans [EMAP] for a project/program
- Review and refine TOR to carry out IEE, EIA and to prepare EMAP in consistent to ESMF in order to make these more relevant and specific to the proposed project
- Conduct Screening of projects, analysis of environmental risk

- Annual safeguard plan preparation including monitoring, implementation.
- Ensure in BOQs, bids/contract clauses and other document for each package for incorporation of relevant mitigation and enhancement measures specified in IEEs, EIAs, SIAs and SSEMAPs,
- Develop and maintain Environmental monitoring and reporting system, and facilitate monitoring/check by GESU
- Ensure contractor EMPs are prepared by contractors prior to construction and endorsed to BIMP.
- Support to incorporate enhancement program related to soil conservation, natural resource management through road and bridge projects all over the country. Suggest to incorporate bio-engineering work, flood protection work, gully protection work afforestation work, reinstate of irrigation canal etc. in contract document (of road and bridge program.)
- Regular safeguard compliance monitoring, consolidate project wise environmental status separately for each projects highlighting the main issues and successes.
- Assist GESU to Coordinate with other agencies, raise the awareness, disseminate information on environmental aspects of bridge among various stakeholders
- Support GESU in preparing training packages and delivery of trainings, awareness training in each Division Road Office staffs on climate change and disaster risks management.
- Co-ordinate activities of Safeguard Mobilizer(SM) in 6 regions, Monitor the implementation of environmental works in all regions, suggest corrections if needed and reporting regularly to GESU along with Bridge Program.

Consolidate monthly environmental monitoring reports from SMs and submit quarterly environmental monitoring report to World Bank.

Name of Assignment or Project: Integrated Urban Development Project (IUDP) financed by ADB Loan/Grant: L2851-NEP; G0284-NEP;

Year: October 2013 to September 2014;

Location : Dharan, Janakpur, Siddharthanagar and Nepalgunj municipalities, Nepal;

Client: Department of Urban Development Building Construction (DUDBC)

Main Project Features: Water Supply development, Solid Waste Management, Drainage and Roads. The project with integrated urban environmental improvements, including drainage systems, solid waste management facilities, and urban roads, will be implemented in Janakpur, Nepalgunj, and Siddharthanagar municipalities. A water supply development subproject will be implemented in Dharan municipality;

Position Held: Environmental Specialist;

Activities Performed: Responsible for undertaking following activities:

- review screening report of project through Rapid Environmental Assessment (REA), Environmental assessment and review framework (EARF)
- review and confirm EIA/IEEs/EMPs are prepared based on detailed designs.
- confirm EMPs are included in the bidding documents and civil works contracts;
- ensure contractor EMPs, Occupational health and safety plan are prepared by contractors prior to construction and endorsed by Project Implementation Unit (PIU)s;
- prepare and include environmental, clauses, cost in BoQ and specification in subprojects contract procurement document;
- establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the EMP;
- facilitate and confirm overall compliance with all Government rules and obtain all required environmental and social clearances and any other environmental and social permits prior to contract award;
- ensure contractor EMPs are prepared by contractors prior to construction and endorsed by PIUs;
- supervise and provide guidance to the PIUs to properly carry out environmental monitoring and reporting;
- regular environmental compliance monitoring, where appropriate, highlight to concerned agencies on situations of significant deviation from project environmental requirements; proposed remedial actions; and proposed

modifications to existing procedures or to project standards; review and update Safety Management/Risk Management Plan of contractors;

Prepare monitoring report; consolidate quarterly environmental monitoring reports from PIUs and submit semi-annual environmental monitoring report to ADB.

Name of Project: Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP)/DoLIDAR financed by ADB, DFID, SDC and OFID;

Year: December 2009 to September 2013;

Location : 20 Districts in all development region, Nepal;

Client: Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR);

Main Project Features: Improve the Connectivity, Enhance Economic and Employment Opportunities, Increased Access to Market and Social Services of Rural Communities of the Project Candidate Districts. The major components of the projects are as follows: i) Component 1: **Rural Roads- construction of 560 Km** of Rural Roads in 20 districts affected by the conflict and **42 bridges**, ii) Component 2: Supplementary Infrastructure - construction and rehabilitation 485 infrastructure supplementary to the Rural Road component included market facilities, school infrastructure, **micro-irrigation**, link trails, trail bridges, and **390 rural water supply and sanitation schemes** in 38 districts. iii) Component 3: Community Empowerment iv) Component 4: Institutional Capacity.

