



Government of Nepal
Ministry of Urban Development
Department of Urban Development and Building Construction
Urban Resilience and Livability Improvement Project
Project Coordination Office

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Ref. No.:

082-83-207

Babarmahal
Kathmandu, Nepal

Date: 17 June 2026

To,
The Project Manager,
Urban Resilience and Livability Improvement Project
Lumbini Sanskritik Municipality, Rupandehi.

Sub: Approved IEE Report of Bus Terminal Sub project at Lumbini

Dear Project Manager,

Please find attached herewith the approved Initial Environmental Examination (IEE) document of
Bus Terminal – Sub project.

With regards

.....
(Suresh Kumar Wagle)
Project Director

CC:

The Team Leader, Supervision and Design Consultant (SDC), WUC,
BDA in Joint Venture with B.N and UDAYA, Rupandehi.



नेपाल सरकार
शहरी विकास मन्त्रालय
सिंहदरबार, काठमाण्डौ



प.सं. :- २०८२/८३

च.नं. :- २७१६

मिति :- २०८३/०२/२९

ने.स. :- ११४६ अनलाग, १२ शुक्रवार

विषय: बस टर्मिनल निर्माण गर्ने प्रस्तावको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन स्वीकृत गरीएको सम्बन्धमा।

श्री शहरी विकास तथा भवन निर्माण विभाग, बबरमहल, काठमाण्डौ

प्रस्तुत विषयमा, तहाँ कार्यालय मार्फत, प्रस्तावक श्री क्षेत्रीय शहरी विकास आयोजना समन्वय कार्यालय, द्वारा लुम्बिनी सांस्कृतिक नगरपालिका वडा नं. १० रुपन्देही जिल्लामा प्रस्तावित बस टर्मिनल निर्माण गर्ने प्रस्तावको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन स्वीकृतिका लागि यस मन्त्रालयमा पेश गरेकोमा उक्त प्रतिवेदन तपशिलमा उल्लेखित शर्तहरू बस टर्मिनलको निर्माण तथा संचालनमा कार्यन्वयन गर्ने गरी यस मन्त्रालयको मिति २०८३/०२/२६ को (सचिवस्तर) निर्णयानुसार स्वीकृत गरिएको ब्यहोरा निर्देशानुसार अनुरोध छ ।

तपशिल

१. प्रस्तावकले पूर्वाधार निर्माणको योजना कार्यन्वयन गर्दा प्रचलित कानून बमोजिम पुरा गर्नुपर्ने शर्त तथा मापदण्ड पुरा गरेर स्थानिय वासिन्दा तथा अन्य सरोकारवाला संगको समन्वयमा विवाद नहुने गरि मात्र कार्यन्वयन गर्नुपर्नेछ । पूरा गर्नुपर्ने शर्त तथा मापदण्ड पूरा नगरी निर्माण कार्य कार्यन्वयन गरेमा सोको जवाफदेहिता/जिम्मेवारी प्रस्तावक र प्रस्तावसँग सम्बन्धित निकायमा रहनेछ ।
२. प्रस्तावकले निर्माण कार्यमा प्रयोग हुने माटो तथा अन्य निर्माण सामग्रीको गुणस्तर चेकजाँच गरी प्रयोग गर्नुपर्नेछ ।
३. प्रस्तावकले प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदनमा उल्लेख भए अनुसार वातावरणीय प्रभाव अनुगमन योजना बमोजिम स्वः अनुगमन गरी तथा वातावरण संरक्षण नियमावली, २०७७ को नियम ४५ बमोजिमको प्रतिवेदन सम्बन्धित निकायमा अनिवार्य पेश गर्नुपर्नेछ ।
४. प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदनमा उल्लेख भएका वातावरणीय प्रभावहरू बाहेक थप नयाँ वातावरणीय प्रभावहरू तथा सम्बन्धित अन्य समस्याहरू देखिएमा सोको समेत प्रस्तावकले आफ्नै खर्चमा निराकरण/न्यूनीकरण गर्नुपर्नेछ ।
५. प्रस्ताव कार्यन्वयन तथा संचालनको सन्दर्भमा प्रस्तावसँग सम्बन्धित ऐन, नियम, राजपत्र, कार्यविधि, मार्गदर्शन, मापदण्ड तथा परिपत्रको पुर्ण पालना गर्नुपर्नेछ ।
६. प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदनमा उल्लेख भएको तथ्याङ्क र विवरणको आधिकारिकताको जवाफदेहिता प्रस्तावकमा रहनेछ ।

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नेपाल सरकार
शहरी विकास मन्त्रालय
शहरी विकास तथा भवन निर्माण विभाग
(दिगो विकास तथा वातावरण शाखा)
बबरमहल, काठमाण्डौ



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क्षेत्रीय सहरी विकास आयोजना

बबरमहल

प्रस्तुत विषयमा, तहाँ आयोजना समन्वय कार्यालय प्रस्तावक रहेको लुम्बिनी सांस्कृतिक नगरपालिका वडा नं. १० रुपन्देही जिल्लामा प्रस्तावित बस टर्मिनल निर्माण गर्ने कार्यको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन सम्बन्धमा श्री शहरी विकास मन्त्रालयको प.सं. २०८२/८३, च.नं. २७१६, मिति २०८३/०२/२९ को पत्र (यसैसाथ संलग्न) मार्फत उक्त प्रतिवेदन तपशिलमा उल्लेखित शर्तहरू बस टर्मिनलको निर्माण तथा संचालनमा कार्यन्वयन गर्ने गरी मन्त्रालयको मिति २०८३/०२/२६ को (सचिवस्तरीय) निर्णयानुसार स्वीकृत गरिएको व्यहोरा अनुरोध छ।

तपशिल:

१. प्रस्तावकले पूर्वाधार निर्माणको योजना कार्यन्वयन गर्दा प्रचलित कानून बमोजिम पुरा गर्नुपर्ने शर्त तथा मापदण्ड पुरा गरेर स्थानिय वासिन्दा तथा अन्य सरोकारवाला संगको समन्वयमा विवाद नहुने गरि मात्र कार्यन्वयन गर्नुपर्नेछ। पूरा गर्नुपर्ने शर्त तथा मापदण्ड पूरा नगरी निर्माण कार्य कार्यन्वयन गरेमा सोको जवाफदेहिता/जिम्मेवारी प्रस्तावक र प्रस्तावसँग सम्बन्धित निकायमा रहनेछ।
२. प्रस्तावकले निर्माण कार्यमा प्रयोग हुने माटो तथा अन्य निर्माण सामग्रीको गुणस्तर चेकजाँच गरी प्रयोग गर्नुपर्नेछ।
३. प्रस्तावकले प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदनमा उल्लेख भए अनुसार वातावरणीय प्रभाव अनुगमन योजना बमोजिम स्वः अनुगमन गरी तथा वातावरण संरक्षण नियमावली, २०७७ को नियम ४५ बमोजिमको प्रतिवेदन सम्बन्धित निकायमा अनिवार्य पेश गर्नुपर्नेछ।
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नेपाल सरकार
शहरी विकास मन्त्रालय
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(दिगो विकास तथा वातावरण शाखा)
बबरमहल, काठमाण्डौ



५. प्रस्ताव कार्यान्वयन तथा संचालनको सन्दर्भमा प्रस्तावसँग सम्बन्धित ऐन, नियम, राजपत्र, कार्यविधि, मार्गदर्शन, मापदण्ड तथा परिपत्रको पुर्ण पालना गर्नुपर्नेछ ।
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Bus Terminal Project

Lumbini Sanskritik Municipality-10, Rupandehi District
Lumbini Province

Initial Environmental Examination (IEE)



SUBMITTED TO:

Ministry of Urban Development (MoUD)
Singhadurbar, Kathmandu

PROPONENT:

Regional Urban Development Project (RUDP)
Project Coordination Office (PCO)
Department of Urban Development and Building Construction (DUDBC)
Babarmahal, Kathmandu, Nepal
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May 2026



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ABBREVIATION

प्रा.बा.प.	प्रारम्भिक वातावरणीय परीक्षण
ADB	Asian Development Bank
CO	Carbon monoxide
CCTV	Closed-Circuit Television
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DDR	Due Diligence Report
DUDBC	Department of Urban Development and Building Construction
DIA	Direct Impact Area
DO	Dissolved Oxygen
DPR	Detailed Project Report
DUDBC	Department of Urban Development and Building Construction
EMP	Environmental Management Plan
EMoP	Environmental Monitoring Plan
EPA	Environment Protection Act
EPR	Environment Protection Regulation
ERP	Emergency Response Plan
ESP/EPS	Expanded Polystyrene
EWCD	Elderly, Women, Children and Differently abled
FGD	Focal Group Discussion
FPS	Fine Particulate Sampler
GH	Ground Height
GLBC	Greater Lumbini Buddha Circuit
GBIA	Gautam Buddha International Airport
GPS	Global Positioning System
GoN	Government of Nepal
GTI	Green Tech Instrument
HDPE	High Density Polyethylene
HH	Household
IBAT	Integrated Biodiversity Assessment Tool
IEE	Initial Environmental Examination
IIA	Indirect Impact Area
IUDP	Integrated Urban Development Plans
KBA	Key Biodiversity Area
KI	Key Informant
KII	Key Informant Interview
IUCN	International Union for the Conservation of Nature
LC	Least Concerned
LDT	Lumbini Development Trust
LPI	Liquefaction Potential Index
LPG	Liquefied petroleum gas
M	Municipality
MoUD	Ministry of Urban Development
NEIAG	National Environmental Impact Assessment Guideline
NOx	Oxides of Nitrogen
NAAQS	National Ambient Air Quality Standards
NEIAG	National Environmental Impact Assessment Guideline
NPHC	National Population and Housing Census
OHS	Occupational Health and Safety
PCO	Project Coordination Office
PGA	Peak Ground Acceleration
PM	Particulate Matter
PSTP	Package Sewage Treatment Plant
PVC	polyvinyl chloride
RCC	Reinforced Concrete Cement
RoW	Right of Way



3

RUDP	Regional Urban Development Project
SO _x	Oxides of Sulphur
TDS	Total Dissolved Solid
ToR	Terms of Reference
TSP	Total Suspended Particulate Matter
URLIP	Urban Resilience and Livability Improvement Project
USGS	United States Geological Survey
WCUS	Western Corridor Urbanizing Strategy
WUC	West Urban Corridor
WUC-UDP	West Urban Corridor- Urban Development Project
ZOI	Zone of Influence

WEIGHTS AND MEASURES

ब. मी.	बर्गमीटर
प्रा.वा.प	प्रारम्भिक वातावरणीय परीक्षण
°C	degree celsius
cm	centimetre
CUM	Cubic meter
dB	decibels
g	Acceleration due to gravity
ha	hectare
kg	kilogram
km	kilometre
km ²	square kilometre
KLD	Kilo liters per day
kVA	Kilovolt-Ampere
KW	kilowatt
KWp	Kilowatt peak ²
L	litre
m	meter
MT	Metric ton
asl	meters above sea level
mm	millimetre
m ²	square meter
m ³ /s	cubic meter per second
mg/l	milligrams per litre
ml	millilitre
PPM	Parts Per Million
LPD	litres per day
s	second
µg	microgram
µS	microSiemens



कार्यकारी सारांश

प्रस्तावक र परामर्शदाताको विवरण

प्रस्तावक: आयोजना समन्वय कार्यालय, क्षेत्रिय शहरी विकास आयोजना, शहरी विकास तथा भवन निर्माण विभाग, शहरी विकास मन्त्रालय रहेको छ ।

ठेगाना: बबरमहल, काठमाडौं

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सम्पर्क नं: ०१-५३५६६५१

परामर्शदाता: DOHWA ENGINEERING , ERMIC (P) Ltd., SILT Consultants (P.) Ltd., र DIGICON (P) Ltd.

ठेगाना: मध्य-बानेश्वर, काठमाडौं

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सम्पर्क नं : ०१-४५६५८६३

प्रस्तावको उद्देश्य

क्षेत्रिय आर्थिक पूर्वाधार र आवश्यक शहरी पूर्वाधारलाई मजबुत बनाउने लक्ष्य अन्तर्गत लुम्बिनी सांस्कृतिक नगरपालिकामा क्षेत्रिय (regional) बस टर्मिनल प्रस्ताव गरिएको छ। यस आयोजनाले लुम्बिनी गार्डेन र गौतमबुद्ध अन्तर्राष्ट्रिय विमानस्थल जस्ता महत्वपूर्ण स्थानहरूसँगको रणनीतिक सम्पर्क (Strategic Connection) लाई सुधार गरि स्थानीय तथा क्षेत्रिय यातायातमा उल्लेखनीय सुधार गर्नुको साथसाथै आर्थिक गतिविधि र पर्यटनलाई समेत प्रोत्साहन गर्नेछ।

प्रारम्भिक वातावरणीय परीक्षणको उद्देश्य

बस टर्मिनल आयोजनाको प्रारम्भिक वातावरणीय परीक्षण गर्नुको मुख्य उद्देश्य सम्भावित वातावरणीय प्रभावहरू पहिचान र मूल्याङ्कन गरी आयोजनालाई वातावरणमैत्री बनाउनु हो।

यसका अन्य प्रमुख उद्देश्यहरू:

- आयोजना क्षेत्रका भौतिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक पक्षसम्बन्धी तथ्यांक संकलन गरी सम्भावित प्रभावहरूको अध्ययन तथा मूल्याङ्कन गर्ने,



3

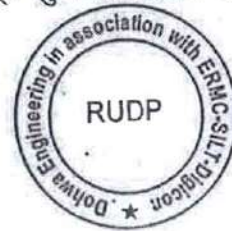
- सकारात्मक प्रभावको बढोत्तरी तथा नकारात्मक प्रभावको न्यूनीकरण गर्न व्यावहारिक तथा स्थल-विशेष उपायहरू पहिल्याई वातावरणीय व्यवस्थापन योजना तयार पार्ने,
- प्रस्तावित आयोजना बारे निर्णयकर्ता र सरोकारवाला निकायलाई वातावरणीय अवधारणा अनुरूप कार्यान्वयन गर्नु हुने वा नहुने र कार्यान्वयन गर्दा के कस्ता प्रतिक्रिया अपनाउनु पर्छ भन्ने जस्ता कुराको परामर्श र जानकारी उपलब्ध गराउनु हो।

भू-उपयोगमा पर्ने असर

यो आयोजना नगरपालिकाको भोगाधिकार रहेको हाल बाँझो जग्गामा प्रस्ताव गरिएको छ। यस आयोजनालाई कुनै पनि निजी जग्गा अधिग्रहण गर्न आवश्यक पर्दैन। निर्माण चरणमा हुन सक्ने क्रियाकलापहरू जस्तै: माटो व्यवस्थापन (spoil disposal), निर्माण सामग्री भण्डारण क्षेत्र र कामदारहरूको शिविर आदिका कारणले अल्पकालीन प्रभाव पर्न सक्छ। यसका साथै, टर्मिनल भवन, कर्मचारी आवास, ग्यारेज, भण्डारण र घन्टाघर (clock tower) जस्ता स्थायी संरचनाहरूको निर्माणले जग्गाको उपयोगमा परिवर्तन ल्याउनेछ।

प्रस्तावको सान्दर्भिकता

शहरी विकास मन्त्रालय/ शहरी विकास तथा भवन निर्माण विभागद्वारा प्रस्तावित Urban Resilience and Livability Improvement Project (URLIP) आयोजनाले सम्बद्ध नगरपालिकाहरूमा शहरी सेवाहरू प्रदान गर्ने लक्ष्यका साथ उत्थानशील शहरी विकास र पूर्वाधार सुधार लक्षित प्राथमिकताका आयोजनाहरूमा र एसियाली विकास बैंकले ऋण सहयोग गर्नेछ। बुटवल, सिद्धार्थनगर, तिलोत्तमा, लुम्बिनी-साँस्कृतिक, देवदह, सैनामैना, कपिलवस्तु, रामग्राम, र कृष्णनगर ९ वटा प्रमुख नगरपालिकामा विशेष गरी पर्यटन क्षेत्रको विस्तारको सम्बन्धमा शहरी सेवाको दीगो विकास र प्रवर्धन गर्न यी नगरपालिकाहरूको छनोट गरिएको हो। आयोजनाहरूले नगरपालिकाको पूर्वाधार लगानी, शहरी योजना, र संस्थागत सुदृढीकरणलाई प्राथमिकता दिनेछन्। यी नगरपालिकाहरू मध्ये पाँच पश्चिम तराईका नगरपालिकाहरू (लुम्बिनी साँस्कृतिक, सैनामैना, देवदह, तिलोत्तमा र सिद्धार्थनगर) Greater Lumbini Buddhist Circuit (GLBC) अन्तर्गत रहेको हुनाले URLIP को एक हिस्साका रूपमा, लुम्बिनी साँस्कृतिक नगरपालिकामा यो आयोजना एक आवश्यक शहरी पूर्वाधार साथसाथै क्षेत्रिय आर्थिक पूर्वाधार हो। लुम्बिनी साँस्कृतिक नगरपालिकामा रहेको सिद्धार्थ गौतमको जन्मस्थल कपिलवस्तुमा हरेक वर्ष असंख्य स्वदेशी तथा विदेशी पर्यटक आउने गर्दछन्, तर यहाँ अझै पूर्ण सुविधासहितको अन्तर-सहरीय



बस टर्मिनल छैन। प्रस्तावित बस टर्मिनलले यात्रुहरूलाई सहज सेवा-सुविधा, अतिरिक्त पार्किङ स्थल र सेवा सञ्चालन गर्न उपयुक्त व्यवस्थापन बिन्दु प्रदान गर्नेछ। यसले नगरभित्रका विभिन्न बस मार्गलाई एकीकृत गरेर यातायात पहुँचलाई सरल बनाउने मात्र होइन, यातायात व्यवस्थापन सुधारमा सम्भावना पनि राख्छ।

आयोजनाको विवरण

यो आयोजना स्थल लुम्बिनी-सांस्कृतिक नगरपालिका वडा नं. १०-मधुवनी, महिलवार बजारबाट करिब १.५ कि. मी. दूरीमा प्रस्तावित छ। यो आयोजना निर्माण स्थल ओशो जेटवनको नजिक, टेलर नदीको छेउमा ११६२८.४१ वर्गमिटर (व.मि.) को क्षेत्रफलमा (२७°२८'३४.६०" उत्तर, ८३°१७'४०.१७" पूर्व) मा अवस्थित छ जसको कुल क्षेत्रफल २०८७.४९ रहेको छ।

आयोजनाका मुख्य अवयवहरूमा इन्टरसिटी बस टर्मिनल (३९.९८ * १७.५३) व.मि., कर्मचारी आवास (१९.९५ * ८.८३) व.मि., ग्यारेज (१२.२५ * ९.३) व. मि., भण्डारण क्षेत्र (९*५) व. मि., बस पार्किङ बे, क्लक टावर (४*४) व.मि. आदि रहेको छ। टर्मिनलको डिजाइन क्षमता २४ कार पार्किङ (निजी), १० इन्टरसिटी बसहरू, १२ लामो दुरीका बस पार्किङ रहेको छ।

प्रारम्भिक वातावरणीय परीक्षणको कानुनी औचित्य

वातावरण संरक्षण ऐन, २०७६ को दफा ३ (१) तथा वातावरण संरक्षण नियमावली, २०७७ को नियम ३ बमोजिम विकास र वातावरण संरक्षणलाई समानान्तर रूपमा मूलप्रवाहीकरण गर्ने उद्देश्यले उपयुक्त वातावरणीय मूल्याङ्कन गर्नुपर्ने व्यवस्था गरिएको छ। वातावरण संरक्षण नियमावली, २०७७ को अनुसूची २ अन्तर्गत "ज" (आवास, भवन, बस्ती विकास तथा शहरी विकास) को ८ बमोजिम यस आयोजनाका लागि प्रारम्भिक वातावरणीय परीक्षण (प्रा.वा.प.) आवश्यक पर्नेछ।

खण्ड ८ बमोजिम २०,००० घनमिटर (m³) भन्दा बढी माटो कटान तथा भरण (cut and fill) गरी साइट विकास गर्नुपर्ने अवस्थामा प्रा.वा.प. आवश्यक पर्छ।

यस आयोजनाले करिब २५,९७१ घनमिटर माटो अन्यत्रबाट कटान गरि निर्माणस्थलमा भरण गर्नुपर्ने भएकाले प्रा.वा.प. आवश्यक रहेको छ।



यस प्रारम्भिक वातावरणीय परीक्षण, वातावरण संरक्षण ऐन, २०७६ को परिच्छेद २ अन्तर्गत दफा ३ र वातावरण संरक्षण नियमावली, २०७७ को परिच्छेद २ अन्तर्गत नियम ३ अनुरूप तयार पारिएको हो। साथै, वातावरण संरक्षण नियमावली, २०७७ को नियम ७ (८) बमोजिम वैदेशिक लगानीका आयोजनाका वातावरणीय अध्ययन प्रतिवेदन तथा कार्यसूची अङ्ग्रेजी भाषामा तयार गर्न सकिने भए तापनि यसको सारांश भने नेपाली भाषामा तयार गर्नुपर्ने व्यवस्था अनुसार नेपालीमा यो सारांश तयार पारिएको छ।

आयोजनाका आवश्यकताहरू

आयोजनाका लागि निजी जग्गा अधिग्रहण गरिने छैन; यद्यपि निर्माण अवधिमा सामग्री भण्डारण र कामदार शिविरका लागि करिब ७५० वर्ग मिटर निजी कृषि जग्गा अस्थायी रूपमा आवश्यक पर्न सक्छ। आयोजनामा टर्मिनल भवन, कर्मचारी आवास, ग्यारेज, स्टोरेज ब्लक, खुला हरियाली क्षेत्रसहितको घडी टावर र चालक आवास निर्माण गरिनेछ, जसको कुल निर्मित क्षेत्रफल २,०८७.४९ वर्ग मिटर रहेको छ। निर्माण अवधि २८ महिना अनुमान गरिएको छ, जसका लागि दैनिक करिब ४३ जना कामदार आवश्यक पर्नेछन्, जसमा १३ जना दक्ष/अर्धदक्ष र ३० जना अदक्ष कामदार रहनेछन्। सञ्चालन अवधिमा नियमित वा करार आधारमा करिब ३५ जना कर्मचारी आवश्यक पर्नेछन्।

आयोजनाका लागि आवश्यक प्रमुख निर्माण सामग्रीहरूमा ८४८.९० मे.टन सिमेन्ट, १,६२७.३३ घन मिटर (घ.मि.) बालुवा, २,७२६.८१ घ.मि. गिट्टी, ४७८,६३१ वटा ईटा, १४७,३४५.१२ के.जी. रड, ४०.३६ मे.टन बिटुमिन, १,०६५.९० घ.मि. सब-बेस सामग्री, ५,२१३.८५ लिटर डिजेल र १,१६१.६१ लिटर पेट्रोल समावेश छन्। निर्माण RCC बिधिले गरिनेछ, जसमा Insulation सामग्री तथा टिकाउ बाहिरी फिनिसिङ सामग्री पनि प्रयोग गरिनेछ। निर्माण चरणमा ठोस फोहोर उत्पादन ६.६२ के.जी./दिन अनुमान गरिएको छ, जसमा करिब ३.७१ के.जी./दिन जैविक फोहोर र बाँकी अजैविक फोहोर रहनेछ। कामदार शिविर र निर्माण स्थलमा कम्तीमा दुईवटा छुट्टाछुट्टै फोहोर संकलन बिन राखिनेछन्, एउटा जैविक फोहोरका लागि र अर्को अजैविक फोहोरका लागि।

सञ्चालन चरणमा कुल ठोस फोहोर उत्पादन ३१७.५ के.जी./दिन अनुमान गरिएको छ, जसमा करिब १८९.८६ के.जी./दिन जैविक फोहोर र बाँकी अजैविक फोहोर रहनेछ। सञ्चालन चरणको फोहोर व्यवस्थापनका लागि विभिन्न स्थानहरूमा ५० लिटर क्षमताका कुल १९ वटा



फोहोर बिन प्रस्ताव गरिएको छ, जसमा ११ वटा जैविक फोहोरका लागि र ८ वटा अजैविक फोहोरका लागि रहनेछन्। यसले स्रोतमै फोहोर छुट्याउन र व्यवस्थित संकलनमा सहयोग पुऱ्याउनेछ।

निर्माण गतिविधिहरूका लागि अनुमानित पानी आवश्यकता करिब ६९०,७४० लिटर रहेको छ। यो पानी मुख्य रूपमा masonry works, concrete works, subgrade, subbase, base preparation, kerbstone works तथा अन्य सम्बन्धित निर्माण गतिविधिहरूका लागि आवश्यक पर्नेछ। सञ्चालन चरणमा दैनिक पानीको माग ९,८०५ लिटर/दिन, अर्थात् करिब ९.८ घन मिटर/दिन, अनुमान गरिएको छ। यसमा यात्रु तथा आगन्तुकहरूको छोटो अवधिको प्रयोग र चालक आवास तथा ग्यारेजसम्बन्धी पूर्ण-दिनको मागलाई ध्यानमा राखिएको छ। फोहोर पानी व्यवस्थापनका लागि दुई-पाइप निकास प्रणालीमा आधारित Package Sewage Treatment Plant (PSTP) प्रयोग गरिनेछ, जहाँ आपूर्ति गरिएको पानीको करिब ८०% फोहोर पानीको रूपमा फर्किने अनुमान गरिएको छ। निर्माण चरणमा अधिकतम फोहोर पानी उत्पादन ३,४४० लिटर/दिन अनुमान गरिएको छ।

आयोजनाका लागि ऊर्जा आपूर्ति नेपाल विद्युत् प्राधिकरणको प्रणालीबाट गरिनेछ। आयोजनाको आकलित विद्युत् लोड २३३.२१ kVA रहेको छ, जसका लागि २५० kVA ट्रान्सफर्मर, आपतकालीन अवस्थाका लागि १५० kVA डिजेल जेनेरेटर, र ८० kVA सौर्य PV प्रणाली प्रस्ताव गरिएको छ। निर्माण चरणमा हरितगृह ग्यास उत्सर्जन कुल २९,१०२.०२ के.जी. CO₂ equivalent अनुमान गरिएको छ, जुन मुख्य रूपमा डिजेल, पेट्रोल र LPG खपतबाट उत्पन्न हुनेछ।

विद्यमान वातावरणीय अवस्था

१. भौतिक वातावरण

आयोजना क्षेत्रको अवस्थिति

प्रस्तावित आयोजना क्षेत्र समथर तराई भू-भागमा पर्दछ। आयोजना स्थल समग्रमा समथर भू-आकृतिमा रहेको छ, जसले संरचना निर्माण तथा पहुँचको दृष्टिले अनुकूल अवस्था रहेकोछ।

जलवायु तथा मौसम



आयोजना क्षेत्र उप-उष्ण जलवायु क्षेत्रमा पर्दछ। यहाँको औसत अधिकतम तापक्रम 30.6°C देखि 31.7°C सम्म र औसत न्यूनतम तापक्रम 15.3°C देखि 19.5°C सम्म रहने गर्दछ। वार्षिक औसत वर्षा करिब $1,250$ मि.मि. रहेको छ। वर्षाको स्वरूप अनियमित (erratic) रहेको पाइन्छ, जहाँ मनसुन अवधि (आषाढ-भाद्र) मा अत्यधिक वर्षा हुने र अन्य महिनाहरूमा सुख्खा अवस्था रहने गर्दछ। हालका वर्षहरूमा वर्षा घट्दै गएको तथा तापक्रम बढ्दो क्रममा रहेको देखिन्छ, जसले जलवायु परिवर्तनको प्रभावलाई संकेत गर्दछ।

जलवैज्ञानिक विश्लेषण

आयोजना क्षेत्रको प्रमुख नदी टेलार नदी हो। यस स्थानमा टेलार नदीको कुल जलाधार क्षेत्र करिब 50 वर्ग किलोमिटर रहेको छ, जसको अधिकांश भाग कृषि भूमिले ढाकिएको छ। टेलार नदीको जलविज्ञान जटिल प्रकृतिको रहेको छ। सिंचाइ नहरको भङ्ग, सतही बहाव तथा आसपासका कृषि क्षेत्रबाट आउने पानीका कारण नदीको बहावमा मौसमी उतार-चढाव देखिन्छ (Hydrological Analysis of Bus Terminal Project, 2025)।

भूकम्पीय जोखिम (Seismicity)

आयोजना क्षेत्र मध्यमदेखि उच्च भूकम्पीय जोखिम क्षेत्रमा पर्दछ। राष्ट्रिय भवन संहिता NBC 105:2025 अनुसार 875 वर्षको पुनरावृत्ति अवधिका लागि यस क्षेत्रको Peak Ground Acceleration (PGA) करिब $0.30g$ रहेको छ। USGS को वर्गीकरणअनुसार यस स्तरको PGA ले मध्यम संरचनात्मक क्षति पुऱ्याउन सक्ने भएकाले आयोजना डिजाइनमा भूकम्प प्रतिरोधी उपायहरू राष्ट्रिय भवन संहिताअनुसार समावेश गरिएको छ।

भू-उपयोग तथा भू-आवरण

आयोजना अवस्थित नगरपालिकाको कुल भू-भागमध्ये 92.50% क्षेत्र कृषि भूमिको रूपमा प्रयोग भइरहेको छ। यसपछि आवासीय क्षेत्र 2.77%, जलाशय 1.94%, सार्वजनिक क्षेत्र 0.93%, औद्योगिक क्षेत्र 0.06%, सांस्कृतिक तथा पुरातात्विक क्षेत्र 0.03%, वन क्षेत्र 0.09% र अन्य प्रयोग 2.75% रहेको छ। यसले आयोजना क्षेत्रको कृषि-प्रधान वास्तविकता झल्काउँछ।

भूमिगत पानीको सतह



3



आयोजना स्थलमा तीनवटा बोरहोल परीक्षण गरिएको थियो, जसमा BH१ र BH२ १५ मिटर गहिराइसम्म र BH३ १२ मिटर गहिराइसम्म ड्रिल गरिएको थियो। परीक्षण अनुसार तीनवटै बोरहोलमा भूमिगत पानीको सतह जमिनको सतहबाट करिब २.५ मिटर तल रहेको पाइयो, जसले आयोजना क्षेत्रमा भूमिगत पानीको सतह उथलो रहेको देखाउँछ।

आधारभूत ध्वनि गुणस्तर

२४ घण्टे ध्वनि स्तर मापन (दिउँसो ७:०० देखि राति १०:०० र राति १०:०० देखि बिहान ७:०० सम्म) गरिएको थियो। मापनअनुसार दिनको समयमा समतुल्य ध्वनि स्तर ५१ dB र रातिको समयमा ३६ dB रहेको पाइयो। बसको निरन्तर आवागमन, विद्यालय गतिविधि तथा सार्वजनिक जमघटका कारण दिनको समयमा ध्वनि स्तर उच्च देखिएको हो।

आधारभूत वायुको गुणस्तर

आधारभूत वायुको गुणस्तर अनुगमनका नतिजाअनुसार PM₁₀, PM_{2.5}, NO₂ र CO जस्ता अधिकांश सूचकहरू राष्ट्रिय वातावरणीय वायु गुणस्तर मापदण्डभित्र रहेका छन्। SO₂ पत्ता लागेन भने Total Suspended Particulates (TSP) केही हदसम्म मापदण्डभन्दा बढी देखिएको छ, जसले स्थानीय स्तरमा वायु प्रदूषण रहेको संकेत गर्दछ। समग्रमा वायुको गुणस्तर स्वीकार्य अवस्थामा रहेको छ।

आधारभूत सतही पानीको गुणस्तर

सतही पानीको गुणस्तरको परीक्षण Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem, 2008 र Irrigation Water Quality Guideline, २००८ मा समावेश गरिएको भौतिक, रासायनिक तथा सूक्ष्मजीवसम्बन्धी सूचकहरू अनुसार गरिएको थियो। पानीको नमुनामा कुल कोलिफर्म अत्यधिक मात्रामा भेटिएकोले सूक्ष्मजीवजन्य प्रदूषणको संकेत गर्दछ। त्यो साथै Electrical Conductivityको value पनि irrigation water quality guidelines २००८ मा दिएको threshold value भन्दा बढी पाएको थियो। क्लोराइड तथा heavy metalsको मात्रा न्यून रहेकोले बाह्य प्रदूषणको प्रभाव सीमित देखिन्छ।

भूगर्भ तथा माटो

लुम्बिनी सांस्कृतिक नगरपालिकामा मुख्य रूपमा Alfisols, Entisols र Inceptisols प्रकारका माटो पाइन्छन्। Alfisols उच्च उर्वरता भएका माटो हुन्, Entisols हालसालै बनेका कम



विकसित माटो हुन् भने Inceptisols अपेक्षाकृत विकसित तर हालसालै बनेका माटो हुन्। यी माटोहरू कृषि तथा निर्माण कार्यका लागि उपयुक्त मानिन्छन्।

२. जैविक वातावरण

वनस्पति (Flora)

आयोजना क्षेत्र कुनै पनि संरक्षित क्षेत्र वा राष्ट्रिय वनभित्र पर्दैन। प्रभाव क्षेत्रभित्र मुख्य रूपमा साल (*Shorea robusta*), सिसौ (*Dalbergia sissoo*), सिमल (*Bombax ceiba*), जामुन (*Syzygium cumini*), आँप (*Mangifera indica*), लिची (*Litchi chinensis*) र बकाइनो (*Melia azedarach*) जस्ता सामान्य रोपाईं तथा सडक किनाराका प्रजातिहरू पाइन्छन्।

जीवजन्तु (Fauna)

आयोजना स्थल शहरी तथा अर्ध-शहरी क्षेत्रभित्र पर्ने भएकाले यहाँ सामान्य रूपमा पाइने जीवजन्तुहरू मात्र देखिन्छन्। चराचुरुङ्गीमा भँगेरा, काग, परेवा, सुगा र मैना; सरीसृपमा अजिङ्गर, कोब्रा; तथा स्तनधारीमा स्याल, न्याउरी मुसा, जंगली बँदेल र नीलगाई पाइने उल्लेख स्थानीय स्रोतबाट प्राप्त भएको छ। सरकारद्वारा संरक्षित सारस केन (*Grus antigone*) तथा विश्वव्यापी रूपमा संकटापन्न Slender-billed Vulture (Critically Endangered), Steppe Eagle (Endangered) र Burmese Python (Vulnerable) जस्ता प्रजातिहरू व्यापक प्रभाव क्षेत्रमा देखिएको जानकारी पाइए तापनि आयोजना स्थलभित्र तिनको गुँड वा महत्वपूर्ण आवास फेला परेको छैन। त्यसैले आयोजनाबाट वन्यजन्तुमा उल्लेखनीय नकारात्मक प्रभाव पर्ने अपेक्षा गरिएको छैन।

३. सामाजिक-आर्थिक वातावरण

अध्ययन विधि

सामाजिक वातावरणसम्बन्धी आधारभूत तथ्याङ्क राष्ट्रिय जनगणना २०२१, नगरपालिका प्रकाशन, सम्भाव्यता अध्ययन तथा Due Diligence Report (DDR) बाट सङ्कलन गरिएको हो। प्राथमिक तथ्याङ्क प्रत्यक्ष अवलोकन, घरघुरी सर्वेक्षण (१७ घरघुरी), Focus Group Discussion, सरोकारवाला परामर्श तथा मुख्य सूचनादाता (Key informant) अन्तर्वार्तामार्फत संकलन गरिएको हो।



जनसांख्यिक अवस्था, धर्म तथा भाषा

२०२१ को जनगणनाअनुसार लुम्बिनी सांस्कृतिक नगरपालिकाको कुल जनसंख्या ८७,३८३ रहेको छ। प्रत्यक्ष प्रभाव क्षेत्रमा क्षेत्री, दलित र यादव प्रमुख जातीय समूहका रूपमा रहेका छन्। सबै सर्वेक्षण गरिएका घरघुरीहरू हिन्दू धर्मावलम्बी हुन्। मातृभाषाका रूपमा नेपाली प्रमुख रहेको छ भने अवधी र भोजपुरी पनि प्रयोगमा छन्।

आर्थिक अवस्था तथा जीविकोपार्जन

नगरपालिका स्तरमा कृषि मुख्य आर्थिक आधार भए तापनि प्रत्यक्ष प्रभाव क्षेत्रमा जीविकोपार्जनका स्रोतहरू विविध पाइएको छ। सर्वेक्षणअनुसार ३५.२९% घरघुरी कृषि, २९.४१% ज्याला मजदुरी, १७.६५% व्यवसाय, ११.७६% सेवा र ५.८८% वैदेशिक रोजगारीमा निर्भर रहेका छन्।

शिक्षा तथा साक्षरता

नगरपालिकाको समग्र साक्षरता दर ७१.१% रहेको छ। पुरुष साक्षरता दर (८०.६%) महिला साक्षरता दर (६२.१%) भन्दा उच्च रहेको छ, जसले महिला शिक्षामा थप सुधार आवश्यक रहेको देखाउँछ।

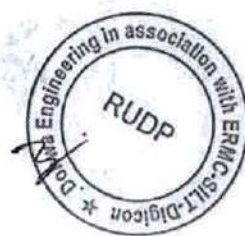
बसाइँसराइ

९३% भन्दा बढी जनसंख्या स्थानीय जन्मस्थलमै बसोबास गर्ने रहेको छ। वैदेशिक रोजगारी भए तापनि यसको मात्रा सीमित रहेको छ।

खानेपानी तथा सरसफाइ

प्रत्यक्ष प्रभाव क्षेत्रका सबै घरघुरीहरू सुधारिएको खानेपानी स्रोतमा पहुँच राख्दछन्, जसमा मुख्यतः पाइपधारा प्रयोग भइरहेको छ। सरसफाइको अवस्था पनि सामान्यतया सन्तोषजनक रहेको छ। यद्यपि आयोजना नजिकैको सिँचाइ नहर बिग्रिएको (Damage) भएको कारण वर्षायाममा पानी व्यवस्थापन चुनौतीपूर्ण हुने गरेको देखिन्छ।

फोहोर व्यवस्थापन



नगरपालिकाले साप्ताहिक रूपमा ठोस फोहोर संकलन सेवा उपलब्ध गराउँदै आएको छ। आयोजना अन्तर्गत जैविक, पुनःप्रयोगयोग्य र जोखिमपूर्ण फोहोर छुट्याउने व्यवस्था प्रस्ताव गरिएको छ।

पहुँच तथा यातायात

आयोजना क्षेत्र हुलाकी (लुम्बिनी) राजमार्गसँग जोडिएको छ। सबै सर्वेक्षण गरिएका घरघुरीहरू सार्वजनिक यातायातको पहुँचमा छन्। मोटरसाइकल र साइकल जस्ता व्यक्तिगत सवारी साधनको प्रयोग सामान्य छ।

सूचना पहुँच, इन्धन तथा वित्तीय सेवा

सर्वेक्षण गरिएका घरघुरीहरूमा स्मार्टफोन, टेलिभिजन र इन्टरनेटको राम्रो पहुँच रहेको छ। अधिकांश घरघुरी LPG प्रयोग गर्छन् भने केहीले दाउरा र गोबर पनि प्रयोग गर्ने गरेका छन्। सबै घरघुरी राष्ट्रिय विद्युत् प्रसारण प्रणालीमा जोडिएका छन्। बैंकिङ पहुँच राम्रो रहेको र आधाभन्दा बढी घरघुरीले ऋण लिएको पाइएको छ।

सरोकारवाला परामर्श

सरोकारवाला परामर्शबाट जग्गा स्वामित्व, कृषि भूमिमा पर्ने सम्भावित असर, पानी निकास, स्थानीय रोजगारी र सांस्कृतिक स्थलसम्मको पहुँच सुनिश्चित गर्नुपर्ने विषय उठान भएको छ। मुख्य सूचनादाताहरूले आयोजना स्थल कुनै पनि महत्वपूर्ण चराचुरुङ्गी आवास नभएको पुष्टि गरेका छन्।

संस्थागत व्यवस्था तथा भूमिका:

MOUD अन्तर्गतको DUDBC/PCO ले आयोजनाको समग्र समन्वय, व्यवस्थापन तथा आयोजना र नगरपालिकासँगको समन्वयको जिम्मेवारी लिनेछ। लुम्बिनी सांस्कृतिक नगरपालिकाले आयोजना कार्यान्वयन गर्ने निकाय (PIU) को रूपमा रहेर कार्यान्वयन तथा सुपरिवेक्षणको जिम्मेवारी लिनेछ। WUC-PCO ले DUDBC/PCO, नगरपालिका, PIU र परामर्शदाताहरूबीच समन्वय सहजीकरण गर्नेछ। PMCDC ले ADB का आवश्यकताअनुसार सुरक्षण (safeguards) तथा क्षमता अभिवृद्धि सहयोग प्रदान गर्नेछ भने Supervision Consultant ले निर्माण सुपरिवेक्षण, गुणस्तर सुनिश्चितता, सुरक्षा अनुपालन, वातावरणीय तथा सामाजिक व्यवस्थापन अनुगमनमा सहयोग गर्नेछ।



प्रस्तावसँग सम्बन्धित नीति, कानून तथा मापदण्डः

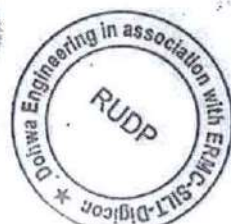
प्रस्तावित आयोजनाको वातावरणीय अध्ययनलाई मार्गदर्शन गर्न सम्बन्धित नीति, ऐन, नियमावली, निर्देशिका, मापदण्ड, ADB safeguard आवश्यकताहरू तथा अन्तर्राष्ट्रिय सन्धि/सम्झौताहरूको समीक्षा गरिएको छ। समीक्षामा वातावरण संरक्षण, IEE तयारी तथा स्वीकृति प्रक्रिया, सार्वजनिक सुनुवाइ, वातावरणीय व्यवस्थापन योजना, फोहोरमैला व्यवस्थापन, श्रम तथा व्यवसायजन्य स्वास्थ्य र सुरक्षा, बालश्रम निषेध, अपाङ्गमैत्री पहुँच, भूमि प्रयोग, शहरी विकास, सांस्कृतिक सम्पदा संरक्षण, पानी, हावा तथा ध्वनि गुणस्तर मापदण्ड, GESI र ADB safeguard सम्बन्धी प्रावधानहरू समेटिएका छन्। यी प्रावधानहरू सम्भावित प्रभावहरूको मूल्याङ्कन, न्यूनीकरण उपायहरूको तयारी, EMP निर्माण तथा आयोजनाको वातावरणीय अनुपालन योजनामा समावेश गरिएको छ।

वातावरणीय प्रभावहरू

सकारात्मक प्रभावहरू

आयोजना कार्यान्वयनका मुख्य फाइदाहरू यस प्रकारका छन्ः

- निर्माण चरण) २८ महिना (मा करिब १३ जना दक्ष तथा ३० जना अदक्ष कामदारहरूका लागि रोजगारी सिर्जना हुने, जसले स्थानीय स्तरमा आयआर्जनका अवसरहरू बढाउनेछ।
- आयोजना सञ्चालन तथा मर्मत (Operation & Maintenance) चरणमा पनि प्रत्यक्ष रोजगारीका अवसरहरू सिर्जना हुनेछन्। सञ्चालन चरणमा रोजगारी, चालक, मर्मत कर्मचारी, प्रशासनिक कर्मचारीजस्ता रोजगारीका अवसर सिर्जना गर्नेछ।
- क्षेत्रिय यातायात केन्द्र (Regional Transport Hub) को रूपमा बस टर्मिनल निर्माण भएपछि स्थानीय समुदायको आवागमन, पहुँच र गतिशीलतामा उल्लेखनीय सुधार आउनेछ।
- बस टर्मिनल सञ्चालनमा आएपछि आसपासका क्षेत्रको जग्गा तथा सम्पत्तिको मूल्य वृद्धि हुने सम्भावना रहन्छ।
- नजिकैको महिलार बजारमा तरकारी, चामल, दाल, तेल, प्याकेट खाद्य सामग्री तथा मसालाजस्ता वस्तुहरूको माग बढ्ने भएकाले स्थानीय व्यापारमा वृद्धि हुने अपेक्षा गरिएको छ।



- निर्माण चरणमा आवश्यक सिमेन्ट, बालुवा, गिट्टी, ईटा, रिबार, डिजेल आदि निर्माण सामग्रीहरू सम्भव भएसम्म स्थानीय बजार तथा व्यवसायबाट खरिद गरिने हुँदा स्थानीय व्यापार प्रवर्द्धन हुनेछ।
- DPR (२०२५) अनुसार दैनिक करिब २००० भन्दा बढी यात्रुको आवागमन हुने अनुमान गरिएकोले होटल, रेष्टुरेन्ट, पसल तथा अन्य स्थानीय व्यवसायको विस्तारमा टेवा पुग्नेछ।
- पुरानो बस पार्कका सीमितताहरूलाई समाधान गर्दै नगरपालिका स्तरमा यातायात जडान सुदृढ भई केन्द्रीय यातायात हबको रूपमा विकास हुनेछ।
- आयोजनाका संरचनाहरू ज्येष्ठ नागरिक, महिला, बालबालिका तथा अपाङ्गता भएका व्यक्तिहरू (EWCD) का लागि सार्वभौमिक पहुँच सुनिश्चित हुने गरी डिजाइन गरिएको छ।
- बस टर्मिनल सञ्चालनपछि स्वास्थ्य संस्थासम्म पहुँच सजिलो हुने साथै पहुँच मार्ग सुधारले धुलो घटेर स्थानीय बासिन्दालाई स्वस्थ वातावरण प्रदान गर्ने छ।

बस टर्मिनलले आधुनिक सुविधा सहित (enhanced infrastructures) स्थानीय र क्षेत्रिय सम्पर्कमा (regional connectivity) सुधार ल्याउँछ।

- वृद्ध, महिला, बालबालिका र अपाङ्गमैत्री पूर्वाधार (Universal accessibility design) ले सबै वर्गलाई सहज पहुँच सुनिश्चित गर्छ।

नकारात्मक प्रभावहरू

भौतिक वातावरण

आयोजना कार्यान्वयनबाट भौतिक वातावरणका निम्न नकारात्मक प्रभावहरू देखा पर्न सक्ने देखिन्छः

- आयोजनाको स्थायी (बस टर्मिनल भवन, रेस्टुरेन्ट र टिकेट काउन्टर आदिको निर्माण (Built-up Area) र अस्थायी (कामदार शिविर, stockpiling, २५,९१७ घनमिटर माटो कटान र भरण (Cutting and Filling) जस्ता क्रियाकलापहरूले त्यस ठाउँको भू-उपयोगमा परिवर्तन हुने सम्भावना छ।
- निर्माण चरणमा माटो कटान, धुलो, धुवाँ, NO_x, SO_x, PM आदि उत्सर्जनले वायु प्रदूषण बढाउँछ। धुलो र धुवाँको कारण आयोजना क्षेत्रको वायुको गुणस्तरमा असर पर्न सक्ने।



- निर्माण चरणमा प्रयोग गरिने साधनहरू (मेसिनरी र गाडी)ले आयोजना क्षेत्रमा ध्वनी प्रदूषण र कम्पन हुने सम्भावना राख्दछ र स्थानीय बासिन्दालाई असर गर्छ।
- निर्माण कार्यहरू र श्रमिक शिविरबाट निर्माण समयमा उत्पन्न हुने फोहोर (६.६२ के.जी. प्रति दिन) तथा bus terminal सञ्चालन बेला passengers, driver, etc. उत्पन्न हुने फोहोर (३१७.५ के.जी. प्रति दिन)ले वातावरण प्रदूषण बढ्न सक्छ।
- सञ्चालन चरणमा यात्रु र व्यवसायबाट फोहोर उत्पादन भई व्यवस्थापन चुनौतीपूर्ण हुन सक्छ।
- सञ्चालन चरणमा बस टर्मिनल भवन, रेस्टुरेन्ट र टिकेट काउन्टरको आवाजले दीर्घकालीन असुविधा ल्याउन सक्छ।
- निर्माण चरणमा ढल, फोहोर र तेल नजिकैको तेलर र कोइलीहवा खोलामा मिसिदा पानीको गुणस्तरमा असर पुर्याउन सक्छ।
- सञ्चालन चरणमा फोहोर, तेल र इन्धन चुहावटले माटो, पानी र वरिपरिको वातावरण प्रदूषित गर्न सक्छ।
- श्रमिक शिविर, अस्थायी कार्यालय तथा फोहोर भण्डारणबाट निस्कने ढल र लिचेटको उचित व्यवस्थापन नभएमा टेलार नदी प्रदूषित हुने सम्भावना रहन्छ।
- सञ्चालन चरणमा अत्यधिक वर्षाका बेला पानी निकास प्रणाली प्रभावकारी नभएमा ह्युम पाइप क्षति तथा डुबानको जोखिम रहन्छ।

जैविक वातावरण

आयोजना कार्यान्वयनबाट जैविक वातावरण निम्न प्रभावहरू पर्ने देखिन्छ:

- निर्माण चरणमा बाहिरी कामदार र सामाग्रीमार्फत मिचाहा प्रजाति (Invasive species) भित्रिन सक्ने जोखिम रहन्छ।
- आयोजना स्थल Crane sanctuary र लुम्बिनीको खेतबारी (Lumbini Farmland) नजिकै पर्दछ, जुन फिरन्ते चराहरू (migratory birds)को बसाई, विश्राम र चरनका लागि मध्यवर्ती बासस्थानको रूपमा काम गर्ने क्षमता राख्दछ, तसर्थ त्यहाँ migratory birds को आवतजावत प्रभावित हुन सक्छ।

सामाजिक, आर्थिक र सांस्कृतिक वातावरण

आयोजना कार्यान्वयनबाट सामाजिक, आर्थिक र सांस्कृतिक वातावरणका निम्न लिखित अवयवहरूमा प्रत्यक्ष प्रभाव पर्ने देखिन्छ।



- निर्माण चरणमा धुलो, आवाज, मेसिनरी र असुरक्षित कामका कारण कामदारहरूको स्वास्थ्य र सुरक्षामा (चोटपटक र रोग) असर पर्नसक्छ ।
- निर्माण चरणमा मेसिनरी प्रयोग, धुलो, धुवाँ, आवाज, कम्पन, र फोहर व्यवस्थापन नहुँदा समुदायको स्वास्थ्य र सरसफाइमा समस्या आउँछ ।
- निर्माण कार्यका क्रममा धुलो, आवाज तथा सम्भावित दुर्घटनाका कारण Occupational Health and Safety (OHS) सम्बन्धी जोखिम रहनेछ ।
- सञ्चालन चरणमा बस, निजी सवारी साधन आदिको आवागमन बढ्दा वायु तथा ध्वनि प्रदूषणको जोखिम बढ्न सक्छ ।
- निर्माण चरणमा बाहिरी कामदारहरूको आगमनले (आवश्यक परेमा मात्र) समाजमा अनाधिकृत क्रियाकलापहरू हुन सक्ने, द्वन्द्वको सम्भावना रहने, स्थानीय धार्मिक,
- सांस्कृतिक मूल्य र मान्यतामा असर पर्न सक्ने साथै यौनजन्य रोग र संक्रामक रोग फैलिने सम्भावना छ ।
- बाल श्रम, लैङ्गिक विभेद, र असमान ज्यालादर वितरण जस्ता समस्याहरू उत्पन्न हुन सक्ने ।
- निर्माण चरणमा श्रमिक शिविर तथा सामग्री भण्डारणका र सञ्चालन चरणमा बढ्दो यात्रु र व्यवसायिक गतिविधिका कारण ठोस फोहर, दुर्गन्ध र पानीजन्य रोग फैलन सक्छ ।
- सञ्चालन चरणमा पर्यटन र व्यवसाय विस्तारसँगै जग्गा रूपान्तरण भई कृषियोग्य जमिनमा असर पुग्न सक्छ ।
- आयोजना क्षेत्र Greater Lumbini Buddhist Circuit भित्र पर्ने भएकाले निर्माणका क्रममा पुरातात्विक अवशेष फेला पर्ने सम्भावना रहन्छ ।

सकारात्मक प्रभाव प्रवर्तकीकरणका उपायहरू

आयोजनाले तल उल्लिखित कार्यहरू प्रवर्तकीकरणका अन्तर्गत प्रस्ताव गरिएको छ ।

- आयोजना निर्माणमा स्थानीय बासिन्दालाई रोजगारीका लागि प्राथमिकता दिइनेछ । यसका साथै, निर्माण सामग्री र स्रोतसाधन पनि स्थानिय बजारबाट आपूर्ति गरिनेछ ।
- आयोजना सम्पन्न भएपछि आर्जित सम्पूर्ण रकम पारदर्शी रूपमा व्यवस्थापन गरिनेछ, र बस टर्मिनलको दिगो सञ्चालन तथा व्यवस्थापनमा खर्च गरिनेछ । यसले पार्कको दीर्घकालीन वित्तीय सुदृढता सुनिश्चित गर्नेछ ।
- हरित क्षेत्रमा स्थानिय प्रजातिका बिरुवाहरू रोपिनेछ, जसले वातावरणीय सुधारसँगै स्थानीय जैविक विविधता संरक्षणमा सहयोग गर्नेछ ।

हो। यस विश्लेषण अन्तर्गत आयोजना डिजाइन, आयोजना स्थल, Hydrological Layout, निर्माण सामग्री/कच्चा पदार्थ (Raw Materials)को प्रयोग, निर्माण विधि तथा प्रविधि, कार्यान्वयन समयतालिका तथा आयोजना कार्यान्वयन नगर्ने (No-Action) विकल्पहरूलाई आधार मानी मूल्याङ्कन गरिएको छ।

१. डिजाइनसम्बन्धी विकल्पहरू

स्रोत-साधनको दक्ष प्रयोग, आर्थिक व्यवहार्यता तथा वातावरणीय दिगोपन सुनिश्चित गर्दै दुईवटा डिजाइन विकल्पहरूको मूल्याङ्कन गरिएको थियो।

विकल्प १:

यो विकल्पले निर्माण लागत र जटिलता न्यून गर्न आधारभूत पूर्वाधार र आवश्यक सुविधाहरूमा जोड दिएको छ। यसमा म्यानुअल टिकट काउन्टर, सीमित यात्रु सुविधा, आधारभूत बस बे, ग्याबियन रिटेनिड वाल, सानो सेप्टिक ट्यांकी तथा सरल ढल व्यवस्थापन प्रणाली समावेश छन्। यो विकल्प न्यून आधुनिकीकरणसहित कार्यक्षमता केन्द्रित रहेको छ।

विकल्प २:

यो विकल्प विकल्प १ लाई परिष्कृत गर्दै आधुनिक तथा दिगो प्रविधिहरू समावेश गरिएको हो। यसमा म्यानुअल तथा स्वचालित दुवै प्रकारका टिकट प्रणाली, ट्राफिक प्रवाह सुधारका लागि तीनवटा बस बे, छुट्टै सोलार प्यानल ब्लक, ढुंगामाटोको रिटेनिड वाल, बक्स कल्भर्टसहितको उपयुक्त आकारको नहर, Package Sewage Treatment Plant (PSTP) तथा भेन्डिड मेसिन, डिजिटल डिस्प्ले र थप सिट क्षमताजस्ता यात्रु सुविधाहरू समावेश गरिएको छ। यो विकल्पले संरचनाको दिगोपन, सञ्चालन दक्षता तथा प्रयोगकर्ताको सहजता उल्लेखनीय रूपमा वृद्धि गर्ने भएकाले वातावरणीय तथा प्राविधिक दृष्टिले उपयुक्त मानिएको छ।

२. जलविज्ञानसम्बन्धी विकल्पहरू (Hydrological Alternatives)

बिग्रेको (damaged) सिंचाइ नहर तथा बरपरका कृषि क्षेत्रबाट आउने पानीको व्यवस्थापनका लागि तीनवटा जलविज्ञान विकल्पहरूको मूल्याङ्कन गरिएको थियो:



3

• विकल्प I: परित्यक्त सिंचाइ नहरको माथिल्लो भाग पूरै भर्ने गरी बस टर्मिनल क्षेत्रमा पानी प्रवेश रोक्ने। यो आर्थिक रूपमा किफायती भए तापनि हालको आयोजना कार्यक्षेत्रभन्दा बाहिर पर्ने भएकाले उपयुक्त मानिएन।

• विकल्प II: नहरको बाँध मर्मत गरी तल्लो कृषि क्षेत्रमा पुनः पानी प्रवाह गराउने। व्यापक शहरीकरण र लामो समयदेखि नहर प्रयोगविहीन भएकाले यो विकल्प प्राविधिक रूपमा चुनौतीपूर्ण देखियो।

• विकल्प III: बस टर्मिनलभित्र आन्तरिक नहर प्रणाली डिजाइन गरी भङ्ग भएको नहर र आसपासका क्षेत्रबाट आउने अधिकतम पानी सुरक्षित रूपमा निकास गर्ने।

सरोकारवाला परामर्श तथा प्राविधिक सम्भाव्यता विश्लेषणका आधारमा विकल्प III चयन गरिएको छ। यसअनुसार बस टर्मिनलभित्रको नहरलाई उच्चतम बहाव धात्र सक्ने गरी डिजाइन गरिएको छ, जसले साइट ड्रानको जोखिम न्यून गर्नेछ (Hydrological Analysis Report, 2025)।

३. निर्माण विधि तथा प्राविधिको विकल्प

निर्माण कार्यका लागि श्रम-आधारित तथा मेसिन-आधारित दुवै विधि संयोजन गर्ने (Hybrid Construction Approach) विकल्प चयन गरिएको छ।

सम्भव भएसम्म म्यानुअल श्रमलाई प्राथमिकता दिइनेछ, जसले स्थानीय रोजगारी सिर्जना र उत्सर्जन न्यूनिकरणमा सहयोग पुऱ्याउनेछ। ठूलो परिमाणको माटो काम, उत्खनन, ब्याचिङ, ग्रेडिङ, कम्प्याक्सन तथा सडक सतह निर्माणका लागि यान्त्रिक उपकरण प्रयोग गरिनेछ। यसले संरचनात्मक मजबुती, वातावरणीय संरक्षण, लागत प्रभावकारिता र समयमै आयोजना सम्पन्न गर्न सहयोग पुऱ्याउनेछ।

४. आयोजना स्थलको विकल्प

प्रस्तावित बस टर्मिनल स्थल लुम्बिनी सांस्कृतिक नगरपालिकाको केन्द्रबाट करिब २.२ कि.मि. दक्षिणमा अवस्थित छ र हुलाकी राजमार्गसँग प्रत्यक्ष रूपमा जोडिएको छ। उक्त जग्गा पूर्ण रूपमा सरकारी स्वामित्वको हो र नगरपालिकाद्वारा औपचारिक रूपमा तोकिएको स्थल हो। नगर विकास योजनासँग पूर्ण रूपमा मेल खाने तथा निजी जग्गा अधिग्रहण आवश्यक नपर्ने भएकाले वैकल्पिक स्थलको अध्ययन गरिएको छैन।

५. कच्चा पदार्थको स्रोत र विकल्प



नकारात्मक प्रभाव न्यूनीकरणका उपायहरू

आयोजनाको निर्माण तथा सञ्चालनको क्रममा नकारात्मक प्रभावलाई सोही अनुरूपको उपयुक्त निगरानीका उपायहरू अवलम्बन गरिनेछ।

भौतिक- रासायनिक वातावरण

- आयोजना स्थलमा seasonal flood probability(मौसमी बाढीको जोखिम) भएकोले, स्थायी रूपमा आवश्यक जमिनको मात्र भू-उपयोग परिवर्तन गरिनेछ, र अस्थायी रूपमा परिवर्तन गरिएको भू-उपयोग पुनर्स्थापना गरी वृक्षारोपण गरिनेछ।
- निर्माण कार्य दिनको समयमा मात्र गर्ने, अनावश्यक ध्वनि र कम्पन उत्पन्न गर्ने साधनहरूको मर्मत गर्ने वा प्रतिबन्ध लगाई राम्रो विकल्प खोजिनेछ।
- निर्माण र सञ्चालनका विभिन्न कार्यहरूबाट उत्पन्न हुने ठोस र तरल फोहोरको उचित संकलन गर्ने, जस्तै डस्टबिन वितरण र साइनबोर्ड राख्ने, तथा संकलित फोहोरलाई वातावरणमा प्रदूषण नगर्ने गरी पूर्वनिर्धारित तरिकामा व्यवस्थापन गरिनेछ।
- निर्माण तथा सञ्चालन चरणमा उत्पन्न हुने ठोस फोहोर व्यवस्थापनका लागि स्पष्ट कार्यविधि लागू गरिनेछ।
- प्रयोग हुने सवारी साधन तथा मेसिनरीहरू नेपाल सरकारको उत्सर्जन मापदण्डअनुसार हुनेछन्।
- धेरै असर पर्ने ठाउँ मा दक्ष श्रमिक र कम प्रभाव पर्ने विकल्पहरूको प्रयोग गरिनेछ।
- निर्माण सामग्रीको उचित योजना, भण्डारण तथा व्यवस्थापन गरिनेछ।
- फोहोर नजलाउने, पानी छर्कने जस्ता अभ्यासमार्फत धुलो तथा वायु प्रदूषण न्यूनीकरण गरिनेछ।
- ध्वनि स्तर स्वीकार्य सीमाभित्र राख्न नियमित अनुगमन गरिनेछ।
- ढल प्रशोधनका लागि Package Sewage Treatment Plant (PSTP) जडान गरिनेछ।
- निर्माण कार्य गर्दा नियमित रूपमा पानी छर्कने र कामदार शिविरमा फोहोर जलाउन निषेध गर्ने।
- कामदारहरूको शिविरमा एलपी (खाना पकाउने) ग्यासको व्यवस्था गर्ने।
- वातावरण संरक्षण नियमावली, २०७७ को नियम १४ (१) बमोजिम कम प्रभाव पर्ने विकल्पहरू जस्तै: हाते वा साना उपकरणबाट उत्खनन गर्ने र रेडिमिक्स वा हातैले मसला



- स्थानीय विशेषता र आवश्यकता अनुसार वेतिभर Vetiver grass (*Vetiveria zizanioides*), Kans (*Sacchrum spontaneum*), Amriso (*Thysanolaena maxima*), Vitex negundo जस्ता विरुवाहरू प्रयोग गरी जैविक इन्जिनियरिङ (Bioengineering) विधिहरू अपनाउने।
- गेवियन पर्खाल (Gabion walls), जुट-नेटिङ (jute-netting) र कुलो/नहरको व्यवस्थापन गर्ने।

सामाजिक, आर्थिक र सांस्कृतिक वातावरण

- कामदारहरूको स्वास्थ्य जाँच गराइने, प्राथमिक उपचारका लागि किट र तालिम दिइने, तथा काम अनुसार हेलमेट, फेस मास्क, पन्जा, इयर-मफ आदि सुरक्षा सामग्री उपलब्ध गराइनेछ र OHS मापदण्ड कडाइका साथ लागू गरिनेछ।
- निर्माण कार्य दिनको समयमा मात्र सञ्चालन गरिनेछ।
- कामदारहरूलाई आचारसंहितालागू गरी निगरानीमा राखिनेछ, र समाजमा अनाधिकृत क्रियाकलाप नगर्न निर्देशित गरिनेछ। त्यस्ता गतिविधि भएमा पाउन सकिने सजायका बारेमा अभिमुखिकरण गरिनेछ।
- आयोजनाका कुनै पनि काममा बालश्रम, लैङ्गिक विभेद, र असमान ज्यालादर वितरण जस्ता कार्यहरू कडाइका साथ प्रतिबन्धित गरिनेछ।
- सामाजिक सद्भाव कायम गर्न स्थानीय र आयोजनाका कामदारहरू बीच अन्तरक्रिया कार्यक्रम आयोजना गरिनेछ।
- कामदारहरूलाई स्थानीय सांस्कृतिक सम्पदाहरू, मूल्य-मान्यता, र परम्परागत भावनाहरूलाई सम्मान गर्न कडा निर्देशन दिइनेछ।

जैविक वातावरण

- वन्यजन्तु तथा जैविक आवासमा असर नपरोस् भन्नका लागि CCTV क्यामेरा, चेतनामूलक सूचना बोर्ड तथा चेतावनी संकेतहरू जडान गरिनेछ।
- मिचाहा प्रजाति देखिएमा सोको उचित व्यवस्थापन गरिनेछ।

विकल्पहरूको विश्लेषण

प्रस्तावित बस टर्मिनल विकास आयोजनाका लागि वातावरणीय दृष्टिले उपयुक्त, प्राविधिक रूपमा सम्भाव्य तथा आर्थिक रूपमा कार्यात्मक विकल्प पहिचान गर्न विकल्पहरूको विश्लेषण गरिएको



निर्माण कार्यमा RCC, ईटाको गारो, स्टिल रिवार, गिटी, बालुवा, ढुंगा, बिटुमिन तथा सब-ग्रेड सामग्रीहरू स्वीकृत जिल्ला दररेट (२०८०/२०८१) अनुसार प्रयोग गरिनेछ। ऊर्जा दक्षता अभिवृद्धिका लागि Glasswool, EPS सिट तथा PVC बुडन प्यानलजस्ता थर्मल इन्सुलेसन सामग्री प्रयोग गरिनेछ। सम्भव भएसम्म स्थानीय रूपमा उपलब्ध सामग्रीलाई प्राथमिकता दिइनेछ, जसले ढुवानी प्रभाव घटाउने, स्थानीय अर्थतन्त्रलाई टेवा पुऱ्याउने र Environmental Footprint न्यून गर्नेछ।

६. आयोजना कार्यान्वयन नगर्ने विकल्प

यदि आयोजना कार्यान्वयन नगरेमा प्रस्तावित स्थल प्रयोगविहीन रहने, मौसमी जलजमावको समस्या यथावत् रहने तथा आर्थिक गतिविधि सुस्त रहनेछ। अपर्याप्त बस सुविधा, यात्रु सुरक्षाको अभाव र केन्द्रीय यातायात जडानको कमी जस्ता समस्या निरन्तर रहनेछन्। रोजगारी सिर्जना, व्यवसाय विकास र शहरी पूर्वाधार सुधारका अवसरहरू गुम्ने भएकाले No-Action विकल्प उपयुक्त मानिएको छैन।

७. आयोजना कार्यान्वयन तथा समयतालिका

आयोजना कार्यान्वयन योजना श्रम-केन्द्रित, लागत-प्रभावकारी, वातावरणमैत्री तथा स्रोत-साधनको अधिकतम उपयोग हुने गरी तयार गरिएको छ। निर्माण गतिविधिहरू दोहोरिन नदिई तर्कसंगत क्रमअनुसार सञ्चालन गरिनेछ।

निर्माण अवधिको अन्त्यतिर परीक्षण, निरीक्षण, सञ्चालनपूर्व तयारी, कर्मचारी तालिम तथा आवश्यक स्वीकृतिहरू लिइने व्यवस्था गरिएको छ। आयोजनाको अनुमानित निर्माण अवधि २८ महिना रहनेछ, त्यसपछि परीक्षण, तालिम र औपचारिक सञ्चालन (Commissioning) गरिनेछ।

वातावरणीय व्यवस्थापन योजना

यस प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदनमा प्रभावहरूको व्यवस्थापन योजना, अनुगमन योजना संलग्न गरि वातावरण व्यवस्थापन योजना तयार गरिएको छ। यस आयोजनामा विद्यमान प्रदूषण मापदण्डहरूलाई समेत मध्यनजर राखी सो सम्बन्धिको व्यवस्था समेत उल्लेख गरिएको छ। यस आयोजनालाई वातावरणमैत्री बनाउनका लागि सकारात्मक प्रभावहरूलाई बढावा दिने तथा नकारात्मक प्रभावहरूलाई न्यूनीकरण गर्ने उपायहरू प्रतिवेदनमा प्रस्ताव गरिएको। आयोजना



कार्यान्वयन कारण स्थानीय क्षेत्रका भौतिक, रासायनिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक क्षेत्रमा पर्ने जाने नकारात्मक असरलाई हटाउने वा न्यूनीकरण गर्ने मुख्य जिम्मेवारी आयोजनाको प्रस्तावकको हुनेछ। उक्त आयोजनाको लागि चाहिने लगाथारू तल दिएको तालिका अनुसार छ।

क्र.सं.	विवरण	रकम (ने. रु.)
१	सकारात्मक प्रभावहरू अभिवृद्धि गर्न लाग्ने कुल लागत (BoQ मा समावेश नभएको)	१५०,०००
२.	प्रतिकूल प्रभावहरू न्यूनीकरण गर्न लाग्ने लागत (BoQ मा समावेश नभएको)	१,६७०,०००
३	प्रतिकूल प्रभावहरू न्यूनीकरण गर्न लाग्ने कुल लागत (BoQ मा समावेश गरिएको)	१४७,१५९,५३७
४	वातावरणीय व्यवस्थापन योजना कार्यान्वयनका लागि लाग्ने कुल लागत	१४८,९७९,५३७
५	वातावरणीय न्यूनीकरण लागत कार्यान्वयनका लागि (BoQ मा समावेश गरिएको लागत)	१४७,१५९,५३७
६	BoQ मा समावेश नभएको अतिरिक्त आवश्यक लागत	१,८२०,०००

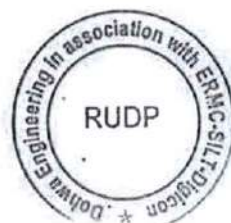
वातावरणीय अनुगमन: निर्माण चरणमा जल, वायु, ध्वनि र दृश्य प्रदूषण, भूमिक्षेत्रमा पर्ने प्रभाव, फोहोर व्यवस्थापन, बिग्रन व्यवस्थापन क्षेत्र, जमिन स्थिरता, प्रस्तावित क्षेत्रभित्र प्रभावित हुने वनस्पति तथा जीवजन्तुको विवरण, लैङ्गिक समानता तथा सामाजिक समावेशीकरण (GESI), प्रस्तावित क्षेत्रभित्र प्रभावित हुने वनस्पति तथा जीवजन्तुको विवरण, वनजन्य श्रोतहरूमा प्रभाव र वृक्षारोपणको लागि आवश्यक जमिन अधिग्रहण, स्थानीय अर्थतन्त्र, सामुदायिक स्वास्थ्य, आदि जस्ता सूचकहरूमा आधारित रहेर अनुगमन गरिने छ।

सञ्चालन चरणमा हावा, पानी, ध्वनि तथा माटोको गुणस्तर, फोहोर व्यवस्थापनको अवस्था, समुदायको स्वास्थ्य अवस्था आदि जस्ता सूचकहरूमा आधारित रहेर अनुगमन गरिने छ।

अनुमानित अनुगमन लागत: वातावरण विज्ञ, सामाजिक-आर्थिक विज्ञ, जीवविज्ञानी, व्यावसायिक स्वास्थ्य तथा सुरक्षा विज्ञ सहायक कर्मचारी, सामाजिक परिचालक र स्थलगत भ्रमणका क्रममा हुने अन्य विविध खर्चसहित कुल अनुमानित अनुगमन लागत नेपाली रूपैयाँ २,९२६,००० रहेको छ।



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स्व-अनुगमन लागतः निर्माण र सञ्चालन चरणहरूमा वातावरणमा पर्ने प्रभावको बारेमा प्रत्येक ६ महिनामा स्व-अनुगमन गरिनेछ र यसको प्रतिवेदन DUDBC/MoUD मा बुझाइनेछ। यस अनुगमनको कुल लागत नेपाली रूपैयाँ ६,५०,००० रहेको छ।

वातावरणीय परीक्षण

वातावरणीय संरक्षण ऐन २०७६ को नियम १२ (१) अनुसार वातावरणीय परीक्षण (Environmental Audit) जुन आयोजना सम्पन्न भएर सुचारु भएको दुई वर्षपछिको ६ महिना भित्र सम्पन्न गरिसक्नुपर्छ। यसले आयोजनाको विगत र वर्तमान अवस्थाको मूल्याङ्कन गर्नुका साथै अपनाइएका न्यूनीकरणका उपायहरूको प्रभावकारिताको लेखाजोखा गर्दछ। नेपालको संविधानद्वारा निर्देशित यो प्रक्रियामा परीक्षक (Auditor), अडिटी (Auditee) र तेस्रो पक्षका विज्ञहरू संलग्न हुन्छन्, जसले कार्यसम्पादन र प्रभावका आधारमा आन्तरिक, बाह्य, अनिवार्य वा स्वैच्छिक अडिटहरू सञ्चालन गर्दछन्। विभिन्न विधाका विशेषज्ञहरूको टोलीले भौतिक, जैविक र सामाजिक-आर्थिक सूचकहरू (जस्तै: वायुको गुणस्तर, जैविक विविधता र लैङ्गिक मुद्दाहरू) समेटेर एक व्यवस्थित प्रतिवेदन तयार पार्छन्, जसले पूर्वानुमानित र वास्तविक प्रभावहरू बीचको तुलना गरी कानुनी पालना सुनिश्चित गर्दै आयोजनाको दिगोपनका लागि आवश्यक सुधारात्मक कदमहरू सिफारिस गर्दछ।

आपतकालीन प्रतिकार्य योजना

दुर्घटना, आगलागी, डुवान/बाढी, इन्धन वा तेल चुहावट, सवारी दुर्घटना तथा सुरक्षा सम्बन्धी आपतकालीन अवस्थाहरू व्यवस्थापन गर्न ठेकेदारले आपतकालीन प्रतिकार्य योजना कार्यान्वयन गर्नेछ। यस योजनाले Protect-Alert-Aid अर्थात् पहिले प्रभावित व्यक्ति तथा अन्यलाई थप जोखिमबाट जोगाउने, त्यसपछि सम्बन्धित व्यक्ति तथा निकायलाई जानकारी गराउने, र अन्त्यमा प्राथमिक उपचार वा आवश्यक आपतकालीन सहयोग उपलब्ध गराउने सिद्धान्त अवलम्बन गर्नेछ। आयोजना स्थलमा प्राथमिक उपचार सामग्री, आगो निभाउने उपकरण, आपतकालीन सम्पर्क नम्बरहरू, चुहावट नियन्त्रण सामग्री, सुरक्षित निकास मार्ग र भेला हुने स्थानको व्यवस्था गरिनेछ। साइट सुपरभाइजर/सुरक्षा अधिकृतले आपतकालीन संयोजकको रूपमा काम गर्नेछ र आपतकालीन प्रतिकार्य, स्थानीय निकायसँग समन्वय, घटना अभिलेखीकरण तथा सुधारात्मक कार्यहरूको जिम्मेवारी लिनेछ।

निष्कर्ष



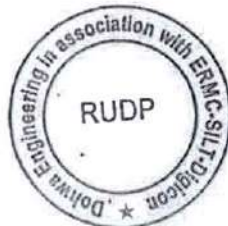
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लुम्बिनी-सांस्कृतिक नगरपालिकामा प्रस्तावित बस टर्मिनल आयोजना नगरपालिका स्वामित्वको खाली जग्गामा निर्माण गरिनेछ र यसले स्थानीय तथा क्षेत्रिय सम्पर्क (Local and Regional Connectivity) मा महत्वपूर्ण सुधार ल्याउनेछ। आयोजनाको निर्माण चरणमा धुलो, आवाज, फोहोर र श्रमिक सुरक्षा जोखिम जस्ता अल्पकालीन वातावरणीय र सामाजिक प्रभावहरू देखिन सक्छन्, तर सिफारिस गरिएका न्यूनीकरण उपायहरू अपनाएमा ती प्रभावहरू प्रभावकारी रूपमा कम गर्न सकिन्छ। यस आयोजनाको दीर्घकालीन फाइदाहरूमा सहज यातायात, पर्यटन प्रवर्धन, आर्थिक अवसर सिर्जना, र शहरी सेवाहरूको सुधार आदि छन्। वातावरण व्यवस्थापन योजनाको उचित कार्यान्वयन गर्दा, यस आयोजनाले नगरपालिकाको विकास र समुदायको समग्र सामाजिक विकासमा सकारात्मक योगदान पुऱ्याउने अपेक्षा राखिएको छ।



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

1.1 The Proponent

Department of Urban Development and Building Construction (DUDBC) under Ministry of Urban Development (MoUD) is the proponent for the construction of Bus terminal.

Name and the Address of the Proponent

Regional Urban Development Project (RUDP)

Project Coordination Office (PCO)

Department of Urban Development and Building Construction (DUDBC)

Ministry of Urban Development (MoUD)

Babarmahal, Kathmandu, Nepal

Phone: 01-5356651

E-mail: rudp.pdsecretariat@gmail.com

1.2 Organization responsible for preparing the report

The DUDBC has assigned the consulting service to DOHWA ENGINEERING in association with ERMIC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd. which is responsible for the preparation of Feasibility Report, Detail Project Report, Environmental assessment An Initial Environmental Examination (IEE) is required for the construction of the Bus Terminal. IEE has been accomplished by involvement of experts in different fields relevant to the proposal as specified in Schedule 13 of Environment Protection Regulation, 2077.

Name and the Address of the Consultant

DOHWA ENGINEERING in association with **ERMIC (P.) Ltd., SILT Consultants (P.) Ltd., and DIGICON (P.) Ltd.**

P. O. Box 12419, New-Baneshwor, Kathmandu, Nepal

Phone No: +977-014583064; 4565863

Email: ermic@ermicnepal.com; info@ermicnepal.com

Website: www.ermicnepal.com



2 SUMMARY OF THE PROPOSAL

The Urban Resilience and Livability Improvement Project (URLIP) will support to improve municipal infrastructures and governance of the selected project municipalities, thereby contributing to achieve inclusive economic growth and improved livability. This will be achieved through the following three outputs:

- (i) Output 1: Development of Municipal infrastructure for resilience;
- (ii) (ii) Output 2: Revitalization of Tourism assets, and improvement of management and
- (iii) (iii) Output 3: Capacity Strengthening of municipalities, and Department of Urban Development and Building Construction (DUDBC).

The DUDBC under the Ministry of Urban Development (MOUD) with the funding from the Asian Development Bank (ADB) is the executing agency and is responsible for technical and project management matters including engineering, safeguards, and social aspects. The project will support nine municipalities including the Lumbini Sanskritik Municipality. The Implementing Agencies are municipalities.

Impact on Land

The project is proposed in the fallow land currently no in use for any other purpose. The project doesn't require any acquisition of private land as the land has been leased by the Lumbini Sanskritik municipality from the Government of Nepal (GoN). During the construction, apportion of land will be used for tsstockpiling and workers camp. The development of permanent structures such as the terminal building, staff accommodation, garage, storage facilities, and clock towers will convert the existing land use into built-up infrastructure, resulting in a permanent land-use change.

Objective of the project

The main objective of the project is to create a safe, efficient, inclusive and passenger-friendly (universal access) bus terminal facility that integrates well with its surroundings and meets the needs of the community it serves. The project seeks to strengthen both regional economic infrastructure and essential urban mobility by developing a systematic, safe, and user-friendly bus terminal. By linking key destinations such as Kapilvastu, Siddharthanagar, Lumbini Garden, and the Gautam Buddha International Airport (GBIA), the project aims to enhance regional mobility while stimulating tourism and local economic growth.

As the birthplace of Siddhartha Gautam, Lumbini Sanskritik Municipality attracts numerous domestic and international visitors each year. However, the area currently lacks a fully equipped intercity bus terminal to meet increasing passenger needs. The proposed facility will provide organized platforms, comfortable waiting areas, adequate parking, and amenities such as ticket counters, sanitation facilities, and information centers.



This project fulfills urban development objectives with sustainable mobility and subsequently helps boost local economy.

Objective of the IEE

The main objective of the IEE for the proposed Bus Terminal Project in Ward No. 10 of Lumbini Sanskritik Municipality is to identify and assess the possible environmental impacts of the project and make it sustainable by the use of mitigation hierarchy. The other key objectives of the IEE are as follows:

1. To collect data on the physical, biological, social, economic, and cultural aspects of the project area, study and assess the potential environmental impacts of the project, and evaluate them.
2. To identify practical and site-specific measures to augment positive impacts and mitigate negative ones, and to prepare an environmental management plan as a basis for implementation.
3. To provide decision-makers and concerned stakeholders with recommendations and relevant information on the environmental feasibility of the proposed project, including the procedures, mitigation measures, and monitoring requirements to be followed during project implementation.

Institutional Arrangement and Roles

MOUD, through DUDBC/PCO, will serve as the Executing Agency and will be responsible for overall project coordination, management, and liaison with the project municipalities. Lumbini Sanskritik Municipality, through its PIU, will act as the Implementing Agency and will be responsible for day-to-day implementation and supervision. The WUC-PCO will facilitate coordination among DUDBC/PCO, the municipality, PIU, and consultants. Project Management and Capacity Development Consultant (PMCDC) will provide safeguards and capacity-building support in line with ADB requirements, while the Supervision Consultant will support construction supervision, quality assurance, safety compliance, environmental and social safeguards monitoring, and reporting.

Relevance of the project

The proposed bus terminal will serve as a key hub, providing various facilities to meet the needs of both locals and tourists. These facilities include restaurants, offices, information centers, tourist ticket booking stalls, and public toilets, making the terminal. The total estimated cost of the bus terminal project is NPR 256,867,717.36. primarily allocated to civil, building, and electrical works, along with environmental and social impact mitigation costs. Revenue sources include rental income from leased spaces, sanitation service fees, and vehicle parking and entry charges. The economic analysis indicates a base case Economic Internal Rate of Return (EIRR) of 11%, exceeding the Economic Opportunity Cost of Capital (EOCC) of 9%, confirming economic viability. However, sensitivity analysis shows that financial viability is limited, as the project does not generate sufficient cash flow to recover its investment within the 20-year time frame. Despite this, the project serves a broader community benefit, and is therefore considered justifiable. With proper and extended project lifespan, the government can effectively manage costs and benefits to maximize its long-term outcome.



Rationality of the IEE

The project requires cut and fill of 25,971 m³. According to the Environment Protection Regulation, 2020, Schedule 2 'ja' (अ) (under the Residence, Buildings, Town Development and Urban Development sector, clause (c) for site development that requires cut and fill of more than 20,000 m³, requires to conduct an Initial Environmental Examination (IEE). Hence, an IEE is required for the project. According to Rule 3 (c) of the Environment Protection Regulation, 2020, environmental study reports and terms of reference for projects involving foreign investment have been prepared in English while the summary of the report has been prepared in the Nepali language.

Description of the Project

Bus Terminal project is proposed in Lumbini-Sanskritik Municipality, which is one of the municipalities under URLIP and is also a part of the GLBC, an important component of the Western Corridor Urbanizing Strategy for integrated development. The Bus Terminal site is located in Madhubani, ward number 10 of Lumbini-Sanskritik Municipality of Rupandehi district in Lumbini Province, located at 27°28'34.60" N, 83°17'40.17" E at an average elevation of 97m above MSL. The total area required for the bus terminal is 11,756.33 m². The Bus Terminal lies 1.5km from Mahilwar Bazar adjacent to Telar River contained in an area of 11628.41m². The bus terminal is located 2.25 km from Hulaki Rajmarga at Jhulanipur. The main road networks are the Hulaki/Lumbini highway passing east to west that links it with Bhairahawa and Kapilvastu and Hulaki Highway provides inter-regional linkage with other parts of the country. The proposed Bus Park will be used for the interstation buses within the municipality as well as long-route buses driving through Hulaki Highway. The project cost is estimated to be NPR 256,867,717.36.

Project Requirement

The proposed Bus Terminal Project is located on municipality-owned land in Lumbini Sanskritik Municipality. No private land will be acquired for the project. The project includes the construction of a terminal building, staff accommodation, garage, storage block, clock tower with open green space, and driver's house, with a total built-up area of 2,087.49 m². The construction period is estimated at 28 months, requiring about 43 workers per day, including 13 skilled/semi-skilled and 30 unskilled workers. During operation, about 35 staffs will be required on a regular or contract basis.

Major construction materials required for the project include 848.90 MT cement, 1,627.33 m³ sand, 2,726.81 m³ aggregate, 478,631 bricks, 147,345.12 kg rebar, 40.36 MT bitumen, 1,065.90 m³ sub-base material, 5,213.85 litres diesel, and 1,161.61 litres petrol.



Construction will use RCC with brick masonry, supported by insulation materials and durable exterior finishes.

The estimated construction-phase solid waste generation is 6.62 kg/day, comprising approximately 3.71 kg/day biodegradable waste and 2.91 kg/day non-biodegradable waste. At least two separate waste bins will be provided at the workers' camp and construction site: one for biodegradable waste and one for non-biodegradable waste. During operation, total solid waste generation is estimated at 317.5 kg/day, consisting of about 189.86 kg/day biodegradable waste and 127.64 kg/day non-biodegradable waste. For operation-phase waste management, a total of 19 waste bins of 50-litre capacity is proposed at strategic locations, including 11 bins for biodegradable waste and 8 bins for non-biodegradable waste, to support source segregation and proper collection. The total estimated water requirement for the listed construction activities is approximately 690,740 litres for masonry works, concrete works, subgrade, subbase, base preparation, kerbstone works, and other related construction activities.

The daily water demand during operation is estimated at 9,805 litres/day or about 9.8 m³/day, considering short-term use by passengers and visitors and full-day demand for driver accommodation and garage activities. Wastewater will be managed through a Package Sewage Treatment Plant (PSTP) based on the two-pipe drainage system, assuming that around 80% of supplied water returns as wastewater. During construction, maximum wastewater generation is estimated at 3,440 litres/day. The project will require energy from the Nepal Electricity Authority supply system, with an assessed load of 233.21 kVA, a proposed 250 kVA transformer, backup 150 kVA diesel generator, and an 80 kVA solar PV system. Total greenhouse gas emissions during construction are estimated at 29,102.02 kg CO₂ equivalent, mainly from diesel, petrol, and LPG consumption.

Existing Environmental Condition

Physical Environment:

The project area is located on flat terrain, in the plain Terai region. The major features of the physical environment are as follows:

Climate and Weather:

The project area experiences a sub-tropical climate. Average maximum temperatures range from 30.6°C to 31.7°C, while average minimum temperatures range from 18.3°C to 19.8°C. Average annual rainfall is approximately 1,250 mm, characterized by erratic patterns with intense rainfall during the monsoon season (Asadh-Bhadra) and dry spells in other months. Recent trends indicate reduced rainfall and increasing temperatures, reflecting climate variability.

Hydrology and Water Resources:

The main river of the project area is Tetar River. The total catchment area of the River at this location is 50 km² where the major portion of the catchment is covered with agricultural



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fields. The hydrological analysis of Telar River is complex. (Hydrological Analysis of Bus Terminal Project, 2025)

Seismicity:

The project area lies in a moderate to high seismic zone, with a seismic zoning factor (z) of approximately 0.30 g, representing peak ground acceleration for a 475-year return period, as per NBC 105:2025. According to United States Geological Survey (USGS) classifications, PGA values within this range may cause moderate structural damage, emphasizing the need for earthquake-resilient design. Accordingly, the project design incorporates seismic considerations in compliance with national building standards.

Land Use and Land Cover:

The project area is predominantly agricultural, comprising of 92.50% of the total land in municipality. This is followed by residential area (2.77%), water bodies (1.14%), public zone (0.93%), industrial area (0.06%), cultural and archeological zone (0.03%), forest (0.01%) and others (2.78%).

Groundwater Table:

Three boreholes were drilled at the project site: BH1 and BH2 up to 15 m depth, and BH3 up to 12 m depth, following relevant IS standards. The groundwater table was observed at about 2.5 m below ground level in all three boreholes, indicating shallow groundwater conditions at the site.

Baseline Sound Quality

The Sampling of 24 hours sound level during the day time (7 A.M. -10 P.M.) and night time (10 P.M. to 7 A.M.) was performed. The equivalent noise level during the day and night was calculated to be 51 dB and 36 dB respectively. The sound levels were high during the daytime due to the continuous bus movement, school activities, and public congregation.

Baseline Air Quality

Baseline air quality monitoring indicates that most parameters, including PM_{10} , $PM_{2.5}$, NO_2 , and CO, are within Nepal's National Ambient Air Quality Standards. SO_2 was not detected whereas Total Suspended Particulates (TSP) slightly exceeded the permissible limit, reflecting localized dust-related issues, while overall air quality remains generally acceptable.

Baseline Surface Water Quality

Water quality analysis shows that all physical, chemical, and microbiological parameters comply with Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem, 2008 As well as Irrigation Water Quality Guideline, 2008. The water sample was not free from total coliforms with uncountable presence, indicating microbial contamination. The Electrical Conductivity was also found to be higher than the threshold value mentioned in



the irrigation water quality guidelines 2008. However, low concentrations of nutrients, chlorides, and heavy metals suggest minimal external pollution influence.

Geology and Soil

The dominant soil found in Lumbini Sanskritik Municipality are Alfisols (which is highly fertile and can support successive three months in the growing seasons of crops., entisols (have little to no development of horizons and are of recent origin but cultivation is possible) and inceptisols (It is of recent origin but comparatively more developed than entisols.)

Biological Environment

Flora

The project area is not located inside any protected or forested area. Vegetation within the zone of influence mainly comprises common planted and roadside tree species such as sal (*Shorea robusta*), sissoo (*Dalbergia sissoo*), simal (*Bombax ceiba*), jamun (*Syzygium cumini*), mango (*Mangifera indica*), litchi (*Litchi chinensis*), and bakaino (*Melia azedarach*).

Fauna

The project site is in a non-forested, peri-urban environment. Recorded fauna in the municipality includes common bird species such as sparrow, crow, dove, parakeet, and hill myna; reptiles such as python, cobra, and keelback; and mammals such as jackal, mongoose, wild boar, and blue bull. One government-protected species, Sarus Crane (*Grus antigone*), and a few globally threatened species including Slender-billed Vulture (*Gyps tenuirostris*) which is Critically Endangered, Steppe Eagle (*Aquila nipalensis*) which is endangered, and Burmese Python (*Python bivittatus*) which is vulnerable were reported from the project zone of influence based on local information. However, no nesting sites or faunal habitats were observed within the project site, and the project is not expected to cause significant impacts on wildlife.

Socio-economic environment

Baseline information on the social environment of the project area was collected through a review of secondary sources, including the National Population and Housing Census (NPHC, 2021), municipal publications, feasibility and Due Diligence Reports (DDR). Primary data were generated through direct field observation, household surveys, focus group discussions (FGDs), stakeholder consultations, and Key Informant Interviews (KIIs). A household (HH) survey was conducted among 17 HHs located within the Direct Impact Area (DIA) of the project, representing residents of Lumbini Sanskritik Municipality Ward No. 10.

Demography, Ethnicity, Religion, and Language

As per the 2021 census, Lumbini Sanskritik Municipality has a total population of 87,383 with an average household size of 6.42 and a sex ratio of 97.61. The community in the DIA is multi-ethnic and multilingual, with Chhetri, Dalit, and Yadav being the dominant caste



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groups. Hinduism is the predominant religion practiced by all surveyed households. Nepali language is the most commonly spoken, followed by Awadhi and Bhojpuri.

Economic Status and Livelihood

A significant proportion of the population aged 10 years and above is economically active, with agriculture remaining the dominant sector at the municipal level. However, the DIA reflects a gradual shift toward diversified livelihoods. Among surveyed HHs, agriculture (35.29%) and wage workers (29.41%) are the major income sources, followed by business (17.65%), service sector employment (11.76%), and foreign employment (5.88%). This diversification indicates an ongoing transition from an agriculture-based to a service-oriented economy.

Education and Literacy

The overall literacy rate of the municipality is 71.1%, with male literacy (80.6%) higher than female literacy (62.1%). Most of the population aged five years and above can read and write, although a notable proportion remains illiterate, indicating the need for expanding educational support, particularly for women.

Migration

Over 93% are native-born, with limited immigration from other districts or countries. Foreign employment is present but not dominant within the DIA.

Water Supply and Sanitation

All HHs in the DIA have access to improved drinking water sources, primarily through piped water supply, while a small proportion relies on hand pumps. Sanitation coverage is generally good, with most HHs having toilets. However, local water management issues exist due to irrigation canal breaches near the project site, emphasizing the need for proper stormwater drainage planning.

Waste Management

Municipal solid waste collection services operate on a weekly basis, with waste transported to a centralized recycling and processing center. The project proposes source-level waste segregation using separate bins for biodegradable, recyclable, and hazardous waste to strengthen local waste management practices.

Accessibility and Transportation

The project area is well connected through the Hulaki (Lumbini) Highway, providing regional and inter-municipal access. All surveyed HHs have access to public transportation. Ownership of personal transport assets such as motorcycles and bicycles is common, enhancing local mobility.



Access to Information

The DIA has good access to information and means of communication. Smartphones are the most widely used medium, followed by television and internet services, indicating strong digital connectivity in the area.

Cooking Fuel and Electricity

Most HHs use LPG as the primary cooking fuel; however, a significant proportion still relies on firewood and cow dung, indicating continued dependence on traditional energy sources. All HHs are connected to the national electricity grid, with no alternative energy sources in use.

Financial Services

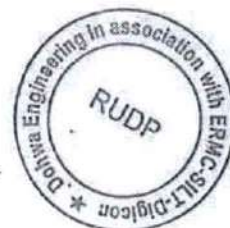
Access to financial institutions is relatively high, with most HHs having bank accounts. More than half of the surveyed HHs have taken loans, reflecting engagement with formal financial systems and potential readiness for entrepreneurial activities.

The characteristics of the household around the project area is shown in the following table:

Table 2-1: Characteristics of Surveyed HHs

Parameter	Description	
Total HHs	17 HHs covering Madhubani and Dinguwa, Ward No. 10 of Lumbini Sanskritik Municipality	
Average HH size	Mean: 8.06	
Caste	Yadav, Chamar/Harijan/Ram, Chhetri, Gurung, Dhobi including Dalits	
Religion	Hinduism	
Gender Ratio	Male: Female (82.35: 17.65)	
Drinking water	Improved source (Municipal supply)	
Sanitation facility	Improved (toilet)	
Electricity	National grid	
Cooking fuels	LPG, Firewood andc dried cow dung	
Impact on community	Positive	100%
	Negative	11.76%
	None	
Major positive impacts	Employment opportunities	76.47%
	Improve in Transporatation	58.82%
	Increase in economic activities	5.88%
	Increased land value	11.76%
Major negative impacts	Pollution	17.65%
	Noise	29.41%
Major Occupation	Agriculture	35.29%

Stakeholder Consultation and Key Informant Insights



Stakeholder consultations highlighted concerns related to potential impacts on surrounding agricultural land, stormwater management, and local employment opportunities. KIIs confirmed that the project site does not serve as a nesting or critical habitat for birds, and anticipated impacts on avifauna are minimal. Stakeholders emphasized maintaining natural water flow, ensuring access to nearby cultural sites, and prioritizing local employment during project implementation.

Review of legislation

Relevant national policies, acts, regulations, guidelines, standards, ADB safeguard requirements, and international conventions were reviewed to guide the environmental assessment of the proposed project. The review covered key provisions related to environmental protection, IEE preparation and approval, public consultation, environmental management planning, waste management, labor and occupational health and safety, child labor prohibition, disability access, land use, urban development, cultural heritage protection, water quality, air quality, noise standards, GESI, and ADB safeguard requirements. These provisions have been considered in the assessment of potential impacts, formulation of mitigation measures, preparation of the EMP, and overall environmental compliance planning for the project.

Environmental Impacts of the project

Beneficial impacts

The major benefits of the proposed project are as follows:

- Employment Opportunity for both skilled and unskilled workers creating 13 and 30 person days respectively during the construction period of 28 months.
- The project will generate employment during the operation and maintenance (O & M) phase for 35 people (either regular or contract based).
- The construction of the bus terminal as a regional transport hub will enhance the mobility as well as the accessibility of local communities.
- Construction materials will be sourced from local businesses as per the availability to meet the need of 848.90 MT cement, 1,627.33 m³ sand, 2,726.81 m³ aggregate, 478,631.05 Bricks, 147,345.12 kg rebar, 5,213.85 litres diesel and 1,161.61 litres petrol.
- With the implementation of the bus terminal, land and property values in the surrounding area are likely to increase.
- The business of existing nearby Mahilwar bazaar may increase as the demand for vegetables, rice, pulses, oil, packed foods and spices may increase as 30 daily consumers (unskilled workers) increases.
- The influx of over 2,000 passengers per day in the bus terminal increases the demand for various commodities and services.



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- The project improves transportation connectivity of the municipality as central hub addressing the limitations of old bus park.
- The project components have been designed with universal accessibility for Elderly, Women, Children and Differently abled (EWCD).
- The operation of bus terminal has the potential to increase the land and property values.

Augmentation measures

- The marginalized and vulnerable HHs including women will be prioritized for employment opportunities.
- Technical training for the capacity building of the staffs will be done.
- Regular maintenance and operation of the bus terminal and its facilities during the operation period.
- Timely monitoring and maintenance of tactile flooring, railings, CCTV cameras for security during the operation period.

Adverse Impacts

The implementation of the project will bring following negative impacts:

Socio-economic Environment

- The project activities such as transportation, stockpiling of construction activities, burning of petrol and diesels can increase fugitive dust, and smoke including the influx of migrant workers if needed, poses threat to community health during the construction period.
- The increased frequency of vehicle movement (buses, private vehicles, etc.) will contribute to increased risk of air and sound pollution during the operation period.
- Improper waste management and sewer drainage from workers camps, temporary field office and leachate from stockpiling of waste can cause problem of waste water management and contaminate the nearby Telar River.
- The construction of the project poses Occupational Health and Safety (OHS) concerns due to fugitive emissions, loud noise, and potential injuries.
- There is possibility of issues associated with Child Labor, Gender and Socially Excluded Group and unfair Wages.
- The project will lead to the generation of waste 6.62 kg per day during construction period and 317.5 kg per day in operation period.
- The project area falls within the Greater Lumbini Buddhist Circuit, and there is a possibility of finding archaeological remains.

Physio-Chemical Environment

- The project will cause impact on land due to activities like clearing land, grading, and preparing the temporary field office and foundation for buildings and rides, earthwork



during the construction period and the construction of terminal buildings, with rooftop restaurant, garage, storage block, etc. converting the open space to built up area of 2,087.49 m².

- It will lead to environmental pollution comprising of air, water, sound and visual in both construction and operation phases if not properly managed. During the construction, land disturbance may increase localized soil erosion from runoff.

Biological Environment

- Possibility of introduction of invasive species due to increase in movement and commercial activities.
- The presence of wildlife in the municipality indicates the need for caution to avoid disturbance to wildlife during construction.

Mitigation Measures

Socio-economic Environment

- Workers and the contractor will be oriented and strictly monitored to conduct construction activities in the daytime with required OHS measures.
- Workers and the contractor will be oriented and strictly monitored about the unacceptable activities like gambling, drugs, etc.
- The documents of the labour will be monitored and the workers and contractor will be oriented about the code of conduct of the safe working environment.

Physio-Chemical Environment

- Proper protocol for solid waste management will be in place to manage the waste generated during construction and operation phase.
- The compliance of vehicles with Government of Nepal's emission standards when procured and utilized will be ensured.
- The stockpiling through efficient planning and material management will be maintained.
- Air pollution through awareness and good practices such as no burning of waste, sprinkling of water will be minimized.
- The noise level will be monitored and maintained within acceptable limits for workers and the public.
- Package Sewage Treatment Plan (PSTP) will be installed for the treatment of sewage water.

Biological Environment

Installation of Closed-Circuit Television (CCTV) cameras, warning signs and boards with information about flora and fauna to prevent habitat disturbance and fragmentation.



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Environmental Management Plan

Above mentioned augmentation measures and mitigation measures will be adhered as the environmental management plan. Following cost are included for the environment management plan.

S.N.	Particulars	Cost (NPR)
1	Total cost of augmenting beneficial impacts (not included in BoQ)	150,000
2	Cost of mitigating adverse impacts (not included in BoQ)	1,670,000
3	Total cost of mitigating adverse impacts (included in BoQ)	147,159,537
4	Total cost for implementing Environmental Management Plan	148,979,537
5	Cost included in BoQ for implementing Environmental Mitigation Cost	147,159,537
6	Additional cost required which is not included in BOQ (B+E)	1,820,000

Analysis of Alternatives

Analysis of alternatives is an integral component of the Initial Environmental Examination (IEE), aimed at evaluating different options to achieve the project objectives while maximizing benefits and minimizing adverse environmental and social impacts. Alternatives related to project design, site, hydrological layout, raw materials, construction methods, implementation schedule, and the no-action scenario were examined throughout the project cycle.

Design Alternatives

Two design alternatives were assessed to identify an option that is resource-efficient, economically viable, and environmentally sustainable, while minimizing alterations to the existing setting.

Alternative 1 emphasizes basic infrastructure with essential facilities to minimize construction cost and complexity. It includes manual ticketing booths, limited passenger amenities, basic bus bays, gabion retaining walls, a smaller septic tank, and simplified wastewater management. This option focuses on functionality with minimal modernization.

Alternative 2 builds upon Alternative 1 by incorporating modern and sustainable features. It includes both manual and automated ticketing systems, increased bus bays (three) to improve traffic flow, a dedicated solar panel block, stone masonry retaining walls, a properly sized canal with box culvert, a Package Sewage Treatment Plant (PSTP), and enhanced passenger amenities such as vending machines, digital displays, and expanded



seating capacity. Alternative 2 offers improved durability, operational efficiency, and user comfort.

Three hydrological options were evaluated to manage water flow from the breached irrigation canal and surrounding agricultural lands:

- **Option I:** Filling the upstream section of the abandoned irrigation canal to prevent water inflow into the bus terminal area. Although financially efficient, this option is beyond the current project scope.
- **Option II:** Repairing the canal embankment and restoring canal flow to downstream agricultural lands. This option is technically challenging due to extensive urbanization and prolonged canal abandonment.
- **Option III:** Designing the internal canal system to safely drain maximum water inflow from the breached irrigation canal and adjacent lands.

Based on stakeholder consultations and feasibility considerations, **Option III** was selected. Accordingly, the canal within the bus terminal has been designed to accommodate peak flows and prevent site flooding (Hydrological Analysis Report, 2025).

Alternative for Construction Methods and Technology

A hybrid construction approach combining labor-intensive and mechanized methods was selected. Manual labor will be prioritized where feasible to generate local employment and reduce emissions. Mechanical excavation, batching, grading, compaction, and road surfacing will be employed for high-volume earthworks and precision tasks. This approach ensures structural integrity, environmental protection, cost efficiency, and timely project delivery.

Project Site Alternative

The proposed bus terminal site is located approximately 2.2 km south of Lumbini Sanskritik Municipality and is connected to the Hulaki Highway. The land is entirely government-owned and was officially designated by the municipality. As the site aligns with municipal development plans and avoids private land acquisition, no alternative sites were considered.

Raw Materials Alternative

Construction materials such as reinforced cement concrete (RCC), brick masonry, steel reinforcement, aggregates, sand, boulders, bitumen, and sub-grade materials will be used as per approved district rates (2080/2081). Thermal insulation materials including glass wool, EPS sheets, and PVC wooden panels will enhance energy efficiency. Priority will be given to locally available materials to reduce transportation impacts, support the local economy, and minimize environmental footprints.

Zero-Action Alternative



Under the no-action scenario, the project site would remain underutilized and vulnerable to seasonal waterlogging, and economic stagnation. Existing transportation challenges, including inadequate bus facilities, poor passenger safety, and lack of centralized connectivity, would persist. Opportunities for employment generation, business development, and improved urban infrastructure would be lost. Therefore, the no-action alternative is not considered viable.

Project Implementation and Schedule

The project implementation plan emphasizes labor intensity, cost-effectiveness, environmental safety, and resource optimization. Construction activities are sequenced logically to minimize duplication and ensure timely completion. Testing, inspection, commissioning, and regulatory approvals are scheduled toward the end of the construction period to ensure operational readiness. The estimated construction duration is 28 months, followed by testing, staff training, and project commissioning.

Environmental Monitoring Plan (EMoP)

An EMoP will be implemented to ensure that environmental mitigation measures are effectively carried out and remain compliant throughout the project lifecycle. Monitoring will be conducted during the pre-construction, construction, and operation phases to assess actual impacts against predicted impacts, evaluate the effectiveness of mitigation measures, ensure compliance with environmental regulations, and determine the overall effectiveness of the EMP.

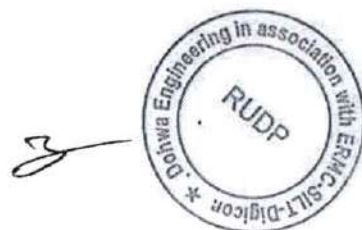
Construction Phase Monitoring:

During construction, monitoring will focus on potential impacts related to flooding risk, land use change, hydrology, groundwater and surface water quality, air and noise pollution, solid waste management, land acquisition, occupational health and safety, community health and safety, traffic management, social conflicts, GESI aspects, and protection of cultural and chance-find resources. Key indicators include impacts on utilities and land area, disturbance to water flow, soil erosion and stability, air, water, noise and soil quality, workforce health and safety, community well-being, and interactions between workers and local communities.

Operation Phase Monitoring:

Monitoring during operation will assess long-term environmental and social performance, including natural resource consumption, waste management effectiveness, sanitation conditions, and community health, and air, water, noise, and soil quality. Monitoring indicators, methods, locations, schedules, costs, and responsible agencies will be clearly defined.

Baseline Monitoring:



Baseline environmental monitoring will be carried out prior to project implementation to document existing physical, biological, socio-economic, and cultural conditions. This will provide a reference point for evaluating environmental changes resulting from the project.

Impact Monitoring:

Impact monitoring will be conducted during construction and operation to identify actual environmental and social impacts. The findings will guide corrective actions to minimize adverse impacts and enhance positive outcomes.

Compliance Monitoring:

Compliance monitoring will ensure adherence to national environmental standards, labor regulations, GESI provisions, and approved management plans. This will include periodic review of environmental quality data, contractor records, labor practices, waste management arrangements, and grievance redress mechanisms.

Overall, the EMoP will support environmentally responsible project implementation, safeguard community and worker health, and promote sustainable operation of the project.

Estimated Monitoring Cost: The estimated total monitoring cost is NPR 2,926,000 including environment expert, socio-economic expert, biologist, OHS expert, support staff, DFO staffs, social mobilizer and miscellaneous requirement during the field.

Self-monitoring cost: Self-monitoring will be done on the impact of the environment during the construction and operation phases every six months and the report will be submitted to DUDBC/ MoUD. The total cost of monitoring is NPR 650,000.

Environmental Audit

As per the Environment Protection Act 2076, Environment Audit must be conducted within 6 months after two years of project operation to evaluate past and present conditions and the effectiveness of mitigation measures. Empowered by the Constitution of Nepal, this process involves auditors, auditees, and third-party experts to assess various audit types-such as performance and impact audits- categorized as internal, external, mandatory, or voluntary. A multidisciplinary technical team prepares a structured report covering physical, biological, and socio-economic indicators (such as air quality, biodiversity, and gender issues) to compare predicted versus actual impacts, ultimately ensuring regulatory compliance and providing necessary corrective actions for project sustainability.