Position Held: Environmental Management Specialist/Environment Team Leader

Activities Performed: Responsible for undertaking following activities:

- Review the Environmental Assessment and Review Procedures (EARP) of RRRSDP, prepare environmental guidelines manual for project;
- Support all District Technical Offices (DTOs) in undertaking environmental appraisal of subprojects that are required by national legislation and ADB procedures. This comprise: (a) Environmental and Social Screening of all sub-projects; (b) Environmental impact assessment; and (c) the processing the completion of all approvals by the appropriate authorities;
- Develop Screening format, ToR of Environmental Assessment (TOR of IEE), Initial Environmental Examination (IEE)/Environmental Management Plan(EMP) formats for subprojects
- Review all screening report, environmental assessment report (IEE) of all subproject and take necessary action before forward to ADB and Concern ministry for approval.
- Prepare standard mitigation enhancement cost, clauses and specification in contract document of subprojects.
- Regular environmental compliance monitoring of all subprojects, Where appropriate, highlight to concerned agencies: (a) situations of significant deviation from project environmental requirements; (b) proposed remedial actions;;
- Develop an institutional mechanism for speedy and efficient delivery of all aspects of environmental management in the project cycle of subprojects; Establish Environmental safeguard unit (environmental focal person) to 20 district, orient them their role and responsibility in project, provide regular technical guidance;
- Conduct environmental training to DDC/DTO/DPO/DIST team on preparation of Environment Management Action Plan (EMAP), environmental monitoring and reporting, Support to conduct Environment awareness training to Community based organization (CBOs), Road Building Group (RBGs), Contractors; Awareness training in each DTO/DIST on climate change and disaster risks management
- Develop sustainable local mechanisms for the maintenance and repair of the environmental measures such as soil conservation through bio-engineering measures, bio-diversity conservation, local level erosion control measures, various measures adopted for minimizing air, water and noise pollution;
- Develop biodiversity mapping of the project area of Manange and Mustang sub projects which is fall under Annapurna Conservation Area(ACAP). Special (Advisory) role play for environmental management/biodiversity management by allocating Environment management budget in all subprojects

during design period and which is included in all subproject contract document. For natural resource management, biodiversity conservation and green road development 3% of total project cost has been allocated in 18 district and in Manang and Mustang 7% and 10% has been allocated. Special provision has been done for Compendatory tree plantation by adding 10% (1:25 is GoN rule) In this project we made mandatory 1:25+10 to develop more green area and will help for climate change. This work has been carried out through community based organization (CFUG, RBG).

- Prepare a Institutional Mechanism for Controlled Operation of Road to protect High Value Ecology and Integrity, which is new innovation for environment management.
- Develop subproject wise environmental safeguard compliance matrix format
- Involved for the preparation of Bio- Engineering guidelines, contract document, specification, detailed bio-engineering study, design, cost estimation of Bio-engineering works, implementation plan preparation, supervision and monitoring of Bio-engineering works. Conduct on the job Bio-engineering training to CBOs, Contractors.

Annual planning, Monthly, quarterly progress report preparation, Prepare semi annual report and submitted to ADB.

Name of Assignment or Project: Feasibility Study of Mass Rapid Transit (63 Km) (Underground and Elevated Railway) System in Kathmandu Valley; Funding Agency: GoN

Year: February 2012 to December 2012 (4 months Intermittent);

Location: Kathmandu, Nepal; **Client:** Department of Railway/GoN;

Main Project Features: Feasibility Study of Mass Rapid Transit;

Position Held: Environmental Expert;

Activities Performed: Responsible for feasibility survey and environmental assessment of the project. Major specific tasks to be handled are as follows:

Environmental assessment; Preparation of Scoping Document of EIA for the project; Identification of environmental impact mitigation measures; Support to team for designing and selection of route/ site; Recommend environment friendly construction methods taking into account environment impacts; Other environmental issues recommended by TL/DTL.