Emergency Response Plan

An Emergency Response Plan will be implemented by the Contractor to manage accidents, fire, flooding, spills, traffic incidents, and security-related emergencies. The plan will follow the basic principle of Protect-Alert-Aid, where affected individuals will first be protected from further risk, concerned personnel and authorities will be informed, and first aid or



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emergency support will be provided. First aid kits, fire extinguishers, emergency contact numbers, spill control materials, safe evacuation routes, and assembly points will be maintained at the site. The Site Supervisor/Safety Officer will act as the Emergency Coordinator and will be responsible for emergency response, coordination with local authorities, incident reporting, and follow-up corrective actions.

Conclusion

The proposed Bus Terminal Project in Lumbini-Sanskritik Municipality is planned on unused municipal land and will significantly improve local and regional connectivity. While the project has some short-term environmental and social impacts during construction such as dust, noise, waste generation, and worker safety risks, these can be effectively minimized through the recommended mitigation measures. The long-term benefits, including better mobility, support for tourism, economic opportunities, and improved urban services, are substantial. With the proper implementation of the Environmental Management Plan, the project is expected to contribute positively to the municipality's development and overall community well-being.



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3 DESCRIPTION OF THE PROPOSAL

3.1 Introduction of the Proposal

The Ministry of Urban Development (MoUD)/ Department of Urban Development and Building Construction (DUDBC) with the support of Asian Development Bank (ADB) under the Urban Resilience and Livability Improvement Project (URLIP) (Project number: 55346-001) is financing priority projects in seven municipalities to improve the resilience and delivery of urban services and facilities. DUDBC on behalf of MoUD will assume the role of an executing agency while the seven municipalities will be the implementing agencies. Government of Nepal (GoN) and ADB intends to invest in activities of risk reduction for resilience and infrastructure improvement of urban tourism products through the URLIP. Thus, the ultimate project goal is delivery of urban services in respective municipalities to improve livability and promote sustainability of urban services.

URLIP will support a total of seven municipalities: Pokhara, Janakpur, Lumbini Sanskritik, Sainamaina, Devdaha, Tilottama and Siddharthanagar. The selection of project municipalities is based on their high economic growth potential especially as it relates to the expansion of tourism sector. Among the seven municipalities, five municipalities of western Terai region (Lumbini Sanskritik, Sainamaina, Devdaha, Tilottama and Siddharthanagar) are part of the Greater Lumbini Buddhist Circuit (GLBC). All seven project municipalities are prioritizing conservation of natural and cultural heritage coupled with tourism to achieve sustained local economy, protection of natural resources and improvement of urban livability.

Bus Terminal sub-project is one of the proposed project in Lumbini Sanskritik Municipality, under URLIP and is also a part of the GLBC, an important component of the Western Corridor Urbanizing Strategy for integrated development. The Bus Terminal site is located in ward number 10, Madhubani of Lumbini Sanskritik Municipality of Rupandehi district in Lumbini Province. The total area required for the bus terminal is 11,628.41.33 m².

The bus terminal is aimed to improve transportation connectivity within the area by providing a central hub for various bus routes, making it easier for people to access different parts of the municipality. Also, by consolidating bus services at a single terminal, there may be a reduction in traffic congestion on local roads, as fewer buses will be travelling to and from different stops.

3.2 Nature of Proposal

The proposed Bus Terminal is aimed at boosting both regional economic infrastructure and essential urban infrastructure. It is designed primarily to function as a central transportation hub within the municipality. The intra-city bus network aims to seamlessly connect various areas, facilitating efficient mobility through buses, taxis, electric rickshaws, and bicycles, strategically incorporating key stopovers such as Kapilvastu Bus Terminal.



Siddharthanagar Bus Terminal, Lumbini Garden, and the Gautam Buddha International Airport (GBIA), the initiative seeks to improve local and regional connectivity while concurrently promoting economic activities and tourism. Numerous domestic as well as international visitors will visit the birthplace of Siddhartha Gautam, Kapilvastu which lies in Lumbini Sanskritik municipality, further elevating the importance of this project in the area.

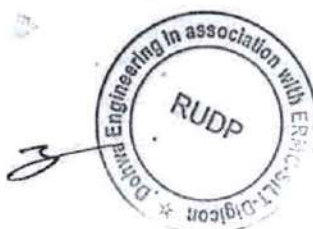
The municipality lacks a fully equipped intercity bus terminal facility. The bus terminal facility is envisaged to provide convenient services to incoming and outgoing passengers, additional parking space and an appropriate point from where services can be controlled.

3.2.1 Salient Features

Table 3-1: Salient Features of the proposal

Name of the project	Bus Terminal in Lumbini Sanskritik Municipality
1. Location	Ward 10 of Lumbini Sanskritik Municipality in the plain land in an area of 15, 048 m ² .
2. Type of project	Regional economic infrastructure, Essential urban infrastructure
3. Project Boundary	Figure 3-6
4. Number of users/visitors	Designed capacity: Bus Park with 24 car parking (private), 10 Intercity buses, 12 Long-term bus parking
5. The area that will be covered by the bus terminal	11628.41 m ²
6. Project Components with dimensions	Intercity Bus Terminal (39.98×17.53) m ² , Staff Accommodation (19.95×8.83) m ² , Garage (12.25×9.3) m ² , Storage (9×5) m ² , Bus Parking Bay, Clock Tower (4×4) m ² , Pergola (56 m ²), Car parking (629.27 m ²), Passenger walk (202.34 m ²), Passenger space (1064.51 m ²), Speed bump cross (114.96 m ²), Box culvert (153.8 m ²)
7. Built up area	2,087.49 m ²
8. Construction materials	Concrete, steel, Timber/wood, stone, glass wool, UPVC roofing, UPVC, Granite/Tile, Sitting chamber(metal)
9. Retaining Structures	Stone masonry wall
10. Earthwork requirement	Cut/ Fill- 25,917 m ³
11. Muck/ Spoil Volume	No
12. Energy requirement/ management/ Energy source/ Electricity/ Fossil Fuel	132 No's. of 400wp each panel, Installation of 80KVA solar power generate and LED lights
13. Auxiliary facilities	Temporary Living Center, RCC Drain
14. Construction Technology	RCC Frame structure/ Steel structure
15. Machinery and Equipment used for construction	Cranes/ Excavator/ RMC/ Mixtures, etc.
16. Expected completion date	28 months excluding O and M period
17. Total Cost	NPR 292,865,071.86

Source: DPR, 2025



3.2.2 Permissible limit as per the Bylaw

The proposed parameters were compared with the standard proposed by the Municipal Code Mandate (Lumbini Sanskritik Municipality, 2081) from Section 34 & 35 under the Non-Residential Use Zone (गैर आवासीय उपयोग क्षेत्र).

Table 3-2: Permissible limits as per the Municipal Code Mandate (Lumbini Sanskritik Municipality – 2081)

Parameters	Standard	Proposed	Remarks
Ground coverage	5%	4.9%	Section 34 & 35
Open space	95%	95.1%	
Floor height	3.6 (for terai)	3.7-3.9	
Right of Way (ROW) from road (Section 33 and Section 27.)	Minimum 20 m	20 m	Section 3 (Definitions), Sub-section 11 & 69
Right of Way (ROW) from canal (Section 33 and Section 27.)	3m	6m	Section 12, Sub-section 9 & 11
Set Back	6m from boundary/ROW	47M	
Maximum floor limit	GF+2 UPPER floor	GF+2 UPPER floor	Section 3, Sub-section 31

3.2.3 Proposed Master Plan

The master plan of the Bus Terminal focuses on increasing the flow of visitors, efficient operations, and enhance visitor's experience. It consists of functional and serviceable public open space, car parking zone for short-term visitors or taxis, terminal zone for passengers, inter-city bus bay zone, driver's house, garage and solar energy zone. Additionally, including clock tower, kiosks, and shop and landscaping has created inclusive environment that encourages social interaction and feasibility.

3.2.4 Earthwork

As the project site for the Bus Terminal is lower than the surrounding land, all flood water flows into the site. Therefore, to protect against flood damage, it is necessary to keep the bus terminal Ground height higher than the adjacent land level. As per the scenario study, the Bus Terminal formation height was decided to be 96.5m at msl instead of being at 97.0m. Thereby, the volume of filling soil will be economical and reduce the possible impact on the neighboring facilities.

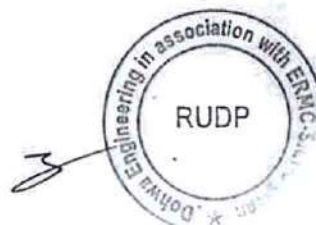


Table 3-3: Total earthwork required in the prooject area

Earthwork item	Unit	Cutting Volume	Filling Volume	Borrow	Remarks
Ground Formation Work	m ³	0	28,458		Including canal
Building and Civil Work	m ³	356			
Pavement Work	m ³	2,185			
Total		2,541	28,458	25,917	Borrow pit is in Dano river.

The borrowed earth from Dano River will be $28,458 - 2,541 = 25,917 \text{ m}^3$. The location of borrow pits are: Site 1 ($27^{\circ}31'22.83''\text{N}$ $83^{\circ}20'51.30''\text{E}$) and Site 2 ($27^{\circ}30'21.22''\text{N}$ $83^{\circ}20'6.48''\text{E}$) with the excavable quantity of $10,586 \text{ m}^2$ and $18,851 \text{ m}^2$ respectively but the municipality needs to get environmental clearance for the sites in the form of Brief Environmental Study or IEE or Environmental Impact Assessment.



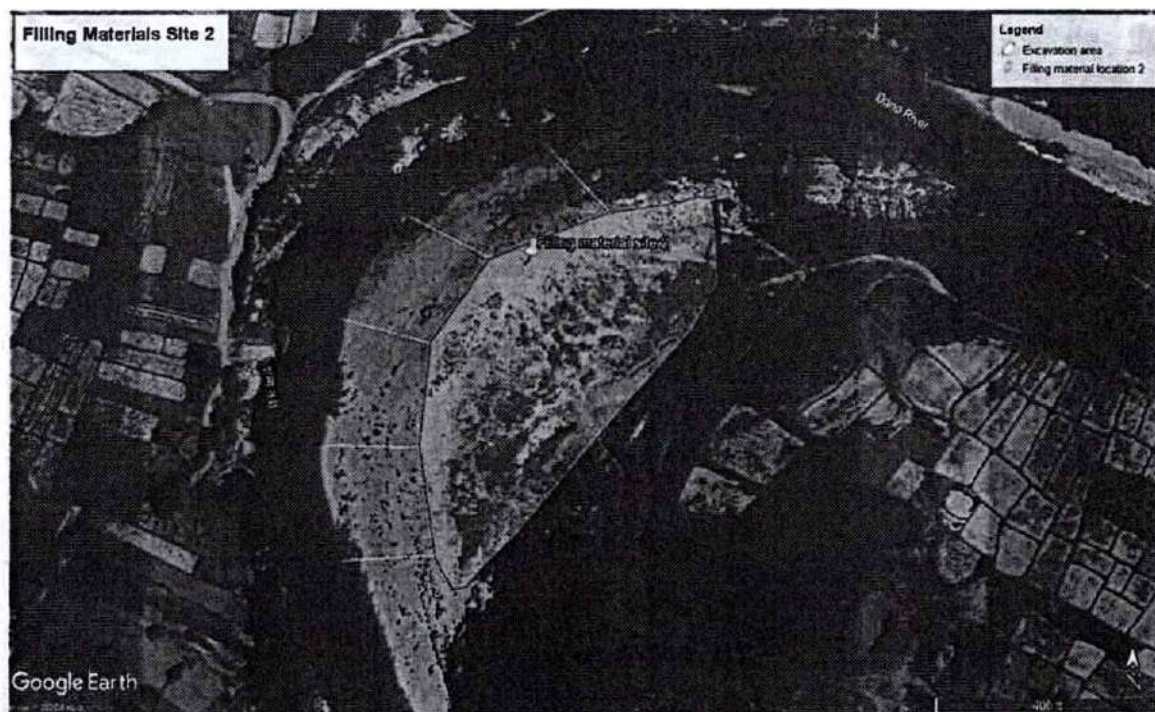


Figure 3-1: Location of Borrow Pit shown in Google Earth



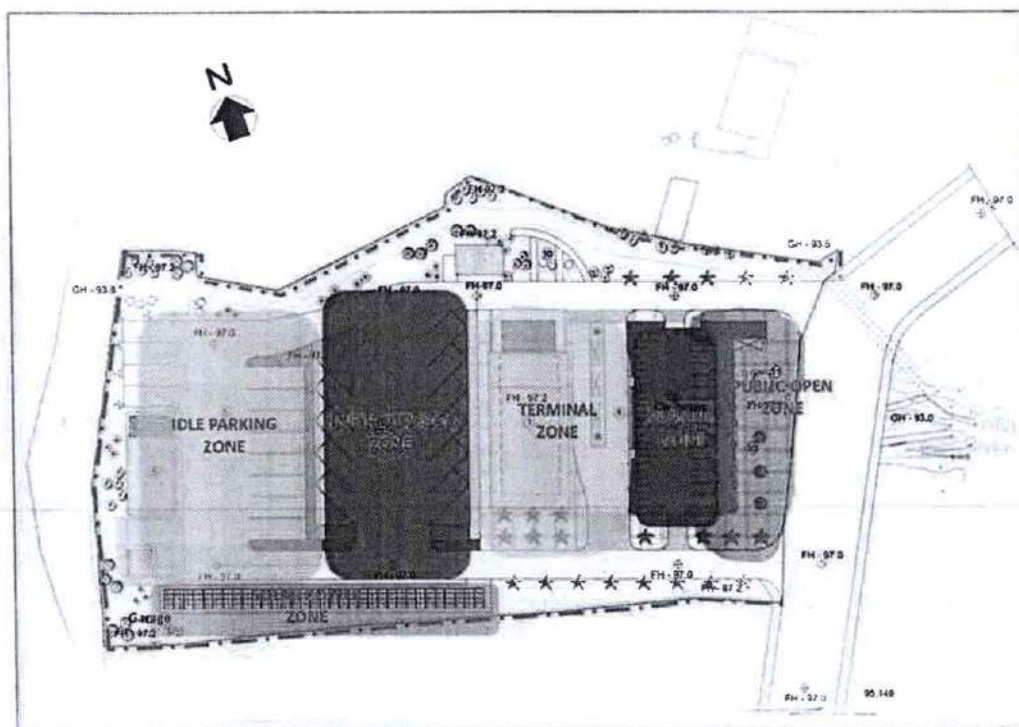


Figure 3-2: Zoning Plan of Bus Terminal

3.2.5 Retaining Wall (Stone masonry wall)

As mentioned in Earthwork plan, the site is filled up to make a formation elevation, which is higher than the surrounding grounds and Telar River. Therefore, in order to provide structural support and stability to prevent soil or other materials from eroding or collapsing. Retaining walls are typically used in situations where there is a significant change in elevation or slope, and they help to retain or "hold back" the soil or other materials, preventing them from sliding or slumping. Stone masonry wall made up of natural stones will be built as the retaining structures to support as well as giving more attractive look. It is also stronger and more durable than the Gabion wall. Furthermore, it is more cost-effective than the other types of retaining walls.

3.2.6 Storm Water Drain

A drainage plan for the Bus Terminal shall consider several things of effective management of storm-water runoff and prevent flooding or other drainage related issues. Since the site is relatively small and no connection lines running off to the site from surrounding area, the drainage approach is to collect and discharge the storm-water installing gutters, pipes, manholes.

The return period for road storm water drainage is 5 years based on IRC: SP: 0.42(2014). Guidelines on Urban Drainage

The velocity of drainage pipe is: Min 0.6 m/sec, Max. 3 m/sec

- Time for concentration from far most point of the catchment area to the outlet point
 - $t_c = 0.87 * ((L * L * L) / H)^{0.385} + \text{Flow Time}$
 - Flow time = Q/A , where t_c = Time of Concentration
 - L" Longest dimension of catchment area (km)
 - H: Vertical drop (Stream fall) of the flow from farthest point to the outlet point(m)
 - Q: is charge (m^3/hr)
 - A: Area of storm water drain(m^2)

In the case of Bus Terminal, the catchment area is too small and limited to calculate the required drainage volume. Thus, the drain pipe size at the beginning is 500 mm Hume pipe as a standard pipe size.

3.2.7 Diverted canal plan

During the monsoon season, the site served as a flood retention pond, and during the dry season, it served as pasture for cattle. When the site was proposed as a Bus Terminal area, the main concern was how to replace the previous canal function of the site. Therefore, the existing canal was planned to relocate to the edge of the site's northern boundary. The second concern was the canal size because there was no regional flooding data. The only bench mark was the existing box culvert crossing the access road in front of the bus terminal site. The size of box culvert was $153.8m^2$. Therefore, the new canal was designed to fit the size of the previous culvert.

3.2.8 Pavement

The master plan of the Bus Terminal is designed to accommodate vehicles, motorbikes, and buses of the visitors. There is one main access driveway to the front of the park, and two parking lots, respectively one for cars, vans, motorbikes, and one for Buses and taxi bay.

■ Asphalt Pavement for driveway and parking

The Bus Terminal has a driveway and parking for visitors and staff. The roads are installed on filled ground, which is approximately 1.0m or maximum 1.5m from the sub-grade ground. Therefore, the asphalt pavement is designed with total thickness 390mm assumed with Effective CBR 8% with below msa 5¹.

■ Speed Bump Cross

Speed bumps are designed to slow down vehicles as they approach the crosswalk. By introducing an elevated section of the road, drivers are prompted to reduce their speed to navigate over the bump safely. This helps create a safer environment for pedestrians by

reducing the risk of high-speed collisions. This can help create a safer and more pedestrian-friendly environment, discouraging aggressive or reckless driving behavior near crosswalks.

3.3 Project Activities

3.3.1 Pre-construction

Prior to construction, legal documents and project-related approvals is required to obtain, and project documents needs to be prepared, covering all required pre-construction activities. A conceptual design of the Bus Terminal was developed during the feasibility phase of the project (the base design) and final design was made during the detailed project report phase. Additionally, topographical survey, geotechnical survey, have been completed in the pre-construction phase of the project.

Table 3-4: Activities during Pre-construction Phase

Obtain permission regarding	Responsible entities
Preliminary design and detailed design	Design team
Hydrological survey	Hydrologists
Topographical survey, Geotechnical survey	Geotechnical team
Quarry and crusher sites	Municipality
Establishment of camps	Locals

The Contractor has to apply for all relevant permits for the construction (location permit) and operation. The Contractor has to coordinate with the Lumbini Sanskritik Municipality (LSM) for permission for land and construction of the Bus Terminal and Nepal Electricity Authority (NEA) for connection to the electricity network and using electricity from the public net

3.3.2 Construction Phase

The following activities are planned during the construction phase:

- Construction of accommodation facilities for workers, including provisions for water supply, sewage, and waste disposal at the workers' camp. Additional rented rooms will be arranged for other staff.
- Preparing the site by clearing vegetation and performing excavation and filling work.
- Transportation and storage of construction materials and machinery.
- Storage of chemicals and fuel, along with designated parking for vehicles.
- Construct buildings for terminal building, driver's house, storage, and garage and other facilities.
- Utilities installation will encompass water, sewage, and electricity, along with effective drainage management.
- Landscaping work, involves planting trees, shrubs, grass, and installing walkways, seating areas, and decorative elements.
- Testing and inspection, coordinating with regulatory authorities to obtain final permits and licenses.



- Final preparations, including staff training, conducting safety drills, and holding the official opening ceremony.

Once the main activities begin, it is estimated that the construction period of the Bus Terminal will take approximately **28 months** to complete.

3.3.3 Operation and Maintenance

The Operations and Maintenance (O&M) strategy for the Bus Terminal is essential for ensuring a safe and enjoyable visitor experience. The key components of Operations and Maintenance (O&M) for the Bus Terminal serve as guidelines for the municipality. They include overseeing daily terminal operations, ensuring the safety, comfort, and convenience of terminal users, and managing general and financial administration. Additionally, the plan emphasizes maintaining cleanliness throughout all areas of the Bus Terminal to provide a pleasant environment for all users.

The proposed Bus Terminal management committee will be tasked with developing an operational and management framework for the terminal. This includes engaging with private entities to establish operational models, coordinating with various inter-governmental bodies (provincial and federal) to secure funding through loans, grants, and partnerships, and liaising with special-purpose entities like the Office of Investment Board of Nepal (OIBN) and the Province Investment Authority (PIA) to attract investment for the terminal's construction, operation, and future management.

The following manpower of O&M organization is proposed for the day-to-day operation and maintenance of the bus terminal under the administration of the municipality.

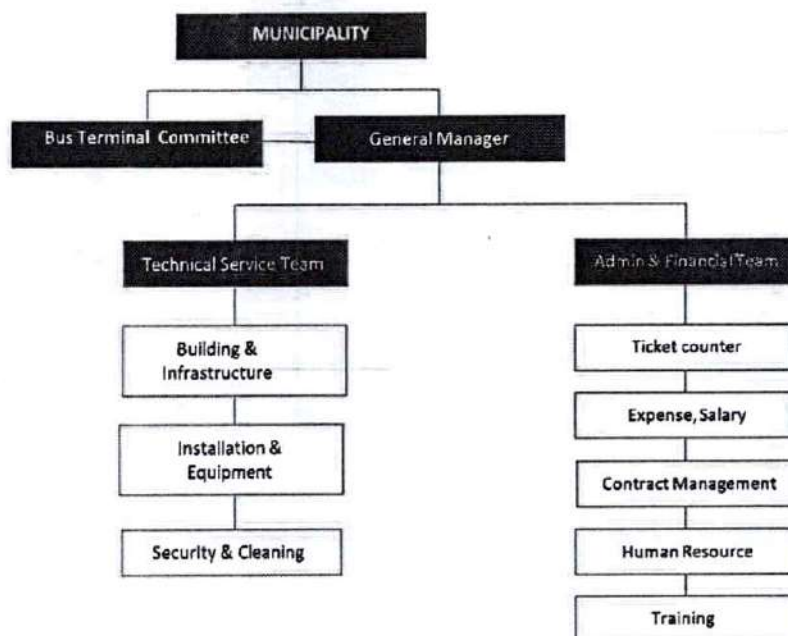


Figure 3-3: O&M Organization for Bus Terminal

The outlined key components of Operation and Maintenance (O&M) serve as a guideline for municipalities in managing a Bus Terminal effectively. These components include:

- **Daily Operation:** Ensuring the smooth and efficient daily functioning of the Bus Terminal.
- **Safety, Comfort, and Convenience:** Prioritizing the safety, comfort, and convenience of all Bus Terminal users, including passengers, staff, and other stakeholders.
- **Administration:** Conducting both general and financial administration tasks to ensure the Bus Terminal operates within budget and adheres to all regulatory requirements.
- **Clean Environment:** Maintaining a clean and hygienic environment throughout all areas of the Bus Terminal to enhance user experience and comply with health standards.

The proposed Bus Terminal management committee is tasked with developing an operational and management framework for the terminal. This includes negotiating with private entities regarding the operation and management framework of the terminal.

This approach aims to foster a collaborative environment that leverages both public and private sector expertise and resources to ensure the successful development and operation of the Bus Terminal.

3.4 Rationale for the IEE

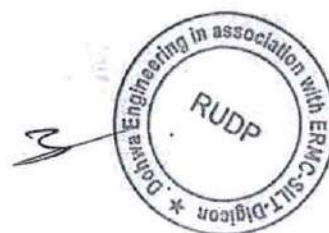
Environment Protection Act, 2076 (EPA), Section 3 (1) and Environmental Protection Regulation, 2077 (EPR), Rule 3 of the Government of Nepal (GoN) provisions for an appropriate environmental assessment to integrate environmental conservation with development as per the schedule 1 to 3 of EPR. According to the Schedule 2; clause 8 under "H" (अ) of Residence, Buildings, Town Development and Urban Development projects of EPR 2077, an Initial Environmental Examination (IEE) is required for this project.

- Clause 8 specifies that IEE should be carried out for site development that requires cut and fill of more than 20,000 m³.

The project requires cut and fill: 25,971 m³. Hence, an IEE is required for the project.

Table 3-5: Requirement for IEE

Required Environmental Study	Rationale
IEE	<u>(Pursuant to Environment Protection Regulation, 2020, Nepal)</u> Schedule 2; and clause 8 under (अ) of Residence, Buildings, Town Development and Urban Development Sector. <u>(Pursuant to Safeguard Policy Statement, 2009)</u> Category B



According to the EPR Rule 7, Sub-rule 8, in the context of project proposal involving foreign investment, ToR and IEE report can be prepared in Nepali or English language. However, according to Sub-rule 9, it is mandatory to prepare a brief report including an executive summary in the Nepali language. This project is being funded by ADB. Therefore, the IEE report has been prepared in the English language. The summary report in the Nepali language has been prepared and included within the IEE report.

3.5 Relevance of the Project

Lumbini-Sanskritik municipality, the birthplace of Lord Gautam Buddha, welcomes numerous domestic as well as international visitors annually. Many long routes buses, district transport buses and tourist buses enter the municipality carrying lots of passengers. There is an absence of ample space for the operation of bus services, and the municipality lacks a fully equipped bus terminal facility. Thus, introduction of bus terminal facility in the municipality is envisaged to provide convenient services for incoming and outgoing passengers, additional parking space and an appropriate point from where services can be controlled.

The proposed bus terminal will serve as a key hub, providing various facilities to meet the needs of both locals and tourists. These facilities include restaurants, offices, information centers, tourist ticket booking stalls, and public toilets, making the terminal a versatile urban space. The total estimated cost of the bus terminal project is NPR 292,865,071.86, primarily allocated to civil, building, and electrical works, along with environmental and social mitigation costs. Revenue sources include rental income from leased spaces, sanitation service fees, and vehicle parking and entry charges. The economic analysis indicates a base case Economic Internal Rate of Return (EIRR) of 11%, exceeding the Economic Opportunity Cost of Capital (EOCC) of 9%, confirming economic viability. However, sensitivity analysis shows that financial viability is limited, as the project does not generate sufficient cash flow to recover its investment within the 20-year time frame. Despite this, since the project serves a broader community benefit, it remains justifiable. With proper an extended project lifespan, the government can effectively manage costs and benefits to maximize its long-term outcome.

The terminal will occupy an area of approximately 1.18 hectares on government land, surrounded by farmland. There are no environmentally sensitive areas like conservation zones or sanctuaries. The proposed site is prone to seasonal flooding and does not experience other natural hazards like landslides. Collectively, this project represents a comprehensive approach to urban development and regional connectivity, aiming to improve both the functionality and aesthetics of the area.

3.6 Delivery from the Project

The master plan of Bus Terminal emphasizes strategic zoning to enhance visitor's experience. It has components like terminal building with waiting areas, ticketing counters, passenger amenities, bus bays, automated ticketing system, pedestrian walkways, drop-off and pick-up area, signage and landscaping. Additionally, through the installation of



photovoltaic panels and the incorporation of energy-efficient design principles, considerations have minimized the project's carbon footprint. Ultimately, the project aims to create a cohesive environment that maximizes guest satisfaction and supports the feasibility.

3.7 Requirements for the implementation of project

3.7.1 Buildings and their types

The buildings that will be constructed as a part of the project is given below.

Table 3-6: Buildings and their types

Buildings	Dimensions
Terminal Building	627.07 m ²
Staff Accommodation	176.60 m ²
Garage	197.39 m ²
Storage	63.24 m ²
Clock tower with open green space	801.1 m ²
Driver's house	222.09 m ²
Total built-up area	2,087.49 m ²

3.7.2 Land requirement

The proposed project is to be developed on Municipality-owned land. No private land will be acquired or affected during the implementation of project. However, during the construction period, some land outside the project area might be required for project activities like spoil disposal, stockpiling area, workers camp, etc.

Table 3-7: Land requirement for stockpiling and workers camp

S.N.	GPS Coordinates	Area	Total Area (m ²)	Ownership	Remarks
1.	27°28'34.46"N, 83°17'41.69"E	Stockpiling area	500	Private	Agricultural Land
2.	27°28'35.92"N, 83°17'41.02"E	workers camp	250	Private	Agricultural Land





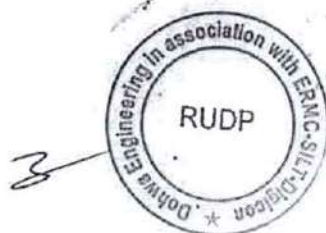
Figure 3-4: Workers camp and stockpiling area delineation in Google Earth with verification during field survey

3.7.3 Construction Materials Requirements for the Project

The quantity of materials required for the project has been estimated based on the total work volume obtained from project estimation and rate analysis. Major construction materials include cement, sand, aggregate, water, bricks, rebar, bitumen, sub-base material, diesel and petrol. These materials have been approximated to ensure the successful and timely completion of the project while maintaining quality standards.

Table 3-8: Construction materials requirement for projects

S.N.	Materials	Quantity	Unit
1.	Cement	848.90	MT
2.	Sand	1,627.33	m ³
3.	Aggregate	2,726.81	m ³
4.	Brick	478,631.05	Nos
5.	water	501,720.74	KL
6.	Rebar	147,345.12	Kg
7.	Bitumen	40.36	MT
8.	Sub-Base	1,065.90	m ³
9.	Diesel	5,213.85	litre
10.	Petrol	1,161.61	litre



The contractors shall source the construction materials from approved quarry sites or the authorized suppliers complying with the national legislations and standards. The Contractor shall seek the approval of the Employer's Representative, for the samples of all construction materials. Materials will be transported during the low traffic hours. Covering construction materials and earth stockpiles using plastic cover/tarpaulin will be mandatory.

3.7.4 Description of Machinery and equipment

The project is planned to be constructed within 28 months after the contract award. The construction work will be halted during monsoon season, extreme heat and any other exception event like any natural calamities, or any national political issues. Safety barriers, delineators and safety parapets etc shall be used. The probable requirement of equipment during the construction of the proposed project are listed below:

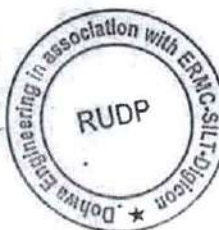
Table 3-9: Equipment's required for different project activities

Building site	Pavement
Hydraulic Excavator	Tractor with ripper
Vibrator	Mechanical Broom
Concrete Mixer	Air Compressor
Tipper	Boiler
Motor Grader	Generator
Vibratory Roller	Bitumen Distributor
Tractor/Loader	Batch Mix HMP
	Paver Finisher
	Smooth Wheeled Roller
	Pneumatic Roller
	Road Marking Machine
	Tractor Trolly
	Kerb Casting Machine

Source: DPR, 2025

3.7.5 Construction Technology

The construction of the buildings employs a variety of materials and methods to ensure structural integrity and thermal efficiency. The primary framework consists of RCC with brick masonry for both exterior and interior walls, providing strength and aesthetic appeal. Thermal insulation is enhanced using glass wool and Expanded Polystyrene (ESP) or thermocol sheets, which minimize heat transfer and contribute to energy conservation while offering sound insulation benefits. Additionally, PVC wooden panels are utilized for the exterior, offering a visually appealing wood-like finish that is both durable and weather-resistant, ensuring long-term protection against the elements while maintaining the building's aesthetics.



3.7.6 Water Requirement

Construction Phase

The total estimated water requirement for the listed construction activities is approximately 690,740 litres. This water will mainly be required for masonry works, concrete works, subgrade, subbase, base preparation, kerbstone works, and other related construction activities.

For brick masonry, water demand has been calculated for mortar ratios of 1:6 and 1:4, requiring about 40,189 litres and 47,572 litres, respectively. For stone masonry, the water requirement for 1:6 mortar is estimated at about 89,284 litres.

The major water requirement is for concrete works, particularly 1:1.5:3 concrete, which requires about 256,094 litres, followed by 1:2:4 concrete requiring about 40,581 litres, and 1:1:2 concrete requiring about 30,444 litres. No water demand has been estimated for 1:3:6 concrete, as no quantity has been considered for this item.

For road and pavement-related works, water demand is estimated at about 55,431 litres for subgrade, 49,964 litres for subbase, and 80,531 litres for base works. Prime coat requires only about 10.74 litres, while kerbstone works require approximately 638 litres. Overall, concrete works account for the largest share of construction water demand.

Table 3-10: Water requirement during the construction phase

Brick masonry	Quantity		Total Water
1:6	401.89	100	40189
1:4	365.94	130	47572.2
Stone masonry			
1:6	1275.49	70	89284.3
Concrete			
1:3:6		100	0
1:2:4	312.16	130	40580.8
1:1.5:3	1280.47	200	256094
1:1:2	101.48	300	30444
Plastering			
12.5-1:3	960.73		
12.5-1:4	817.98		
20-1:4	2204.52		
Punring			
Subgrade	1385.78	40	55431.2
Subbase	832.74	60	49964.4
Base	805.31	100	80531

Brick masonry	Quantity	Total Water
prime coat	5368.71	0.002
Kerbstone	1276.12	0.5
		690,739.7

Source: Derived from DPR, 2025

Operation Phase

Water Supply

A Bus Terminal is going to be established in the Lumbini Sanskritik Municipality. This shall be ideal in all respects. For that a lot of facilities must be provided. Among them, water supply and sanitation facilities are one of the prime. The water supply system has therefore been designed to provide adequate water for drinking, sanitation, restaurant use, driver accommodation, vehicle washing, and other terminal-related services.

Water Consuming Structures

The main water-consuming areas of the proposed bus terminal include the terminal building, toilet blocks, terrace restaurant, driver accommodation building, and garage. The terminal building will serve passengers, service providers, staff, vendors, and other daily users. Since most passengers and visitors will stay only for a short duration, their water demand has been adjusted using an occupancy factor. Driver accommodation, garage, and other service areas have been estimated separately based on their expected use.

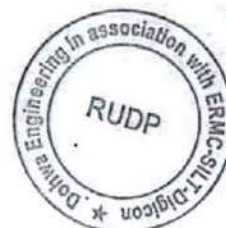
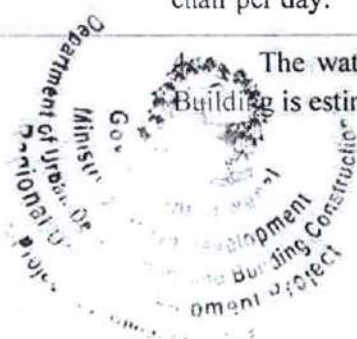
Water Requirements Rate

Water requirement rates as mentioned in Nepal Building Code (NBC 208: 2003) have been applied.

The requirements of water in the above buildings and structures are as follows: -

1. Water required for visitors and service providers in the terminal building are estimated to be 15 litres per person per day.
2. Water required for the toilet block is 12 litres of water per person (NBC 2008:2003, Equivalent to day school). So, water consumption per toilet block per day will be 360 litres, assuming 30 individuals will use toilet every day.
3. The water required for visitors to Terrace Restaurant are estimated to be 50 litres per chair per day.

The water required for people staying overnight in the Drivers Accommodation Building is estimated to be 100 litres per person per day.



5. Water required for garage for vehicle repair and vehicle wash. For that it is estimated that about 300 litres water is required per vehicle.

For temporary users such as passengers and visitors, the standard daily water demand has been adjusted by applying a 0.25 occupancy factor, assuming an average stay of about 2 hours against a typical 8-hour daily use period.

Daily Water Demand

Providing the quantity of water as mentioned above, daily water will be as follows:

1. Terminal building

Water @ 15 liters/person/day for 300 users = $15 \times 0.25 \times 300 = 1,125$ LPD

2. Toilet block

Water @ 12 liters/person/day for 30 users for 2 toilet blocks = $12 \times 0.25 \times 30 \times 2 = 180$ LPD

3. Terrace Restaurant

Water @ 50 liters/chair/day for 40 chairs = $50 \times 40 \times 0.25 = 500$ LPD

4. Drivers Accommodation

Water @ 100 litres/person/day for 20 people = $100 \times 20 = 2,000$ litres

5. Garage (Vehicles washing and others)

Water @ 300 litres per vehicle per day for 20 vehicles = $300 \times 20 = 6,000$ litres

Daily water demand for Bus Terminal Development Plan comes out to be 9,805 liters per day.

Therefore, the revised daily water demand for the proposed bus terminal is estimated to be approximately **9,805 litres per day, or about 9.8 m³/day**. This estimate considers that most passengers and visitors will use the terminal only for a short duration, while full-day demand has been retained for driver accommodation and garage-related activities.

3.7.7 Human Resources Requirement

The human resource estimation was carried out based on the total quantity of work derived from the project estimation and rate analysis of the project, which specify the human resource required per unit quantity of work. The total workforce needed was calculated by multiplying the total work quantity by the person-days per unit quantity. Considering the project's duration of 28 months the total human resource requirement will be distributed over the project duration as required by nature and intensity of work to ensure smooth workflow and timely completion. The skilled and semi-skilled human resource required for each day is 13 and unskilled manpower required for each day is 30.

Table 3-11: Human resources requirement for the project construction

Human resource Type	Total human Resource Required (Person-days)	Duration (Months)	Daily Requirement (Number of Workers)
Skilled and Semi-skilled	10,859	28	13
Unskilled	25,188	28	30
Total	36,047	28	43

Source: Estimates based on DPR, 2025



3



Human resources requirement operation phase for the operation and maintenance of the Bus Terminal is given in the table below.

Table 3-12: Human resources requirement for the project operation

Human resource Type	Total human Resource Required (Person-days)	Remarks
Skilled and Semi-skilled	20	Regular or contract based.
Unskilled	15	
Total	35	

3.7.8 Waste output from the Bus Terminal

The Bus Terminal is a bulk waste generator and has a variety of facilities accommodated inside the park like shops, café, restaurant, workshop building, ticket boxes, venders, kiosks, etc. Based on the facilities, the type of waste output has been calculated and presented in following sections:

Table 3-13: Types of waste generated as per facilities in Bus Terminal

Type of Facility	Type of waste generated
Terminal building	Paper, plastic, glass, metal waste, bottles
Restaurant/Cafeteria/Canteen	Bio-degradable waste, food waste, tea/coffee residues, waste vegetable, oil, paper, plastics, glass, metal waste, napkins, cans, bottles, wet wipes, packaging materials.
Shops	Glass bottle, tins, cans, paper, plastic, rubber, leather, cardboard, wood, packaging materials
Toilets	Napkins, papers, hygienic materials
Driver's house	Food waste, paper, plastics, cardboard, glass, bottle, tins cans, leather, rubber, wood, packaging materials
Green Space	Dry leaf, green leaf, waste, plastics, paper, dust particles, dirt

Source: DPR, 2025

3.7.9 Solid Waste (Sludge)

Construction Phase:

The amount of waste generated during the **construction phase** was estimated to be 6.62 kg per day considering a total of 43 workers.

- Per Capita Waste Generation Rate: $114.97\text{g/capita/day} = 0.115\text{kg/capita/day}$ (taking reference from per capita waste generation rate of Lumbini Sanskritik Municipality from ADB Report "Solid Waste Management in Nepal: Current Status and Policy Recommendations").
- Increase in Per Capita Waste Generation Rate: 1%



Projection of Per Capita Waste Generation Rate from 2012 – 2024: Projected unit waste generation from 2012 - 2024 will be 0.154 Kg/capita/day

Table 3-14: Waste per capita from 2012 to 2024

S.N.	Year	Per Capita Waste Generation
1	2012	0.141
2	2013	0.142
3	2014	0.143
4	2015	0.144
5	2016	0.145
6	2017	0.146
7	2018	0.147
8	2019	0.148
9	2020	0.149
10	2021	0.150
11	2022	0.151
12	2023	0.152
13	2024	0.154

Quantity of Waste generation: $43 \times 0.154 = 6.62$ kg per day

Hence, the total waste generated in the construction phase is 6.62kg per day.

Based on the ADB report *Solid Waste Management in Nepal: Current Status and Policy Recommendations*, household waste in Nepal is largely organic, with about 66% organic waste in overall municipal waste

Table 3-15: Calculation of degradable/non-degradable waste during construction phase

S.N.	Waste Source	Calculation	Quantity (kg/day)
1.	Total construction phase waste	$43 \text{ workers} \times 0.154 \text{ kg/person/day}$	6.62
2.	Biodegradable waste	$6.62 \times 66\%$	
3.	Non-biodegradable waste	$6.62 \times 34\%$	

The total solid waste generation during the construction phase is estimated at 6.62 kg/day, based on 43 workers and a projected per capita waste generation rate of 0.154 kg/person/day. Since the waste generated by workers will be similar to municipal domestic waste, the biodegradable fraction has been estimated at 56%, based on the ADB report *Solid Waste Management in Nepal: Current Status and Policy Recommendations*. Accordingly, approximatelykg/day of biodegradable waste and ... kg/day of non-biodegradable waste are expected to be generated during the construction phase.



At least two separate waste bins will be provided at the workers' camp and construction site: one for biodegradable waste and one for non-biodegradable waste. Waste will be collected regularly and managed as per the municipal waste collection system.

Operation Phase:

The total waste generation from Bus Terminal: $254 + 25.4 + 25.4 + 12.7 = 317.5$ Kg on average. The estimation of the passengers is given in Annex 1.9.

Table 3-16 Total Projected Waste Generation

S.N.	Waste Source	Maximum people acting in the park	Waste generation in kg per day
1	Passenger	Approximately 2000×0.17	254 kg
2	Yard/Garden	10 % of S.N.1 source	25.4kg
3	Restaurant generation	10 % of S.N.1 source	25.4 kg
4	Shops generation	5% of S.N.1 source	12.7kg
	Total		317.5 kg

Based on the ADB report *Solid Waste Management in Nepal: Current Status and Policy Recommendations*, municipal solid waste in Nepal is largely organic, with about 56% organic waste in overall municipal waste, 66% organic waste in household waste, and 43% organic waste in commercial waste. Accordingly, source-wise biodegradable fractions have been applied for the bus terminal waste estimation.

Table 3-17: Percentage of degradable waste as per Solid Waste Management in Nepal: Current Status and Policy Recommendations, municipal solid waste in Nepal

S.N.	Waste Source	Percentage (%) of degradable waste	Basis
4.	Passenger	56%	Municipal waste organic fraction in Nepal
5.	Yard/Garden	100%	Dry leaves/green leaves/organic garden waste
6.	Restaurant generation	66%	Similar to household/food-dominant waste
7.	Shops generation	43%	Similar to commercial waste

Table 3-18: Calculation of degradable/non-degradable waste during operation phase

S.N.	Waste Source	Total Waste (kg/day)	% degradable waste	Biodegradable kg/day	Non-biodegradable kg/day
1.	Passenger	254.0	56%	142.24	111.76
2.	Yard/Garden	25.4	100%	25.40	0.00
3.	Restaurant generation	25.4	66%	16.76	8.64
	Shops generation	12.7	43%	5.46	7.24

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Ministry of Urban Development and Building Construction
Regional Urban Development Project Coordination Office

नेपाल सरकार
प्रवाहक विकास मन्त्रालय
विवरण, काठमाडौं

Engineering in association with ERM-C-SILT-Design
RUDP

S.N.	Waste Source	Total Waste (kg/day)	% degradable waste	of Biodegradable kg/day	Non-biodegradable kg/day
	Total:			189.86	127.64

The total waste generation during operation is estimated at 317.5 kg/day, of which approximately 189.86 kg/day is biodegradable and 127.64 kg/day is non-biodegradable.

Estimation of numbers of Waste Bins:

- Mass (M1) for bio-degradable waste: 189.86 kg/day
- Mass (M2) for non-biodegradable waste: 127.64 kg/day
- Density (D): 350 Kg/m³
- Volume (V): Mass/Density = 317.5 / 350 = 0.90 m³

Table 3-19: Required number of bins

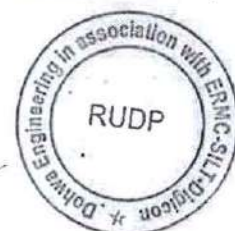
S.N.	Waste type	Quantity (kg/day)	Volume (L)	Required no. of bins (50 L)	Recommended no. of bins
1.	Biodegradable	189.86	189.86 / 350 = 0.54 m ³ = 542 L	542 / 50 = 10.8	11 bins
2.	Non-biodegradable	127.64	127.64 / 350 = 0.36 m ³ = 365 L	365 / 50 = 7.3	8 bins
	Total	317.5	0.93	18.1	19

A total of 19 waste bins of 50-litre capacity will be provided at strategic locations, comprising 11 bins for biodegradable waste and 8 bins for non-biodegradable waste. Biodegradable bins will be placed mainly near the restaurant/cafeteria, green areas, and waiting areas, while non-biodegradable bins will be placed near shops, ticket counters, passenger waiting areas, parking areas, and terminal circulation areas. Waste will be collected regularly and managed as per the municipal waste collection system.

3.7.10 Liquid Waste

The wastewater generated is calculated assuming that 80 % of the water consumed will end up as wastewater (DPR, 2025). The daily requirement of water per person per day in Nepal is 100 liters². The number of workers required per day is 43 (DPR, 2025). Priorities will be given to locals for employment. But even if all the workers have to be hired from outside and live in workers' camp, the maximum amount of water consumed will be 4,300 liters per day during the construction phase. So, the maximum amount of wastewater produced will be 3440 liters per day. The daily water demand is 14000 litres per day during

² Department of Water Supply and Sewerage Management. (2019). Water and Sanitation Status Report . Kathmandu: Government of Nepal



the operation phase (DPR, 2025). So, the wastewater during the operation phase is 11,200 liters per day.

3.7.11 Wastewater Treatment Technology

Package Sewage Treatment Plant (PSTP) has been proposed for treatment of sewage. About 80% of water supplied to any block will return as black and grey water. Therefore, volume of individual PSTP has been calculated on 80% return of water supplied to the block. Both black and grey water will enter the PSTP and treated effluent will be discharged from the PSTP. Wastewater from toilet, sink, shower etc. flows through the sewer drainpipe and reaches into a PSTP. The system is designed based on two pipe system as a separate system for sewage and sullage up to the first manhole by means of vertical soil and waste pipe with vented connection. The material of the pipe shall be UPVC inside toilet and shaft which will be discharged into the manhole. The PSTP provides several important functions through a complex interaction of physical and biological processes. PSTPs with capacities 1.2 KLD, 2 KLD, 3 KLD, 4 KLD, 5 KLD and 6 KLD are available. Typical diagram of PSTP is shown below:

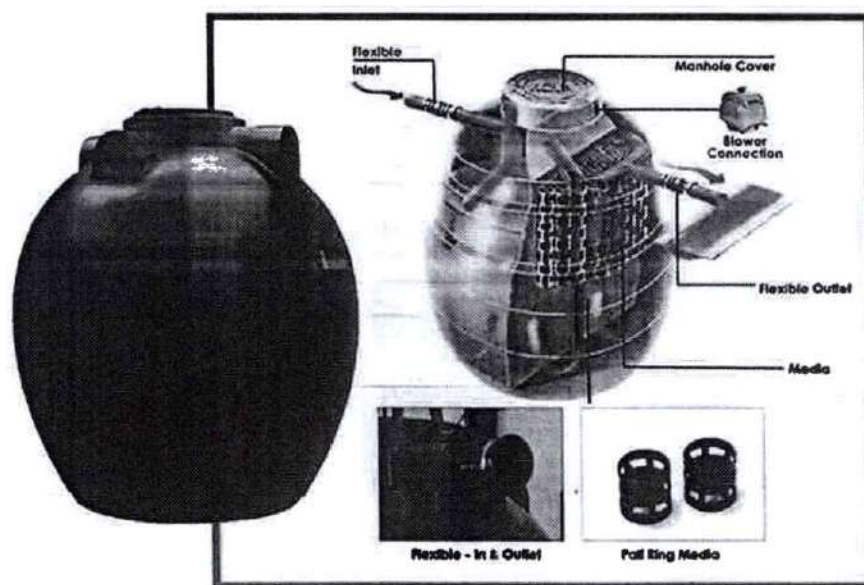


Figure 3-5: Package Sewage Treatment Plant (PSTP)

3.7.12 Gaseous effluent

The gaseous emission during the construction phase was calculated with reference to the fuel consumption. The total diesel required for the construction activities is as given in the table below.

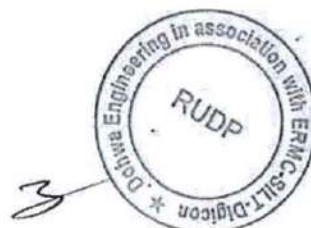


Table 3-20: Gaseous emission during construction phase

Fuel type	Requirement(L)	CO ₂ emission rate	CO ₂ emission in grams	CO ₂ emission in kg
Diesel	5,213.85	2,640 gm CO ₂ /L	13,764,564	13,764.56
Petrol	1,161.61	2,390 gm CO ₂ /L	27,76,247.9	2,776.24
LPG	7,567.56	1,660 gm CO ₂ /L	12,561,220	12,561.22
Total				29,102.02

Source: Sajdl, 2025³

It is estimated that a total of 270 LPG cylinders will be consumed at the workers' camp, which is equivalent to 7,567.56 L (1 cylinder = 14.3 kg = 28.03 L). Therefore, the total carbon emission of the project is calculated to be 29,102.02 kg.

3.7.13 Noise production

Different equipment like hydraulic excavator, tipper, dozer, motor grades, vibratory roller, tractor with ripper, vibratory roller mixer will be used which can generate 85-100 dB of noise during construction activities.

3.7.14 Energy Usage

No energy supply is currently available on the site of the project. The connection to an external energy supply system has to be established at the beginning of the construction works.

Type

Energy will be used for different purposes. Different types of energy usage are as follows:

- 1) Lighting (Indoor and Outdoor)
- 2) Power
- 3) HVAC
- 4) Networking and Others
- 5) Size of Supply
- 6) Illumination System

Source

The Source of supply is the city line which is purchased from Nepal Electricity Authority (from 11kV side). The load assessed is 233.21 kVA and the transformer size considered is 250kVA. Besides the main supply, the captive supply of Diesel Generator (DG) is put for the outage and emergency condition. One unit of 150 kVA DG set is synchronized and fed to the main panel at the time of mains failure (Outage) with the means of AMF panel (DPR, 2025).

Quantity (Per hour, day and year)

Sajdl, I. J., (2025) Calculation of CO₂ emissions. Sajdl, I. J., PhD. (2025, January 22). Calculation of CO₂ emissions. autolexicon.net. <https://www.autolexicon.net/en/articles/vypocet-emisi-co2/>

The energy required for the lighting a total of 6.33 KW of energy is required, 126 KW for power, for HVAC 49.25 KW, for networking equipment including fire alarm and CCTV is 96 KW. The detailed information from DPR is included in Annex 10.

PV Solar System

The purpose of solar installation is for the energy of 80 kVA in Bus Terminal itself capable to generate its energy demand.

3.8 Detailed Condition of the Project Area

3.8.1 Maps

The site location of Bus Terminal is presented in Figure 3-7 and location and accessibility map is presented in Figure 3-8. The land use land cover map is presented in Figure 3-6 while workers camp and stockpiling map is presented Figure 3-4. Seismic zoning map is presented in Figure 3-10.

3.8.2 Location

The Bus Terminal is in Ward-10, Madhubani which is 1.5km from Mahilwar Bazar. The site lies near Osho Tapoban and adjacent to Telar river contained in an area of 1.88 Bighas (12,800 m²). The Bus Terminal is located at 27°28'34.60" N and 83°17'40.17" E at an average 97m above Mean Sea Level (MSL). The main road networks are the Hulaki/Lumbinii highway passing east to west that links it with Bhairahawa and Kapilvastu and Hulaki Highway provides inter-regional linkage with other parts of the country. The proposed Bus Terminal will be used for the interstation buses within the municipality as well as long route buses driving through Hulaki Rajmarg. The bus terminal is located 2.25 km from Hulaki Rajmarga at Jhulanipur. There is an existing road with a width of 5 m, ROW of this road is 18 m including three lane carriageways, median in between the lanes, footpath and drains.



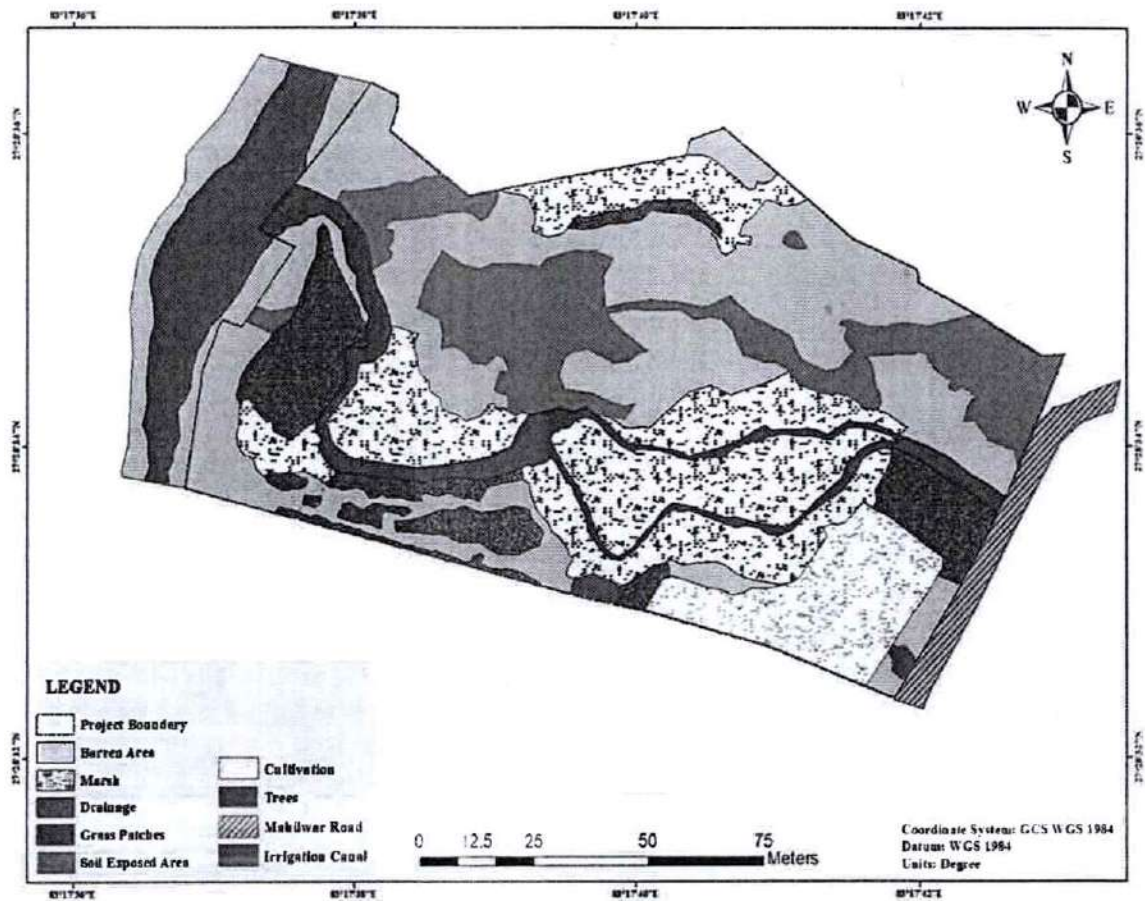


Figure 3-6: Current land use land cover map of the Project Site View

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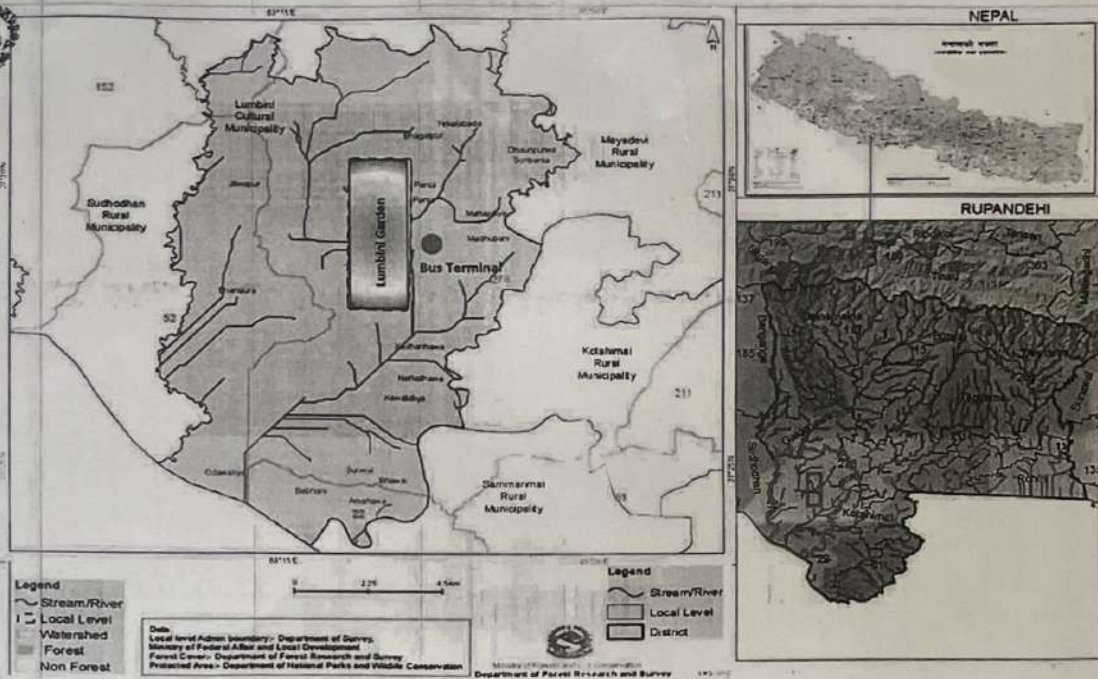


Figure 3-7 Site location and Geographic conditions of Bus Terminal in Lumbini Sanskritik Municipality



Figure 3-8: Location and accessibility of the Bus Terminal



3.8.3 Environmental and Social Sensitivity around the project area

A religious tree and a Lord Ganesh temple are located approximately 100 m from the project site, separated by the Mahilwar Chowk Bus Terminal Highway Road. The communities nearby have a long-standing cultural practice of dedicating an elephant statue from each house for lord Ganesh., began around 20-25 years ago (Field Survey, 2025). In addition, Osho foundation/healing center (called Osho Jet ban) is approximately 120 m from the project site (Annex 3.4) and the Lumbini World Heritage Site at 900 m (Annex 1.2). Further construction and operation of the Bus Terminal project could emit air and sound pollution disrupting the religious practitioner and visitors of the area. Additionally, the current proposed area of Bus Terminal has a natural canal for the retention of flood during rainy season. As outlined in DPR, the project implementation is only possible if the project site is raised to certain elevation and if the natural canal is accommodated properly within the project site. However there is a chance of inundation in the monsoon season in the project area. The high vegetation growth in the irrigation canal connecting the Telar River with the Bus Park, due to abandonment for many years, further complicates the magnitude and velocity of flood flow in the canal. Hence the flood discharge in the canal entering the Bus Park will not be reliable.

3.8.4 Existing Environmental Condition

3.8.4.1 Physical Environment

A multidisciplinary team visited the project area for physical inspection and data collection. The field study was focused on the collection of information on the existing social, cultural, economic, physical, chemical and biological environment of the project area. Further assessment of the project was done on the basis of primary and secondary data sources. Air, water, and Noise quality assessments involved sampling in the field along with the laboratory analysis following national standards such as the Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem, 2008, Irrigation Water Quality Guideline, 2008 and the National Ambient Air Quality Standard (NAAQS) 2069. Water samples were collected from groundwater sources to test the parameters like pH, nitrates, arsenic, etc while TSPM, PM₁₀, PM_{2.5}, SO₂, etc were assessed using high volume samplers and appropriate laboratory techniques. Detailed information about the methodology is mentioned in the ToR

3.8.4.2 Geographic and Topographical Condition

Bus Terminal is located at Ward-10, Madhubani 2.4 km from Mahilwar Bazar Lumbini Sanskritik municipality in Rupandehi. The bus terminal coordinates are 27°28'34.60"N, 83°17'40.17"E. The site area is estimated at 11, 628.41 m². There is a connecting canal between the Telar River and the Koilihawa River at this site.

3.8.4.3 Weather and Climatic Condition

The project area experiences a sub-tropical climate. The analysis of temperature data from 2017 to 2022 (NSO, 2024⁴) across three different station (Bhairawa Airport, Bhairawa

⁴ NSO. (2024). ENVIRONMENT STATISTICS OF NEPAL. Government of Nepal Office of the Prime Minister and Council of Ministries National Statistics Office.

Agriculture and Tilottama) shows mean maximum temperature ranging from 30.6°C to 31.7°C, indicating consistently high day time temperature, while mean minimum temperature varied between 18.3°C and 19.8°C, reflecting warm nights with minimal annual fluctuation. Though, the average annual precipitation over the Telar river catchment is 1,550 mm/year whereas the annual evapotranspiration is estimated at 646 mm/year (Source: Hydrology report).

3.8.4.4 Hydrology and Catchment area: River, other water resources and flood

Lumbini Sanskritik municipality has an abundance of river, ponds, lake and wetlands. Some rivers flowing through the municipality are Ghorhawa river, Telar river, Dano river, Kothi river, Koilihawa river, Harhewa river.

Table 3-21: Summary of Telar River catchment

Catchment Area: 50 km ²	River Length: 22.97 km
Highest River Elevation: 145 m	Lowest River Elevation: 116 m
Average River Slope: 0.1%	

Source: Hydrology Report, 2024

The hydrological analysis of Telar River is complex. The river water is diverted for various purposes at different locations upstream of the Bus Park. During high flood the water from neighboring catchments enters the Telar River, and vice versa, due to multiple crisscrossing canals, and very flat nature of the catchment (average river slope 0.1 percent). The reliability of the flow analysis with assumption of natural hydrological river flow with natural conditions will be low. The Telar River catchment is ungauged, there are no hydrological or meteorological stations within the catchment.

The land is located at the left bank of an abandoned irrigation canal originating from Telar River. The approximate size of the trapezoidal irrigation canal is 5 m wide at the bottom, 8 m wide at the top and 3 m in depth with canal bed slope ranging from about 1 to 2%. Based on the map study, field verification, and interaction with the local residents, the canal was dug several decades ago to irrigate agriculture lands.

When the canal is in full capacity, the discharge in the canal is about 14 m³/s. The canal inside the Bus Park premises is designed with concrete structure, and the canal size, shape and slope are designed to be able to safely carry the flood flow entering the Bus Park area from the irrigation canal, the construction of the canal alignment along the north border of the Bus Park area will have no negative consequence to the private land and the private houses constructed near the north border of the Bus Park. The catchment delineation is shown in (Annex 1.1).

The site elevation varies from Ground Height (GH)-93 to GH-95. On the other hand, the surrounding area is higher than the site. The existing road is GH-97.0 m, which will be developed as an access road to the bus terminal. As the site is lower than the surrounding land, all flood water flows into the site. Therefore, to protect against flood damage, it is necessary to keep the bus terminal GH higher than the adjacent land level.

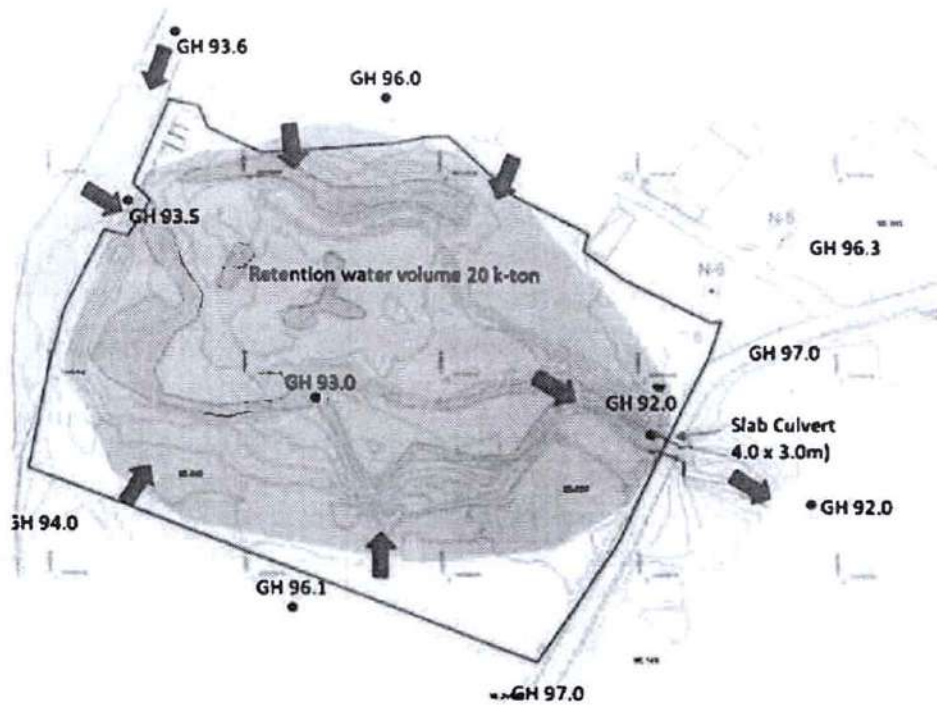


Figure 3-9: Ground Height (GH) of the project site

3.8.4.5 Seismicity

As per Building Code of Nepal, NBC 105:2025, Nepal has been subdivided into different seismic zones based on local seismic hazard as shown in (Figure 3-10). The seismic zoning factor (z) represents the peak ground acceleration (PGA) for 475-year return period. The value of z for the proposed site is around 0.3 g (Soil Report of Bus Terminal, 2024). According to the United States Geological Survey (USGS), PGA value ranging from 0.2 g to 0.8g cause moderate damage.

3.8.4.6 Liquefaction analysis

The deterministic approach for liquefaction analysis was done as per the National Center for Earthquake Engineering Research (NCEER) 1996/98. Severity due to liquefaction was determined by calculating LPI following Iwasaki et al. (1982) to determine the severity of the liquefaction. The liquefaction analysis at the project site revealed very low severity of liquefaction with the Liquefaction Potential Index (LPI) value of 0 except from boring hole 3 (27°28'34.69"N, 83°17'37.51"E) (Geotechnical Investigation for Bus terminal, 2024).

Liquefaction analysis is a geotechnical engineering assessment used to evaluate the potential for soil to lose its strength and stiffness during an earthquake or other rapid loading conditions. The LPI value of 0 indicates that the project components are not in the risk to liquefaction induced damage except for Bus/ Freight vehicle parking zone where boring hole 3 (27°28'34.69"N, 83°17'37.51"E) showed value 43.27 indicating the potential for soil to lose its strength and stiffness during an earthquake or other rapid loading conditions.

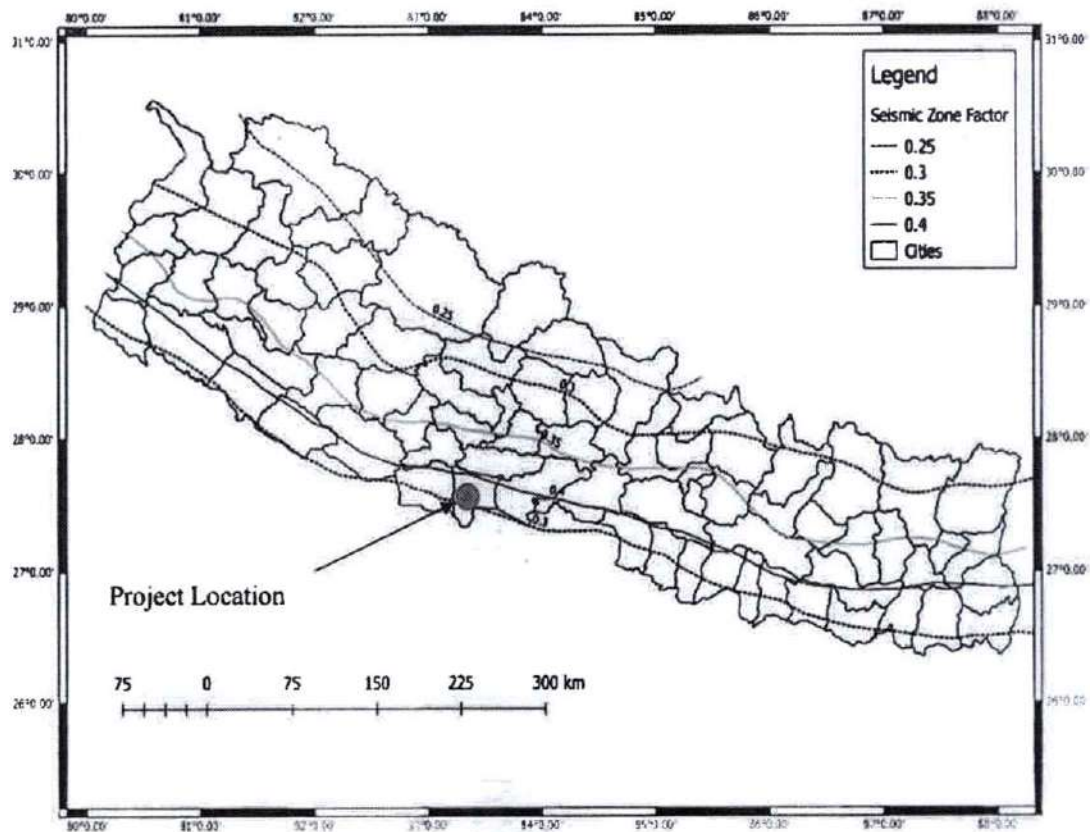


Figure 3-10: Seismic Zoning map of Nepal (Source: Soil report, Bus Terminal, 2024)

3.8.4.7 Land use and cover

The land use land cover map is presented in Figure 3-6. The area comprises of 34.07% barren land followed by 24.90% of marshy area, 15.50% of soil exposed area, 11.17% of grass patches, 7.52% of cultivation, 6.16% drainage area, 0.52% of trees and 0.15% of buildings.

3.8.4.8 Groundwater Level

A total of three borehole was drilled at BH1(27°28'34.61"N, 83°17'40.57"E), BH2(27°28'33.76"N, 83°17'40.32"E) and BH3 (27°28'34.69"N, 83°17'37.51"E), at the depth of 15m (BH1 and BH2) and 12m (BH3) below the existing ground level. The work was performed in accordance with IS: 1892-1979. The bore holes were drilled in soil by percussion drilling method. Casing pipes were used to support the side of boreholes up to the drilling depths. Ground Water Table (GWT) was monitored as per boreholes during the drilling as per IS 6935-1973 (Soil Test Report for Bus Terminal, 2024). The groundwater level was 2.5m from the ground in each BH.

3.8.4.9 Baseline Sound level

The sound level was measured at project site (27.476559° N and 83.295122° E) using the sound level meter 'SL-1352'. 24 hours sampling was done. Equivalent noise level for day as well as

night was measured. Day denotes 7 to 22 hours (7 A.M. -10 P.M.). Night denotes 22 to 7 hours (10 P.M. to 7 A.M.) which is presented in (Table 3-22).

Sound levels are high during daytime as compared to the night due to continuous bus movement, school activities, and public congregation in the nearby Samai Mata Temple as well as lack of acoustic planning. However, the sound level was found below the limits.

Table 3-22: Baseline Sound Level

Description	Sound Level (dB)	Guideline value for Residential area
Equivalent Noise level (Day)	51	55
Equivalent Noise Level (Night)	36	45

Source: Field Survey, 2025

3.8.4.10 Baseline Water Quality

The water sample from the project site (27.474388° N and 83.294929° E) was collected. The physical, chemical and microbiological parameters were examined. The parameters were compared to the Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem, 2008 as well as Irrigation Water Quality Guideline, 2008 for those. While the pH level of the sample was within the acceptable range which is presented in (Table 3-23). However, the water sample was not free from microbial contamination, as evidenced by the uncountable presence of Total Coliforms. This finding is crucial because it indicates that the water is critically unsafe from pathogenic bacteria, which are common indicators of faecal contamination.

The Electrical Conductivity (EC) was found to be higher than the threshold value of 400 $\mu\text{S}/\text{cm}$ mentioned in the irrigation water quality guidelines 2008. EC is the thermophysical property of water, which has strong interrelationship with pollution level (Das et al., 2006). Thus, higher value of EC indicates that the water body is polluted and unsuitable for irrigation. Additionally, the low concentrations of chloride, and metals such as arsenic and aluminium in the water sample suggest that the water sources are not impacted by external pollution sources. These results indicate no significant influence from industrial discharges, agricultural runoff, or other potential contaminants that could compromise water quality.

Table 3-23: Baseline Water Quality

S.N.	Category	Parameters	Observed Value	*	#
1	Physical	pH	7.3	X	6.6-8.5
2		Temperature °C	31.7	X	X
3		Total Dissolved Solid, TDS (mg/L)	340	X	X
4		Electrical Conductivity, EC ($\mu\text{S}/\text{cm}$)	610	X	<400
5	Chemical	Total Suspended Solid, TSS (mg/L)	95	X	X

S.N.	Category	Parameters	Observed Value	*	#
6		Total Solids, TS (mg/L)	435	X	X
7		Dissolved Oxygen, DO (mg/L)	5.84	6-9 mg/l	X
8		Oil and Grease, (mg/L)	3.89	X	X
9		Chloride, Cl ⁻ (mg/L)	28.32	<600	<100
10		Chlorine, Cl ₂ (mg/L)	56.64	X	X
11		Total Alkalinity (mg/L)	175	X	X
12		Total Hardness (mg/L, as CaCO ₃)	165	Hard 120-180	X
13		Calcium Hardness (mg/L, as CaCO ₃)	90	X	X
14		Magnesium Hardness (mg/L, as CaCO ₃)	73	X	X
15		Iron Fe ⁺⁺ (mg/L)	1.94	<10	X
16		Nitrate (NO ₃ ⁻), (mg/L)	19.39	X	X
17		Potassium (K ⁺), (mg/L)	3	X	X
18		Sodium (Na ⁺), (mg/L)	14	X	<70
19		Arsenic As, (mg/L)	0.006	X	X
20	Micro-Biological	Total Coliform, (CFU/100 ml)	UN	X	<1 count/100 ml

*: Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem, 2008

#: Irrigation Water Quality Guideline, 2008

X: No criteria

3.8.4.11 Baseline air quality

The baseline information has been collected by using the Green Tech Instrument (GTI)151, GTI Fine Particulate Sampler (FPS) 375 (High-Volume Sampler) to know the condition of air quality at the main location of the project area (27.476565° N and 83.295068° E) and compared with the existing national quality standards, which is presented in (Table 3-24Error! Reference source not found.). This information will be very useful for depicting the environment of the current project site and for comparative study of the impact on the environment in the future. This information indicates that total suspended particulates (TSP) exceeded the tolerance limit of National Ambient Air Quality Standards (NAAQS) of Nepal (MoFE, 2012), while all other parameters were within the tolerable range of the standard, indicating overall good air quality during the baseline monitoring period.

Table 3-24: Baseline Air Quality

SN	Parameters	Unit	Observed Value	Tolerance (µg/m ³)	Limit*	Remarks
	TSP	(µg/m ³)	258.1	230		Not within the limit

SN	Parameters	Unit	Observed Value	Tolerance ($\mu\text{g}/\text{m}^3$)	Limit*	Remarks
2	PM10	($\mu\text{g}/\text{m}^3$)	63.5	120		Within the limit
3	PM2.5	($\mu\text{g}/\text{m}^3$)	38.2	40		Within the limit
4	SO ₂	($\mu\text{g}/\text{m}^3$)	Not detected	70		Not detected
5	NO ₂	($\mu\text{g}/\text{m}^3$)	11.2	80		Within the limit
6	CO	ppm	10.5	40		Within the limit

* (National Air Quality Standard, Ministry of Forests and Environment, 2012)

Source: Field Survey, 2025

3.8.4.12 Geology and Soil

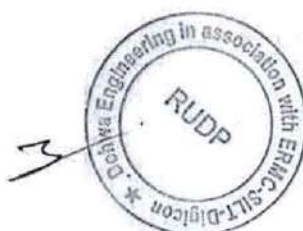
The proposed site lies in Rupandehi District in the Terai region of Nepal. The Gangetic Plain is also called as Terai Zone and it is the Nepalese portion of the Gangetic Plain that extends from the Indian Shield in the South to the Sub-Himalayan (Siwalik) Zone to the North. The plain is in less than 200 meters above sea level and usually has thick (nearly 1500 m) alluvial sediments. The alluvial sediments contain mainly boulder, gravel, silt and clay. The width of Terai Zone varies from 10 to 50 km and forms a nearly continuous belt from east to west. Terai Zone is a foreland basin and has sediment originated from peaks of Northern part. To the north, this zone is separated by an active thrust system called as the Main Frontal Thrust (MFT) with Siwalik. At some places along MFT, the Siwalik rocks are observed to rest over the recent sediments of the Terai.

As there is topography difference in the municipality, this has direct bearing on the soil texture found in the municipality. The mid-Bhabar region located at the southern foot of Chure mountain range has a presence of gravel, sandy, loamy and clayey soil. Sandy loam, cobbles and pebbles are predominant in this area. Similarly, in the Terai region located at the southern part of the municipality, there is occurrence of clayey, sandy and loamy soil (Lumbini Sanskritik Municipality Office, 2021).

Alfisols, entisols and inceptisols are the dominant soil found in Lumbini Sanskritik Municipality.

Table 3-25: Description of Soil Types found in Lumbini Sanskritik Municipality

Soil Type	Description
Alfisols	These soils are highly fertile and consist of clay-enriched sub-surface horizon and have enough water content that can support successive three months in the growing seasons of crops.
Entisols	They have little to no development of horizons and are of recent origin. If supplied with enough water and necessary plant nutrients, cultivation is possible in entisols despite minimal horizon.



Inceptisols	Similar to entisols, inceptisols to have minimal horizon development, however are comparatively more developed than entisols. Inceptisols are of recent origin too. It is the most found soil throughout the world.
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Source: Britannica, The Editors of Encyclopedia, 2011

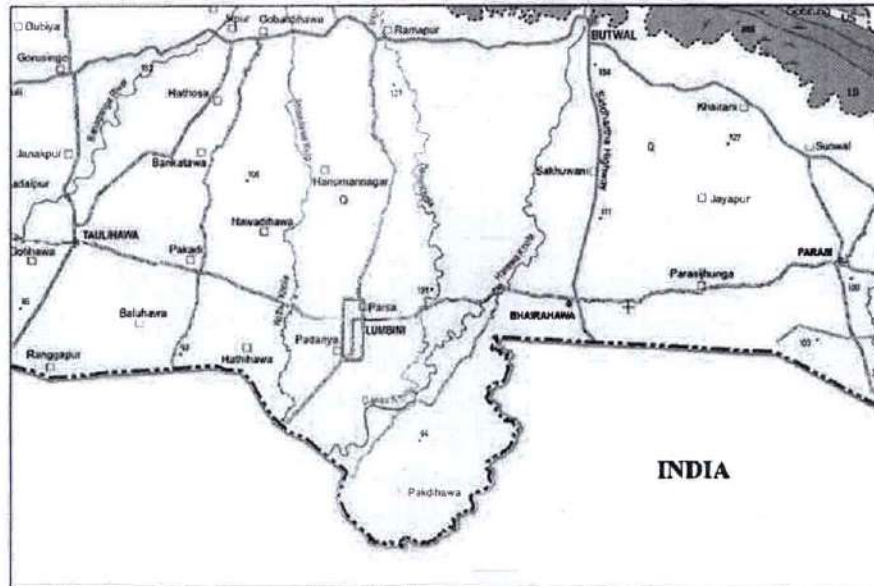


Figure 3-11: General Geology of the site (Source: Soil Report, Bus Terminal, 2024)

3.8.5 Biological Environment

3.8.5.1 Type of Forest

The proposed site is not located within any protected areas and the project site and the direct impact area has no forest or trees within them.

3.8.5.2 Major Flora

The flora available within the municipality are Asna (*Terminalia tomentosa*), Banjhi (*Anogeissus latifolia*), Karma (*Adina cardifolia*), Harro (*Terminalia chebula*), Barro (*Terminalia balearica*), Jaamun (*Syzygium cumini*), Sal (*Shorea Robusta*), Simal (*Bombax Ceiba*), Sisau (*Dalbergia sissoo*) and Tik (*Tectona grandis*), etc.

As per the KII with the bird expert, in the bus terminal area, there will be no impact on birds as nesting is not seen in that area. The project will not harm the birds.

The Table 3-26 below lists some of the plant species found in the zone of influence (ZOI).

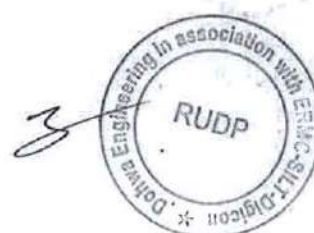


Table 3-26 Plants around the ZoI

S. N.	Scientific Name	Common Name	IUCN	CITES
1.	<i>Melia azedarach</i>	Bakaino	LC	
2.	<i>Mangifera indica</i>	Mango	LC	
3.	<i>Litchi chinensis</i>	Litchi		
4.	<i>Dalbergia sissoo</i>	Sisau	LC	II
5.	<i>Bombax ceiba</i>	Simal	LC	

Source: Field Visit 2025

3.8.5.3 Fauna

There is no forest near the project site. Some fauna found near the project according to the locals are given in the table below.

Table 3-27: Major Fauna around the project zone

S.N.	Scientific Name	Common/local name	GoN	IUCN	CITES
Birds					
1	<i>Passeridae</i>	Sparrow/bhagera			
2	<i>Grus Antigone</i>	Sarus Crane/Sarus	P	VU	II
3	<i>Gyps tenuirostris</i>	Slender billed vulture/Giddha		CE	II
4	<i>Aquila nipalensis</i>	Steppe eagle/chil		EN	II
5	<i>Corvus splendens</i>	House crow/Kag		LC	
6	<i>Gracula religiosa</i>	Common hill myna/Rupi		LC	II
7	<i>Spilopelia chinensis</i>	Spotted Dove/dhukur		LC	
8	<i>Psittacula krameri</i>	Rose ringed Parakeet/Suga		LC	
Amphibian					
9	<i>Channa sp</i>	Frog/Bhyaguto			
Reptiles					
10	<i>Python bivittatus</i>	Burmese Python/Ajingar		VU	II
11	<i>Xenochrophis piscator</i>	Checkered Keelback/Pani saap		LC	III
12	<i>Naja naja</i>	Spectacled cobra/Goman		LC	II
13	<i>Ptyas mucosa</i>	Oriental Tat Sanke/Dhamel		LC	
Mammals					
14	<i>Boselaphus tragocamelus</i>	Blue bull/Nilgai		LC	III
15	<i>Sus scrofa</i>	Wild Boar/Badel		LC	
16	<i>Herpestes</i>	Mongoose/Nyaurimusa		LC	III
17	<i>Canis sp</i>	Jackal/Syal		LC	

Note: IUCN Threat Category: T: Threatened, E: Endangered, R: Rare, V: Vulnerable, LR/LC: Lower Risk/least concern; CITES Category: Appendix I, II, III (Classified according to the threat due to trade); Government of Nepal (GoN) Protection Category: P: Protected.

3.8.5.4 Key Biodiversity Areas (KBA)

As per the Integrated Biodiversity Assessment Tool (IBAT) screening⁵, there is one protected area and eight key biodiversity areas (KBAs) with more than 50 km only.

Area name

- Dang Deukhuri foothill forests and west Rapti wetlands
- Chitwan National Park
- Gairdha Tal
- Jagdishpur Reservoir
- Nawalparasi forests
- Rampur V alley
- Shivapur Forest
- Sohagibarwa Wildlife Sanctuary
- Valmiki Tiger Reserve and Saraiyaman Lake

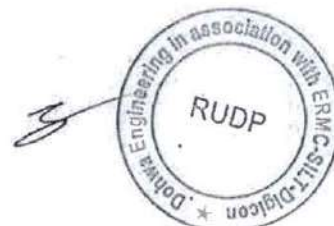
3.8.6 Social environment

The information on the socio- economic data of the municipality, ward and project area were collected through various methods. Available literature in the form of reports: NPHC reports and publications from municipality were collected and reviewed to generate the baseline environmental database of the project area. Published and unpublished reports were reviewed for the reference. Direct field observation, questionnaire and checklist preparation, Focus Group Discussion (FGD)/ stakeholder's discussion, Key Informant Interview (KII), and community consultation meeting were done to obtain the required data and information on socio-economic and cultural baseline of the project area. Moreover, feasibility reports and Due Diligence Report (DDR) were also reviewed. Further detailed information about the method is explained in the ToR.

Approach taken for information from the Project affected Households (HHs)

HHs located within 150 meters of the project area are expected to be directly affected by various project activities during implementation. To assess the baseline conditions, a household survey was conducted. A structured questionnaire was used for data collection, and the list of respondents is provided in the annex.

⁵ Final IEE of Nepal: Urban Resilience and Livability Improvement Project, 2024, Project No: 55346-



The objective of the survey was to generate baseline information that can be used as a reference point to compare and identify the project impacts, provide evidence-based management plans, and determine project effectiveness, efficiency and relevance. Convenience sampling (Non probability sampling method) was used to find sample. As a result, the total of 17 HHs were used.

Demography

The total population of Lumbini Sanskritik municipality is 87,383 as per the census of 2021 A.D. (NPHC, 2021). The population details of the ward 10 are presented in the **Table 3-28**.

Table 3-28 Total population of Lumbini Sanskritik municipality- ward no. 10

Year	Population		
	Total	Male	Female
2021	8,356	4,244	4,112

Source: NPHC, 2021

The census of 2021 shows near balance sex ratio, with a slight male predominance. The male population exceeds female population by just 132 individuals.

3.8.5.1 Ethnicity, Religion and Language

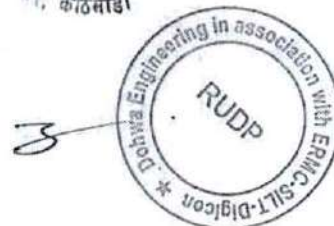
The population of the DIA comprises of majority Dalit HHs (41.17%), followed by Khas-Arya (23.53%) and Madheshi groups (23.53%), with smaller representation from Indigenous communities (5.88%).

Table 3-29: Division of population in the DIA according to the caste

Categories	Caste	Percentage	Total categories
Khas-Arya	Chhetri	23.53	23.53
Indigenous communities	Gurung	5.88	5.88
Dalit	Chamar/Harijan/Ram	11.76	41.17
	Dhobi	11.76	
	Bishwokarma	17.65	
Madheshi group	Yadav	17.65	23.53
	Hajam	5.88	
Others		5.88	5.88

Source: Field Study, 2025

The dominance of Dalit population, which is traditionally considered a socially and economically marginalized group, indicates a need for targeted inclusion measures such as equitable access to employment opportunities, fair wage practices, non-discriminatory working conditions, and priority in skill development and livelihood support. Similarly, there is potential social risks including exclusion of vulnerable groups from project benefits, conflict or tension if benefits are perceived as unequal, and elite capture.



Mother tongue	Percentage (%)	Language Family	Branch
Nepali	52.94		
Awadhi	23.53		
Bhojpuri	23.53		

Source: Field study, 2025

3.8.6.2 Economic status

The HH survey occupational profile indicates that agriculture (35.29%) is the dominant livelihood, followed by wage labor (29.41%), business (17.65%), service sector (11.76%), and a smaller proportion of HHs engaged in foreign employment (5.88%). The data reflects a diversified but economically vulnerable community, where agriculture and wage labor dominate, and more stable or higher-income opportunities remain limited.

Table 3-30: Economic status in directly impacted HHs

Main Occupation	Percentage (%)
Service	11.76
Agriculture	35.29
Wage workers	29.41
Foreign employment	5.88
Business	17.65

Source: Field Study, 2025

The high dependence on agriculture suggests that a significant portion of the population relies on land and natural resources for their livelihood.

3.8.6.3 Migration

The field study shows that migrated HH (52.94 %) slightly exceeds native born HHs, indicating transitional community with some economic opportunities.

Status	Percentage
Native-born household	47.06
Migrated household	52.94

Source: Field Study, 2025

3.8.6.4 Water resources and water supply system

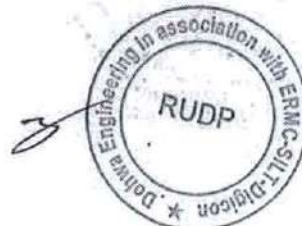
The data indicates that most HHs rely on pipeline water supply (94.12%), while a small proportion depends on handpumps (5.88%). It shows that the nearby communities

Table 3-31: Source of Drinking water in DIA HHs

Type	Percentage (%)
Pipeline	94.12
Handpump	5.88

Source: Field Study, 2025

The data indicates centralized water distribution system and good access of drinking water. So, the project activities should be carried out with caution to prevent damage in existing pipelines, interrupt water supply, and also must not create strain on water resources used by local.



3.8.6.5 Waste disposal and management facilities

Kerbside waste collection is in practice. All collected waste is transported to Ward 4, where it is sorted, reprocessed, and recycled. But, the municipality lacks a landfill, but has a reprocessing and recycling center. (Field Survey, 2025)



Figure 3-12 Solid Waste Management Processing

The frequency of municipal waste collection signals capacity constraints in the local waste management system. The additional waste generated during construction and operation phase may overburden the existing system, and lead to temporary accumulation of waste if not properly managed.

3.8.6.6 Accessibility to the Project Area

The primary road network consists of the Hulaki (Lumbini) Highway, which runs east–west and connects the area to Bhairahawa and Kapilvastu. The proposed bus terminal at Jhulanipur, which is situated approximately 2.25 km from the highway. An existing access road leads to the site, currently 5 meters wide, with a total right-of-way (ROW) of 18 meters.

Table 3-32: Accessibility options in directly impacted HHs

Accessibility Options	Percentage (%)
Bicycle	70.59
Motorbike/scooter	82.35
Car/Jeep/Van	11.76

Motorbikes and scooters are the most used and owned transportation assets, with 82.35% usage, followed by bicycles at 70.59%, while only 11.76% of HHs own cars, jeeps, or vans that indicatesome individuals own more than one mode of transportation.

Ownership of motorbikes and bicycles indicates that HHs have some disposable income and mobility capacity, but the low ownership of cars/jeeps suggests limited wealth accumulation. This points to a lower-middle or middle-income community.

3.8.6.7 Access to Information

Smartphones are the most widely used technology (94.12%), followed by television (70.59%) and Wi-Fi access (64.71%), while radio usage is relatively low (11.76%), which indicatessome HHs own more than one ICT technologies.

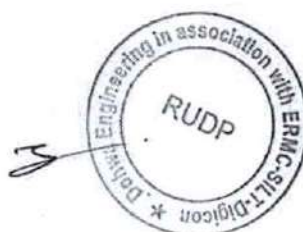


Table 3-33: Access to information in directly impacted HHs

Source of Information	Percentage (%)
Television	70.59
Radio	11.76
Smart phone	94.12
Wi fi	64.71

Source: Field Study, 2025

3.8.7 Cooking fuels

The data shows that LPG (88.24 %) is used by majority of HHs, followed by firewood (47.06 %), while cow dung (29.41 %) is the least used cooking fuel with some HHs depending on more than one fuel source. This signals significant dependency on fuelwood.

Table 3-34: Cooking fuels in directly impacted HHs

Cooking fuels	Percentage (%)
LPG	88.24
Firewood	47.06
Cow Dunk	29.41

The project must be constructed and operated without putting significant strain on the locals for any of such resources.

3.8.8 Electricity Options

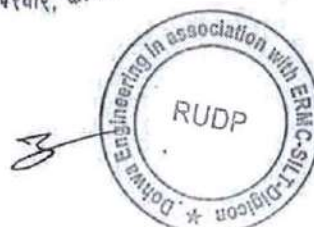
All HHs have access to electricity through the national grid signifying a reliable power supply for the proposed bus terminal.

3.8.9 Bank Accounts/Loans

A majority of HHs (82.35%) have bank accounts while 58.82 % have taken loans from various sources (Table 3-35); which suggests a financially connected but economically fragile population, dependence on credit due to unstable income sources (e.g., agriculture, wage labor), limited savings capacity.

Table 3-35: Bank account and loans of DIA

Bank status	Account	Percentage (%)	Loans/debt status	Percentage (%)
Yes		82.35	Yes	58.82
No		17.65	No	41.18

3.9 Other Information

3.9.1 Institutional Arrangement and Roles

3.9.1.1 Institutional Arrangement

The Ministry of Urban Development (MOUD), through the Project Coordination Office (PCO) established in the Department of Urban Development and Building Construction (DUDBC) which will be the executing agency, and will be responsible for liaising with the project municipalities. DUDBC will be supported by the Project Management and Capacity Development Consultant (PMCDC). PCO is headed by the Project Director, who is supported by Deputy Project Director who is the focal points for the WUC cluster.

The project municipality will be the implementing agency. The municipality will have its own Project Implementation Unit (PIU). A regional level Western Urban Corridor Project Coordination office (WUC-PCO) will also be established, headed by a Deputy Project Director (WUC-PCO) and will be responsible for coordination with DUDBC PCO, consultants and the WUC PIU. The Project Implementation Unit (PIU) at the municipal level, will be responsible for the day-to-day coordination and supervision of project implementation. The PIU is headed by the Project Director of the PCO.

*A Supervision Consultant (SC) will be kept to ensure the highest standards of quality, safety, and compliance with project specifications during the execution of the project.

3.9.1.2 Role and Responsibilities

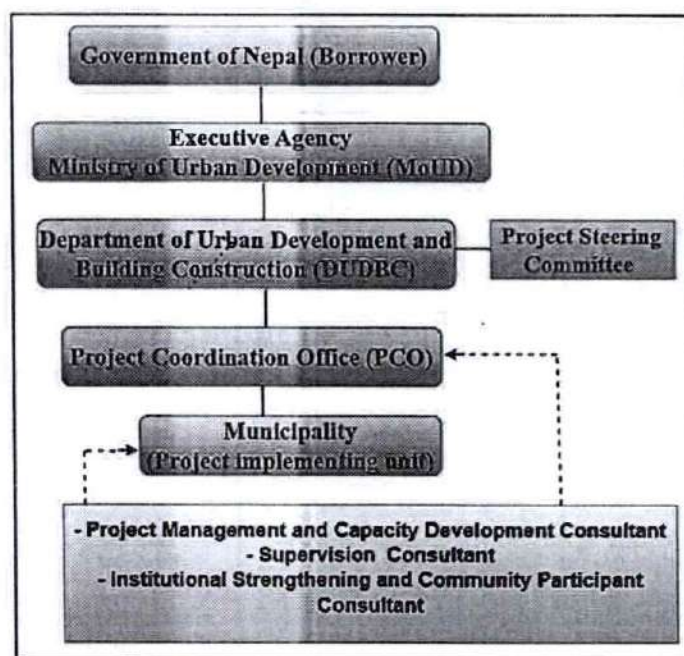
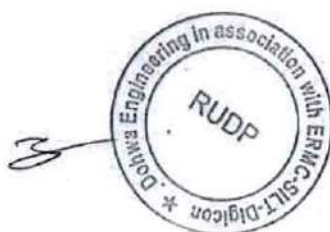


Figure 3-13: Organogram for the project implementation

The PCO will be responsible for the overall management of the project. The municipalities will be the implementing units of the project. The PIU with the support of the SC will be



responsible for social safeguards compliance, monitoring, and reporting to ADB. The SC will be responsible in managing the various construction activities, from the initial phases to project completion.

PMCDC will support capacity building for safeguards and safeguards compliance in accordance to ADB procedures. To handle all environmental safeguards-related responsibilities and support the PCO safeguards team in overseeing the implementation of the safeguards framework and safeguards planning documents, PMCDC will designate an environmental safeguards specialist. The environmental safeguards specialist will supervise the PCO's safeguards officers and work in coordination with the SC's Environmental Safeguards Specialist (PIU-support) to complete all responsibilities pertaining to social safeguards.

3.9.2 Review of Legislation

Constitution of Nepal, 2072

Article 30 (Right regarding clean environment) states that the state will make appropriate arrangements to keep the environment clean. The State will give priority to the prevention of adverse impacts in the environment from physical development activities, by increasing the awareness of the general public about environmental cleanliness, as well as to the protection of the environment.

- **Article 30(1)** bestows right to every citizen to live in a clean and green environment.
- **Article 30(2)** further grants right to compensation to the victim of environmental pollution and degradation, the responsibility of which should be borne by the polluter.

Plans, Policies and Strategies

Plans, Policies and Strategies	Clause, Sub-section and section
Sixteenth Five-year Plan (2080/81-2085/86), Nepal	• The 16th 5-year plan conceptualizes environment and biodiversity protection, disaster risk management and sustainable development as one of its twelve sectoral structural transformation strategies. • Internalizing, mainstreaming and localizing gender equality and empowerment, social justice and inclusion: In order to implement the idea of "leaving no one behind" of the Sustainable Development Goals, all levels and thematic areas of the state shall include women, children, senior citizens, individuals with disabilities, gender and sexual minorities, etc. • Further the plan envisages building sustainable and environmentally friendly infrastructure, Climate resilience and inclusive development, controlling pollution for a healthy society. • Sustainable forest management for environmental services and green development, conserving biodiversity for ecosystems, policy reform and expansion of institutional capacity.
National Urban Policy, 2081/82	Clause 1.3: To develop the country's major cities, including provincial capitals, as major economic centers. Clause 1.4: To identify, preserve, revive and develop diverse original urban and settlement forms. Clause 2.2: Upgrade and expand urban infrastructure in an integrated manner.

	Clause 2.4: Manage and maintain urban infrastructure assets. Clause 4.4: Make urban planning and infrastructure governance inclusive.
National Environment Policy, 2076	Main Goal: Pollution control, solid waste management and greenery promotion in order to ensure right of people to live in a clean and healthy environment.
National Climate Change Policy, 2076	Main Goal: To achieve socio-economic prosperity through a climate-resilient society that is achievable through adoption of low emission development, mitigation of emissions, adoption of suitable adaptation measures, national and international financial resources reach and their effective mobilization, mainstreaming climate change into development planning and various sectors, effective technology development, investments in R&D and service delivery related to climate change.
Land Use Policy, 2015 (2072)	Guides the responsible use and management of land and its resources.
Solid Waste Management National Policy, 2079	Clause 9.2.4. Waste disposal in river systems, lakes, wetlands, wildlife habitats, religious sites, heritage sites, protected areas, etc. and other public places will be completely prohibited by determining the standards for waste disposal sites. Clause 9.3.4. Maintain the cleanliness of rivers, lakes and wetlands. The mixing and disposal of polluted water, sewage and waste into rivers, lakes and wetlands will be controlled. Clause 9.3.5. The "polluter pays" principle will be adopted by arranging service fees according to the nature and quantity of waste.

Acts

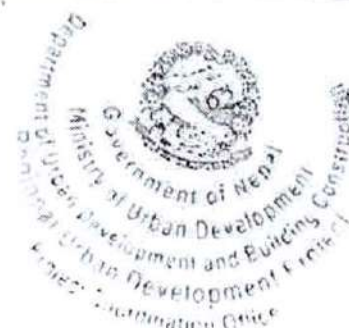
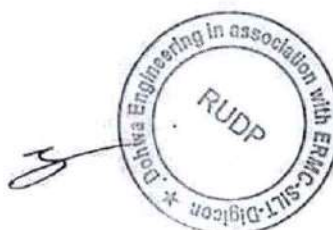
Acts	Clause, Section or sub-section
Environment Protection Act, 2076.	Section 3 of the Act necessitates the preparation of environmental study report for a proposal related to development work or physical activity that may alter the existing environmental conditions. As per the Section 4 of the act, the proponent must analyze various options that may be adopted to mitigate the adverse effects of the proposal in the environmental study report and must also recommend alternatives to the proposal. Section 5 of the act mentions that before preparing the environmental study report of any proposal, the concerned body shall approve the ToR in case of Initial Environment Examination (IEE). The report shall be prepared within the prescribed format to maintain the standards and quality of GoN as per the Section 6 . Section 7 and 8 of the act clearly mentions that prior to implementation of the proposal, the environmental study report needs to be approved and in no way can be implemented unless approved. Before implementing the proposal, the proponent must prepare environment management plan as prescribed as mentioned in Section 10 of the act.
Local Government Operation Act, 2074	Section 11(2) of the act elucidates on function, duties and rights of municipality. The clause " Ka (2) Cha " under the Section 11(2) entrusts the municipal police with responsibility for protection and safeguard of public unregistered and vacant land, public buildings, heritage and physical infrastructures. Clause " Pa " of the same section and sub-section also vests power to municipality for protection of watershed, wildlife, mines and minerals.
Soil and Watershed Conservation Act, 2039 (1982)	Section 17 prohibits the destruction, damage, deformation or alteration of the activities carried out in conserved watershed area by the conservation officer under Section 4 .
The Act Relating to Rights of Individuals with Disabilities, 2074	According to the Section 7 , the individuals with disabilities shall have the right to enjoy the rights granted under the prevailing law on an equal basis with others. According to the Section 15.1 , the individuals with disabilities shall have the right to have easy access to other services and facilities that are open or provided for the public.
Labor Act, 2074	Section 28 of the act mentions that the employer shall not employ workers for more than 8 hours per day and 48 hours in a week. workers should be given 30 minutes' rest after 5 consecutive hours of work and if the work cannot be stopped and the work should be continued, rest periods should be given alternatively to the workers.



Acts	Clause, Section or sub-section
	Section 68 and Section 69 of the Act attaches importance to safety and health of workers and other individuals at the workplace.
Building Act, 2055	The government of Nepal shall form a Building Construction Management Upgrading (Consolidation) Committee for consolidation of building construction works. DUDBC shall act as the secretariat of the committee. It's major functions, duties and powers (specifically for the project) shall be as follows: Section 4(d) To inquire into whether approval of designs has been made in consonance with the standards set forth in the building code. Section 4(e) To make recommendation to the Nepal Quality Assurance Council to determine the quality of native or foreign materials related with building construction. Section 4(g) To give information through various means to the general public about the utility of the building code.
Town Development Act, 2045	According to the Section 4.1, The Government of Nepal may form Town Development Committee in any area, city rural area, town area or regional development center as per necessity. The committee may regulate, control or prohibit different activities and no one shall without the prior-approval of the committee, perform or cause to perform those activities. Those activities (related to the project) include: 9.1.1 To enjoy and use natural heritage, flora forest, fauna, etc. 9.1.4 To do any act and activity which causes adverse effect on natural beauty, tourism site and public health or which causes environmental pollution.
Ancient Monument Preservation Act, 2013	- The act mentions any ancient monuments and artistic objects of hundred years old shall be regarded archeologically important objects and Department of Archaeology (DoA) shall preserve such objects. - works as such excavation, laying of water, sewer lines, repairing road etc., in the monument protection / conservation zone, require prior permission of Department of Archaeology. Application in the prescribed format need to be submitted to DOA.
Solid Waste Management Act 2068(2011)	Section 4(2) of the act makes the local body responsible for managing wastes except the responsibility is on the person or organization for processing and management of hazardous waste, health institution waste, chemical waste, industrial waste. Section 5(1) propounds to waste minimization while carrying out any work by a person, institution and agency Section 5(2) puts the responsibility on a person or organization for managing the disposal and re-use (when possible) of wastes so that less amount ends up in a landfill or dumping site.
Child Labor (Prohibition and Regulation) Act, 2056	The Section 3 of the Act explicitly prohibits a child, who has not reached the age of 14, to work as a laborer and prohibits any child as defined by the act to engage in factories, mines or similar risky activities, which are listed out in Schedule 1 of the act. Section 4 of the act further forbids to engage a child in labor work without their consent. Section 9 of the Act does not permit a child to engage in work from 6 pm to 6 am, work for more than 6 hours in a day and more than 36 hours in a week whether or not additional remuneration is provided. The health and safety of the child must be ensured by the enterprise engaging a child in their work. If an enterprise does not abide by the act, it is liable to punishments as given in Section 19 of the Act.
Local Self Governance Act, 1999	•This Act gives Local Government the functions, duties and power to, among others; (i) conserve and protect their local environment and natural resources; (ii) plan, implement and / or operate and maintain local water supply projects; (iii) implement and / or arrange for implementation local sanitation / sewerage and drainage projects; (iv) protect cultural heritage and religious sites and / or (v) monitor project activities within their jurisdictions.
Tourism Act, 2035	•This Act facilitates to increase tourist arrival in the country and encourages tourists and their handling agents in Nepal to minimize environmental impact during their visit. The Act also shows serious concerns about visitors' health, facilities and welfare and empowers the Government to generate tourism revenue and establish plough-back mechanism for tourism infrastructure development.

Rules and Regulations

Rules and Regulations	Clause, sections and sub-sections
Environment Protection Regulation 2077	Rule 3(1): The proponent shall carry out a IEE in case of proposals mentioned in Schedule 2. The proponent should prepare a ToR first before preparing IEE report in the format given in Schedule 7 as per the Clause "Kha" under Rule 5(2). As per the Rule 5 (5), upon the receipt of the ToR, the concerned ministry if after the necessary examination finds the ToR appropriate or if necessitates revision of the report, should approve the report within 15 days from the date of ToR submission. As per the Rule 6(1), 6(2) and 6(3), the proponent must conduct public hearing about the proposal in areas that will be affected by the implementation of the project to gather opinions and suggestions from project affected people, representative from Community Forest User Groups (CFUGs) and local representatives in more than one location depending on the geographical area covered by the project. The proponent should make use of local newspaper, radio or other means of communication to publicize about the date, time and location of public hearing and also for the purpose of dissemination of project information and additionally should paste such notice in respective ward office and any public place within the project area and attach the list of participants, suggestions from hearing, pictures and audio-video materials in the IEE report as per Rule 6(4) and 6(5). As per the Rule 7(1), the proponent should prepare IEE report based on the approved ToR report and the suggestions received from the public hearing. The proponent should ask for written suggestions from the local level where the proposal will be implemented and from the concerned bodies, individuals or organizations in that area regarding the impact that the implementation of the proposal may have on the environment within 7 days for which a Muchulka should be prepared by pasting a notice in the office, educational institution, health institution and any public place in that area in the format given in Schedule-9 as per Rule 7(2). The IEE report should be prepared as per the format given in Schedule-11 of the EPR, 2077 as per Rule 7(5). The proponent should submit the IEE report to the relevant ministry of GoN for final approval as per the Rule 8(1).
Labor Rules, 2075	According to Rule 16(1), the employer is entitled to set their own working hours depending on the nature of work at the enterprise and should relay the information to labors. The employer can determine the time in such a way that workers can be employed on a rotational basis conditional on nature of work at the establishment. Rule 17 provides additional resting time of 30 minutes that can be utilized at once or several times, which is in addition to the time mentioned in Section 28 (2) of the Labor Act, to (a) Women worker requiring time to breastfeed and attend to their child under three years of age and (b) pregnant women worker.
Solid Waste Management Rules, 2070 (2013)	This regulation has emphasized the segregation of waste at source, and mentioned that the responsibility of proper disposal, and management of source belongs to the producers themselves. Rule 3 describes the segregation, and management of solid waste. It has been mentioned that it is essential to segregate degradable, and non-degradable solid waste at the source. Rule 7 sets out the conditions for the local body regarding the transportation of waste.
Soil and Watershed Conservation Regulations, 2042	Pursuant to Rule 10(1) natural calamity clause (a), (b), (c), (d), (e), (f), (g) of section 10 of the Act and (h) if anyone has to do the work mentioned in the reason to do so. An application has to be submitted to the Watershed Conservation Officer in the format of open schedule 4 (2) After receiving the application as per sub-rule (1), the watershed protection officer in case of any action contrary to the purpose of the Act, in the format of Schedule 5 as per schedule. will allow.