Name of Assignment or Project: Road Sector Development Project (RSDP) financed by World Bank;

Year: March 2012 to April 2012 (1.5 Months);

Location : Nepal;

Client: Department of Road;

Main Project Features: Environmental Study and Biodiversity Management Plan (BMP) preparation of Narayanghat- Mugling road.

Position Held: Environmental Specialist/Environment Team Leader;

Activities Performed: Responsible for undertaking following activities:

- Review environmental assessment (IEE) report and fill in the information gap in the existing IEE report and update it as per World Bank comments, which is fall under Barandabar Forest Corridor (BFC)
- Identify the major issues that may arise as a result of proposed works on bio-physical environmental impacts of the project area.
- Conduct consultation meetings with concern stakeholder (local communities, local government, and central government offices, NGOs) for their feedback on impacts and mitigation measures
- Carryout baseline biodiversity survey (flora and fauna(wildlife,herpetofauna, aquatic life) to find out specially wildlife movement areas, endangered species of flora, fauna and aquatic life, wetland, hotspots and preparation of biodiversity management plan (BMP). Prepare forest details, Chainage wise tree felling list, process for clearance and permits of forest tree cutting. Develop biodiversity mapping of the project area.

- Recommend practical and site specific environmental mitigation and enhancement measures, biodiversity enhancement measures, update environmental management plan (EMP) and associated cost for the project, Provide information for decision-makers about the environmental implications of the proposed project

Name of Project: Road Improvement Project(RIP), financed by Exim Bank, India, (Construction Phase);

Year: December 2008 to November 2009;

Location : Various locations of Nepal;

Client: DOR/RIP;

Main Project Features: Hill Roads Upgrading Works, Roads included: Bhalubang-Pyuthan Road (67 km); Chakchake-Libang (63 km), Tulsipur-Salyan Road (61 Km), Surkhet-Siapur-Dailekh Road (44 km);

Position Held: Environmentalist;

Activities Performed: Responsibility included followings:

Review and update Environment Management Plan submitted by contractor; guide awareness to contractor about EMP of construction works, ensure that all activities and sites including air, noise and water pollution, spoil disposal, quarry, borrow, material crushing, material stockpiling, compacting etc are operated and reinstated according to the IEE/ Environment Management Plan, identify environmentally safe tipping areas for surplus mass of excavated or any other material, Make regular site visit and monitor the conformity with the social, environmental and Occupational Health and Safety components by the contractor; organize routine meeting attended by the representatives of the Client, Consultant and Contractor to review environmental compliance situations. Planning, design and implementation of Bio-engineering works for slope stabilization of major landslide areas along the road Prepare monitoring report.

Name of Project: Road Connectivity Sector I Project (RCSP) Department of Roads (ADB Grant 0051 – NEP (SF);

Year: October 2007 to November, 2008;

Location : Various locations within Nepal;

Client: DOR/RCSP;

Main Project Features: Feasibility studies and Detailed Engineering Design including Environmental and Social assessment of about 550 km roads and Construction supervision of 227 km of Sample roads;

Position Held: Environmental Engineer/Bio-engineer;

Activities Performed: Responsible for undertaking following activities:

- Conducted screening of sub project, Rapid Environmental Assessment (REA),
- Carry out environmental survey / studies for the selection of 550 Km of Roads in different Region of Nepal.
- Prepare Terms of Reference (ToR) of Initial Environmental Examination (IEE), Conduct IEE study, prepare Environmental Management Plan (EMP) and report. Coordinate with concerned Ministry and Department and ADB for approval of IEE reports.
- prepare Scoping Document and Terms of Reference of Galchhi -Trishuli – Syaphrubesi for EIA and get it duly approved by Ministry of Environment, Science and Technology (MoEST), GoN
- carryout baseline survey of physical, biological, socio-economic and cultural environment of project area
- conduct public consultation through FGD, sample survey, household survey , interview with elated local stakeholders, NGOs, CBOs ; conduct public hearings involving local stakeholders and NGOs.
- prepare database and analysis for evaluation of impact, develop mitigation measures
- prepare Environment Management Plan and monitoring plan