Guidelines and National Standards

Guidelines and National Standards	Clause, sections and sub-sections
National EIA Guidelines, 1993 (2050)	To assess a project's environmental impacts, maintain a balance between environment and development, find strategies to reduce negative effects of projects, integrate environmental concerns into project planning processes, and provide decision makers with information for project approval and implementation. This guideline shall be used from the course of a pre-feasibility study, feasibility study, before undertaking Environmental Impact Assessments, while reviewing EIA reports, decision making project cycles, in the course of environmental monitoring and even at the post auditing stage and it consists of brief chapters of all the required steps for the assessment such as: i. Project Screening ii. Scoping for EIA iii. Preparation of Terms of Reference iv. Environmental Impact Assessment Report v. Identification of Environmental Impacts vi. Impact Mitigation Measures vii. EIA report review criteria viii. Environmental Impact Monitoring ix. Environmental Impact Auditing x. Public Involvement
National Drinking Water Quality Standard, 2079	The Government of Nepal, using the authority given by Section 18(1) of the Water Resources Act, 2049, has prescribed the quality of drinking water. (Table below)
National Ambient Air Quality Standard, 2069	The National Ambient Air Quality Standard 2012 was fixed for pollutants along with information on averaging time of data and the respective testing methods (Table below)
National Standard for Sound Quality, 2069	Using the authority given by Rule 15 of EPR, 2054 B.S. of GoN, the national standard for sound quality was fixed in the year 2069 B.S. (Table below)
Gender and Social Inclusion Action Plan for Climate Change Policy, 2077-2087	Strategy 5.2.1: Ensure women's participation and leadership in decision-making processes at all levels of forest, biodiversity and watershed conservation and management. Strategy 5.8.1: Reduce the risks and vulnerabilities of women involved in the ecotourism industry.
Gender Equity and Social Inclusion (GESI) Operational Guideline, 2017	Ensure the implementation and monitoring of GESI Operational Guidelines at the project level. Chapter III of the guideline outlines the steps to be followed in the process of project identification, need assessment, project preparation, project appraisal, project implementation and benefit monitoring and evaluation arrangements. All these steps must mainstream GESI.

National Drinking Water Quality Standards, 2079 B.S.

S.N.	Parameters	Unit	Maximum Concentration Limit	Remarks
Physical Parameters				
1.	Turbidity	NTU	5	NHBGV
2.	PH		6.5-8.5	NHBGV
3.	Color	TCU	5	NHBGV
4.	Taste and Odor		Subjective	NHBGV
5.	Electrical Conductivity	µS/cm	1500	NHBGV
Chemical Parameters				
6.	Iron	mg/L	0.30 (3)	NHBGV
7.	Manganese	mg/L	0.20	NHBGV
8.	Arsenic	mg/L	0.05	HBGV
9.	Fluoride	mg/L	0.50- 1.50	HBGV
10.	Ammonia	mg/L	1.50	NHBGV

S.N.	Parameters	Unit	Maximum Concentration Limit	Remarks
11.	Chloride	mg/L	250	NHBGV
12.	Sulphate	mg/L	250	NHBGV
13.	Nitrate	mg/L	50	HBGV
14.	Copper	mg/L	1	NHBGV
15.	Zinc	mg/L	3	NHBGV
16.	Aluminum	mg/L	0.20	NHBGV
17.	Total hardness	mg/L	500	NHBGV
18.	Residual Chloride	mg/L	0.10-0.50	HBGV
Microbiological Parameters				
19.	E.Coli	CFU/100 ml	0	HBGV

Additional parameters to be tested based on risk and relevancy:

S.N.	Parameters	Unit	Maximum Concentration Limit	Remarks
Physical Parameters				
1)	Total Dissolved Solids	mg/L	1000	NHBGV
Chemical Parameters				
2)	Calcium	mg/L	200	NHBGV
3)	Lead	mg/L	0.01	HBGV
4)	Cadmium	mg/L	0.003	HBGV
5)	Chromium	mg/L	0.05	HBGV
6)	Cyanide	mg/L	0.07	HBGV
7)	Mercury	mg/L	0.001	HBGV
8)	Cyanides	mg/L	3	HBGV
Microbiological Parameters				
9)	Total Coliform	CFU/100 ml	0 (In 95% of sample)	HBGV

Note: HBGV- Health Based Guideline Value

NHBGV- Non- Health Based Guideline Value

National Standard for Sound Quality, 2069

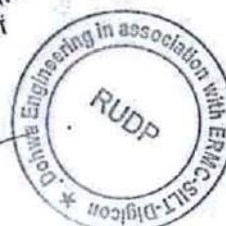
Sector/ Area	Noise Limit L_{eq} (Decibel)	
	Day	Night
Industrial Sector	75	70
Commercial Area	65	55
Rural Residential Area	45	40
Urban Residential Area	55	50
Mixed Residential Area	63	55
Tranquil Area	50	40

Maximum Noise Emission Limit of Household Appliances

S.N.	Appliance	Maximum Limit (Decibel)
1.	Water Pump	65
2.	Diesel Generator	90
3.	Equipment for Entertainment	70

Safeguard Policy Statement (SPS), 2009

ADB Policies

नेपाल सरकार
प्रवाह विकास मन्त्रालय
सिंहदरबार, काठमाडौं

ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. ADB environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts.

A project is classified based on the most environmentally sensitive component, and assigned with one of the four environmental categories (A, B, C, or FI) defined in the SPS.

- **Category B:** Project with potential adverse environmental impacts that are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination (IEE), including an EMP, is required.

International Treaty, Conventions, Guidelines and Agreements

International Treaty, Conventions, Guidelines and Agreements	Goals, objectives, clauses etc.
World Heritage Convention, 1978	Parties to ensure the protection and conservation of the cultural and natural heritage situated on territory of, and primarily belonging to the State. World Heritage sites are identified as per this convention. The project components will not impact physical cultural resources and natural heritage during project implementation and operation.
ILO Convention No. 190	Right to work without violence and harassment and address the issue of violence and harassment occurring in the context of work, spanning various scenarios such as within the workplace itself, including public and private work-related spaces.

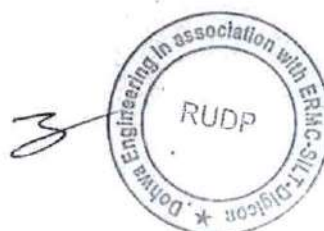
3.9.3 Public Consultation

Public Consultation was done as per the provision of EPA 2019 and EPR 2020 while also guide by the principles of public consultation in the ADB's Environmental Assessment Guideline, 2003:

:

1. Information Dissemination
2. Information Solicitation
3. Integration
4. Coordination
5. Engaging People in Dialogue

A stakeholders mapping was done to identify different stakeholders which has been presented in Annex 4. The stakeholders were informed and involved in the public consultation, public hearing, meetings, interactions and discussions. Public consultation minutes after the ToR phase is included in Annex 5. A notice was published in a local newspaper and on the proponent's website providing a 7-day notice for a public hearing as required by Rule 6 of



EPR, 2077. It is presented in Annex 6.1. The public hearing minutes are presented in Annex 6.5.

The public hearing program was conducted as per the EPR, 2020 after the preparation of draft IEE report. Locals were informed about the public hearing program via notice publication in Butwal Today on 19/10/2025 AD (BS 2082/07/02). The notices about public hearing were affixed in the premises of local schools and public places to inform the locals. Different stakeholders including the municipalities, Division Forest Offices were formally requested with official letters, the copies of which are provided in Annex 8. The Public hearing program was held at Lumbini Sanskritik Municipality-03 on 01/11/2025 AD (BS 2082/07/15).

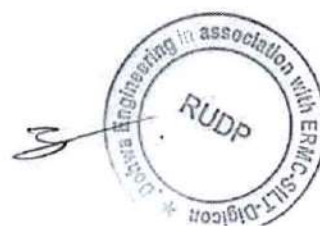
25 individuals actively participated in the public hearing. All the participants were from Lumbini sanskritik Municipality.

3.9.4 Summary of issues raised by the locals during public hearing and consultation

The issues raised by the locals during public hearing is listed below. The deed of inquiry is included in Annex 6.5.

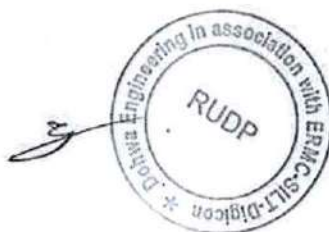
Table 3-36: Issues raised during public hearing

S.N.	Issues raised	Incorporation in the IEE report	Response/ Remarks
1.	The area occupied by buildings need to be reduced.		The terminal building size has been calculated to meet the projected demand. Lumbini Municipality is a home of Buddha, and the new bus terminal is designed to function as a gateway to the city, with a size that accommodates anticipated visitor traffic and conveys a welcoming image to visitors. Traffic flow calculation is included in the section 4.4 of Detailed Engineering Design report (Volume 1: MAIN REPORT).
2.	The capacity of the parking seems less compared with the investment.		The terminal has been designed as intercity bus terminal in a limited land area as provided by the municipality. Hence, all the required facilities are accommodated in the design.
3.	The management buildings, solar panel, rest house and other infrastructure areas should be decreased, and the parking capacity of the bus		Traffic flow calculation is included in the section 4.4 of Detailed Engineering Design report (Volume 1: MAIN REPORT).



S.N.	Issues raised	Incorporation in the IEE report	Response/ Remarks
	terminal should be increased. 75% should be entirely for parking alone.		
4.			The proposed drainage system appropriately combines underground stormwater drainage with an open canal to ensure effective and safe water management for the bus terminal. As shown in the storm drainage plan (section 5.3 of Detailed Engineering Design report (Volume 1: MAIN REPORT), stormwater generated within the site is collected through gutters, pipes, and manholes and conveyed via an underground pipe network designed in accordance with IRC: SP: 50 (2014), adopting a 5-year return period suitable for urban road infrastructure. Given the relatively small and self-contained catchment area of the terminal, with no external inflow from surrounding lands, underground drainage is sufficient and efficient for managing on-site runoff. At the same time, the canal along the site boundary is intentionally kept as an open channel, allowing uninterrupted conveyance of larger and variable flows, easy inspection, desilting, and safe passage during monsoon conditions. This approach avoids blocking the natural flow path of canal water, reduces flood risk, and simplifies long-term operation and maintenance, making it a technically sound and context-appropriate solution for the bus terminal.

S.N.	Issues raised	Incorporation in the IEE report	Response/ Remarks
5.	A small road should be constructed on the northern side of the project.		Road construction is constrained by available land, irrespective of road width. The terminal is accessible from road in the southern side. Extra road will not add value to the project.
6.	The boundary wall should not be erected. If done, it hinders the trade and economic development of local people.		Boundary wall is necessary for the security purpose and to reduce the risk of encroachment by the local vendors.
7.	The design should be restructured in such a way that it increases the parking capacity of the bus terminal. For e.g.: Solar panels should be at the roof.		Already addressed in point number 3. In addition, for solar panels; from a performance standpoint, ground-mounted panels in the Terai climate perform more reliably. High ambient temperatures in Lumbini Sanskritik Municipality reduce photovoltaic efficiency, and roof-mounted systems tend to trap heat, further lowering output. Ground-mounted panels can be optimally tilted, ventilated, and oriented for maximum solar gain and easier cleaning, an important factor in the dusty Terai environment, resulting in better long-term energy yield and lower maintenance costs. Safety and maintenance considerations also favor the current layout. Roof-integrated systems increase risks related to leakage, fire safety, electrical faults, and maintenance access in a public building with heavy footfall. The separate solar zone isolates these risks, allows safe access for technicians, and avoids disruptions to terminal operations.
8.	There should be a statue on top of the clock tower preferably that of Gautam Buddha.		Addressed in the design.



S.N.	Issues raised	Incorporation in the IEE report	Response/ Remarks
9.	The existing road to the project site should be improved.		The existing road is a part of URLIP, and the construction contract for upgrading the road has already been floated by the municipality separately.
10.	The local should be given priority for employment.	Section 4.1.1 as well as the EMP of the IEE	Locals will be prioritized for the project as addressed in Section 1.4(page no. 3) of the Detailed Project Report as well as in.
11.	80% of the space should be allocated to the local bus park while 20% area should be allocated to VIP bus park.		The terminal building size has been calculated to meet the projected demand. The new bus terminal is designed to function as a gateway to the city, with a size that accommodates anticipated visitor traffic and conveys a welcoming image to visitors.
12.	The administrative building should be multi-storied and should be outside of the boundary.		The administrative office is located within the terminal building to facilitate efficient terminal operations.
13.	In the future, the municipal level bus should be operated from this place.		The terminal is designed for intercity buses.

3.9.5 Key Informant Interview (KII) with the relevant stakeholders

KII was conducted with relevant stakeholders as provided in table below.

Table 3-37: KII consultation

Name	Date	Location	Designation	Purpose of KII	Key Findings
Kailash Jaiswal	June 6, 2025	Lumbini Sanskritik Municipality office	Local Bird Enthusiast	The KII was done to find out whether the project site receives any seasonal migratory birds or is home to any kind of vulnerable and endangered bird species.	There are no nests of any birds in the project site of the Bus terminal. Normally, birds' nests and eggs are overlooked while using the water for irrigation from the nearby river. A certain portion of project land should be designated for birds while constructing where they can use it for nesting, bathing and other activities.

4 IMPACTS DUE TO IMPLEMENTATION OF THE PROJECT

Any project will have both beneficial and adverse impacts. In this chapter the impacts have been discussed by categorizing them as into Socio-economic and Cultural, Biological and Physical environment for both construction and operation phases as prescribed by EPR 2020 (Schedule 11). Generally, adverse impacts are pre-dominating in the construction phase due to implementation of various project activities and beneficial impacts come into play predominantly during the operation phase. All the major beneficial and adverse impacts as well as direct and indirect impacts have been assessed and presented. Nature, magnitude, extent and duration of impacts have been identified using appropriate symbols and scores as mentioned in the National Environmental Impact Assessment Guideline (NEIAG), 1993.

4.1 Beneficial Impacts

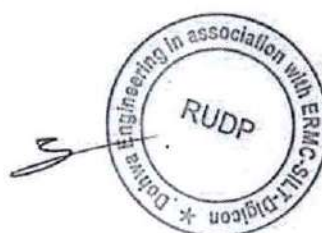
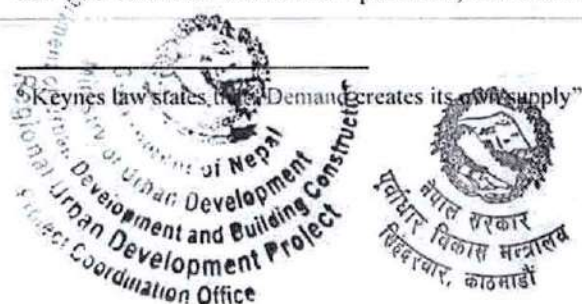
4.1.1 Social Environment

4.1.1.1 Skill enhancement, Employment, and income generation

Construction Phase: The project will generate employment opportunities for 13 skilled/semi skilled workers and 30 unskilled workers per day. Locals will be prioritized for the work, so the project will increase employment opportunities to locals and support income generation. This experience that they gain by working in the project will enhance their skills particularly in construction of buildings, canal and landscaping, which they can use as the means of supporting their livelihood by using it in the similar project in the future. Work responsibilities to the unskilled includes collection and sieving gravel, collection of rubble, collection and sieving sand, quarry output and transportation of water by manpower including loading, hauling, unloading and stacking (DPR, 2025). Additionally, the demand for construction materials for the project as mentioned in Table 3-8 will be sourced from the ZoI as possible. During construction, the business of existing nearby Mahilwar bazaar may increase as the demand for vegetables, rice, pulses, oil, packed foods and spices may increase as 30 daily consumers (unskilled workers) increases. This will increase the income of the local vendors, and shopkeepers.

The impacts are direct, low, site-specific and short term.

Operation Phase: The operation of a bus terminal will create job opportunities for locals, including maintenance staff, and administrative personnel. With the influx around 2000 passengers per day in the bus terminal and most of them are intercity travelers, the demand for various commodities and services such as accommodation, fast food shops, souvenirs shops will increase, and consequently businesses will open to fulfill the demand⁶ which will increase employment in the area. This will stimulate economic activity of the surrounding area. When the bus terminal comes to operation, revenue will be generated through restaurant, kiosks,



shops, garage, ticket counters. Local transportation revenue is also expected to increase with the anticipated increase in the number of visitors. The bus terminal will support tourism by providing efficient transportation options for visitors. This will lead to increased tourist satisfaction and potentially boost the local economy.

The impacts are direct, low, site-specific and long term.

4.1.1.2 Improved connectivity

Operation Phase: The Lumbini Inter-city Bus Terminal will serve as a central point where multiple bus routes will converge, improving both local and regional connectivity within the municipality and the surrounding region. This allows passengers to transfer easily between different bus lines or modes of transportation, enhancing mobility and accessibility. It also provides a vital service for residents, improving their access to employment, education, and other essential services. Additionally, it is situated 4.5km away from the main gate of Lumbini Garden, hence it is expected to serve as a key transport node, increasing the flow of passengers traveling to and from the area. This improved connectivity will indirectly support local economic activities and enhance accessibility to the site. The nearest tertiary hospital is Lumbini Zonal Hospital which is in Butwal municipality. The construction of the bus terminal as a regional transport hub will enhance the accessibility of local communities to tertiary health care as local community can find bus to Butwal easily from the bus terminal.

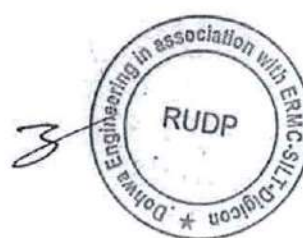
In addition to it, the bus terminal addresses the limitations of the old bus park that lacks adequate infrastructures, modern facilities as well as enhanced connectivity. The new bus terminal will offer better amenities like waiting areas, restrooms, and automated ticketing facilities (DPR, 2025).

The impacts are direct, high, regional and long term.

4.1.1.3 Universal Accessibility in Design

Operation Phase: Additionally, the project components have been designed with universal accessibility for Elderly, Women, Children and Differently abled (EWCD) infrastructure as it has incorporated following (DPR, 2025):

- Disabled friendly toilets are proposed in each building and public toilet block.
- Nursing / lactation /baby care room is also provided in terminal building and shuttle bus terminal block.
- Waiting areas and seating spaces will be provided in each building and outer spaces throughout the bus terminal for elderly, disabled and children.
- In the pedestrian walkways and main building, tactile flooring will be used for guiding visually impaired people.
- Additionally, railings will be provided in regular intervals in pedestrian walkways for safety.
- Surveillance cameras will be placed in the bus terminal and main building, public spaces and entry and exit gates for security of visitors.



- Wayfinding and directional boards will be installed to facilitate visitor movement. In addition, QR codes will be provided adjacent to these maps, enabling users to download them onto their mobile devices for ease of navigation.
- Traffic signages and zebra crossings will be provided at needed areas. Signage boards such as Route Information display board, Information signage board, accessibility signage board will be placed.

The impacts are direct, medium, site-specific and long term.

4.1.1.4 Increase in land valuation:

Operation Phase: With the implementation of the bus terminal, land and property values in the surrounding area are likely to increase. This is due to the anticipated improvements in connectivity, better trade and business prospects, and real estate investors' speculation of increase of land value in the future. The bus terminal is expected to serve around 2000 passengers daily (DPR, 2025) This can increase influx of visitors, trade and business, use of surrounding agricultural land for non-agriculture purposes, practice of renting land for businesses, and employment opportunities which will raise the land value.

The impacts are direct, moderate, site-specific and long-term.

4.1.2 Physical Environment

4.1.2.1 Resilience and Sustainability

Operation phase: Currently the project site is prone to flooding during monsoon season. Water logging during rainy season is very common in the project area. Provision like stone masonry retaining walls, stormwater drainage and diverted canal system, the project provides essential structural stability against soil erosion and preserves the site's original hydrological functions and prevents flooding during the monsoon.

The impacts are direct, moderate, site-specific and long-term.

4.2 Adverse Impacts

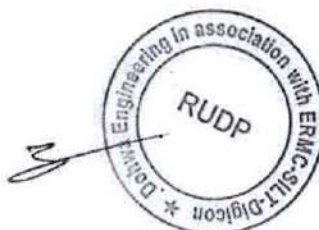
4.2.1 Socio-economic and cultural environment

4.2.1.1 Impact on Human Health

4.2.1.1.1 Impact on Community Health and Sanitation

Construction Phase: There are around 12 houses within the DIA of the project. The use of heavy machinery, such as hydraulic equipment and vibratory rollers (Table 3-9), will increase noise and vibration levels during construction. Continuous exposure to such disturbances may induce or aggravate stress (Ahmed, 2025) among nearby residents. Since stress is a major contributing factor to hypertension and cardiovascular diseases, the prevalence of such health problems may increase among people living within the DIA of the project site (Ahmed, 2025)..

The project activities such as transportation and stockpiling of materials, construction works, and the combustion of petrol and diesels are likely to increase fugitive dust and smoke.



emissions. This may elevate the risk of dust-related and respiratory illnesses, including asthma, chronic obstructive pulmonary disease (COPD), silicosis, and lung cancer among the surrounding population (Khanal, 2023). Elderly residents above 50 years of age, are more vulnerable to the impacts of noise and air pollution due to their greater sensitivity to such environmental stressors (Ahmed, 2025)..

Improper handling of waste, sewer drainage from workers' camp and temporary site office, and sanitation facilities together with the leachate from improperly stored waste, may create localized wastewater and sanitation problems during the construction phase of the bus terminal. If discharged without adequate treatment or control, such wastewater may contaminate nearby drainage channels and the nearby Telar River. The estimated wastewater generation during construction is about 3,440 liters/day. In low-lying or poorly drained areas, wastewater may accumulate and become stagnant, creating unhygienic site conditions and potential breeding grounds for vectors such as mosquitoes and flies. These conditions may increase the risk of vector-borne diseases in the project area. Likewise, the influx of migrant workers and their interaction with local communities may increase exposure to communicable diseases, including water-borne, vector-borne, and sexually transmitted infections (STIs), particularly in the absence of adequate sanitation, drainage, waste management, and health awareness measures.

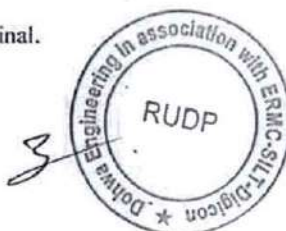
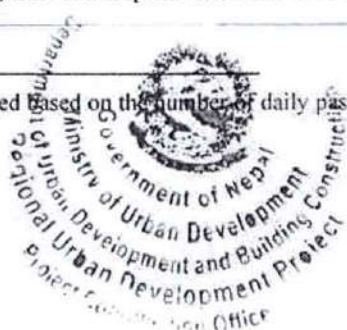
The impacts are direct, moderate, site-specific and long-term.

Operation phase: During operation, the proposed bus terminal will serve as a regional transit facility, resulting in increased vehicular movement within and around the site. This is expected to increase noise levels and vehicular emissions in the surrounding area. Emissions from buses and other vehicles, particularly during idling and movement, may contribute to localized deterioration of air quality within the terminal premises and adjacent areas, especially during peak traffic hours and dry conditions. The impact will be more relevant for people with existing respiratory problems, terminal workers, vendors, traffic personnel, and nearby residents exposed on a regular basis.

The operation phase is also expected to generate about 11,200 liters/day of wastewater and 317.5 kg/day of solid waste⁷. Inadequate treatment or disposal of wastewater and poor management of solid waste may pollute the Telar River downstream. Poor housekeeping, blocked drains, and water stagnation within or around the terminal may also create favorable conditions for mosquito breeding, particularly during the monsoon and post-monsoon period. In this context, the project may contribute to a small increase in local vector-related nuisance and public health risk if drainage and sanitation are poorly managed.

In addition, operation of the bus terminal may increase community health and safety risks associated with vehicle-pedestrian interaction, crowd movement, informal vending, improper parking, and inadequate internal traffic management.

⁷ Estimated based on the number of daily passengers/visitors to the bus terminal.



The impacts are assessed as indirect, moderate, site-specific and long-term.

4.2.1.1.2 Occupational Safety and health

Construction Phase: During construction, workers will be exposed to a range of occupational health and safety risks associated with earthworks, concrete works, steel fixing, equipment operation, and material handling. The use of cement, aggregates, rebar, diesel-powered machinery, and electrical equipment is likely to expose workers to dust inhalation, respiratory irritation, eye and skin irritation from cement and chemicals, electrocution, and noise-related discomfort or hearing impairment if exposure is prolonged and personal protective measures are not used. In addition, construction activities may create accident risks such as slips, trips, falls, cuts, struck-by incidents, and injuries related to lifting, machinery operation, and improper handling of tools and materials.

If worker camps and sanitation facilities are not properly managed, there may also be increased risk of communicable diseases among the workforce.

Equipment such as bulldozers, excavators, and drilling machines will increase noise levels at the site above measured baseline conditions (51 dB daytime and 36 dB nighttime), which may cause irritation, fatigue, and hearing-related effects if exposure is prolonged. Hearing protection should therefore be used where noise exposure exceeds 85 dBA, and exposure above permissible limits should be prevented through appropriate controls.

Workers may also be exposed to accident and injury risks during construction activities, including slips, trips, falls, cuts, struck-by incidents, and equipment-related injuries. Such risks may increase in the absence of proper housekeeping, safe material storage, waste management, supervision, and use of personal protective equipment. Therefore, the impact is considered direct, site-specific, and of moderate significance during the construction phase.

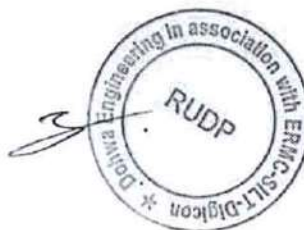
The impacts are direct, moderate, site specific and short term.

Operation Phase: During operation, the bus terminal will employ managerial, administrative, technical, security, cleaning, and other service staff. Occupational risks will vary according to the nature of work. Desk-based and passenger-facing staff may experience stress, fatigue, and ergonomic discomfort related to prolonged sitting, repetitive work, and continuous interaction with the public. Security, cleaning, and maintenance staff are likely to be more exposed to physical and safety risks due to their work in active terminal areas, movement around vehicles, and routine field duties. Noise from vehicle movement, horns, and public announcement systems may also affect staff comfort and working conditions, especially for those exposed for long periods.

These impacts will be direct, low, site-specific and medium term.

4.2.1.2 Degradation of cultivable land

Construction Phase: The construction of the project does not directly impact agricultural land. However, during the construction activities, A worker camp in 208 m² land is proposed at



27°28'35.92"N, 83°17'41.02"E. The wastewater runoff from the workers' camp, may degrade agricultural lands that lie in the north-south of the project site.

No impacts are envisaged.

Operation Phase:

Operation of the proposed bus terminal will increase the commercial importance and land value of plots located in its immediate influence area. Improved connectivity and concentration of passenger and vehicle movement may attract small-scale business and service activities around the terminal. As a result, some nearby land, particularly along the roadside or close to the terminal, may gradually shift from agricultural or open use to commercial use⁸. However, given the scale and function of the project, such effects are likely to be localized and incremental, rather than causing major land market distortion or widespread agricultural land fragmentation on their own.

The impacts are low, site specific and long term.

4.2.1.3 Impact on Population

Construction Phase:

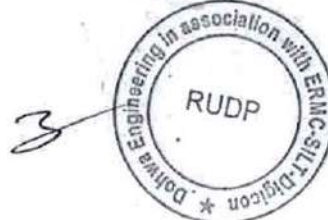
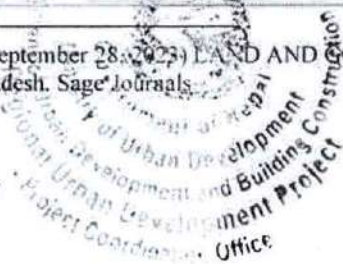
During construction, the influx of non-local workers, if required, may create a risk of social tension with nearby communities. Around 29.41% of HHs in the DIA rely on wage labor as their primary livelihood source, suggesting that expectations for local employment opportunities from the project may be high (HHs of Zone of Impact, 2025). If these expectations are not met, and a larger share of jobs is provided to migrant workers, dissatisfaction may develop among local residents.

The DIA population includes around 29.4% Dalits, indicating the need for socially sensitive and inclusive engagement during project implementation. Potential sources of tension may include pressure on local services and resources, noise and dust nuisance, reduced privacy for residents in the immediate vicinity of the project site, improper sanitation and waste management, and concerns related to worker-community interaction. If not properly managed, these issues may lead to community grievances and affect the project's social acceptance.

These impacts are indirect, medium, site-specific, and short-term.

Operation Phase: At present, parts of the proposed project site are used informally by locals for occasional cattle grazing. In addition, a small seasonal depression area within the site, through which water drains via the culvert, is sometimes used for cattle wallowing during the wet period. Construction of the bus terminal is likely to restrict access to these informal uses. However, since the wallowing area is small and seasonal rather than a permanent wetland or

⁸ Rao, C (September 28, 2023) LAND AND GOLD: Commodification of Agricultural land and its implication in Andhra Pradesh. Sage Journals.



major grazing resource, nearby households that use the area for livestock-related purposes may experience some inconvenience.

The impacts are direct, medium, site-specific and long term.

4.2.1.4 Issue of Child Labour

Construction Phase: Out of the total child labour, 19.4% comes from the Dalit families in Nepal while Terai caste groups account for 12.7 % of the total child labor⁹. The HH survey shows 17.65% to be Dalit HHs in the DIA of which 11.76 % specifically belong to Chamar/Ram/ Harijan communities. Hence, children from these castes are at risk of being involved in child labor.

The children from HHs where parents/family members are involved in hazardous occupations often engage in child labor. In the ZoI, 29.41% of HHs rely primarily on wage labor as their main source of income. Consequently, children from these HHs may be more likely to engage in labor during the construction of the project. On the other hand, the contractor with the intent of minimizing labour cost may be tempted to employ children as the workers. At the same time, children themselves may be willing to work on construction activities to earn supplementary income for their families. .

The impacts are direct, medium, site-specific and short-term.

Operation Phase: Though less likely, child labor can be used during the operation of the bus terminal directly or indirectly. However, certain areas such as ground floor shops and kiosks, the rooftop restaurant, and staff accommodation could present minor direct or indirect risks if underage individuals are employed to assist with sales, cleaning, or food preparation. Exposure of children to such work could lead to exploitation, safety hazards, and legal violations.

The impacts are direct, high, regional and long-term.

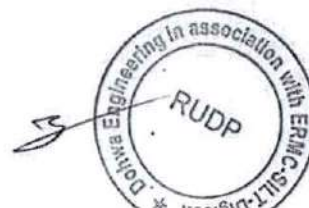
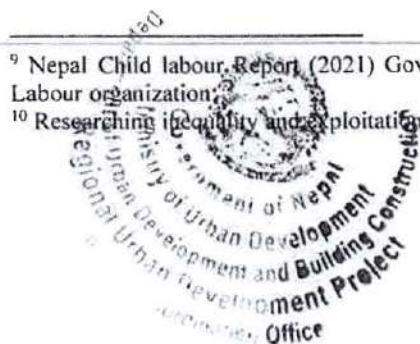
4.2.1.5 Gender discrimination and socially excluded groups among workforce

Construction Phase: The workforce will comprise of both men and women. Generally, there is the tendency in the developing countries to pay less to female workers. In a study conducted by ActionAid, 88.4 % of the women expressed that they are paid less than their male counterparts for the same job, and 90.2 % believe that their gender was the main reason for the inequality¹⁰. Similarly, wage disparities based on gender or social group could occur, leading to female workers being paid less than what is fair for their work and needs. These problems could lead to discrimination in employment practices and affect fair access to opportunities. Similarly, there may be practices of providing wages below the rates prescribed by the district rates and minimum wages set by the national regulation.

The impacts are direct, medium, site-specific and short-term.

⁹ Nepal Child labour Report (2021) Government of Nepal, National Planning Commission and International Labour organization.

¹⁰ Researching inequality and exploitation in wages based on gender in Nepal (September 27, 2021) ActionAid.



Operation phase: During the operation of the park bus terminal, there is a risk of wage discrimination based on gender, which could lead to dissatisfaction, reduced motivation, and inequality in the workplace.

The impacts are direct, medium, site-specific and long-term.

4.2.1.6 Chance finds

Construction Phase: The project area is part of Greater Lumbini Buddhist Circuit (GLBC) which comprises three districts of Nepal: Rupandehi, Nawalparasi, and Kapilvastu. The GLBC contains hundreds of archaeological sites¹¹. Lumbini is a significant cultural center of international repute. Given its historical and cultural significance, chances of finding items of archaeological importance in the project area can be expected while its further examination may cause disruption in construction schedule.

The impacts are direct, medium, site-specific and short-term.

4.2.1.7 Disputes and unwanted activities

Operation Phase: Different people will visit the bus terminal, including passengers, drivers, conductors, vendors, workers, and local people. As different groups will gather in one place, there may be chances of disputes and unwanted activities within the terminal area. These may include competition among transport operators for passengers and parking space, traffic congestion and parking disputes, fare-related disagreements between passengers and conductors, theft, pickpocketing, unauthorized vending, security incidents, and gender-based harassment or safety concerns. These issues may affect the safety and comfort of passengers, especially women, children, elderly people, etc.

The impacts are direct, medium, site-specific and long term

4.2.2 Physico-chemical Environment

4.2.2.1 Impact on Land

Construction Phase: The construction of the bus terminal will significantly impact land use in several ways. Initial steps involve clearing land, grading, and preparing the temporary field office and foundation for buildings and rides leads to change in land use and land cover. The land use change is further elevated by temporary activities, including the construction of workers' camps, storage yards for construction equipment and materials, and the stockpiling of construction materials.

Earthwork: The calculated earth volume for filling the Bus terminal site is 28,458 m³. Cutting earth volume is 2,541 m³ from the site. Excavation and filling activities will release dust into the air. It may disturb the natural soil profile, which may increase surface runoff and cause soil erosion, especially during rainfall.

The impacts are direct, medium, site-specific and long-term.

Operation phase:



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Fuel spills, oil leaks, and lubricant disposal may occur during the parking, maintenance, and refueling of buses and service vehicles. This poses the risk of soil and water contamination, and nuisance to nearby residents. The storage of goods, fuel, and supplies has the potential for accidental spills or leakage of hazardous materials.

The impacts are direct, medium, site-specific and long-term.

4.2.2.2 Impact on Air

Construction Phase: During construction, particulate matter emissions will arise from earthworks, exposed surfaces, storage piles, and frequent vehicle movement on unpaved roads. These activities, especially near sensitive areas like residential neighborhoods will increase. Suspended Particulate Matter (SPM) levels. Construction machinery and vehicles will also emit Carbon Monoxide (CO), Oxides of Sulphur (SOx), Oxides of Nitrogen (NOx), and Particulate Matter (PM), which can worsen local air quality.

The impacts are direct, medium, site-specific and short-term.

Operation Phase: The increased traffic flow of vehicles to the bus terminal will lead to additional exhaust emissions from incoming vehicles. Moreover, the heavy influx of visitors may generate dust, further contributing to air pollution.

The impacts are direct, medium, site-specific and short-term.

4.2.2.3 Impact on Water

Construction Phase: The discharge of chemicals from construction vehicles, such as used engine oil and lubricants, pose a risk of water contamination. If spillage occurs, these chemicals, along with excavation activities, can contaminate soil and subsequently the groundwater and can disrupt river water quality of the nearby Telar River (around 120 m from the project site).

The impacts are direct, medium, local and short-term.

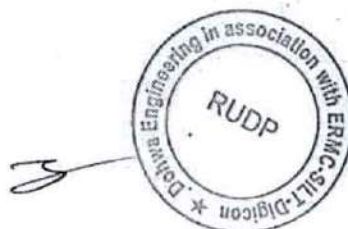
Operation Phase: Improper management of solid waste and discharge of contaminated water from the terminal, including wastewater from restrooms, restaurants and cleaning of the terminal facilities can contribute to water pollution in the nearby Telar River along with the groundwater. Waste generated by passengers, staff, and terminal operations may increase the risk of waterborne diseases and degrade local water quality if not properly treated and disposed of.

The impacts are direct, medium, site-specific and long-term.

4.2.2.4 Noise and vibration

Construction Phase: Due to construction activities such as machinery operation, excavation, and vehicle movement, sound levels will rise. This increase is likely to affect livelihood, potentially causing disturbances and adverse effects.

The impacts are direct, medium, site-specific and long-term.



Operation Phase: The bus terminal will have continuous noise from vehicles including the noise from different component of the Bus Terminal: ticket counter, garage and restaurant.

The impacts are direct, low, site-specific and long-term.

4.2.2.5 Soil Pollution

Construction Phase: The soil could be contaminated by disposal of spoil, fuel and lubricants from the vehicles and machineries, can contaminate the soil affecting its productivity and also acting as the secondary source of water pollution. The improper management of solid waste in workers camp can also cause soil pollution.

The impacts are direct, medium, site-specific and short-term.

Operation Phase: During the operation phase, quality of soil can be degraded in and outside the bus terminal due to trampling, haphazard disposal of solid waste and waste water effluent. The impacts are direct, medium, site-specific and short-term.

4.2.2.6 Issues related to waste generation:

Construction Phase: 30 Number of workers can generate waste of 6.62kg per day. Leftover materials from construction activities, unregulated spoil generation, and waste from the workers camp will contribute to an increase in waste at the proposed site.

The impacts are direct, medium, site-specific and short term.

Operation Phase: Estimated number of individuals per day including staffs and passengers is expected to be around 2000, thus waste generated by passengers, staffs and inadequate waste management will significantly exacerbate the waste problem within the bus terminal. The total waste generated in the Bus terminal is estimated as 317.5 kg/day, on average (DPR, 2025). The table (Table 3-13) shows the type of waste generation as per the facilities.

These impacts are direct, medium, site-specific and long term

4.2.2.7 Flooding/ Flash flood/ Erosion issues:

Construction Phase: Water logging during rainy season is very common in the project area. This has been corroborated during discussions with the local community. Excavation and filling for the bus terminal will change the natural land surface, making soil more exposed and less able to absorb rainwater. This will increase surface runoff during rainfall, which can cause localized flooding in and around the site. Exposed soil on slopes and near the access road may be washed away, leading to soil erosion and sediment blocking nearby drains. Additionally, components of the terminal like bus parking located close to the river are at higher risk of flash flooding during heavy rain events.

The impacts are direct, medium, site-specific and long term.

Operation Phase: High rainfall may lead to overflow and flooding in the area, potentially causing damage to physical infrastructure and endangering people in the vicinity.



The impacts are direct, medium, site-specific and medium-term.

4.2.2.8 Visual nuisance

Construction Phase: During the construction phase, installation of heavy machineries, barriers, unmanaged workers camp, improper solid waste disposal and unorganized storage of construction material creates unsightly scene to the worker, local and passerby as well.

The impacts are direct, medium, site-specific and short-term.

Operation Phase: After the bus terminal comes to the operation, haphazard installation of hoarding boards, notice boards, light infrastructures that does not blend with nature or the architecture might, dismantling or improper management of the components by the visitors may create visual disruptions.

The impacts are direct, medium, site-specific and short-term.

4.2.3 Biological Environment

4.2.3.1 Natural Habitat and Community

Construction Phase: The project site is in a fallow land. During construction, external agents such as construction workers and vehicles carrying construction materials may introduce invasive species, negatively impacting biodiversity around the project area. . .

The impacts are direct, medium, site-specific, and short-term.

Operation Phase: After bus terminal's operation, invasive species may unintentionally be introduced through activities associated with passengers, staff, and transported goods. Dormant seeds or plant materials carried on vehicles, luggage, or construction materials could be established in the area. The impacts are direct, low, site-specific, and long-term.

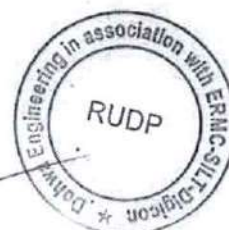


Table 4-1: Significance score of beneficial impact

Activities	Impacts	Impact severity						
		Direct/ indirect	Reversible/ Irreversible	Magnitude	Extent	Duration	Total score (Category)	
Construction phase								
Impact on Socio-economic and cultural environment								
The project construction will require 43 person-days for both skilled and unskilled workers.	Skill enhancement, Employment, and income generation	Direct	Irreversible	Low (10)	Site-specific (10)	Short term (5)	25 (Insignificant)	
Operation Phase								
Impact on Socio-economic and cultural environment								
Revenue from roof top restaurant, kiosks, shops, garage, ticket counters, etc.	Skill enhancement, Employment, and income generation	Direct	Reversible	Low (10)	Site-specific (10)	Long-term (20)	Insignificant (40)	
Easy movement of passengers between different bus lines or modes of transportation.	Improved Connectivity	Direct	Irreversible	High (60)	Regional (60)	Long term (20)	Highly Significant (140)	
The project components have been designed with universal accessibility for Elderly, Women, Children and Differently abled (EWCD) infrastructure	Universal Accessibility Design in	Direct	Reversible	Medium (20)	Site-specific (10)	Long-term (20)	50 (Moderately Significant)	



Table 4-2: Significance score of adverse impacts							
Activities	Impacts	Impact severity		Magnitude	Extent	Duration	score (Category)
		Direct/indirect	Reversible/Irreversible				
Impact on Socio-economic and cultural environment							
Construction phase							
Construction of bus terminal	Impact on Community Health and Sanitation	Direct	Reversible	High(60)	Site-specific (10)	Long term (20)	90 Highly Significant
Construction work and improper camp sanitation	Occupational Safety and health (OSH)	Direct	Reversible	Medium(20)	Site-specific (10)	Short term (5)	35 Insignificant

Activities	Impacts	Impact severity		Magnitude	Extent	Duration	Total score (Category)
		Direct/indirect	Reversible/Irreversible				
Clearance and construction of heavy machinery and vehicles	Degradation of cultivable land	Indirect	Irreversible	Low (10)	Site-specific (10)	Short-term (5)	25 (Insignificant)
Impact on population	Impact on population	Indirect	Reversible	Medium (20)	Site-specific (10)	Short-term (5)	35 (Insignificant)
Labour construction activities	Issues of Labour	Direct	Reversible	Medium (20)	Site-specific (10)	Short-term (5)	35 (Insignificant)
Possibility of cultural exchanges	Gender discrimination and socially excluded groups among workforce	Direct	Reversible	Medium (20)	Site-specific (10)	Short-term (5)	35 (Insignificant)
Excavation and construction work	Chance Finds	Direct	Irreversible	Medium (20)	Site-specific (10)	Short-term (5)	35 (Insignificant)
Operation Phase							
Impact on Socio-economic and cultural environment							
Operation of the bus terminal increases movement, noise, waste generation, release of air and water pollutants	Impact on community health and sanitation	Direct	Reversible	High (60)	Site specific (10)	Long term (20)	90 (Highly Significant)

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Activities	Impacts	Impact severity		Magnitude	Extent	Duration	Total score (Category)
		Direct/indirect	Reversible/ Irreversible				
Construction of the Bus Terminal	Occupational Safety and health	Direct	Reversible	Low (10)	Site specific (10)	Medium term (10)	30 (Insignificant)
Degradation of the Bus Terminal	Degradation of the cultivable land	Indirect	Reversible	Low (10)	Site-specific (10)	Long term (20)	40 (Insignificant)
Construction of the Bus Terminal	Impact on Population	Direct	Irreversible	Medium (20)	Site-specific (10)	Long term (20)	50 (Moderately Significant)
Employment of children in the operation of the bus terminal	Issues of child labour	Direct	Reversible	High (60)	Regional (60)	Long term (20)	140 (Highly significant)
Possibility of discrimination in salary, promotion	Gender discrimination and socially excluded groups among workforce	Direct	Reversible	Medium (20)	Site-specific (10)	Long-term (20)	50 (Moderately Significant)
Possibility of competition among transport operators for passengers and parking space, traffic congestion and parking disputes, fare-related disagreements between passengers and conductors, theft, pickpocketing, unauthorized security	Disputes and unwanted activities	Direct	Reversible	Medium (20)	Site-specific (10)	Long-term (20)	50 (Moderately Significant)

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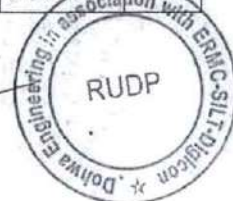
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Activities	Impacts	Impact severity		Magnitude	Extent	Duration	Total score (Category)
		Direct/indirect	Reversible/ Irreversible				
incidents, and gender-based harassment or safety concerns							
Impact on Physio-chemical Environment							
Construction Phase							
Construction of workers' camp and storage of construction material.	Impact on land	Direct	Reversible	Medium (20)	Site specific (10)	Long term (20)	50 (Moderately significant)
Heavy machines, construction work	Impact on Air	Direct	Irreversible	Medium (20)	Site specific (10)	short term (10)	40 (Insignificant)
Hazardous chemicals released from construction materials, leakage of machinery instruments, stockpiling, and sanitation facilities.	Impact on water	Direct	Irreversible	Medium (20)	Local (20)	Short term (10)	50 (Moderately Significant)
Heavy machinery operation, construction activities.	Noise and Vibration	Direct	Reversible	Low (10)	Site specific (10)	Long term (20)	40 (Insignificant)
Disposal of spoil, fuel and lubricants	Soil Pollution	Direct	Reversible	Medium (20)	Site specific (10)	Short term (5)	35 (Insignificant)

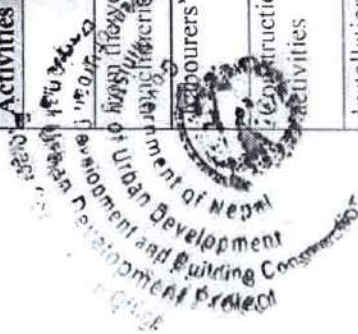


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Activities	Impacts	Impact severity		Magnitude	Extent	Duration	Total score (Category)
		Direct/indirect	Reversible/ Irreversible				
Installation of heavy machinery, unmanaged workers camp, unorganized storage of construction material	Issues related to waste generation	Direct	Reversible	Medium (20)	Site specific (10)	Short term (5)	35 (Insignificant)
	Flooding/Flash flood/ Erosion issues	Direct	Reversible	Medium (20)	Site specific (10)	Long term (20)	50 (Moderately Significant)
	Visual Disruption	Direct	Reversible	Medium (20)	Site specific (10)	Short term (5)	35 (Insignificant)
Operation Phase							
Construction activities	Impact on land	Direct	Irreversible	Medium (20)	Site-specific (10)	Long-term (20)	50 (Moderately significant)
Increased traffic flow to park	Impact on air	Direct	Reversible	Medium (20)	Site-specific (10)	Short term (5)	35 (Insignificant)
Improper management of waste.	Impact on water	Direct	Reversible	Medium (20)	Site-specific (10)	Long-term (20)	50 (Moderately significant)
Increased visitors and vehicle movement.	Noise and Vibration	Direct	Reversible	Low (10)	Site-specific (10)	Long term (20)	40 (Insignificant)
Increased visitors and vehicle movement.	Soil Pollution	Direct	Reversible	Medium (20)	Site-specific (10)	Short term (10)	40 (Insignificant)



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Activities	Impacts	Impact severity		Magnitude	Extent	Duration	Total score (Category)
		Direct/ indirect	Reversible/ Irreversible				
Waste generation by passengers and staffs	Issues related to waste generation	Direct	Reversible	Medium (20)	Site-specific (10)	Long term (20)	50 (Moderately Significant)
Unmanaged waste and infrastructures	Flooding/ Flash flood/ Erosion issues	Direct	Reversible	Medium (20)	Site-specific (10)	Medium-term (10)	40 (Insignificant)
Hazardous waste installation of boards, lights infrastructures	Visual nuisance	Direct	Reversible	Medium (20)	Site-specific (10)	Short term (5)	35 (Insignificant)
Impact on Biological Environment							
Construction Phase							
Construction of Bus Terminal	Natural Habitat and Community	Direct	Irreversible	Medium (20)	Site-specific (10)	Short-term (5)	35 (Insignificant)
Operation Phase							
Operation of the Bus terminal	Natural Habitat and Community	Direct	Irreversible	Medium (20)	Site-specific (10)	Long-term (20)	50 (Moderately Significant)

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5 ANALYSIS OF ALTERNATIVES

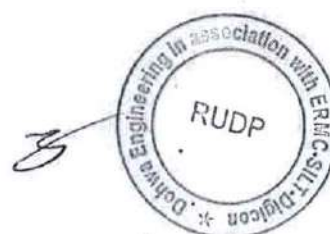
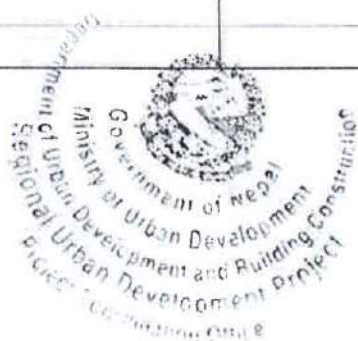
The alternative analysis is considered an integral part of an IEE study, which involves an examination of alternative ways of achieving the objectives of a proposed project. The alternatives which would achieve the same objectives in terms of design, sites, technologies, methods, schedule, operation procedures and the construction materials to be used were explored throughout the project cycle. The alternatives are examined to augment the benefits and minimize the adverse impacts.

5.1 Alternative of Design

Two alternatives are were explored in terms of design to be optimal in terms of resources and economic efficiency as well as to cause the least alteration to the existing environment. The project components for the two design alternatives have been elaborated in the table below:

Table 5-1: Alternatives of Design

Components	Alternative 1	Alternative 2	Remarks
Ticketing booth	Manual	Automated Ticketing booth and manual counter	
Shops, kiosks, Cafeteria	Proposed	Proposed	
Bus bays and Parking	Proposed	Proposed	The number of bus bay is raised to 3 in the parking area to control the traffic flow
Vending machine	Removed	Proposed	
Retaining wall	Proposed	Proposed	
Solar Panel	Proposed	Proposed	block is designated for the solar panel
Retaining wall	Gabion wall	Stone Masonry wall	
Canal	Proposed	Proposed	Canal channel with box culvert (153.8m ²)
Waiting Lounge	Removed	Proposed	
Waste water management	Reduced water supply distribution; smaller septic tank	PSTP	
Passenger Amenities	Proposed	Proposed	vending machine, seating for 40+, digital displays in alternative 2



Alternative 1

Alternative 1 for the bus terminal is selected to propose to improve transportation connectivity within the area by providing a central hub for various bus routes, making it easier for people to access different parts of the municipality. It focuses on introducing basic and essential facilities while keeping several components simplified to reduce the cost. Components like ticketing booth, bus bays, and kiosks, solar panel for limited area, waiting lounge, septic tank and passenger amenities like Cloak room, lockers, drinking water, toilets, and seating are proposed in the alternative 1. Retaining structures like gabion wall and a new canal where needed is proposed in the alternative 1.

Alternative 2

Alternative 2 proposed similar features to alternative 1 while modernizing some features and focusing on sustainable retaining structures. Along with the manual ticket booth automated ticket booth is also proposed in this alternative. The number of bus bay is raised to 3 in the parking area to control the traffic flow. A separate block is designated for the solar panel. Storm water drains and stone masonry wall which is more durable and pleasing in appearance is suggested as the retaining structures. The new canal was designed to fit the size of the previous culvert. PSTP is suggested for the sewage treatment. Additional passenger amenities like vending machine, seating for 40 plus, and digital displays are proposed in alternative 2.

Alternative of Hydrological Design:

Option I: Since the irrigation canal is already blocked and no longer in use, the canal can be filled at upstream site of the Bus terminal to prevent the water coming to the Bus terminal. Stopping the water from entering into the irrigation canal will prevent the proposed bus terminal area from flooding since only water coming in the bus terminal is the rainwater over the Bus terminal area, which can be addressed by constructing a small side canal along the periphery of the Bus terminal area. This option will be financially efficient. However, at this stage of the project design, this option is perhaps beyond the scope of work.

Option II: If Option I is not possible what some reason, repair the breached embankment and clear the blockage in the irrigation canal. This will prevent the water from the irrigation canal entering the Bus terminal, and the downstream agricultural areas will have access to water. If this option can be implemented, the Bus terminal will not need large canal to drain out the water coming to the Bus terminal from the irrigation canal.

However, since the area downstream of the Bus terminal has been urbanized with large settlements and road network crisscrossing the area, and the irrigation canal has been abandoned for several years, implementing this option may be a challenging to the Municipality. Also, at this stage of the project design, this option is perhaps beyond the scope of work.

If Option I or Option II can be implemented the canal size in the Bus terminal can be reduced significantly.



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Option III: If the Option I or Option II cannot be implemented for some reason, then the canal design in the Bus terminal should be able to drain out the maximum flow coming to the Bus terminal from the breached section of the irrigation plus the water flowing from the adjacent agricultural lands to the Bus terminal.

Based on the discussion with the local residents and other concerned officials, the Option I or Option II are unfeasible. The Consultant designed the canal within the Bus terminal to cater to the requirement of draining all the water coming to the Bus terminal from the irrigation canal. The following section deals with the hydraulic analysis of the canal within the Bus terminal.

Source: Hydrological Analysis Report, 2025

5.2 Alternative of Project Site

The proposed Bus Terminal is 2.2km south from Lumbini Sanskritik Municipality, and it is connected to Hulaki highway. The project area contains no private property; it is entirely situated on government-owned land. Since the location is explicitly suggested and assigned by the local municipality, no other site is taken into consideration for this project. The selected site aligns with the municipality's vision as Bus terminal is aimed at boosting both regional economic infrastructure and essential urban infrastructure.

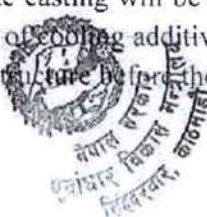
5.3 Alternative for use of raw materials

During the construction phase and the operation phase, the project will be utilizing various raw materials like RCC with brick masonry, rebar, stone, bitumen, sub-grade and boulders. Additionally, the application of thermal insulation materials like glass wool, ESP thermal sheets for floor insulation, and the use of PVC wooden panels for exterior insulation will be used. Raw materials such as sand, boulder, gravel, aggregates (from Dano river), and surface dressing chips will be procured as per the approved district rates (2080/2081). These materials are used in the region in general. Additionally, the design will emphasize the use of natural resources like bamboo, cane, thatch and stone over artificial ones for possible components like kiosks and restaurant, further enhancing the project's sustainability and reducing its ecological footprint.

5.4 Alternative for Construction and Project implementation Schedule

The development of **Alternative 2** will take 28 months, within the seasonal constraints to accommodate in the designed schedule. The schedule starts with design finalization, approvals, and procurement in order to give weather-sensitive tasks priority. Outside tasks like site preparation, earthworks, and structural construction will be completed either before or after the monsoon season (June to September) in order to prevent rain damage and flooding. Indoor tasks like design revisions will continue during monsoon.

In minimize heat-induced cracking, concrete casting will be done at night during the hottest summer months (April-June), with the help of cooling additives and shaded curing processes. Important duties include creating the superstructure before the intense summer heat, finishing



the roofing to provide weatherproofing, and completing the foundations around the rainy season. Pre-monsoon material stockpiling, strategic scheduling of equipment's and assigning workers to the morning and evening shifts, will enhance productivity and safety.

Sustainability initiatives will include: weather-resistant concrete with waterproofing admixtures, corrosion-resistant metals like galvanized or stainless steel, durable road finishes like porous asphalt or permeable pavers, Phased construction, testing, commissioning, and project handover will all take place within the permitted 28 months, which will be monitored by monthly progress reports and dynamic schedule modifications.

5.5 Alternatives for Construction Methods/ Technology

Various construction methods and technologies were evaluated to ensure structural integrity, environmental protection, and cost efficiency. Workers for manual work are essential to the project's success because they promote economic growth, create jobs for the community, and offer flexibility in jobs requiring for creativity and problem-solving abilities, like modifying designs to fit site conditions or guaranteeing on-site safety during risky operations like controlling vibratory rollers and operating excavator in unstable terrain. When compared to heavy machinery, labor-intensive processes like hand polishing and kerb casting cut emissions, which support the project's emphasis on small-scale sustainable practices. Equipment will also be used as required to overcome weather-related issues and complete the job within the allotted time of 28 months. For earthwork and, mechanical excavation using hydraulic excavators was preferred over manual digging as cut volume of cut and fill is (approximately 2,541m³ cut, 28,458m³ fill, and borrow is 25,917m³). Concrete mixers with vibrators and generators, mechanical brooms and air compressors ensure quick work and prevent dust for human labour; motor graders and vibratory rollers ensure accurate grading and compaction; batch mix HMP and bitumen distributors ensure quick and weatherproof road surfacing. However, manual or minimal impact alternative of this technology will be preferred where possible to minimize the adverse impact. The use of hydraulic excavator will be substituted by manual excavation and small excavator. Manual soil lessening will be done, ready mix or manual mixing will be done instead for using machine like concrete mixer, concrete vibrator to minimize the impact.

5.6 No Action Alternative/ Do Nothing Scenario

The 'No- action scenario' where no development work is undertaken, would worsen the site's current underutilization and economic slowdown. The land would remain devoid of value generation, failing to address local employment or income deficit. Additionally, the land will continue to be misused by illegal/ unrecorded excavation of soil. In this scenario, passengers would continue relying on inadequate and scattered bus stops with limited facilities, lack of proper waiting areas, poor connectivity between intercity and local buses, and insufficient safety provisions. The present site, which is seasonally waterlogged and lacks proper drainage management, would continue facing flooding issues with no improvement in storm water diversion or canal rehabilitation. Without the proposed bus terminal, opportunities to create



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jobs in construction and hospitality, improve transportation connectivity within the area by providing a central hub for various bus routes, kiosk, bus bays and shops would be lost, directly impacting the economy. The community will be deprived of the absence of infrastructure which would potentially contribute to the municipality. Additionally, indirect economic benefits such as small business, cafeteria would not generate income. The land would continue to lie idle, contributing neither to environmental improvement nor to social progress, where plot breaks and ecological vulnerability remain unaddressed. Therefore, this alternative of not implementing the project is not selected.

5.7 Project Implementation and it's Time Schedule

With an emphasis on labor intensity, cost effectiveness, minimal environmental risk, and resource efficiency, the project's construction schedule has been carefully planned. Each step has been planned as per Detailed Project Report's (DPR) implementation guidelines and practical field realities.

The project plan aims to reduce effort duplication and optimize the use of time, money, and resources by merging related tasks, such as building roads and installing utilities. Important tasks like testing, inspection, and obtaining approvals are scheduled for the project's completion to ensure everything is secure and prepared for opening. The primary objective of the timeline is to finish the project in a logical, economical, and ecologically responsible manner while also ensuring that the park is prepared for long-term use and that it benefits the community by creating jobs.

Table 5-2: Time schedule of the activities

Phase	Activities	Detailed works	Duration
1	Site Preparation -Site clearing and grading	▪ Clear vegetation, debris, and prepare the site for construction ▪ Build the temporary field camp ▪ Review DPR document ▪ Prepare document for the client's approval of work schedule and construction methodology	2 months
	-Infrastructure development	▪ Road and Parking lot construction ▪ Utilities installation (Water, sewerage, electricity) ▪ Drainage and storm water management	10 months
2	Building Construction -Foundation and structural work	▪ Construct foundations for buildings ▪ Erect support structures for buildings	2 months
	-Building and facility construction	▪ Build Terminal building, Driver's house, storage, garage	12 months

Phase	Activities	Detailed works	Duration
3	Landscaping and Theming -Landscaping	▪ Plant trees, shrubs, flowers, and grass ▪ Create walkways, paths, and seating areas ▪ Install decorative elements and lighting	5 months
4	Testing and Inspection -Inspection and approvals	▪ Coordinate with regulatory authorities for inspections ▪ Obtain final permits and licenses	2 months
5	Final Preparations -Staff training	▪ Train operation staff ▪ Conduct safety drills and emergency procedures	1 months
6	Opening	▪ Official opening ceremony ▪ Begin regular operations	1 day

The estimated construction period is 28 months.



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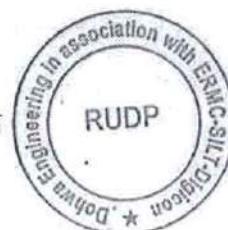


Table 5-3: Construction Planning/Construction Schedule for Alternative for Bus Terminal Implementation

SN	Task Name	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	Remarks
1	Earthwork																													
1.01	Site clearing and grading																													
1.02	Temporary field camp																													
2	Infrastructure construction																													
2.01	Retain wall work																													
2.02	Filling and compacting to formation elevation of earthwork																													
2.03	Utilities installation (Water/Drainage/Sanitary)																													
2.04	Electricity supply & Solar Panel installation																													
2.05	Road and parking pavement work																													
3	Building construction																													
3.01	Building foundation work																													
3.02	Terminal Building work																													
3.03	Driver's house work																													
3.04	Storage work																													
3.05	Garage																													
3.06	Clock Tower installation																													
4	Landscaping work																													
4.01	Plant trees, shrubs, flowers, and grass																													
4.02	Seating, pergola, and shades																													
4.03	Installing decorative elements & lightings																													
5	Testing, inspection and commissioning																													
5.01	Testing all equipment/devices																													
5.02	Inspection and approval																													
5.03	Staff training and handover																													
6	Opening																													
6.01	Soft opening and trial run																													
6.02	Grand opening																													

6 ENVIRONMENTAL MANAGEMENT PLAN

To ensure that the benefits are well at the reach of the locals, the project will provide training and awareness programs in health and sanitation, occupational health and safety measures (OHS), community health and safety, usage of water and its importance (water cost, savings, reuse, recycle, and water pollution etc), to the general public; and Technical training to supervision staff on plumbing, chlorination, water testing, pump maintenance and repair, treatment plant operation and electrical works for water supply and sewerage projects.

Physical impacts will be mitigated with simple and cost-effective methods. Regular monitoring of air, water and noise levels is planned. Proper location of workforce campsites, proper storage of construction materials, proper management of waste from campsites and work-fronts, and use of vehicles and equipment complying with GoN standards with proper maintenance are included in the Environmental Management Plan (EMP) of the project.

The basic objectives of the EMP are:

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

A Safeguards Unit with adequate support staff headed by an Environmental Specialist should be set up by the proponent Different project activities, related potential impacts, their proposed mitigation measures and the responsible stakeholders in addressing the issues have been provided in the proposed EMP of the project. The construction contractor will be required to prepare an Environmental and Social Management Plan (CESMP) based on this EMP before starting the construction works. This may include any additional concerns that might be observed during the period of the work contract. The efforts and resources needed for the mitigation activities have been proposed in the EMP matrix below:



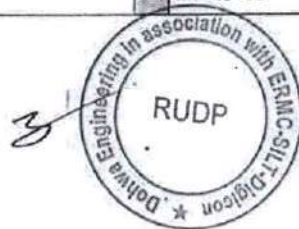
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Table 6-1: EMP Matrix for beneficial impacts

Beneficial Impacts	Augmentation Activities	Location	How	When	Who is responsible	Estimated budget, time and human resource	Monitoring Agency
Construction Phase							
Socio-economic Environment							
Skill enhancement, Employment and income generation	- Prioritizing locals employment opportunities especially women, marginalized and Indigenous people. - Provide necessary training related construction works and construction environment.	ZOI	Consultation with locals, government, representative to identify Marginalized and vulnerable communities.	Project implementation	Contractor, PIU	NPR 150,000 (including 2 tutor for 10 days with unit cost NPR 5000 including materials required and miscellaneous NPR 50,000)	SC, PCO
Physical Environment							
Resilience and Sustainability	Provision of retaining wall, storm water management and diverted canal	Project area	- Regular Monitoring - Enhancement with bio-engineering methods	Project implementation	Contractor, PIU	BoQ	SC, PCO
Operation Phase							



Beneficial Impacts	Augmentation Activities	Location	How	When	Who is responsible	Estimated budget, time and human resource	Monitoring Agency
Socio-economic Impacts							
Skill enhancement, Employment, and income generation	• Prioritizing locals for employment opportunities especially women, and people from marginalized, vulnerable and Indigenous community • Technical training for capacity building of the staffs	Project area	• Transparent job calls Quotas for Women, Marginalized and vulnerable. • In-job training with certificate • Equal pay for equal work	Final Preparations and Opening	Contractor, PIU		SC, PCO
Improved connectivity	Seating facilities, kiosks for connectivity	Project Facilities	Regular maintenance and operation of the bus terminal and its facilities.	Operation and maintenance	Contractor, PIU		SC, PCO
Universal Accessibility	Timely monitoring and maintenance of tactile flooring, railings, CCTV	Project site	• Utilization of ramp, railings in buildings. • Way finding board/direction board is provided for easy movement of the visitors.	Operation of the bus terminal	Contractor, PIU		SC, PCO



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Beneficial Impacts	Augmentation Activities	Location	How	When	Who is responsible	Estimated budget, time and human resource	Monitoring Agency
	cameras security for		• Installation of CC cameras in different areas. • Keeping log book				
Increase in land valuation	Regular maintenance and operation of the bus terminal and its facilities.	Project site	Ensuring that the Bus terminal is maintained and operated on the regular basis.	Project implementation	Contractor, PIU		SC, PIU
						NPR 150,000	

Table 6-2: EMP matrix of Adverse Impact

Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated budget, time and human resource	Monitoring Agency
Socio-economic Environment							
Impact on Community Health and Sanitation.	• Limiting working hours at day time. • Use of machineries in good condition only. • Sprinkling of water at the construction site.	Project area	Orient the contractors and workers about the code of conduct.	Construction period	Contractor, PIU	BoQ	SC, PCO

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Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and resource	budget, human	Monitoring Agency
	• Proper storage of construction materials. • Covering the construction material while transporting. • Define the working Hours. • Providing resting break and adequate water in summer season. • Effective work scheduling during winter and rainy season. • Avoiding overcrowding of the camps. • Regular morning toolbox meetings. • Emergency preparedness Plan (Fire safety, landslide safety). • Provision of PPE to the workers. • Provision of first aid kit in the workplace. • Regular maintenance of the machineries.							
Occupational health and safety (OHS) hazards.		Worker s camps and constru ction site.	Orient the contractors and workers about the code of the safe working environment, safe working environment. Strict monitoring	Construction period	Contractor	NPR 8,00000 for OHS including NPR 566,942 for insurance cost mentioned in BoQ		PIU, SC

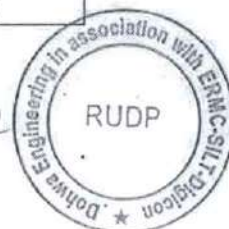
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Government of Nepal
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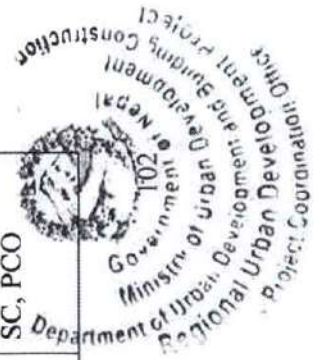
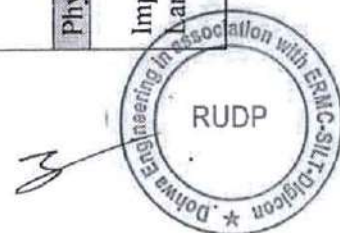
Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and resource	Monitoring Agency
	• Regular health check-up of the workers.						
Degradation of Cultivable land	• Avoid use of agricultural land for project activities. • Only use of machineries in good condition.	Project area	• Orient the contractors and workers about the code of conduct of the working environment. • Consultation with the local farmers to plan project schedule.	Construction period	Contractor, PIU		SC, PCO
Impact on Population	Prohibit illegal activities in the worker's camp.	Project area	• Orient contractor about the unacceptable activities like gambling, drugs, etc.	Project implementation	Contractor, PIU		SC, PIU, Police



Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and budget, and human resource	Monitoring Agency
			Monitor the camp area.				
Issue of child labour	Prohibit children employing	Project area	- Orient contractor about avoiding child labour. - Monitor the documents of the labour	Construction period	Contractor, PIU		SC, PCO, Police
Gender discrimination and socially excluded groups among workforce	- Equal pay for Equal work. - Orient contractor and workers about avoiding gender discrimination. - Grievances redressal mechanism.	Project area, workers' camp	Orientation, monitoring	Construction period			
Chance finds	- Notifying it to relevant communities and legal authorities, such as DOA for any suspicion of chance find. - Stop work immediately to allow further	Project area,	Managing chance finds or any unanticipated discovery as well as, recognition of	Construction period	Proponent		PIU, SC



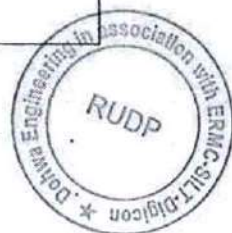
Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and resource	budget, human	Monitoring Agency
	investigation if any finds are suspected. • Meaningful consultation with the local stakeholders.		tangible cultural heritages.					
Disputes and unwanted activities	• Clear operating rules and a code of conduct will be enforced for transport operators, drivers, conductors, vendors, staff, and other users of the terminal. • Security personnel will be deployed during operating hours to manage conflicts, prevent theft and unwanted activities, and support vulnerable users.	Project area	Installation of CCTV cameras, clear rules, and regular monitoring, GRM	Operation period	Proponent	Cost of CCTV is included in Table 6-3.		PIU, SC
Physio-Chemical Environment								
Impact on Land	• Outdoor construction activities requiring land disturbance will not be performed	Project area	Strict monitoring of construction	Design and construction phase	PIU, PCO	BoQ		SC, PCO



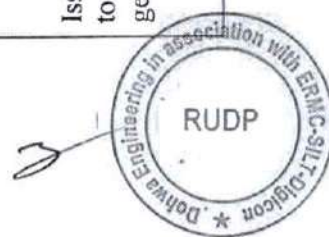
Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and budget, human resource	Monitoring Agency
	during monsoon to avoid side collapse. - Implementation of bio-engineering techniques. - Covering the construction materials and spoil during storage and transport. - Regular sprinkling of water. - Use of vehicles and machineries that meet vehicular emission standards. - Prohibit burning of waster. - Provide LP gas at the workers camp. - Low impact alternative like manual/small excavation, and ready mix/ manual mixing should be used EPR, 2077 Rule 14(I).						
Impact on Air		Project area	Orient the workers and contractors. Strict monitoring	Construction phase. Testing samples every 6 months	Contractor, PIU	1. NPR 200000 for overall test (Air, water, and sound quality) 2. NPR 270,000 for dust suppression by water spraying and tarpaulin.	SC, RUDP- MoUD, PIU

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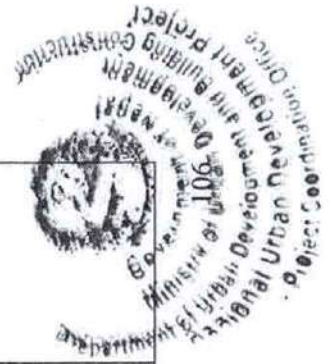
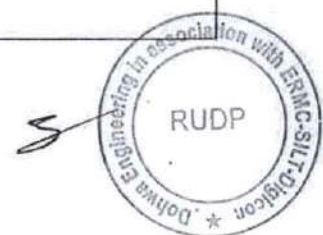


Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and resource	Monitoring Agency
Impact on Water	- Safely store the construction materials, fuels, chemicals, in a designated location away from water sources. - Soakpits should be constructed away from water bodies	Project area	Orientation and monitoring	Design and project, Construction phase. Testing samples every 6 months implementation	Contractor, PIU	NPR 200000 for overall test (Air, water, and sound quality)	SC, PCU, MoUD
Noise and Vibration	- Employ well trained staffs. - Procure machineries in good condition. - Limit working hours in day time.	Project area	Orient workers and contractors	Construction phase. Testing samples every 6 months	Contractor	NPR 200000 for overall test (Air, water, and sound quality)	SC, RUDP- MoUD, PIU
Soil Pollution	Prohibit entry of people and vehicle in agricultural land	Project area	Monitoring and orient workers	Construction period	Contractor		SC, PCO
Issues related to waste generation	- Source separation of the waste from workers camp. - Source separation of the waste in the camp. - Spoil and muck disposal in the designated place.	Project area	Orient workers and contractors. Coordinate with the municipality regarding disposal of waste	Construction period	Contractor, PIU	NPR 1,176,963 of installing PSTP	SC, PCO



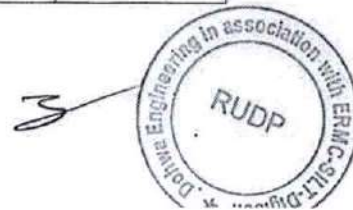


Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and resource	budget, human	Monitoring Agency
	maintain natural aesthetics. • Proper management of any seen invasive species		Prior identification of the significant flora and fauna.			(270 cylinders)=NP R 540,000 2. Installation of informative boards 2xNPR. 25,000=NPR 50,000 3. NPR 221,000 for invasive species management and monitoring. Including: 1. Field coordinator, local labour and technical expert for 10 days =NPR101,00 2. Monitoring and field travel= 10,000 3. Management activities and equipments like		

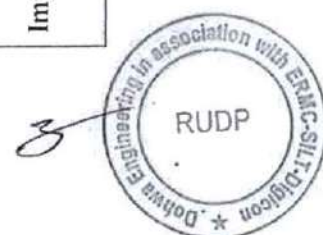
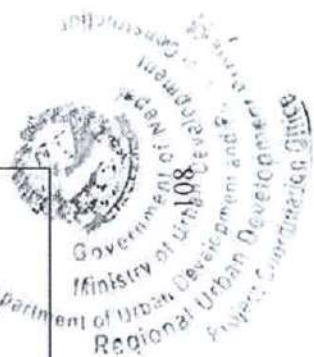


Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and budget, human resource	Monitoring Agency
						sickle, cutter, gloves= NPR 100,000 Reporting=NPR 10,000	
Operation Phase							
Socio-economic Impacts							
Impact on Community Health and Sanitation	Regular maintenance of the facilities.	Project area	Regular monitoring, Daily tool box talk among the management team	Project operation	Contractor, PIU	BoQ	SC, RUDP, MoUD
Occupational Safety and health	- Provision of necessary training and orientation. - Emergency preparedness plan during Fire, landslide, power cut, accidents, etc	Project area	Regular monitoring,	Project operation	Contractor, PIU		SC, RUDP, MoUD
Degradation of Cultivable Land	Regular consultation while the locals with the cropping schedule with the locals about the cropping schedule	Project area	Regular monitoring,	Project operation	Contractor, PIU		SC, RUDP, MoUD

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Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and resource	Monitoring Agency
Impact on Population	Priority to Local for employment.	Project area	Regular monitoring,	Project operation	Contractor, PIU		SC, RUDP, MoUD
Issues of Child Labour	Awareness activities about child rights	Project area	Regular monitoring,	Project operation	Contractor, PIU		SC, RUDP, MoUD, Police
Gender discrimination and socially excluded groups among workforce	• Equal pay for equal work. • Orient contractor and workers about avoiding gender discrimination, sexual exploitation, abuse and harassment. • Grievances redressal mechanism.	Project area	Orientation, Monitoring	Project implementation	Contractor, PIU		SC, RUDP, MoUD
Physico-chemical Environment							
Impact on Land	Maintenance of Bioengineering and Civil structures	Project area	Monitoring of gullies or sedimentation	Operation phase. Once a year	PIU, PCO	BoQ	SC, DUDBC
Impact on Air	Prohibit burning of waste	Project area	Monitoring and sample collection for lab test	Operation phase. Every 6 months	PIU, PCO	NPR 200000 for overall test (Air, water, and sound quality)	SC, DUDBC



Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and budget, human resource	Monitoring Agency
Impact on water	Operation of PSTP	Project area	Monitoring and sample collection for lab test	Operation phase. Every 6 months	PIU, PCO		SC, DUDBC
Noise and vibration	Low noise signage board around the project area. Ban horns	Project area	Planning of bus terminal management plan. Regular monitoring	Operation phase. Every 6 months	PIU, PCO		SC, DUDBC
Soil Pollution	Prohibition of entry of people and vehicle in agricultural land	Project area	Regular monitoring	Operation phase	PIU, PCO		SC, DUDBC
Issues of waste generation	Provide 18 dust bin of 50 liters capacity to collect waste.	Project area	Monitoring	Operation phase	PIU, PCO	NPR 54,000 for 18 dustbin (per rate NPR 3000 for 50 litres)	SC, DUDBC
Flash Flood/Erosion	- Pump and sluice gates to actively remove water. - Higher boundary walls. - Emergency response plan	Project area and near the bank of Telar River	Early warning and monitoring	Operation Phase	Contractor		SC, PIU, PCO
Visual nuisance	Well planned placement of hording board at the eye level and uniform colour.	Project area	Monitoring	Operation Phase	PIU, PCO	Cost of CCTV cameras (17) as per CCTV is NPR	SC, DUDBC

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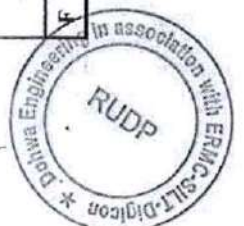
Adverse Impacts	Mitigation Activities	Location	How	When	Who is responsible	Estimated time and budget, human resource	Monitoring Agency
 Ministry of Urban Development and Building Construction National Urban Development Project Coordination Office	Proper management of the waste.					30,000P= NPR 510,000	
	- Proper disposal of invasive species, - Install dim warm light close to ground	Project area	Relocation, planning and plantation in the greenery maintenance	Operation phase	Contractor, PIU		
	Total					1,670,000	

Table 6-3: Summary of EMP cost

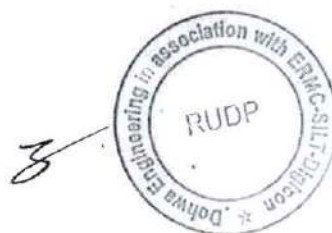
S.N.	Particulars	Cost (NPR)
Augmenting Beneficial Impacts		
A	Cost of augmenting beneficial impacts (Included in BoQ)	0
B1	Training and orientation to the workers on WASH and environmental awareness	150,000
B	Cost of augmenting beneficial impacts (Not Included in BoQ)	150,000
C	Total cost of augmenting beneficial impacts (A+B)	150,000
Mitigating Adverse Impacts		
D1	Civil Works	144,557,571

Sl. No.	Particulars	Cost (NPR)
E0	Implementation of Occupational Health and Safety Measures (OHS) including Personal Protective Equipment (PPE)	800,000.00
E1	Insurance cost	566,942
E2	Cost of Packaged Sewage Treatment Plan	1,176,963
E3	Firefighting plan	58,061
E4	Cost of mitigation adverse impacts (Included in BoQ) (C1+C2+C3+C4+C5+C6)	147,159,537
E5	Requirement of LPG in the worker's camp. (270 cylinders)	540,000
E6	Traffic management during construction, equipment for traffic management in 3 places (Barricade with green nets, Visible warning and danger signs in construction sites).	300,000
E7	Installation of informative boards.	50,000
E8	Provide enough dustbin to throw waste (biodegradable and non-biodegradable wastes, 3 dustbins) during construction phase	NPR 9,000
E9	Provide enough dustbin to throw waste (biodegradable and non-biodegradable wastes, 18 dustbins) during operation phase	NPR 54,000
E10	Cost of CCTV cameras (17) as per the CCTV Plan	510,000
E11	Invasive species monitoring Program	NPR 221,000
E12	Environmental Monitoring Cost for assessment of Air Quality, Noise level, and Water Quality	NPR 200000
E13	Dust suppression measures by Spraying Water (excluding watering for compaction) as per instruction of Engineer appointed by PCO (3 times a day up to contact period excluding monsoon and planning period)	270,000
E14	Cost of mitigation adverse impacts (Not included in BoQ)	1,670,000

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S.N.	Particulars	Cost (NPR)
G	Total cost of mitigation adverse impacts (D+F)	148,829,537
H	Total cost for implementing Environmental Management Plan (C+G)	148,979,537
I	Cost included in BoQ for implementing Environmental Mitigation Cost (A+D)	147,159,537
J	Additional cost required which is not included in BOQ (B+F)	1,820,000



Grievance Redressal Mechanism

It is a dedicated system that will be established to address complaints/concerns about the project in a collaborative, effective and timely manner by the formation of Grievance Redress Committees (GRCs). There will be three levels of GRC: a) Level 1- Field/Ward; b) Level-2 Municipality/PIU Level; c) Level 3- PCOs. The GRCs aims to simplify the process for individuals to raise concerns about social, environmental, and other project-related issues. The GRCs aims to simplify the process for individuals to raise concerns about social, environmental, and other project-related issues. Complaints can be submitted through various channels, including letters, emails, text messages, verbal communication, grievance boxes, and registers. Importantly, this system is designed not to bypass the government's legal process but to offer a transparent and timely mechanism for issue resolution. Individuals retain the right to access the national legal system if necessary. All costs associated with addressing complaints, such as meetings, consultations, communications, and reporting/information dissemination, will be covered by the project.

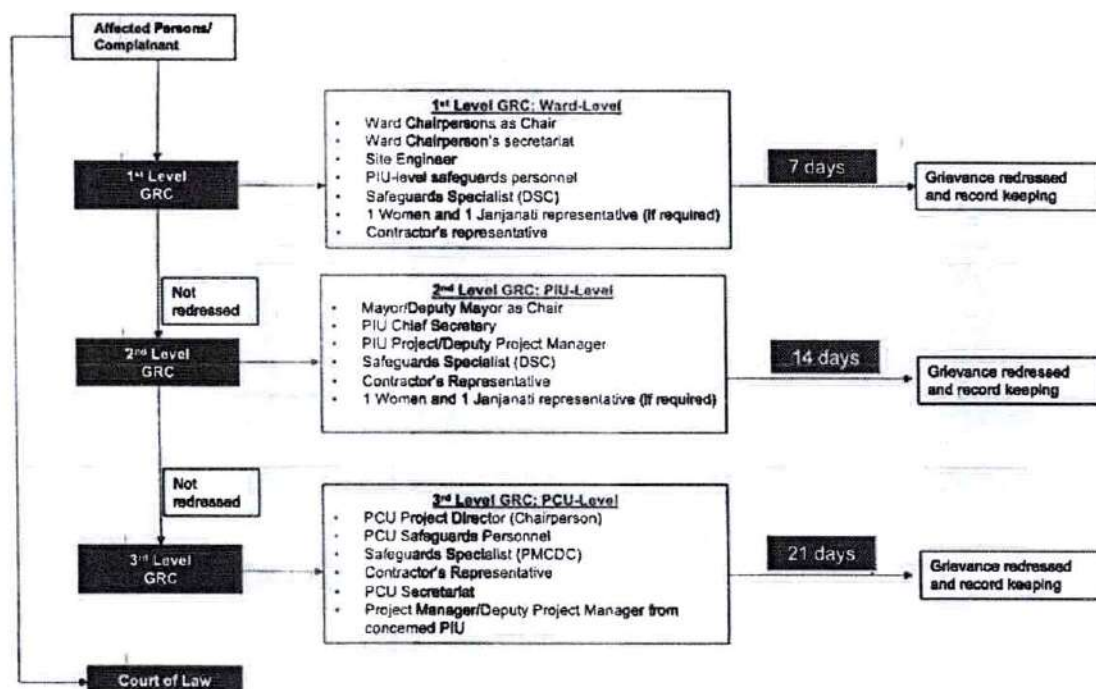
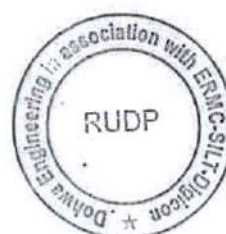


Figure 6-1: Grievance Redressal System



7 ENVIRONMENTAL MONITORING

The environmental monitoring of the project includes field supervision and reporting of project activities before and during the project construction and operation to ensure that the works are being carried out following the approved design and that the environmental mitigation measures are fully implemented following the EMP. A monitoring system will be developed involving i) front line monitoring ii) monitoring by the government line agencies or independent monitors and iii) auditing through the involvement of government agencies, donor agencies and independent auditors.

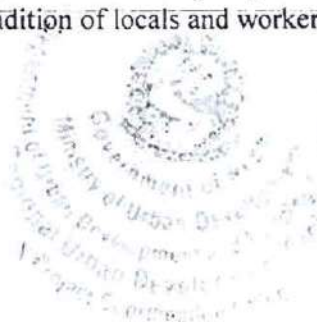
The project will prepare progress reports on EMP implementation and submit them to relevant agencies on regular basis. The DUDBC will oversee the environmental monitoring activities undertaken by the project. The construction and operation phase monitoring of the mitigating measures will mainly consider the following impacts due to:

7.1.1 Construction Phase

Flooding risk, change in land use, change in hydrology and morphology of streams and rivers; water, air and noise (vibration) pollution; solid waste; land intake and compensation; reinstatement of damaged structures and services; crime and community stress; health, safety and sanitation of the workforce and camps; archaeological and cultural sites and chance finds; and traffic management.

Following indicators will be used to monitor the environment during the construction period:

- Impact on public utilities
- Impact on land area (ha): agricultural, vegetated area and wetland etc.
- Determining safe zones for muck/spoil management
- Number and type of plant species selected for bio-engineering
- Details of the number of households affected
- Description of structure to be relocated
- Details of tree felling required for project implementation
- Number and type of plant species selected for bio-engineering
- Destruction of Existing crops,
- Disturbances in water flow (surface and groundwater),
- Reduction in soil water absorption
- Effects on the beauty of the landscape
- Areas prone to erosion and slope instability
- Details of affected households
- Description of affected flora and fauna within the proposed area
- Wage determination
- GESI
- Conflict between the workers and the community
- Air, water, sound and soil quality conditions
- Health condition of locals and workers



7.1.2 Operation Phase

The details of the monitoring plan will further include identification of monitoring indicators, monitoring method, location, time and cost of monitoring and the accountable agency for monitoring.

Following indicators will be used to monitor the environment during the operation period:

- Increasing consumption of natural resources,
- Community health conditions
- Sanitation condition around the project
- State of waste management
- Air, water, noise and soil quality

Environment Monitoring Plan (EMoP) will be prepared and the monitoring plan will incorporate information on 3 essential monitoring types along with self-monitoring required during project construction and operation phase for physiochemical, socio-economic, cultural and biological:

7.2 Baseline Monitoring

Baseline monitoring will be done before project implementation. The existing physical, biological, socio-economic and cultural environment of the project implementation area will be surveyed, monitored and recorded. Due to this, in the process of monitoring, it is possible to know about the changes in the environmental aspect compared to the initial situation.

7.3 Compliance Monitoring

Under this, to ensure that the proponent has complied with the prescribed standards related to environmental protection, the special indicators of environmental quality or the state of pollution will be periodically or continuously monitored and recorded.

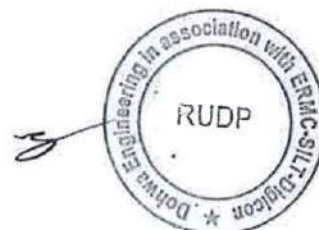
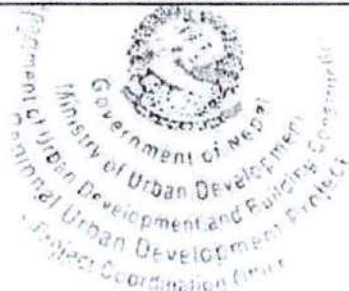
7.4 Impact Monitoring

Impact monitoring will be done during the construction and operation of the project. It involves studying the actual impacts resulting from the project. Impact monitoring will guide how to more effectively maximize positive environmental impacts and minimize negative environmental impacts.

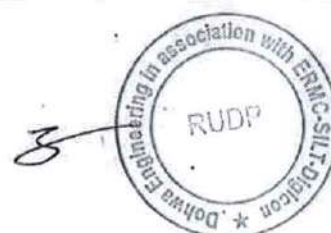
This will evaluate: (i) the extent and severity of the adverse environmental impacts as compared to what was predicted, (ii) how effective the mitigating measures were and compliance with the regulations and the (iii) overall effectiveness of the ESMP.

Table 7-1: Baseline Monitoring

Parameters	Monitoring indicators	Monitoring method	Location	Schedule	Monitoring Agency
Socio economic and cultural Environment					



Parameters	Monitoring indicators	Monitoring method	Location	Schedule	Monitoring Agency
Occupation Health and Safety	Use of PPE, warning and caution sign fencing of the construction area.	Observation and Discussion with Workers, Review of Records	Project Affected Wards	Daily during the construction phase	SC, PCU, Contractor
Existing Social and Cultural Practices, norms and values	Lifestyle, prevalence of social problems and crimes, belief system	Observation and Discussion with Local People	Project Affected Wards	Once prior to implementation of the project	SC, PCU
Local Infrastructure	Transportation option, distance to the nearest bus park	Observation and Discussion with Local People	Project Affected Wards	Once prior to implementation of the project	SC, PCU
Community Health	Types and Incidence of Prevalent Diseases, Number of Health Centers, mental health prevalence	Observation and Discussion with of Local Health Post, screening report	Project Affected Wards	Once prior to implementation of the project	SC, PCU
Local Economy	Major Occupation, Market Area. No of shops	Observation and Discussion with Local People	Direct Impact Area	Once prior to implementation of the project	SC, PCU, RUDP-MOUD
Property valuation	Current rate of land, current market valuation	Discussion with the local people	Direct Impact area	Once prior to implementation of the project	SC, PCU, RUDP-MOUD
Community Structure	Major Ethnic Group, Language	Observation and Discussion with Local People	Projected areas	Once prior to implementation of the project	SC, PCU
Agriculture production	Total production of major crops	Government record	Project Impacted ward	Once prior to implementation of the project	SC, PCU, RUDP-MOUD
Settlements composition	Number of Settlement Areas, presence of slum and squatter settlements	Observation and Discussion with Local People	Nearby Settlements of Project Sites	Once prior to implementation of the project	SC, PCU, Municipality



Parameters	Monitoring indicators	Monitoring method	Location	Schedule	Monitoring Agency
Biological Environment					
Natural Habitat and community	Nests, larvae, eggs,	Observation	Project area	Once prior to implementation of the project	SC, PCU, RUDP, MOUD
Physical Environment					
Land use pattern	Land use area	Observation, Land cover maps	Project area	Once prior to implementation of the project	SC, PCU, RUDP, MOUD
Hydrology and river morphology	River Bank Erosion, Sediment Load	Canal observation and Quarry site	Project area	Pre-monsoon, Post-monsoon and Monsoon	SC, PCU, RUDP, MOUD
Surface Water Quality	pH, Temperature, TDS, EC, TSS, TS, DO, Oil and Grease, CL, CL2, Total Alkalinity, Total Hardness, Calcium Hardness, Magnesium Hardness, Fe++, NO3, K+, Na+, As, Total Arsenic	Water Sampling, Lab Testing and Comparison to Standards	Project area	Once prior to implementation of the project but not in the monsoon.	SC, PCU
Air Quality	TSP, PM10, PM2.5, SO2, NO2, CO	Field Sampling	Projected area	Once prior to implementation of the project	SC, PCU
Noise and Vibration	Noise Level (decibel)	Observation and Sampling	Projected area	Once prior to implementation of the project	SC, PCU
Solid waste	Presence of solid waste, local solid waste management practices	Field observation, discussion with the local people	Projected area and around	Once prior to implementation of the project	SC, PCU
Soil quality	pH, organic matter, Nitrogen (N), Phosphorus (P), Potassium(K), Zinc (Zn), Iron (Fe)	Soil sampling and Lab testing	Construction Sites	Once prior to implementation of the project	SC, PCU



Parameters	Monitoring indicators	Monitoring method	Location	Schedule	Monitoring Agency
Disaster	Flood occurrence, waterlogging	Discussion with the local people	Project Impacted zone	Once prior to implementation of the project	SC, PCU

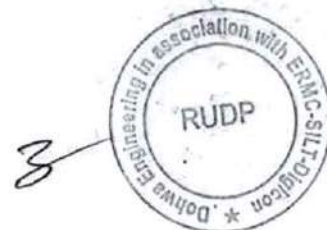


Table 7-2: Impact Monitoring

Parameters	Monitoring Indicators	Monitoring method	Monitoring location	Monitoring Schedule	Monitoring Agency
Beneficial Impacts					
Construction Phase					
Impact on Socio-economic and cultural Environment					
Skill enhancement, Employment, and income generation	No. of locals employed No. and types of training conducted	Field survey and consultation with locals, review of records, C-ESMP	Project area	Every 6 months	SC, PCO, RUDP-MOUD
Operation Phase					
Socio-economic and cultural environment					
Skill enhancement, Employment, and income generation	No. of locals employed No. and types of training conducted	Field survey and consultation with locals, review of records, C-ESMP	Project area	Every 6 months	SC, PCO, RUDP-MOUD
Improved Connectivity	Makes transportation easier	Discussion with the local people	Project Impacted Ward	Every 6 months	SC, PCO, RUDP-MOUD
Universal Accessibility in Design	Everyone can access or utilize the project facilities	Observation	Project area	Every 6 months	SC, PCO, RUDP-MOUD
Increase in land valuation	Increase in price of the land, increase banking valuation	Discussion with the local people	Project Impacted ward	Every 6 months	SC, PCO, RUDP-MOUD
Physical Resilience and Sustainability	No water logging, flooding	Observation	Project area	Every 6 months	SC, PCO, RUDP-MOUD
Adverse Impacts					
Socio-economic and cultural environment					
Construction Phase					
Impact on Community Health and Sanitation	Incidence of any new disease, spread of epidemic, increase	Field survey and consultation with	Project area	Every 6 months	SC, PCO, RUDP-MOUD

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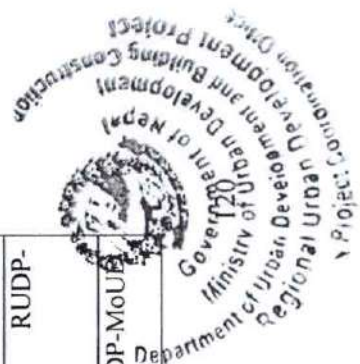
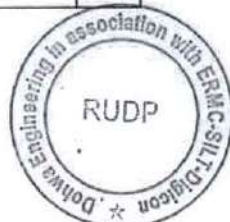
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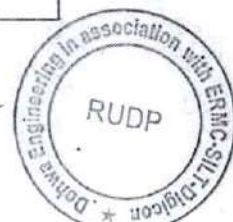
Parameters	Monitoring Indicators	Monitoring method	Monitoring location	Monitoring Schedule	Monitoring Agency
	of non-communicable diseases	locals, Health service center data			
Occupation and Safety and Health (OSH)	Injuries, sickness and diseases, Complaints, fire-related hazard,	Records of health check up, Complaints mechanism, Record of various hazards	Project area	Every six months	PCU, SC, RUDP-MoUD
Degradation of cultivable land	Total production of various crops	Discussion with the local people	Direct Impact Areas	Every six months	PCU, SC, RUDP-MoUD
Impact on Child labour	Workers age	Record of workers age	Project area	Every six months	PCU, SC, RUDP-MoUD
Gender discrimination and socially excluded groups among workforce	Compensation rate	Payment record	Project area	Every six months	PCU, SC, RUDP-MoUD
Chance finds	Monuments found during excavation	Discussion with workers, records of SC	Project area	Every six months	PCU, SC, RUDP-MoUD
Operation Phase					
Socio-economic and cultural environment					
Impact on community health and sanitation	Disturbance due to noise, spread of epidemic, presence of new diseases	Complaints, record of epidemic,	Project Impacted ward	Every 6 months	SC, PCU, RUDP-MOUD
Occupational Safety and Health	Cases of harassment, increase diseases	Record of sick leave, complaint mechanism	Project area	Every 6 months	SC, PCU, RUDP-MOUD
Degradation of the cultivable land	Total production of various crops	Discussion with local people	Direct Impact Area	Every six months	PIU, SC, RUDP-MoUD



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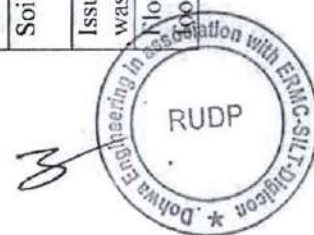


Parameters	Monitoring Indicators	Monitoring method	Monitoring location	Monitoring Schedule	Monitoring Agency
Impact on population					
Gender discrimination and socially excluded groups among workforce	Provision of recruitment, job assignment, compensation, working conditions, terms of employment, access to hiring, Sexual Exploitation and Harassment	Records of procedures of recruitment, job assignment, compensation, working conditions, terms of employment, and access to hiring, Complaint Readdress Mechanism	Project area	Every six months	PIU, SC, RUDP-MoUD
Impact on Physio-chemical Environment					
Construction Phase					
Impact on land	erosion, runoff	soil profile	Project area	Every six months	SC, PCU, MoUD RUDP,
Impact on Air	TSP, PM10, PM2.5, SO ₂ , NO ₂ , CO	Air Quality lab testing and comparison to the National Air Quality Standard	Project area	Every six months	SC, PCU, MoUD RUDP,
Impact on water	pH, Temperature, TDS, EC, TSS, TS, DO, Oil and Grease, CL ₂ , Total Alkalinity, Total Hardness, Calcium Hardness, Magnesium Hardness, Fe ⁺⁺ , NO ₃ , K ⁺ , Na ⁺ , As, Total Arsenic	Water Sampling Lab and Testing Comparison to Standards	Inlet and Outlet of the Pond	Every six months	SC, PCU, MoUD RUDP,
Noise and vibration	Sound Level (decibel)	Sound Quality lab test and comparison with the residential standard	Project area	Every 6 months	SC, PCU, MoUD RUDP,



Parameters	Monitoring Indicators	Monitoring method	Monitoring location	Monitoring Schedule	Monitoring Agency
Soil pollution	Organic and inorganic matter, pH test	Observation and test with a pH meter	Project area	Every six months	SC, PCU, RUDD, MoUD
Issues related to waste generation	Solid waste management procedure, presence of waste	Observation	Project area	Every 6 months	SC, PCU, RUDD, MoUD
Visual Disruption	Surrounding	Observation	Project area	Every 6 months	SC, PCU, RUDD, MoUD
Operation Phase					
Impact on Land	contamination of soil	soil profile	Project area	Every six months	SC, PCU, RUDD, MoUD
Impact on air	TSP, PM10, PM2.5, SO ₂ , NO ₂ , CO	Air Quality lab testing and comparison to the National Air Quality Standard	Project area	Every six months	SC, PCU, RUDD, MoUD
Impact on water	pH, Temperature, TDS, EC, TSS, TS, DO, Oil and Grease, CL ₂ , Total Alkalinity, Total Hardness, Calcium Hardness, Magnesium Hardness, Fe ⁺⁺ , NO ₃ , K ⁺ , Na ⁺ , As, Total Arsenic	Water Sampling Lab Testing Comparison to Standards	Inlet and Outlet of the Pond	Every six months	SC, PCU, RUDD, MoUD
Noise and vibration	Sound Level (decibel)	Sound Quality lab test and comparison with the residential standard	Project area	Every 6 months	SC, PCU, RUDD, MoUD
Soil Pollution	Organic and inorganic matter, pH test	Observation and test with a pH meter	Project area	Every six months	SC, PCU, RUDD, MoUD
Issues related to waste generation	Solid waste management procedure, presence of waste	Observation	Project area	Every 6 months	SC, PCU, RUDD, MoUD
Flooding/Flash Flood/ Erosion issues	Number of flood, condition for erosion	Observation, Observation	Project area	Every 6 months	SC, PCU, RUDD, MoUD

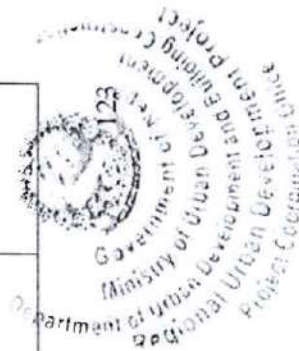
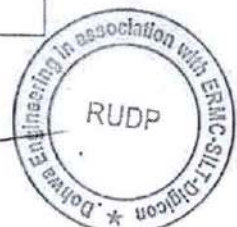
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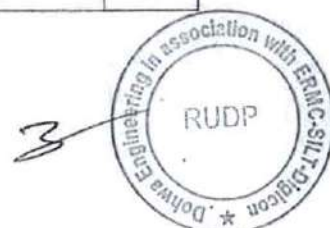
Parameters	Monitoring Indicators	Monitoring method	Monitoring location	Monitoring Schedule	Monitoring Agency
Visual nuisance	Surrounding	Observation	Project area	Every 6 months	SC, PCU, RUDP- MOUD
Biological Environment					
Construction Phase					
Natural Habitat and community	Presence of Invasive species	Observation	Project area	Every 6 months	SC, PCU, RUDP- MOUD
Operation Phase					
Natural Habitat and community	Presence of Invasive species	Observation	Project area	Every 6 months	SC, PCU, RUDP- MOUD

Table 7-3: Compliance Monitoring

Parameters	Monitoring Indicators	Monitoring Method	Location	Schedule	Monitoring Agency
Socio economic and cultural Environment					
Occupational Health & Safety (OHS)	-Personal Protective Equipment usage -Number of accidents and injuries -Fires safety plan, epidemic control plan and emergency hospitalization plan.	-Observation - Accident record -Discussion with Project Manager	Construction areas	Daily during construction	SC, PCO, RUDP- MOUD
Labor Compliance	-Child/forced labor/trafficked labor; -Wages according to district rate, -8 hours daily work with maximum 4 hours additional overtime. -Overtime wages 1.5 the compulsory wages. -Half an hour rest time in every 5 hours work. -Safe workers camp with basic facilities.	-Official documents of workers -Discussion with workers. -Payment records -Attendance records.	Construction site	Every month	SC, PCO, RUDP- MOUD



Parameters	Monitoring Indicators	Monitoring Method	Location	Schedule	Monitoring Agency
Grievance Redress Mechanism (GRM)	- Festival bonus and paid leave in the case of mourning, pregnancy, and during main festivals. -Accessibility of Grievance Redress Mechanism (GRM) to workers and locals. -Number of grievances received -Grievances resolved within timeline, -Retaliation encountered due to Grievance filed	-GRM register review, -Discussion with project workers and local people	Project-affected areas	Every month	SC, PCO, RUDP- MOUD
Stakeholder Consultation and participation	-Number of consultation meeting held -Inclusive consultation including particularly Gender and Sexual Minorities, People with Disabilities, Poor and marginalized communities, Dalit and indigenous groups.	-Meeting minutes, -- Attendance sheets	Project Impacted ward	Every month	SC, PCO, RUDP- MOUD
Gender Equality, Disability and Social Inclusion (GAP Compliance)	-Employment, compensation, training, promotion and consultations to Gender and Sexual Minorities, People with disabilities, poor and marginalized groups, ethnic minorities, Dalit groups and indigenous communities.	-Employment records	Project area	Every 6 months	SC, PCO, RUDP- MOUD
Park Cleanliness & Maintenance	Cleanliness level; functioning of facilities	Routine inspection checklist	Project area	Every 6 months	SC, PCO, RUDP- MOUD
Sexual Exploitation and Abuse (SEA)/Sexual Harassment (SH)	-Signing of code of conduct to workers. - Separate and accessible Grievances Redress Mechanism.	-Employee and workers Contract record -Discussion with employees	Project area	Every 6 months	SC, PCO, RUDP- MOUD
Public Safety Measures	-Safety signage installed -Restricted access enforced	Observation	Direct Impact Area	Every months	SC, PCO, RUDP- MOUD



Parameters	Monitoring Indicators	Monitoring Method	Location	Schedule	Monitoring Agency
Monitoring and Reporting	-Periodic monitoring -Reporting of data in accessible ways	-Monitoring and reporting document	Project area	Every 3 months	SC, PCO, RUDP- MOUD
Biological Environment					
Wildlife protection	-Hoarding boards installed for awareness -Strong barricade in construction site, worker camp.	Observation	Project area	Every month	SC, PCO, RUDP- MOUD
Physical Environment					
Air Quality Management	PM10, PM2.5 levels within permissible limits; dust suppression practices implemented, vehicles emission	Air quality measurement, visual inspection	Construction site and surrounding residential areas	Every 6 months	SC, PCO, RUDP- MOUD
Noise Control	Noise levels (dB) within national standards	Sound level measurement	Site boundary and sensitive places (schools, residential places)	Every 6 months	SC, PCO, RUDP- MOUD
Water Protection	pH, Temperature, TDS, EC, TSS, TS, DO, Oil and Grease, CL ₂ , Total Alkalinity, Total Hardness, Calcium Hardness, Magnesium Hardness, Fe ⁺⁺ , NO ₃ , K ⁺ , Na ⁺ , As, Total Arsenic	Laboratory testing of water samples	River beside the project area	Every 6 months	SC, PCO, RUDP- MOUD
Solid Waste Management	Waste properly segregated, stored, and disposed	Site inspection,	Project site	Every months	SC, PCO, RUDP- MOUD
Infrastructure Quality	Quality and durability of park facilities	Technical inspection and audit	Project area	Every 6 months	SC, PCO, RUDP- MOUD

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7.5 Estimated Monitoring Cost

The management responsibility for the environmental monitoring is transferred to Supervision consultant, PCU/ DUDBC. The project can be hired by independent consultant for monitoring the implementation status of proposed mitigation measures and to suggest further improvement measures for better environment friendly construction activity.

Table 7-4: Cost of experts for Environmental Monitoring during project implementation

S.N.	Necessary Experts and provisions	Months	Rate	Total
1.	Environment expert	4	200,000	800,000
2.	Social expert	4	200,000	800,000
3.	Biological expert	1.5	100,000	150,000
4.	Accommodation+Fooding + transportation	Biological expert will stay in field for 20 days in total, Environment and social experts will be staying for 40 in the fields, and the per-day cost is NRs. 5,000. (2*40*5,000) + (20*5,000)		500,000
5.	Lab test	Water test	16	8,000
		Sound test	16	8,000
		Air test	18	25,000
6.	Stationery	Lump sum		20,000
	Total			2,926,000

7.6 Self-monitoring

The proponent of the project, PCO, WUC, as specified in Rule 45 of the Environmental Protection Regulations, will self-monitor the impact on the environment during the construction and operation phases every six months and submit the report to the DUDBC/ MoUD. For this purpose, the proponent will formulate an annual monitoring plan each year. Based on this plan, the necessary human resources and expenses will be accounted for, and the annual budget and program will be approved by the department of urban development. The self-monitoring report will be prepared by the proponent using the template below approved by the Ministry of Forest and Environment (MoFE):

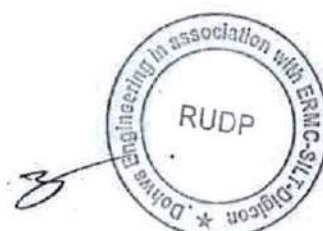
1. Summary of Report
2. Abbreviations/Acronyms
3. Table of Contents
4. Chapter I: Introduction
 - a. Background
 - b. Objectives
 - c. Methods/Methodology of the study
5. Chapter II: Observations and Results
6. Chapter III: Conclusions
7. Annexes
 - a. Lab Report
 - b. Photographs



c. Other related information

Table 7-5: Self monitoring cost

Specialist	Yearly Requirement	Rate	Total (NPR)	Remarks
Environmentalist	2 times	100,000	400,000	4 times in 28 months
Lab Test	Air, Water, Sound quality check in 1 station (per NPR 50,000) 4 times for total project time (50,000*4)		200,000	
Stationary, Print, other miscellaneous	Lump sum		50,000	
Total			650,000	



8 ENVIRONMENTAL AUDIT

According to 12(1) of the Environment Protection Act, 2076, Within six months after 2 years of completion of the project/operation of the project, DUDBC will conduct an environmental audit. This audit reflects the past and present environmental conditions and the effectiveness of mitigation activities.