Involve for detail bio-engineering site assessment, design, cost estimation for (a) Protection of landslides, bare cut and fill slopes, rehabilitation of quarries and borrow pits, spoil disposal,(b) vegetation survey, nursery site selection estimation, and contract document preparation; On the Job Bio-engineering training; bio-engineering implementation and monitoring plan and specification preparation.

Name of Project: Road Network Project(RNP), Department of Roads (DOR), Royal Government of Bhutan financed by ADB (ADB Loan No. 2187-BHU);

Year: December 2006 to January 2007;

Location : Bhutan;

Client: RNP/DOR, Bhutan;

Main Project Features: Road upgrading works; Detail design of Gelephu - Trongsa National Highway (121KM);

Position Held: Bio-Engineer;

Activities Performed: Review the Environmental Assessment and Review Procedures (EARP) of project, Involved for detailed bio-engineering site assessment, design, cost estimation, vegetation survey, nursery site selection estimation, and contract document preparation; bio-engineering implementation and monitoring plan preparation. Review existing Environmental Assessment report and update EMP cost in detail design of strengthening of 121 km sections of Gelephu - Trongsa National Highway.

Name of Project: Environmental Management Program of Melamchi Water Supply Project financed by ADB;

Year: October 2005 to September 2007 (Intermittent);

Location : Sindhupalchowk District; Nepal

Client: Melamchi Water Supply Development Board;

Main Project Features: Main Access Road of Melamchi Water Supply Project (18 km), and Adit Access Roads to Tunnel (27 km); Watershed Management,

Position Held: Bio-engineer/ Environmental engineer ;

Activities Performed:

- Review of Environment Impact Assessment and Environment Management Plan prepared for the project ;
- Involve in baseline study of surrounding biodiversity mainly flora and aquatic life of Melamchi river,
- Involve in establishment of Environmental Lab in the project office to conduct regular air noise and water quality test.
- make regular site visit and monitor the conformity with environmental and Occupational Health and Safety components by the contractor;
- Organize public consultation meetings regarding the adverse impacts incurred to the local area by implementation of the project, and reach an agreement on the compensatory measures acceptable to the community; design of rehabilitation of water supply systems, foot trail as per demand of communities;
- Involve environmental awareness program to local stakeholder/community mainly focus on Disaster risk management, soil conservation, water resources management, afforestation.
- Involve in detail bio-engineering site assessment, design, estimation and contract document preparation, planning and implementation of bioengineering works. On the Job Bio-engineering training; Bio-engineering is cost effective for management of environment and restoration of degraded biodiversity;

Support to Community Forest Users Group (CFUG) for watershed management through providing tree seedlings, flood protection work, gully protection by construction of checkdam, reinstate irrigation canal water resources, awareness program, and monitoring; Prepare regular monitoring report.

Name of Project: Rural Access Improvement and Decentralization Project (RAIDP) financed by the World Bank [Design Phase];

Year: February 2005 to December 2005 (Intermittent 9 months);

Location : Various Districts;

Client: DOLIDAR and RAIDP/World Bank;

Main Project Features: Upgrading and Maintenance of District Roads;

Position Held: Environmental Expert/ Environmental Team Leader;

Activities Performed: Responsible for undertaking following activities:

Responsible for Prepare Terms of Reference (ToR) of Environmental Assessment, prepare 13 environmental assessment report and get it duly approved by Ministry of Local Development (MLD), GoN; Carryout baseline survey of physical, biological, and socio-economic and cultural environment of project area; Conduct public consultation through Focus Group Discussion (FGD), sample survey, household survey, interview; prepare database and analysis for evaluation of impact Identify and predict environmental impacts; Recommend site