The types of environmental audits are as follows:

- a) Decision-level audit
- b) Implementation audit
- c) Performance (Effectiveness) audit
- d) Project impact audit
- e) Predictive technique audit
- f) EIA process audit

8.1 Organizations Involved in Environmental Audit

Generally, three parties are involved in the environmental auditing process:

- a) **The Auditor:** The entity conducting the review
- b) **The Auditee:** (The concerned project proponent: Department of Urban Development and Building Construction)
- c) **Third Party:** (Independent observers or consultants)

8.2 Classification Based on Voluntary or Mandatory Participation

Based on the nature of the involved institutions or requirements, audits are categorized as:

- a) Internal Audit
- b) External Audit
- c) Mandatory Audit
- d) Voluntary Audit



8.3 Format of the Environmental Audit Report

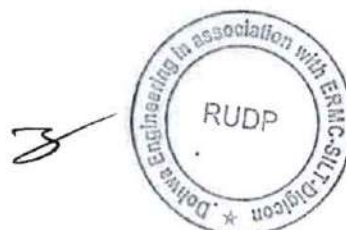


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The report should follow the structure below:

Chapter 1	Executive Summary
Chapter 2	Audit administration and Work description, Details of the interview, interviewee, project site, and methodology should be included in the section. Inclusion of data and explanation related to environmental monitoring and auditing.
Chapter 3	Full Audit Description
Chapter 4	Project related recommendation and corrective action
Annex	Related data and description
Technical manpower required for the auditing team	Environmental expert, Sociologist, Biodiversity expert, transportation engineer, Project related specialist
Checklist for environmental auditing	



9 CONCLUSION

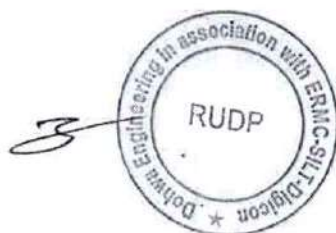
The proposed Bus Terminal Project is environmentally feasible and socially beneficial, with no significant long-term adverse impacts anticipated on the physical, biological, or socio-economic environment, provided that recommended mitigation measures are effectively implemented. The project aims to enhance the regional connectivity and provide modern facilities to the visitors of the Bus Terminal. Most potential impacts are expected to occur during the construction phase and can be minimized through proper planning, environmentally responsible construction practices, effective drainage and waste management, and strict implementation of the Environmental Management Plan (EMP). The project through its components like: Parking zone, terminal zone for passengers, solar energy, automated ticketing facilities, charging stations, shops, restaurants, retaining structures, storm water drain, diverted canal and landscape aesthetics will support sustainability, and feasibility of the project.

The project will proceed with strict adherence to proposed mitigation measures, continuous environmental monitoring, active participation of local communities and stakeholders, and coordination with relevant authorities to ensure compliance with environmental and social safeguards for long-term sustainability.

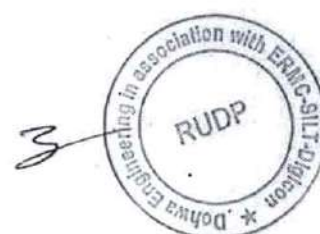
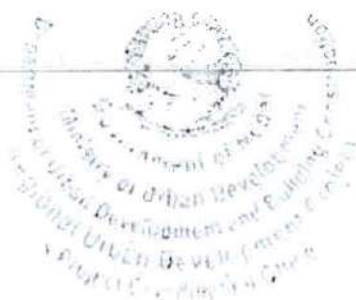


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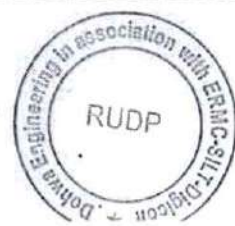
ANNEX

Annex 1:	Project Information
Annex 1.1:	Catchment delineation of Telar river
Annex 1.2:	Distance of project area from Lumbini World Heritage Site
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Annex 1.6:	Renders of the Project
Annex 1.7:	Master Plan Options
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Annex 1.9	LOAD DEMAND ASSESSMENT
Annex 1.10:	Estimate travelling passenger for the waste calculation
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Annex 7	Public Notice for preparation of IEE
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Annex 9	Quantity of major construction materials
Annex 10:	Recommendation Letter from the Municipality
Annex 11:	Hydrological and Geological Analysis Summary
Annex 12:	Emergency Response Plan



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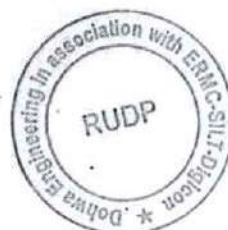
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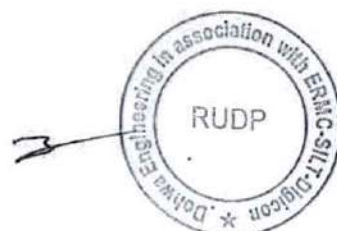
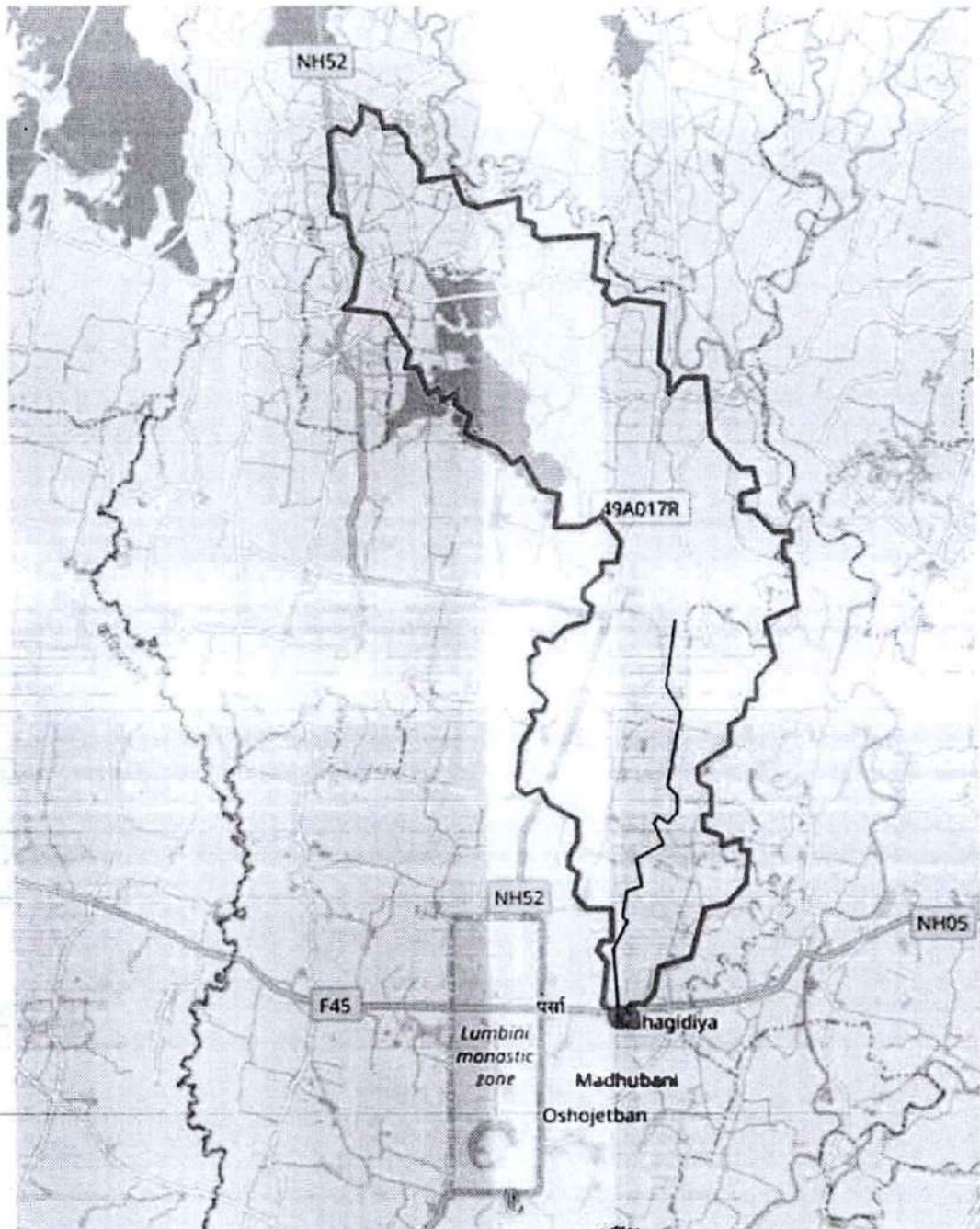
Annex 13	Declaration
Annex 14	Approved Terms of Reference (ToR) Letters
Annex 15	Comment Matrix



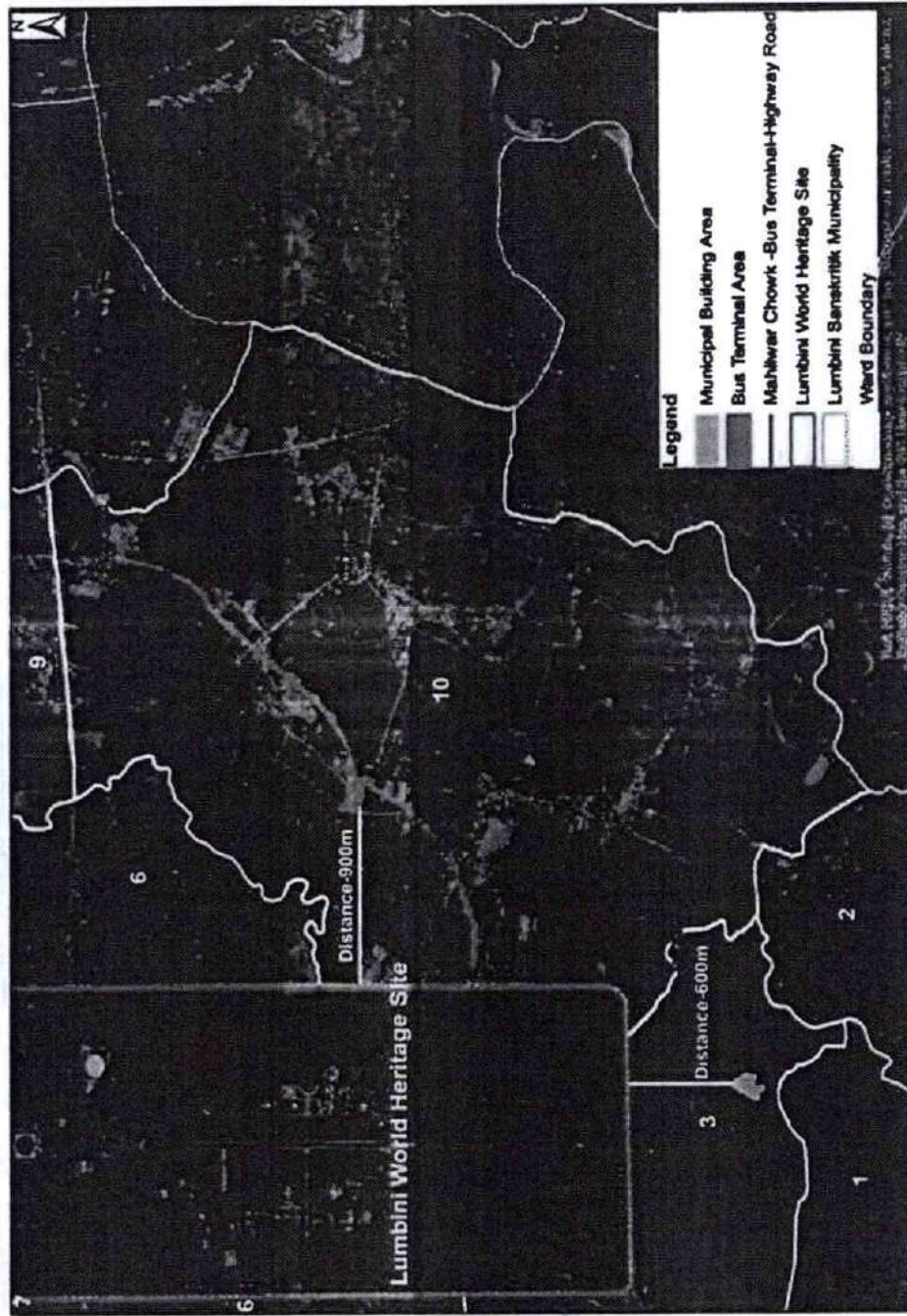
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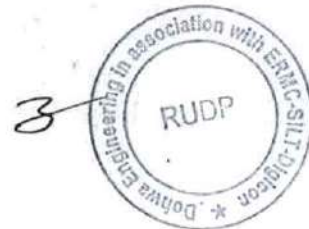
ANNEX 1: Project Information
Annex 1.1: Catchment delineation of Telar River



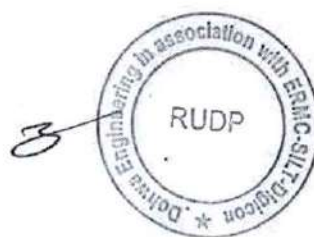
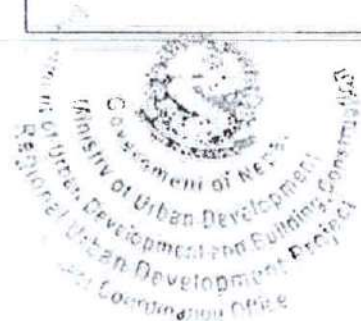
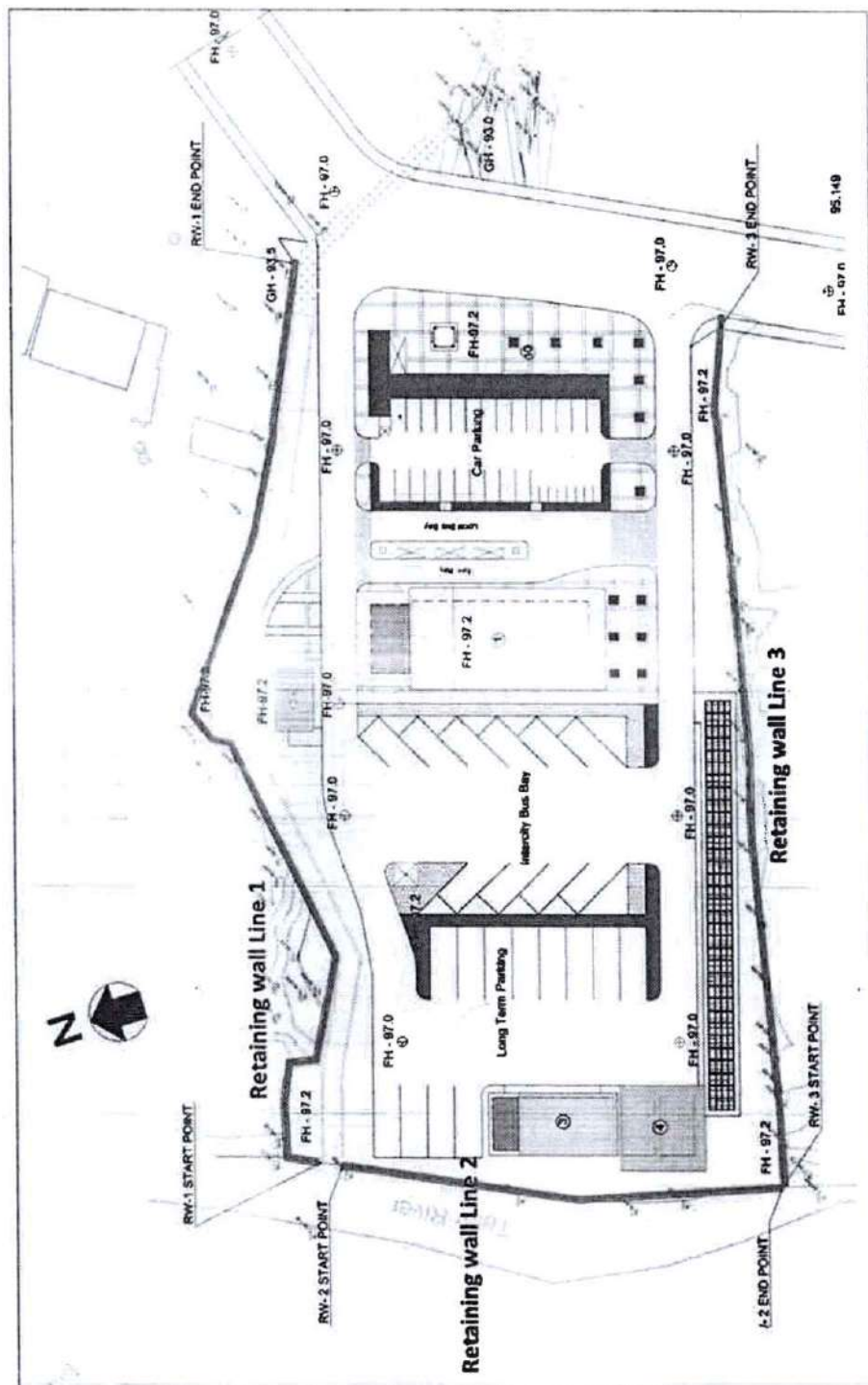
Annex 1.2: Distance of project area from Lumbini World Heritage Site



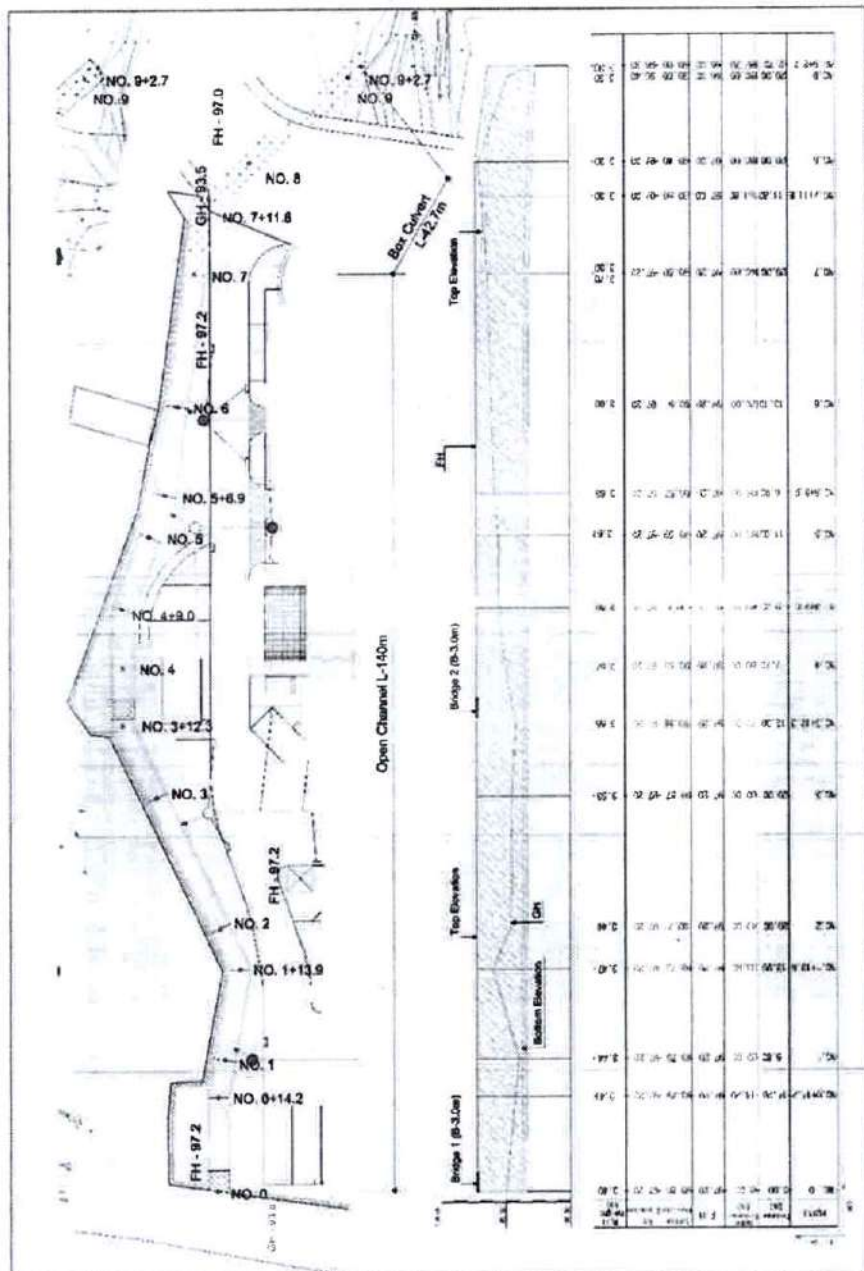
Ministry of Urban Development and Construction
Nepal Government
Lumbini Sanskritik Municipality



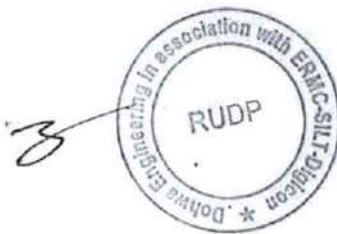
Annex 1.3: Stone masonry wall plan



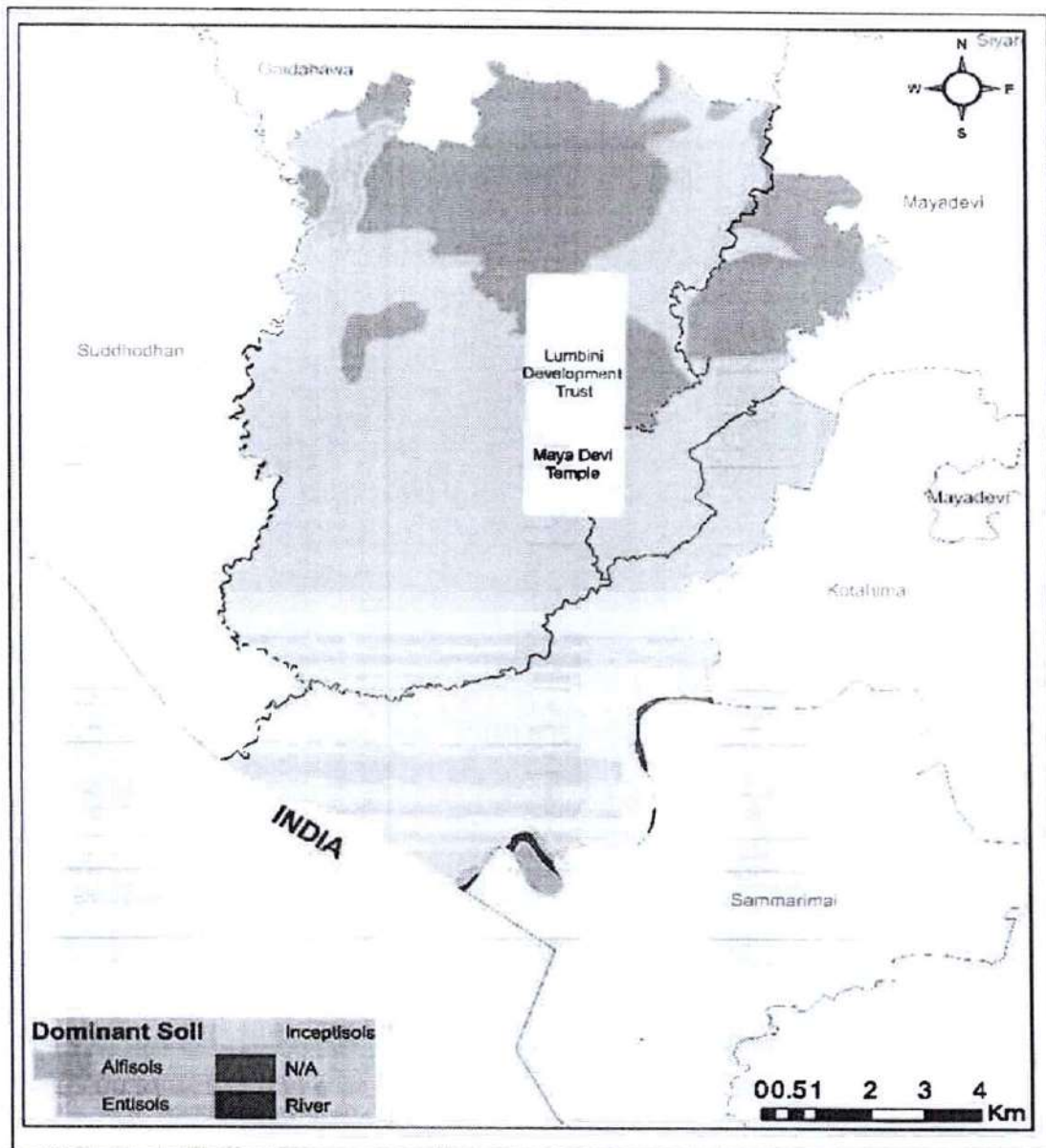
Annex 1.4: New Canal Plan and Profile



Development
 Ministry of Urban Development
 National Urban Development Project
 Project Coordination Office



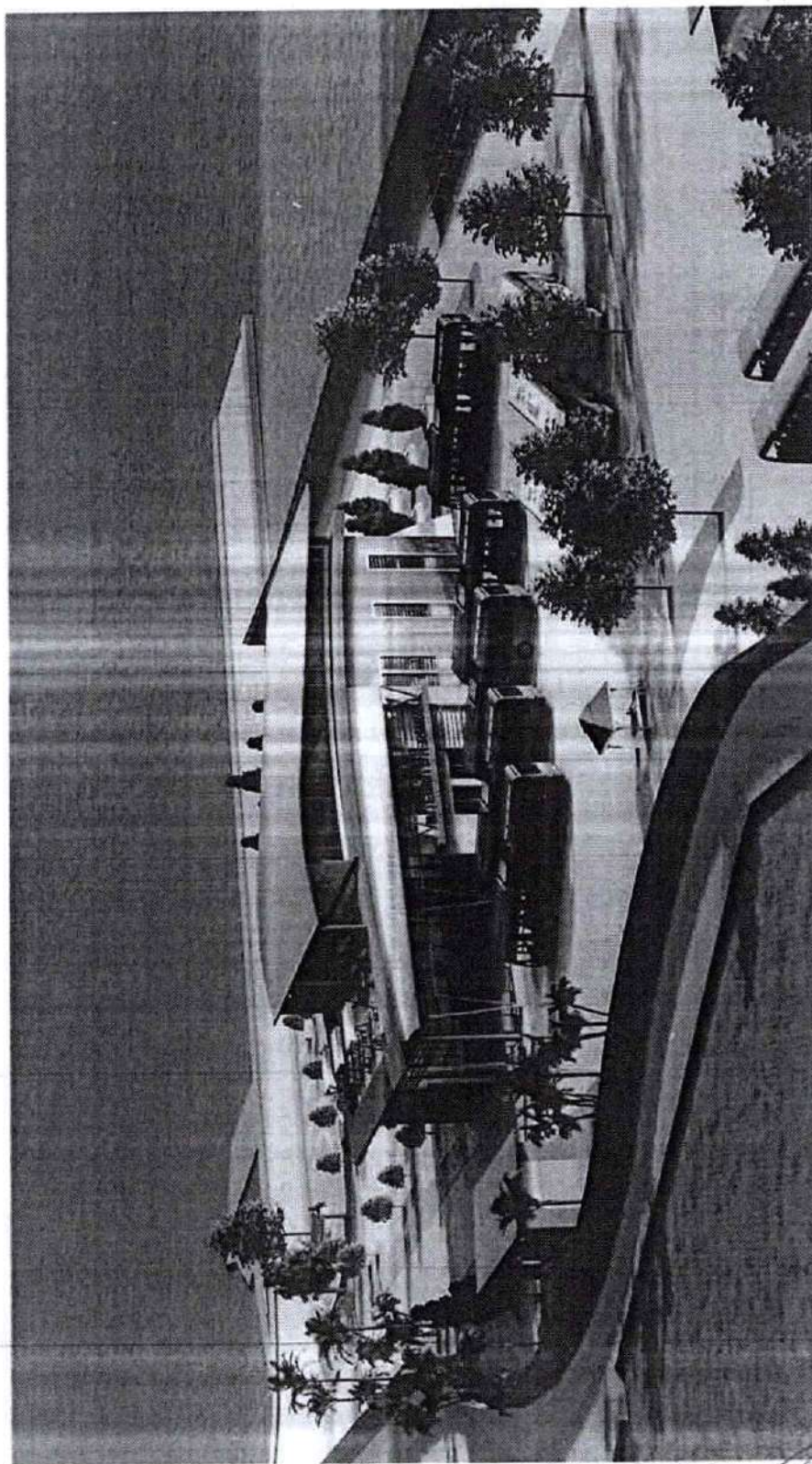
Annex 1.5: Dominant Soil found in Lumbini Sanskritik Municipality as per FAO's SOTER data



Department of Urban Development and Building Construction
Government of Nepal
Ministry of Urban Development and Building Construction
Regional Urban Development Project
Project Coordination Office



Annex 1.6: Render of the Project



Office of the Project
Building Construction
Department

3



Annex 1.7: Master Plan Options

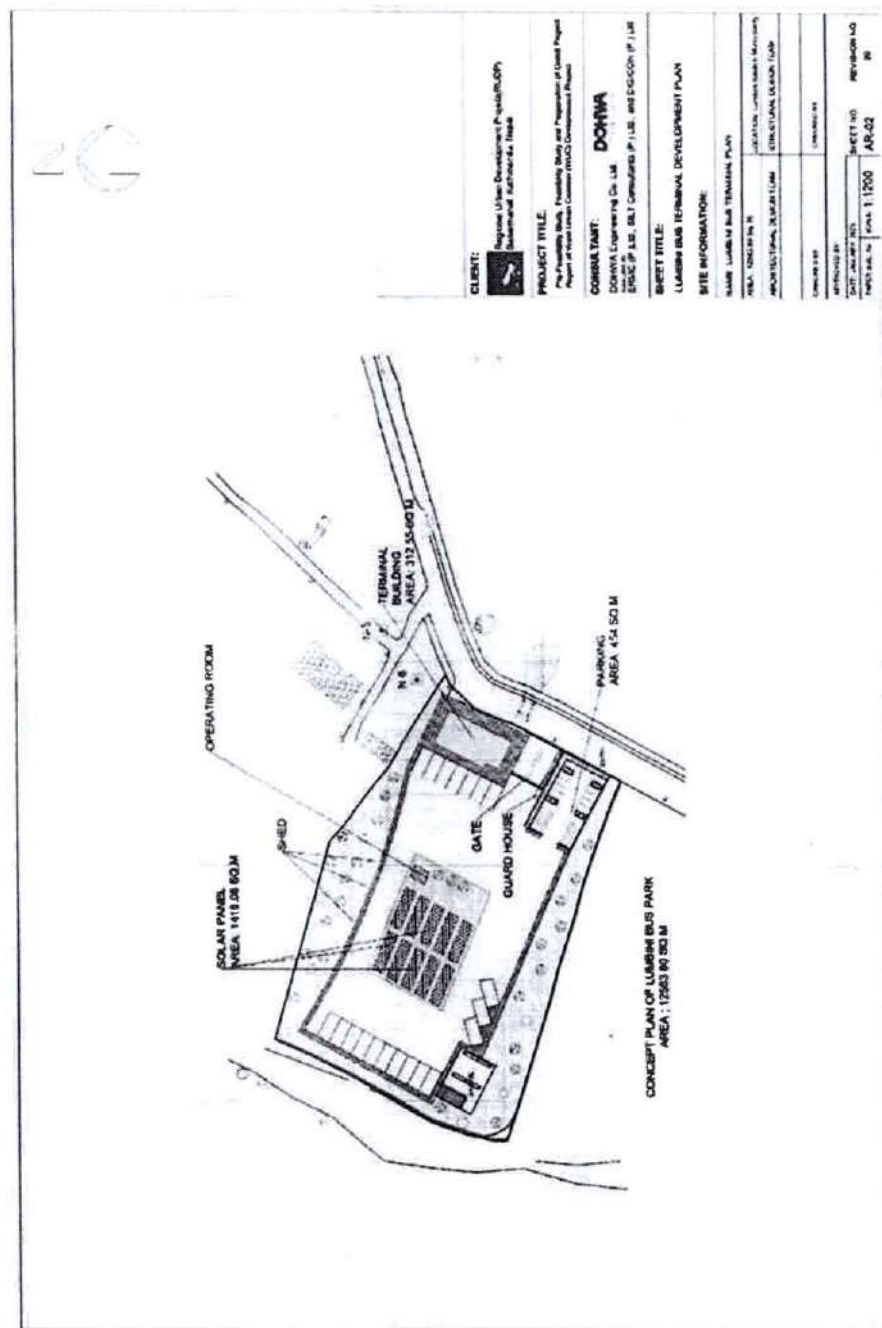
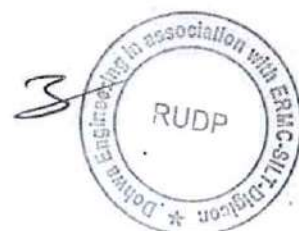


Figure A8: Bus terminal Option 1



141
Office -ment Project
Building Construction
141

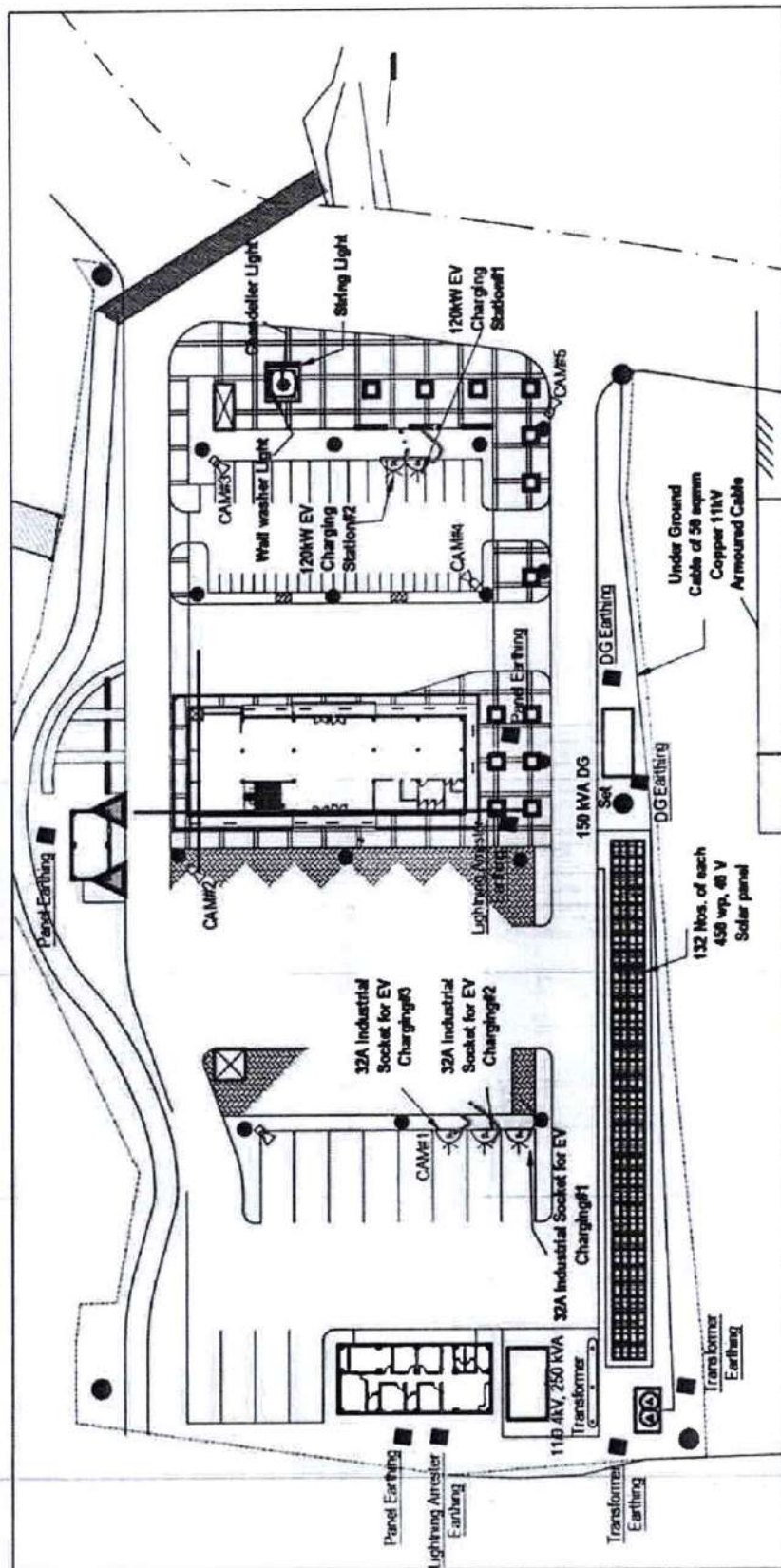


Figure A11: Drawing with EV stations

Annex 1.9: LOAD DEMAND ASSESSMENT

a. Lights

SN	Luminaries	Unit	Terminal Building	Driver's house	Garage	Storage	Clock tower	Out door	Total	Total Wattage
1	6W Down Light	Nos	14	5					19	114.00
2	12W Down Light	Nos	30	11	24				65	780.00
3	12 W Wall Light	Nos				2			2	24.00
4	2w COB Light	Nos	39						39	78.00
5	36W Batten	Nos	53	13	3				69	2,484.00
6	400Watt Chandeliers Light	Nos					1		1	400.00
7	Mirror Light	Nos	8	7					15	300.00
8	String Light	Meter					32.4		32.4	97.20
9	Wall Washer Light	Nos					8		8	160.00
10	90W Security Light	Nos						21	21	1,890.00
Total Wattage in KW										6.33

Power

As most of the loads of the 16A sockets are computer the load taken is of a power of a desktop PC with its accessories like printer etc.

SN	Description	Unit	Bus Terminal Building	Driver's house	Garage Block	Storage	Clock Tower	Out door	Total Wattage
1	Single Phase 16 A 3 Pin (1000 W)	Nos	46	26	7	3	3	5	90,000
2	Three Phase Power Socket (9000W)	Nos	2	0	0			2	36,000
Total Wattage in KW									126



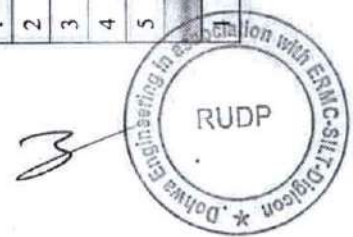
Heating, Ventilation and Air conditioning

As the heating, ventilation and air conditioning imparts the major load of the building. The HVAC loads are as follows.

S N	HVAC	Unit	Bus Terminal Building	Driver's house	Garage Block	Store	Clock Tower	Total Quantity	Total Wattage
1	Ceiling Fan	Set	21	9	2			32	2,080
2	Exhaust System (Ceiling)	Set	4	1				5	200
3	2TR Indoor 4-way Cassette AC	Set		3				3	1,800
4	2.5 TR Indoor 4-way Cassette AC	Set	4	3				7	8,400
5	3 TR Indoor 4-way Cassette AC	Set		2				2	3,600
6	1.5 TR Indoor 4-way Cassette AC	Set	3					3	7,200
7	3 TR Indoor 4-way Cassette AC	Set	1					1	11,190
8	18HP Outdoor Unit	Set		1				1	11,936
9	12HP Outdoor Unit			1	1			2	2,400
10	24HP Outdoor Unit	Set	9	2				11	440
11	42HP Outdoor Unit	Set	7					7	280
	Total Wattage in KW								49.25

Networking and others

SN	Fire Alarm	Unit	Bus Terminal Building	Driver's house	Garage	Storage	Total
1	Heat Detector	Nos	1	2			3
2	Smoke Detector	Nos	13	3			16
3	MCP	Nos	3	1			4
4	Hooter	Nos	6	1			7
5	FACP-4 Zone	Nos	1	1			2
	CCTV						
	Bullet Close Camera IP-4MP	Nos	13	4			17
							146



2	8 Port POE with SFP	Nos	1	1		2
3	16 Port NVR	Nos	1	1		2
	Network					
1	Ethernet Wall Socket	Nos	18			28
2	16 Port Gigabit Switch with SFP Port	Nos	2			3
3	6U Network Rack	Nos	1			2
4	Network Point Wiring- CAT6 and Optical Fiber	Nos	18			28

Annex 1.10: Estimated travelling passenger for waste calculation

- Number of buses travelling to different cities from bus terminal: 10
- Number of private vehicles visiting bus terminal: 14
- Number of Two Wheelers visiting bus terminal: 24
- Number of shops and restaurants in bus terminals: 10

During Arrival:

- Number of passengers in 1 bus: 40
- Number of crew members in 1 bus: 5
- Number of individuals waiting for passengers: $20\% \text{ of passengers} = 40 \times 0.2 = 8$
- Total number of individuals visiting Bus Terminal in 1 bus/trip = $40 + 5 + 8 = 53$
- Total number of individuals visiting Bus Terminal in 10 bus = $10 \times 53 = 530$

During Departure:

- Number of passengers on 1 bus: 40
- Number of crew members in 1 bus: 5
- Number of individuals waiting for passengers: $20\% \text{ of passengers} = 40 \times 0.2 = 8$
- Total number of individuals visiting Bus Terminal in 1 bus/trip = $40 + 5 + 8 = 53$



• Total number of individuals visiting Bus Terminal on 10 buses = $10 \times 53 = 530$
Number of Bus terminal Staffs: 15

Accommodation facilities for crew members: 10

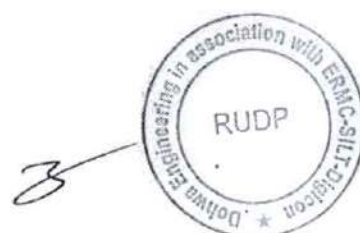
Number of people visiting to bus terminal in private vehicles: $3 \times 14 = 42$

Number of individuals visiting to bus terminal in two wheelers: $2 \times 24 = 48$

Number of individuals working in shops: $2 \times 8 = 16$

Number of individuals working in a restaurant: 6

Total number of individuals visiting Bus Terminal in a day: $530+530+15+10+42+48+16+6$
 $= 1197 \approx 2000$



ANNEX 2: LAB REPORTS

Annex 2.1: Air Quality Report



Lumbini Agro Environment Lab Pvt. Ltd.

लुम्बिनी एग्रो इन्वायरन्मेन्ट ल्याब प्रा. लि.

Ref No: 230/081/082

Helping the world to live better
Sample-12, Report No: 230/081/082

Regd No.: 239602/077/078
Vat No.: 609773466



Issued Date: 2082-03-11

Quality Test Report

Entry No.: LAEL-512-2082

Name of Project: Bus Terminal in Lumbini-Sanskritik Municipality

Address: Ward no. 10, Lumbini Sanskritik Municipality, Rupandehi

Study Site: Temple, School, Meditation centre, Small settlement

Device: GTI 151, GTI FPS-375 (High Volume sampler)

Sample Type: Ambient Air

Sampling Date: 2082-02-29

Sampling Hours: 24 hours

Date completed: 2082-02-30

Location (GPS): 27.476565°N & 83.295068°E

Sampled By: LAEL-field person

SN	Parameters	Unit	Observed Value	Tolerance Limit (National Air Quality Standard, Ministry of Forests and Environment, 2011) ($\mu\text{g}/\text{m}^3$)	Remarks
1	TSP	($\mu\text{g}/\text{m}^3$)	258.1	230	Within the limit
2	PM10	($\mu\text{g}/\text{m}^3$)	63.5	120	Within the limit
3	PM2.5	($\mu\text{g}/\text{m}^3$)	38.2	40	Within the limit
4	SO ₂	($\mu\text{g}/\text{m}^3$)	Not detected	70	Within the limit
5	NO ₂	($\mu\text{g}/\text{m}^3$)	11.2	80	Within the limit
6	CO	ppm	10.5	40	Within the limit

Analysed By
Dipesh Sahani
BSc Ag

Checked By
Dipesh Sahani
BSc Ag

Authorized By
Sudip Paudel
MSc. Env. Sc

The laboratory report is not subjected to any kind of advertisement and publication purpose. The report is not subjected to any legal actions or court evidences. The results of parameters refer only to the tested samples.



Annex 2.2 Sound Quality Report



Lumbini Agro Environment Lab Pvt. Ltd.

लुम्बिनी एगो एन्वायरन्मेन्ट ल्याब प्रा. लि.

Ref No: 230/081/082

Helping the land & water for the people
Sustainable Environment Ltd. 2020Regd No.: 239602/077/078
Vat No.: 609773466

Issued Date: 2082-03-11

Quality Test Report

Entry No.: LAEL-512-2082	Type of sample: Sound Level
Name of Project: Bus Terminal in Lumbini-Sanskritik Municipality	Sampling Date: 2082-02-29
Address: Ward no. 10, Lumbini Sanskritik Municipality, Rupandehi	Date completed: 2082-02-30
Study Site: Temple, School, Meditation centre, Small settlement	Location (GPS): 27.476559°N & 83.295122°E
Device: SL-1352	Sampled By: LAEL-field person
Basic Functions	Run Time: 24 hrs
Accuracy	Range
Resolution	±1.4dB
Frequency Range	0.1dB
Dynamic Range	3.5-8KHz
Level Range	50dB
Time Weighing	Low:30-80dB Medium:50-100dB
	High:80-130dB Auto:30-130dB
	FAST (125ms) SLOW(1s)

Description	Sound Level (dB)	Guideline value for Residential area
Equivalent Noise Level (Day)	51	55
Equivalent Noise Level (Night)	36	45

Day denotes 7:00 hours to 22:00 hours
Night denotes 22:00 hours to 7:00 hours

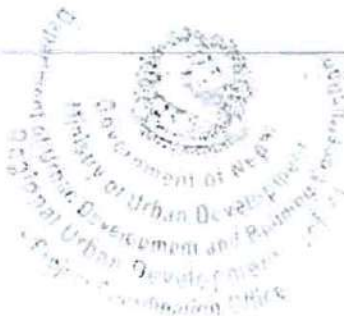
Checked By
Dipesh Sahani
BSc Ag

Checked By
Dipesh Sahani
BSc Ag

Authorized By
Sudip Paudel
MSc. Env. Sci

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CS CamScanner



Annex 2.3: Water quality Report

Lumbini Agro Environment Lab Pvt. Ltd.

लुम्बिनी एग्रो इन्फ्राएरमेन्ट ल्याब प्रा. लि.



Ref No: 230/084/052

Helping the hand to help the people
Surrender - 12, Nepal, 2020

Regd No.: 239602/077/078
Vat No.: 609773466

Issued Date: 2082-03-11

Quality Test Report

Name of Project:	Bus Terminal in Lumbini-Sanskritik Municipality	Lab Code:	LAEL-512-2082
Collector:	Farindra Gupta	Location:	Ward 10 of Lumbini-Sanskritik Municipality
Source:	Surface water	Sampled By:	Laboratory
Sampling Date:	2082-02-29	Test Performance Date:	2082-02-29 to 2082-03-02
Receipt Date:	2082-02-29	GPS Location:	27.474388°N & 83.294929°E

S.N.	Category	Parameters	Method	Observed Value
1	Physical	pH	4500 H.B. APHA 23rd Edition	7.3
2		Temperature, °C	2550 B. APHA 23rd Edition	31.7
3		Total Dissolved Solid, TDS (mg/L)	2540 C. APHA 23rd Edition	340
4		Electrical Conductivity, EC (µS/cm)	2540 C. APHA 23rd Edition	610
5		Total Suspended Solid, TSS (mg/L)	2540 C. APHA 23rd Edition	95
6	Chemical	Total Solids, TS (mg/L)	2540 C. APHA 23rd Edition	435
7		Dissolved Oxygen, DO (mg/L)	4500 O.G. APHA 23rd Edition	5.84
8		Oil and Grease, (mg/L)	5520 B. APHA 23rd Edition	3.89
9		Chloride, Cl ⁻ (mg/L)	4500 C. B. APHA 23rd Edition	18.32
10		Chlorine, Cl ₂ (mg/L)	4500 C. G. APHA 23rd Edition	56.64
11		Total Alkalinity (mg/L)	2320 B. APHA 23rd Edition	175
12		Total Hardness (mg/L, as CaCO ₃)	2340 C. APHA 23rd Edition	165
13		Calcium Hardness (mg/L, as CaCO ₃)	2340 C. APHA 23rd Edition	90
14		Magnesium Hardness (mg/L, as CaCO ₃)	2340 C. APHA 23rd Edition	73
15		Iron Fe ⁺⁺ (mg/L)	3500-Fe B. 2340 C. APHA 23rd Edition	3.94
16		Nitrate (NO ₃ -), (mg/L)	4500-NO ₃ -C. APHA 23rd Edition	19.39
17		Potassium (K ⁺), (mg/L)	3500- K B APHA 23rd Edition	3
18		Sodium (Na ⁺), (mg/L)	3500- K B APHA 23rd Edition	14
19		Arsenic As ₃ (mg/L)	3500- As B APHA 23rd Edition	0.006
20	Micro-Biological	Total Coliform, (CFU/100 ml)	9222 B APHA 23rd Edition	UN

Analysed By
Bipesh Sahani
BSc.Ag

Checked By
Bipesh Sahani
BSc.Ag

Authorized By
Sudip Paudyal
MSc. Env. Sci

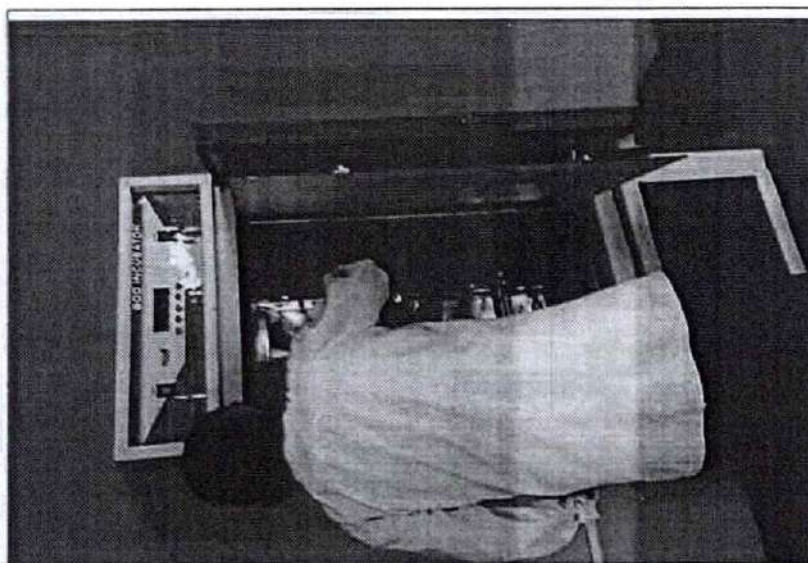
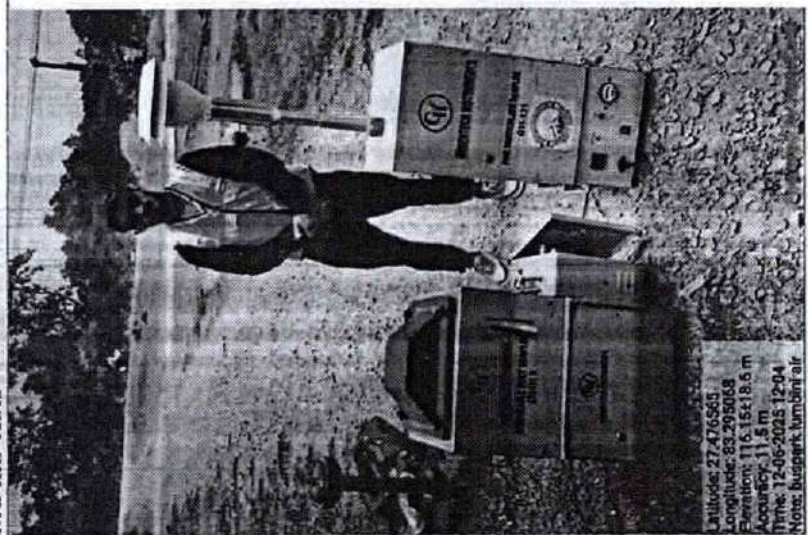
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CS CamScanner

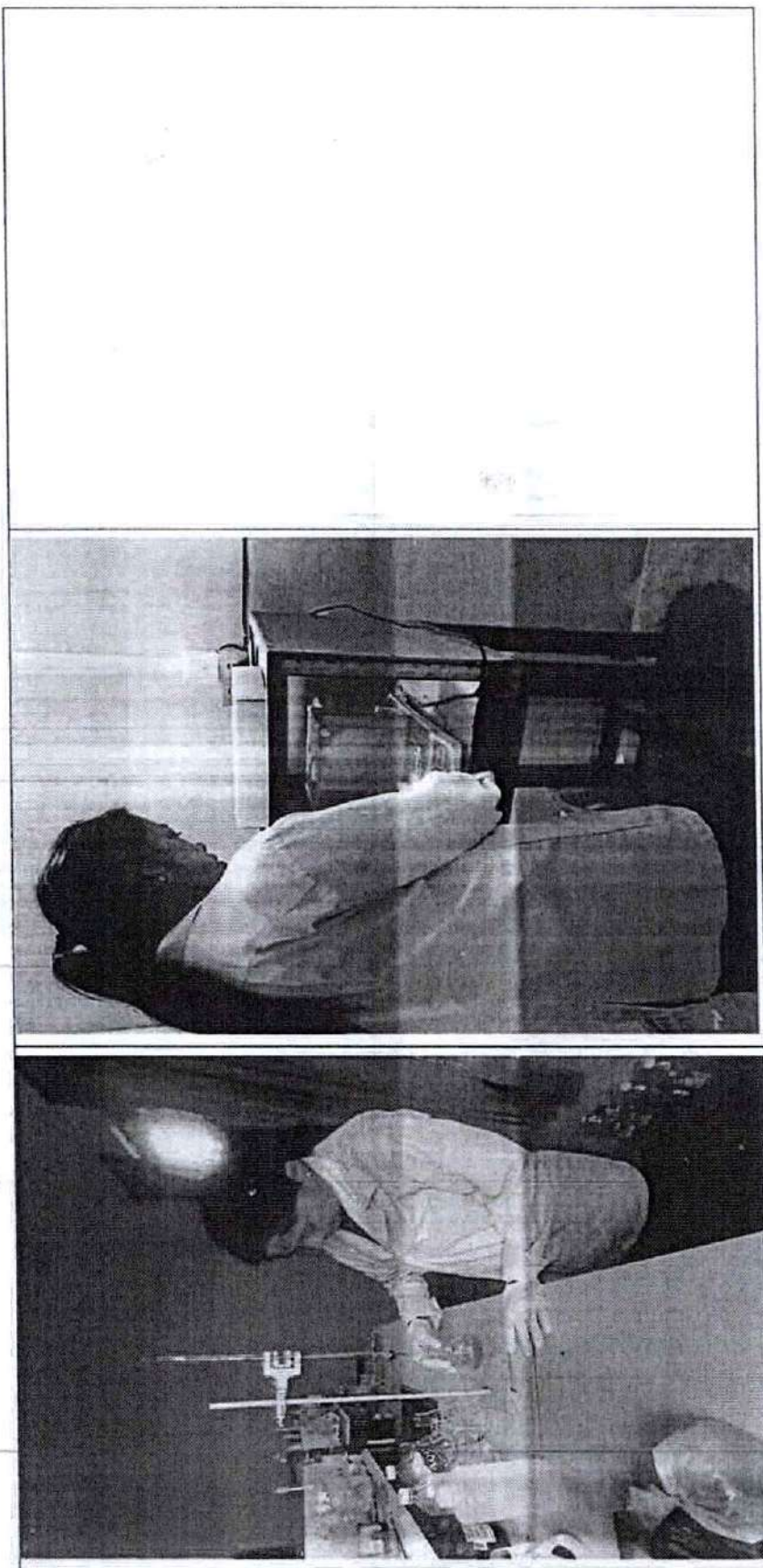


Annex 2.4: Sampling for Air, Water and Sound and lab tests



Government of Nepal
Ministry of Urban Development and Building Construction
Department of Urban Development and Building Construction
Regional Urban Development Project Coordination Office

Engineering in association with ERAC-SIL-Edison
RUDP



ANNEX 3: HH SURVEY OF DIA OF BUS TERMINAL PROJECT

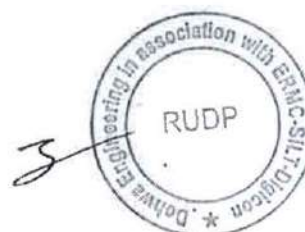
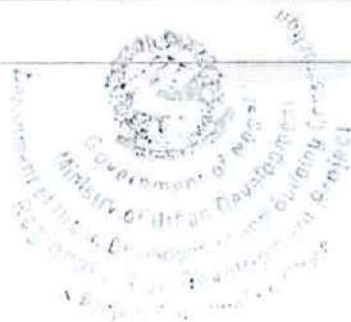
The HH survey was conducted in Jestha, 2082. HHs, whose houses or lands, are near the project area were surveyed. Convenient sampling was used to find the sample from the population, which comprised of the people residing or owning lands near the project site. The maps, questionnaire, the list of the respondents, and some images are given below.

Annex 3.1: Map of Direct Impact Area

The project influence area and the impact area are delineated based on the field conditions and nature of project development using the similar past experiences of the experts involved in the IEE process. Based on the environmental impacts of the project, the project affected areas are classified as the following table:

Table: Categories of project influence and impact area

Directly Impact Area (DIA)	It includes the construction areas of project activities and normally the vicinity within 150m of the project is considered as the Direct Impact Area (DIA). It also includes the ancillary structure sites camp facilities area, excavation area/quarry sites and stockpiling sites including their access components.
Indirect Impact Area (IIA)	It includes the immediate areas of construction with moderate and low impacts, such area covers area beyond the DIA. Therefore, ward number 10, Madhubani of Lumbini-Sanskritik Municipality is considered to be the Indirect Impact area. (IIA)
Zone of Influence (ZOI)	It includes the area that can be impacted excluding the direct and the indirect impact areas. Here, Lumbini-Sanskritik Municipality and Mayadevi RM is considered to be the zone of influence.



Annex 3.2: Questionnaire for Household survey

घरघुरी सर्वेक्षण प्रश्नावली

यस प्रश्नावली सोधनुको कारण, यसको उपयोगिताको बारेमा सबै कुरा बुजेको छु र यसको उत्तर स्व-इच्छाले दिएको हुँ । म यसलाई मेरो गोपिन्यतामा असर नहुने गरि प्रयोग गर्न पूर्ण स्वीकृति यस कार्यालयलाई दिन्छु । सहमती छ / छैन

अन्तर्वार्ता लिने मान्छेको नाम :

१ आयोजनाको जानकारी

१.१ आयोजनाको नाम:	१.२ अन्तरवाताको मिति:
१.३ जिल्ला:	१.४. न. पा. को नाम :
१.५. वडा नं.:	१.६. गाउँ/टोलको नाम:

२ . उत्तरदाताको साधारण जानकारी

२.१. उत्तरदाताको नाम, उमेर :
२.२. जातजाती: सोद/ थारु/ तेली/बानिया/मल्ल/कुर्मी/ यादव/ बानिया/चमार/हरिजन/राम/पहाडको ब्राह्मण/ तराई ब्राह्मण/दुसाध/पासवान/पासी/कहार/ थारु / परियार/मुसलमान/ अन्य) अन्य:.....
२.३. धर्म: (हिन्दु/ बौद्ध/ इसाई/ इस्लाम/ किरात/ प्रकृति/ अन्य).....
२.४. के घरमूलीसँग नागरिकताको प्रमाण पत्र छ? छ/ छैन
२.५. तपाईंको परिवारमा कति जना सदस्यहरु हुनुहुन्छ ?:
२.६ परिवारको प्रकार: एकात्मक परिवार (१ दम्पित) / संयुक्त परिवार (२ दम्पित)/ बिस्तारित परिवार (>२ दम्पित)
२.७. तपाईंको परिवार (पुर्खा) कहिले देखी यस ठाउँमा बस्दै आउनुभएको हो ? (० देखि १० वर्ष सम्म / १० देखि २५ वर्ष सम्म/ २५ देखि ५० वर्ष सम्म/ ५० वर्ष भन्दा माथि
२.८. तपाईं बसाईसराई गरी आउनुभएको हो ? (हो / होइन) हो भने जिल्ला भन्नुहोस ? :.....
२.९ तपाईंको मातृभाषा कुन हो ? (नेपाली / अवधी / भोजपुरी / मैथिली/ उर्दु /नेवारी/ अन्य कुनै) अन्य :

३. घरघुरीको विवरण

३.१ पारिवारिक विवरण



क्र. सं	घरपरिवारका सदस्यहरूको घरमुलीसँगको नाता (स्वयं सहित)	लिङ्ग	उमेर	शिक्षा	पेशा (१४ वर्षभन्दा माथि)	हाल घरमा भएको वा नभएको
१						
२						
३.....						

३.१.१ घरमुलीको वैवाहिक अवस्था: (विवाहित / अविवाहित / विधुर / विधवा / छोडपत्र भएको)

३.२ स्वास्थ्यको

३.२.१. गएका १२ महिनामा तपाईंको परिवारको कुनै सदस्य बिरामी हुनुभएको थियो?

(थियो / थिएन)

यदि थियो भने, कुन रोग लागेको थियो ? कृपया खुलाउनुहोस्: (ज्वरो / सामान्य रुघा-खोकी / मलेरिया / झाडापखाला / जन्डिस / टाईफाइड / निमोनिया / मुटु सम्बन्धी / अन्य)

३.२.२ बिरामी भएको अवस्थामा के गर्नु हुन्छ ? (धामी / झाक्री / स्वास्थ्य चौकी / अस्पताल / घरेलु उपचार)

३.२.३ तपाईंको घरमा अपाङ्गता भएको कोहि हुनुहुन्छ ? (छ / छैन)

यदि छ भने अपाङ्गता प्रकार र कारण खुलाउनुहोस् ? :

३.३ पेशा

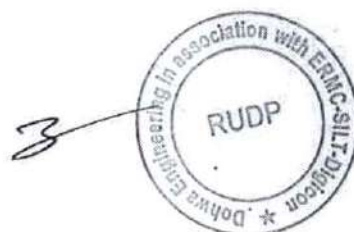
३.३.१ प्रमुख पेशा: गएको वर्षको मुख्य आम्दानीको श्रोत (मुख्य तीन)

प्राथमिक आम्दानीको श्रोत :

सहायक आम्दानीको श्रोत १:

सहायक आम्दानीको श्रोत २:

३.४ घर सुविधा



३.४.१ खानेपानीको स्रोत के हो ? (पाइपलाइन/ बोरिंग/ कल /ढुंगेधारा/ इनार/कुवा / ट्यांकर) अन्य:
३.४.२ शौचालय प्रकार ? (खाल्डे चर्पी र कच्चा चर्पी/ पक्का चर्पी/कुनै पनि छैन)
३.४.३ कुन कुन सवारी साधनहरु छन् ? (मोटरसाइकल/साइकल/मोटरगाडी/ कुनै पनि छैन) अन्य :.....
३.४.४ संचारको साधन के के छन् ? (रिडियो/ टिभी/ टेलिफोन/ साधारण मोबाइल/ स्मार्ट मोबाइल / WIFI/ कुनै पनि छैन) अन्य:.....
३.४.५ अन्य उपकरणहरु भए लेख्नुहोस् ? (फ्रिज/ ए सी/ जेनेरेटर/ फ्यान/ कुनै पनि छैन) अन्य:.....
३.४.६ बत्तीको मुख्य श्रोत: (बिजुली (राष्ट्रिय ग्रिडमा जोडिएको वा लगु विधुत/ सौर्य उर्जा/मट्रितेल/बायो-ग्यास/ विन्डमिल) अन्य:.....
३.४.७ खाना पकाउन प्रयोग हुने इन्धनको मुख्य श्रोत: (दाउरा/ ग्याँस/ बायो ग्याँस/ बिजुली/ गुईँठो/ बृकेट / धानको ब्रोका) अन्य:.....
३.४.८ आफु वस्ने घरको प्रकार: (पिलर भएको पक्कि घर/ पिलर नभएको सिमेन्टले बनेको /कच्ची घर माटो ढुंगाले बनेको) अन्य:.....

३.५ कृषि

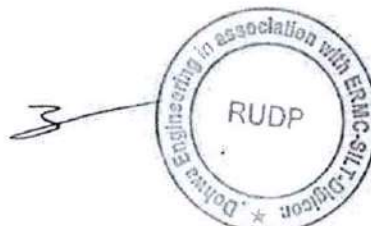
३.५.१ तपाईं कृषिमा संलग्न हुनुहुन्छ ? (छु / छैन)

छ भने भर्नुहोस् ?

३.५.१.१ खेती गर्ने गरेको मुख्य बाली

मुख्य बाली	लगाईएको क्षेत्रफल (बिगामा)	कुल उत्पादन (के.जी.)
धान		
गहुँ		
मकै		
गेडागुडी		
तोरी		
तरकारी		
फलफुल		

३.५.१.२ तपाईंको आफ्नै कृषि उत्पादनले कति महिनालाई पर्याप्त हुन्छ ?



(३ महिना सम्म/ ३ देखि ६ महिना सम्म/ ६ देखि ९ महिना सम्म/ ९ देखि १२ महिना सम्म/१२ महिना भन्दा बढि)

३.५.१.३. तपाईले कृषि उत्पादनलाई बिक्री गरेर गत वर्ष कति आम्दानी गर्नुभयो ?.....

३.६ वन, वनस्पतिजन्य वस्तुको उपलब्धता

३.६.१. के तपाईको निजि वन छ?

(छ / छैन)

३.६.२ तपाई कुनै वनको उपभोक्ता समितिको सदस्य हुनुहुन्छ ? (छ/छैन)

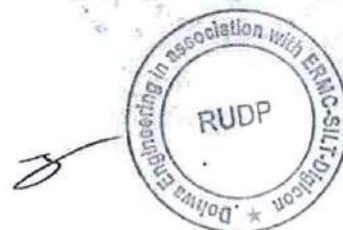
वस्तु	स्रोत	कैफियत
दाउरा		
घाँस		
वाँस		
काठ		
खर		

४ आयोजनाबाट पर्ने प्रभाव

४.१ के तपाईलाई आयोजनासँग सम्बन्धित जानकारी छ ? छ / छैन छ भने कस्तो छ ?.....
४.२ छ भने कस्तो खालको जानकारी-छ ? भन्नुहोस् ? (आयोजनाको बारेमा सामान्य जानकारी / आयोजनाको समयावधि / आयोजनाको लागत/ आयोजना प्रभावित घरधुरीको बारेमा) अन्य:.....
४.३ छैन भने कस्तो प्रकारको जानकारी उपयोग हुन्छ ?:
४.४ आयोजनाले तपाईको भोगचलन गरी आएको जग्गामा प्रभाव पार्छ ? (पर्छ / पर्दैन)
४.५ कस्तो खालको प्रभाव बढी पर्छ ? (सकारात्मक प्रभाव / नकारात्मक प्रभाव/ केहि असर पर्दैन)
४.६ यस आयोजनाबाट तपाईलाई के कस्तो प्रभाव पर्न सक्छ ? (रोजगारीको अवसर / पर्यटन प्रवर्धनमा सहयोग गर्छ / प्राकृतिक स्रोतमा श्रीजना हुने चाप / प्रदुषण / नया व्यापारको अवसर /खेती योग्य जमिनको नास/ धार्मिक परम्परामा असर /पानीको उपलब्धतामा कमि) अन्य :

५. विद्यमान वातावरणीय अवस्था

५.१ यस आयोजनाको सिमा भित्र के कस्ता वनस्पति र वन्यजन्तु पाईन्छ ?



विषय	जलचर	उभयचर	सरीसृप	चरा	स्तनधारी जनावर
उल्लेख गर्नु होस्					

५.२ यस ठाउँमा के कस्तो वनस्पति पाईन्छ ? ति वनस्पति के का लागी प्रयोग गरिन्छ ?

६. प्राकृतिक प्रकोप

६.१ यस क्षेत्रमा क कस्तो प्राकृतिक प्रकोपहरू हुने गरेको छ ?

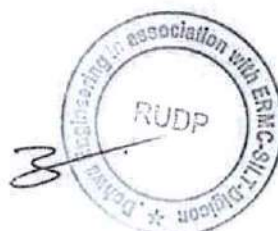
प्राकृतिक प्रकोप	स्थान	बारम्बारता (वार्षिक, मासिक)	कैफियत
बाढी			
आगलागी			
अनावृष्टि			
अतिवृष्टि			

७. आम्दानी तथा ऋण

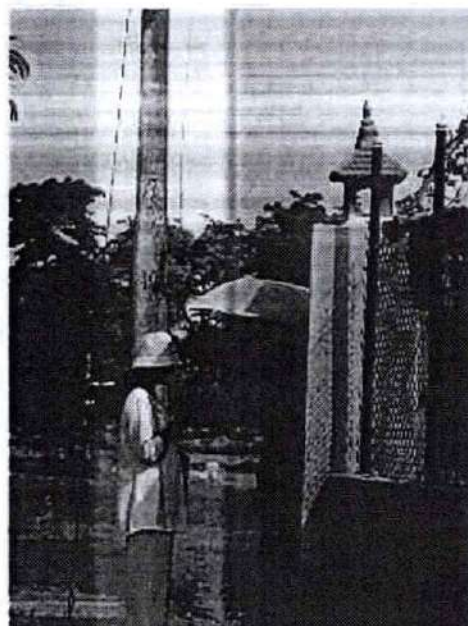
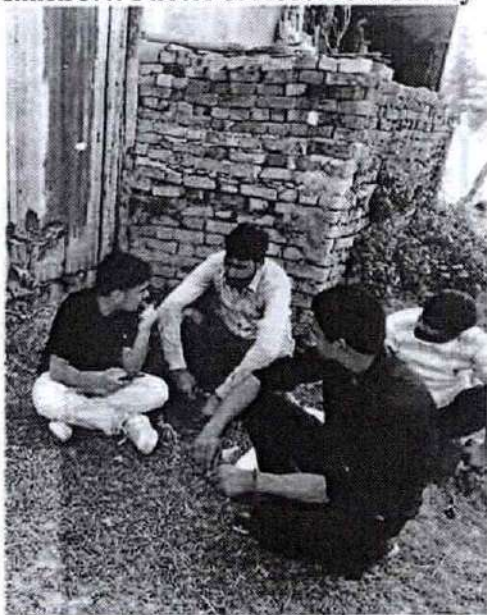
७.१ के घरमूली वा पति/ पत्निले बैंक खाता खोल्नुभएको छ? (छ/ छैन)
७.२ के तपाईंले ऋण वा उधारो लिनुभएको छ ? (छ/ छैन)
७.३ तपाईंको वार्षिक आम्दानी कति छ ?

Annex 3.3: List of People surveyed in DIA

S.N	Name	Gender	Permanent Location
1	Bikas Yadav	Male	Lumbini Sanskritik-10, Madubani
2	Buddhi Ram Harijan	Male	Lumbini Sanskritik-10, Madubani
3	Muneshor Dhobi	Male	Lumbini Sanskritik-10, Madubani
4	Fulmaya BK	Female	Lumbini Sanskritik-10, Madubani
5	Susma Gurung	Female	Lumbini Sanskritik-10, Madubani
6	Uddhav Karki	Male	Lumbini Sanskritik-10, Madubani
7	Sukraprasad Yadav	Male	Lumbini Sanskritik-10, Madubani
8	Maniram	Male	Lumbini Sanskritik-10, Madubani
9	Bring Bihari Nau	Male	Lumbini Sanskritik-10, Madubani
10	Dipak Chhetri	Male	Lumbini Sanskritik-10, Madubani
11	Taulan Harijan	Male	Lumbini Sanskritik-10, Madubani
12	Bir Bahadur B.K	Male	Lumbini Sanskritik-10, Madubani
13	Gobinda Prasad dhobi	Male	Lumbini Sanskritik-10, Madubani
14	Sankar Yadav	Male	Lumbini Sanskritik-10, Dinguwa
15	Bikram Prasad Lodh	Male	Lumbini Sanskritik-10, Madubani
16	Sabita Khadka	Female	Lumbini Sanskritik-10, Madubani
17	Prem Bahadur Bhusal	Male	Lumbini Sanskritik-10, Madubani

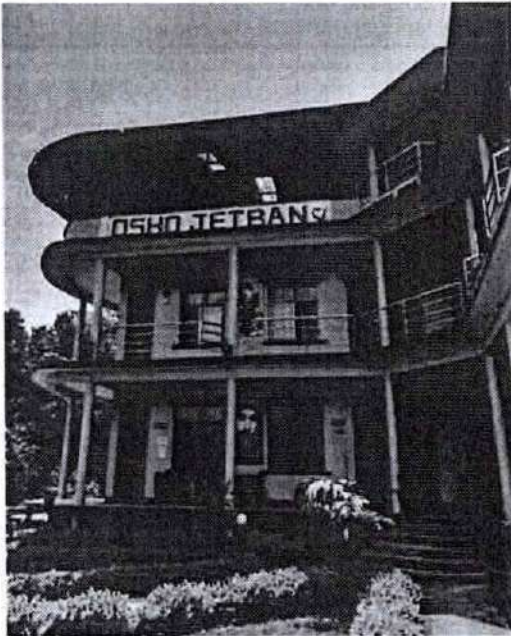


Annex 3.4: Photos of Household Survey

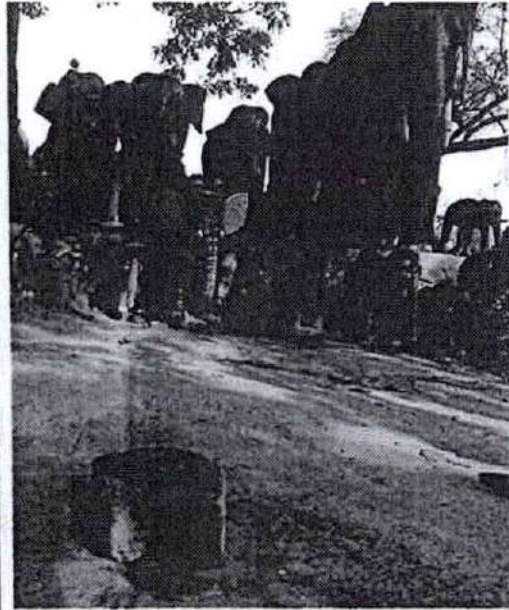


संस्कृतिक नगरपालिका
लुम्बिनी प्रदेश सरकार
लुम्बिनी प्रदेश सरकार
लुम्बिनी प्रदेश सरकार

3
RUDP
* DoHwa Engineering in association with ERAC-SILT-Diggleon *



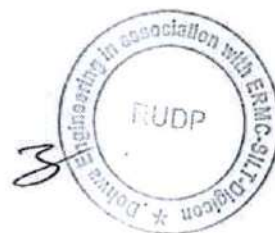
Osho Jetban



Samaya Mai temple near the project site



Box Culvert



Annex 3.5: Minutes of Consultations

अज्ञा मिलि २०७३/११/०३ गतेमा विम लुम्बिनी सांस्कृतिक, नगरपालिका तथा नं १० का नगर प्रमुख श्री राजकुमार शर्माको अध्यक्षतामा रहेको बैठकमा उपस्थित भएका सबै पक्षहरूको सहभागितामा भएको छ।

उपस्थित भएका पक्षहरूको नाम र पदहरू निम्नान्वये उल्लेख गरिएको छः

१. श्री राजकुमार शर्मा	नगर प्रमुख
२. श्री राजकुमार शर्मा	नगर प्रमुख
३. श्री राजकुमार शर्मा	नगर प्रमुख
४. श्री राजकुमार शर्मा	नगर प्रमुख
५. श्री राजकुमार शर्मा	नगर प्रमुख
६. श्री राजकुमार शर्मा	नगर प्रमुख
७. श्री राजकुमार शर्मा	नगर प्रमुख
८. श्री राजकुमार शर्मा	नगर प्रमुख
९. श्री राजकुमार शर्मा	नगर प्रमुख

बैठकको मुख्य विषय र निर्णयहरू निम्नान्वये उल्लेख गरिएको छः

१. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।
२. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।
३. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।
४. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।
५. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।
६. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।
७. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।
८. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।
९. नगरपालिकाको विकास र प्रगतिबारेको छलफल गर्ने।



आयोजनाकर्ताले उपस्थित सबै पक्षहरूलाई जानकारी गराएको छ।

१. उक्त प्रस्तावमा उल्लेख गरिएको प्रस्तावित आयोजनाहरूको पूर्ण रूपमा पूर्ण प्रभावित व्यक्तिहरूको वडाबाट उक्त भूमा पर्ने सबै प्रत्येक व्यक्तिहरूलाई जानकारी गराइने।

२. उक्त भूमा पर्ने सबै व्यक्तिहरूलाई जानकारी गराइने।

३. उक्त भूमा पर्ने सबै व्यक्तिहरूलाई जानकारी गराइने।

४. उक्त भूमा पर्ने सबै व्यक्तिहरूलाई जानकारी गराइने।

५. उक्त भूमा पर्ने सबै व्यक्तिहरूलाई जानकारी गराइने।

६. उक्त भूमा पर्ने सबै व्यक्तिहरूलाई जानकारी गराइने।

७. उक्त भूमा पर्ने सबै व्यक्तिहरूलाई जानकारी गराइने।

८. उक्त भूमा पर्ने सबै व्यक्तिहरूलाई जानकारी गराइने।

९. उक्त भूमा पर्ने सबै व्यक्तिहरूलाई जानकारी गराइने।

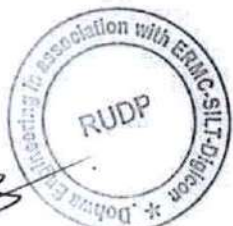




सह-संस्थापन समिति

आवृत्ति २०८१/०८/११ गतेका दिन बुधिनारी सांस्कृतिक नगरपालिका अन्तर्गत निर्माण हुन लागेको यस टर्मिनल स्थलमा रहेको कुलेको स्थान परिवर्तन गरी स्थलको उत्तर पट्टी लागू गर्ने भएको सम्बन्धमा सहसंस्थापको उपस्थितिमा देखिएका विषयमा छलफलका लागि बडा नं. १० का बडा अध्यक्ष श्री विमल कार्कीको अध्यक्षता बैठक गरी निर्णय गरियो ।

- १) बडा नं. १० अध्यक्ष श्री विमल कार्की
- २) बडा नं. १० सदस्य श्री विमल कार्की
- ३) बडा नं. १० श्री विमल कार्की
- ४) बडा नं. १० श्री विमल कार्की
- ५) बडा नं. १० श्री विमल कार्की
- ६) बडा नं. १० श्री विमल कार्की
- ७) बडा नं. १० श्री विमल कार्की
- ८) बडा नं. १० श्री विमल कार्की
- ९) बडा नं. १० श्री विमल कार्की
- १०) बडा नं. १० श्री विमल कार्की
- ११) बडा नं. १० श्री विमल कार्की
- १२) बडा नं. १० श्री विमल कार्की
- १३) बडा नं. १० श्री विमल कार्की
- १४) बडा नं. १० श्री विमल कार्की



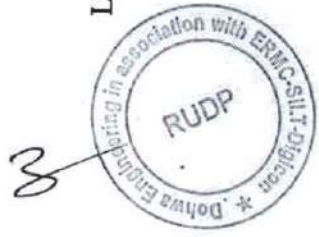
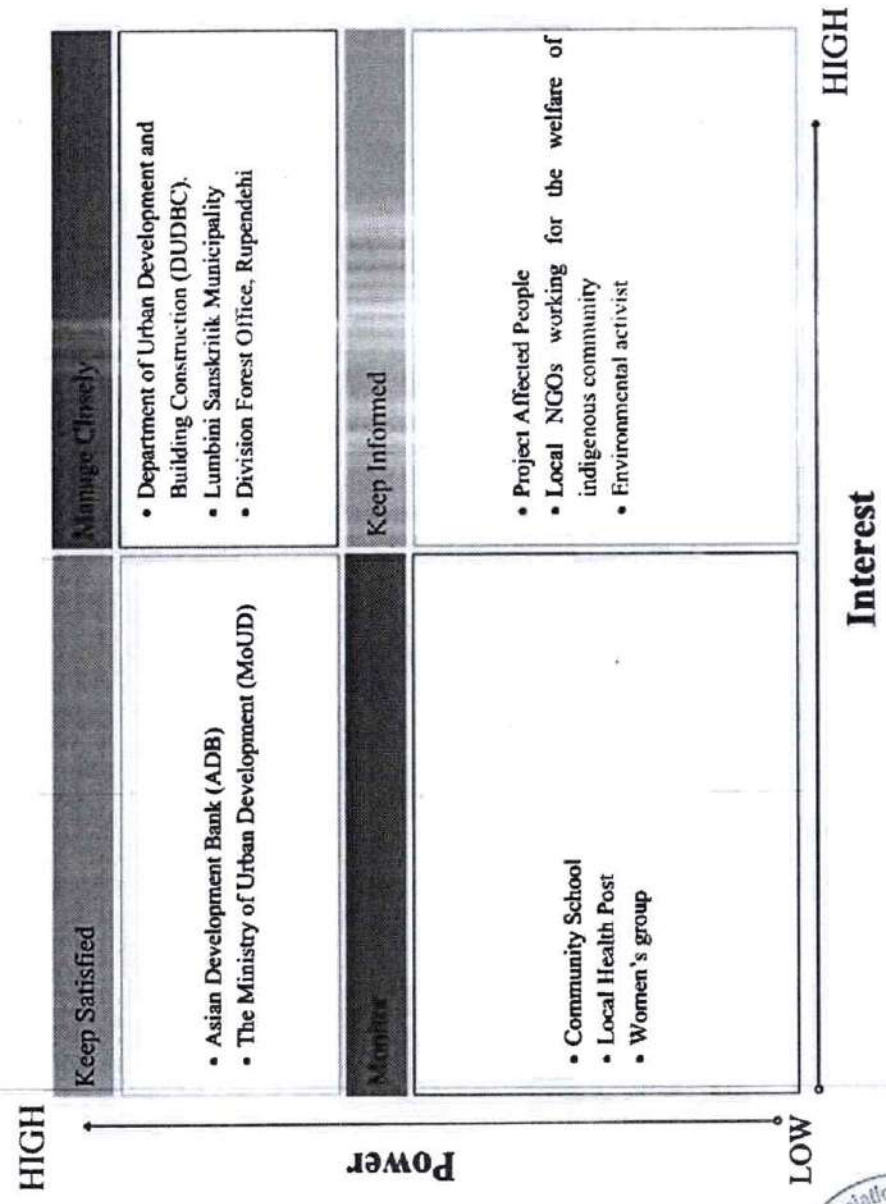
सुविधी सांस्कृतिक नगरपालिका अन्तर्गत बडा नं. १० मा निर्माण हुन लागेको यस टर्मिनल स्थलमा कुलेको स्थान परिवर्तन गरी उत्तर पट्टी लागू गर्ने भएको स्थलमा स्थायीको पूर्ण सम्पत्ती रहेको र कुले कुलेको सम्पत्ती भएको र यस क्षेत्रको विकास कार्यमा सहयोग पुर्‍याउन सहमत रहेको निर्णय गरियो ।

आवृत्ति २०८१/०८/११

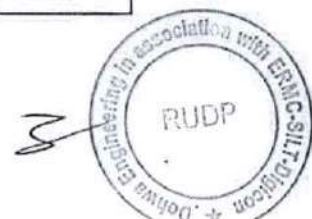
सह-संस्थापन समिति

सह-संस्थापन समिति

ANNEX 4: STAKEHOLDER ENGAGEMENT MAPPING Power Interest Matrix



Stakeholder Name	Interest	Power	What is important to them	How could they contribute to the project	How could they block the project	Strategy for engaging them
High power, Low interest: Keep Satisfied						
Asian Development Bank	Low	High	Indigenous people, Involuntary Resettlement and Environmental safeguards and compliance	By providing funds and technical oversight	By withholding or delaying the funding	Timely safeguard compliance reports and maintaining transparency. Accountability and authentic information and reports.
The Ministry of Urban Development (MoUD)	Low	High	Project completion and compliance with the national laws and policies.	Policy guidance, resource mobilization	Bureaucratic delays	Regular consultation
High Power, High Interest: Manage closely						
Department of Urban Development and Building Construction (DUDBC)	High	High	Timely completion of the quality project within the estimated budgets.	Facilitate approvals, technical support, site monitoring	Administrative delays or non-approval	Frequent technical meetings, collaborative working
Lumbini Sanskritik Municipality	High	High	Land use, local development benefit, public support	Coordination, public consultation, permits	Withhold local level clearances, influence local resistance	Close collaboration through the project, grievance management

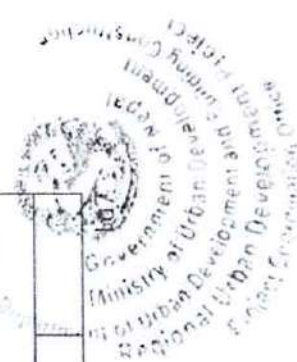
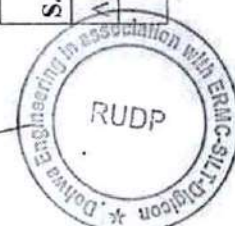


Stakeholder Name	Interest	Power	What is important to them	How could they contribute to the project	How could they block the project	Strategy for engaging them
Divisional Forest Office, Rupendehi	High	High	Does not harm flora and fauna	By providing feedback and technical support related to flora and fauna	Administrative hurdles	Regular involvement and consultation.
High Interest, Low Power: Keep Informed						
NGOs working for the welfare of indigenous people	High	Low	Does not impact the livelihood of local indigenous people	Provide feedback and suggestions to safeguard the welfare of indigenous people	By filing Public interest litigation in the supreme court, lobbying against the project.	By regularly consulting them.
Project affected people	High	Low	Employment, environmental quality, and social benefit	Provide feedback on local impacts, need assessment	Mobilise resistance if expectations are not met	Continuous communication, grievance redress mechanisms
Interest Power	High	Low	Compliance of all the legal environment laws.	Provide feedback and suggestions to compliance with the laws	By filing Public interest litigation in the supreme court,	Provide timely reports showing compliance with the legal laws related to the environment. By regularly consulting them.
Low power, Low Interest: Monitor						

Stakeholder Name	Interest	Power	What is important to them	How could they contribute to the project	How could they block the project	Strategy for engaging them
Women's Group	Low	Low	Gender inclusivity,	Identify gendered impacts,	Do not have that power. Can only submit grievances	Provide information if requested. Address the grievances if came.
Community School-Head-teachers, Teachers	Low	Low	Community welfare, environmental education	Data regarding perspectives and expectations of the people, Support environmental awareness and social cohesion	Passive resistance (influence public opinion subtly)	Engage them in discussions, conduct education campaigns, workshops
Local Health Post	Low	Low	Control of epidemics in workers camp	By providing health services to workers	Cannot block the project	Advice to improve the health and sanitation

ANNEX 5: Checklist for the environmental audit

S.N.	Description	Project Activities	Predicted Impact	Actual Impact	Mitigation Measures	Effectiveness	Information	Source of the data
	Physical Environment							
1	Air Quality							



Annex 6: PUBLIC HEARING INFORMATION

Annex 6.1: Public hearing notice published in Butwal Today



नेपाल सरकार
शहरी विकास मन्त्रालय
शहरी विकास तथा भवन निर्माण विभाग, बबरमहल काठमाडौं

लुम्बिनी सांस्कृतिक नगरपालिकामा बस टर्मिनल आयोजना निर्माणको
प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयारीका लागि सार्वजनिक
सुनुवाई कार्यक्रम सम्बन्धी सूचना !!!

(प्रकाशित मिति: २०८२ ०६ २७)

प्रस्तावकको नाम र ठेगाना	क्षेत्रीय शहरी विकास आयोजना, आयोजना समन्वय कार्यालय शहरी विकास तथा भवन निर्माण विभाग, बबरमहल, काठमाडौं ईमेल: rudp.pdsecretariat@gmail.com फोन नम्बर: ०१-४२६२९६९/४२६२५३५
प्रस्तावको व्यहोरा	आयोजनाको नाम: बस टर्मिनल आयोजना, लुम्बिनी सांस्कृतिक, रूपन्देही आयोजना स्थल: वडा नं १०, मधुवनी (निर्देशांक: २७°२८'३४.६०" उत्तर, ८३°०७'४०.१०" पूर्व) मुख्य अवयवहरू: इन्टरमिडी बस टर्मिनल (३९.९८x१३.५३) वर्गमिटर (व.मि.), कर्मचारी आवास (१९.९५x८.८३) व.मि., ग्यारेज (१२.२५x९.३) व.मि., भण्डारण क्षेत्र (९.५x५) व.मि., बस पार्किङ वे, कलक टावर (४x४) व.मि. आदि रहेको छ। बस टर्मिनलको भवनको ग्रास फ्लोर एरिया १,०५१.९३ व.मि.; टर्मिनलको डिजाइन क्षमता: २४ कार पार्किङ (मिजी), १० इन्टरसिटी बसहरू, १२ लामो दुरीका बस पार्किङ भूमिगत पानी: १५,२२० लिटर प्रति दिन माटो कटान: २५,९७१ घ.मि घन मिटर निर्माण अवधि: २ वर्ष ४ महिना
प्रभाव पर्ने सक्ने जिल्ला न वा वडा	रूपन्देही जिल्ला, लुम्बिनी सांस्कृतिक नगरपालिका, वडा नं १०
परामर्शदाताको नाम र ठेगाना	Dohwa Engineering Co., Ltd. in association with ERM (P) Ltd. (Environment and Resource Management Consultant), SILT Consultants (P) Ltd. and Digicon Engineering Consult Pvt. Ltd. पत्राचार गर्ने ठेगाना- नयाँ बानेश्वर, काठमाडौं ईमेल: ermcd@ermcnepal.com, फोन नम्बर: ०१-४५८३०६४

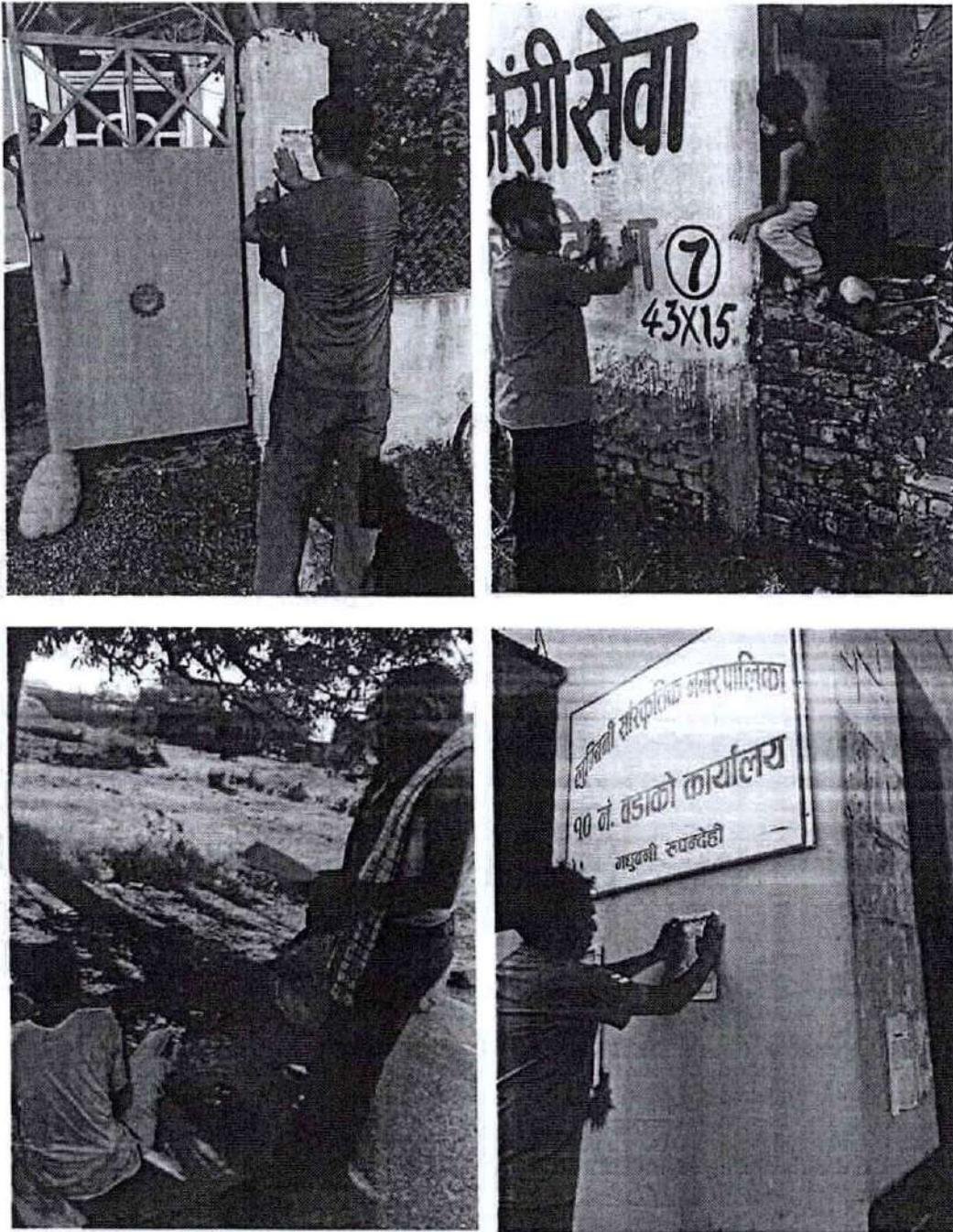
माथि उल्लिखित प्रस्तावको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयारी गर्ने क्रममा सो प्रस्तावको बारेमा सार्वजनिक सुनुवाई आयोजना गरी राय सुझाव संकलन गर्न आवश्यक रहेकोले स्थानीय समुदाय, स्थानीय तहका प्रतिनिधि, वन उपभोक्ता समूहका प्रतिनिधि र सम्पूर्ण सरोकारवाला निकायमा देहाय बमोजिमको स्थान र समयमा उपस्थितिको लागि सूचना प्रकाशित गरिएको छ।

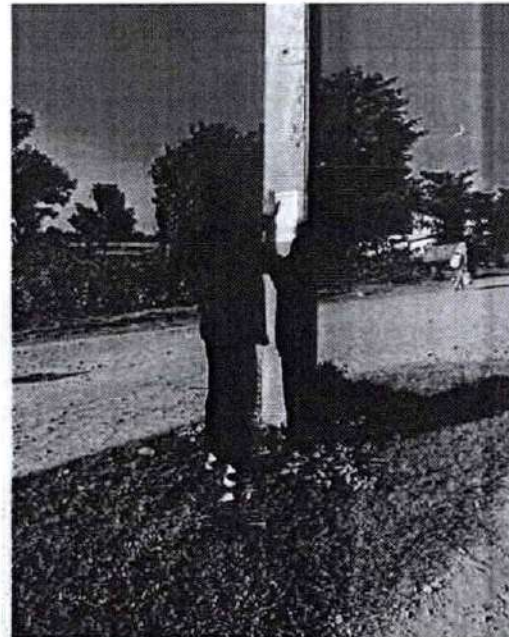
सार्वजनिक सुनुवाई हुने स्थान, मिति तथा समय:

१. स्थान: मधुवनी माध्यमिक विद्यालय, महिल्वार बजार, लुम्बिनी सांस्कृतिक-१०
२. मिति: २०८२/०७/१५
३. समय: विहान ८:३० बजे



Annex 6.2: Photos of Information Dissemination for Public hearing

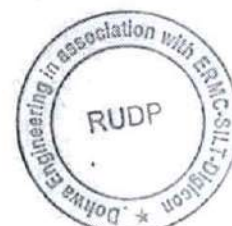
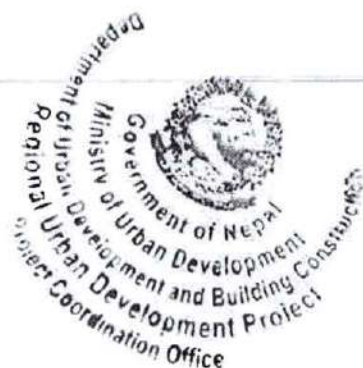
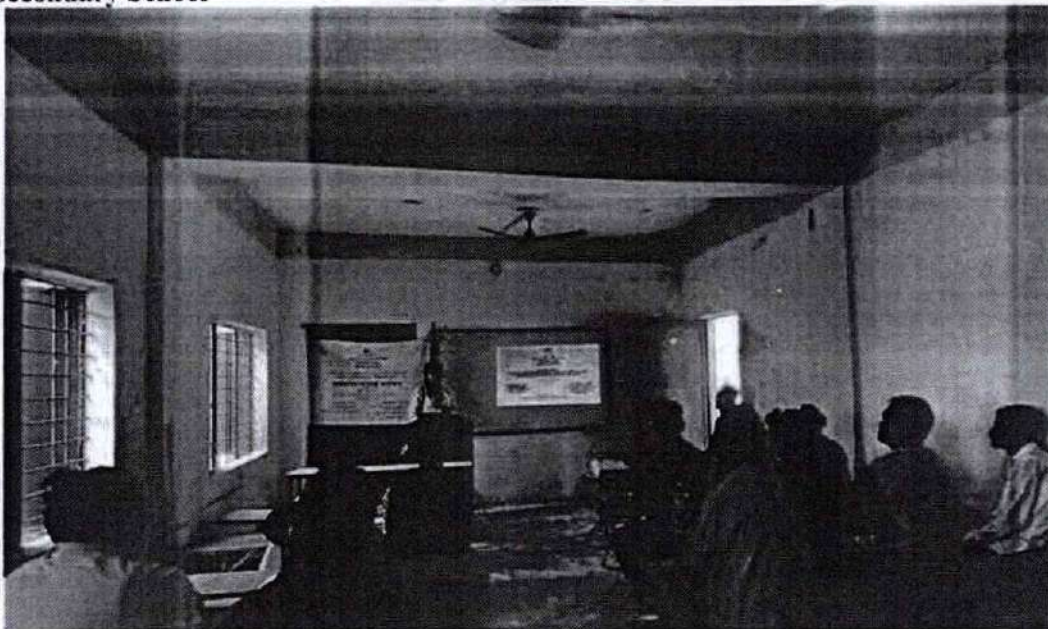


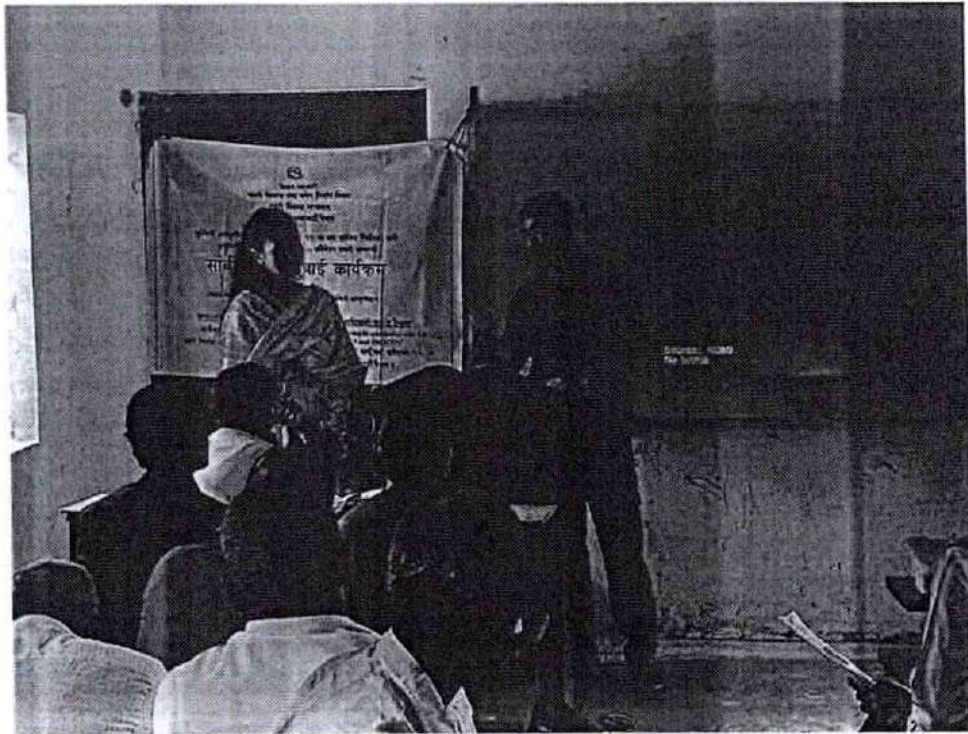


Using local social media group for information dissemination

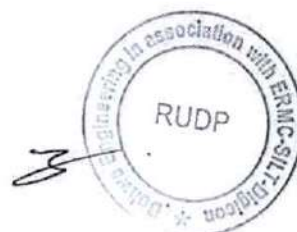
Pasting public hearing notice at public space.

Annex 6.3: Photos of Public Hearing conducted on 15th Kartik, 2082 at Madhubani Secondary School





Participants giving feedback during the public hearing

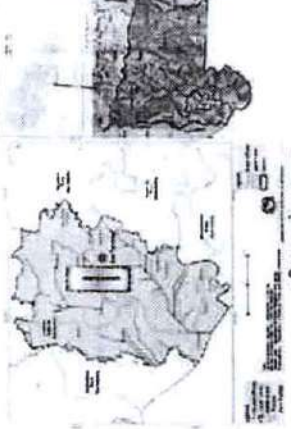


IEE of Bus Terminal Project in Lumbini Sanskritik Municipality

काठमाडौं उपत्यका, लुम्बिनी सांस्कृतिक नगरपालिका, काठमाडौं नगर, लुम्बिनी प्रदेश

काठमाडौं उपत्यका, लुम्बिनी सांस्कृतिक नगरपालिका, काठमाडौं नगर, लुम्बिनी प्रदेश

काठमाडौं उपत्यका, लुम्बिनी सांस्कृतिक नगरपालिका, काठमाडौं नगर, लुम्बिनी प्रदेश



प्रस्तावित क्षेत्र
आयोजना समन्वय कार्यालय
लुम्बिनी सांस्कृतिक नगरपालिका (RLUDP)
गहरी विकास तथा भवन निर्माण विभाग
आयोजना, काठमाडौं, नेपाल
सम्पर्क: ०१-५५५५५५
फोन: ०१-५५५५५५५
ईमेल: rudp.pokhara@gmail.com

प्रस्तावित क्षेत्र
आयोजना समन्वय कार्यालय
लुम्बिनी सांस्कृतिक नगरपालिका (RLUDP)
गहरी विकास तथा भवन निर्माण विभाग
आयोजना, काठमाडौं, नेपाल
सम्पर्क: ०१-५५५५५५
फोन: ०१-५५५५५५५
ईमेल: rudp.pokhara@gmail.com

MASTER PLAN of BUS TERMINAL



स्थान: लुम्बिनी सांस्कृतिक नगरपालिका, काठमाडौं नगर, लुम्बिनी प्रदेश
समय: वि.सं. २०७३



Ministry of Urban Development and Building Construction
Development Project
Liaison Office

Ministry of Nepal
Development
and Building Construction
Department Project
Office

Ministry of Nepal
Development
and Building Construction
Department
Office

[illegible]

श्रीरङ्ग प्रसाद पाठक २४.१५.५९.३२५८
राजिन्द्र आहूरी २४.१०.७६
वन्द्य प्रसाद पाठक २४.१०.७६

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नाम / भुक्तान्तः

आवाश नेत्र घटञ्जुपयो ।

सगली झणसाको गाडी पार्किङ समेत कमि थियो।

आली पाकिङ्ग दंगला लढाउनु पथो ।

वगैरे को प्रेमनाई घटाऊना पना । (६५) पाकिइ दोष बने

पानीको निकासी जमिनमुनीनाए व्यवस्था गर्नपडै ।

गुजरात को पहिन्द । अतः माने बनाउनपर्छ ।

ब्रह्मविद्या है गुरु लगायत आपन । बाउन्ही लगायत

1. 1946 12/24/46

भूला (प्यागल्ला) दारुण. । दमिवस्था

ANNEX 7: PUBLIC NOTICE FOR PREPARATION OF IEE
Annex 7.1: Public Notice Published in (Butwal Today)

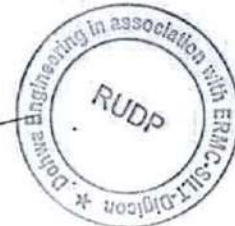


 बेपल सरकार शहरी विकास मन्त्रालय सिंहदरबार, काठमाडौं	
लुम्बिनी सांस्कृतिक नगरपालिकामा वस टर्मिनल आयोजनाको प्रारम्भिक तातावरणीय परिक्षण तयारी सम्बन्धी सावजनिक सूचना	
प्रकाशित मिति: २०८२/०८/१०	
लुम्बिनी प्रदेश, काभ्रेलेही जिल्ला, लुम्बिनी सांस्कृतिक नगरपालिकामा नेपाल सरकार, शहरी विकास मन्त्रालय, शहरी विकास तथा भवन निर्माण विभाग, बबामहल, काठमाडौं द्वारा निम्न बयोबिमको प्रस्ताव कार्यान्वयन गर्न लागिएको छ।	
प्रस्तावकर्ताको नाम र ठेगाना	क्षेत्रीय शहरी विकास आयोजना, आयोजना समन्वय कार्यालय, शहरी विकास तथा भवन निर्माण विभाग, बबामहल, काठमाडौं ईमेल: rudp.pdsecretariat@gmail.com फोन नम्बर: ०१-४२६२९६९/४२६२५३५
प्रस्तावको विवरण	आयोजनाको नाम: वस टर्मिनल आयोजना लुम्बिनी सांस्कृतिक नगरपालिका, काभ्रेलेही जिल्ला, वडा नं १०, मधुवनी (निर्देशांक: २७°२८'३८.६०" उत्तर, ८३°०३'३०.१०" पूर्व) मुख्य अवयवहरू: इन्टरसिटी वस टर्मिनल (३९.९८ x १३.५३) वर्गमिटर (व.मि.), क्रमचारी आवास (११.९५ x ८.८३) व.मि., ग्यारेज (१२.२५ x १.३) व.मि., भण्डारण भेज (१ x ५) व.मि., बस पार्किङ ६, कलक टावर (४ x ४) व.मि. आदि रहेको छ। वस टर्मिनलको भवनको प्रस फ्लोर एरिया १,०५१.९३ व.मि. टर्मिनलको डिजाइन क्षमता: २४ कस पार्किङ (निजी), १० इन्टरसिटी बसहरू, १२ लामो दुरिका बस पार्किङ; भूमिगत पानी: १५.२२० लिटर प्रति दिन, बाढी कटान: २५.९०१ घ.मि (घन मिटर); निर्माण अवधि: २ वर्ष ४ महिना
प्रभाव गर्ने स्थान जिल्ला तथा वडा	काभ्रेलेही जिल्ला, लुम्बिनी सांस्कृतिक नगरपालिका, वडा नं १०

माथि उल्लिखित प्रस्तावको प्रारम्भिक तातावरणीय परीक्षण प्रतिवेदन तयारी गर्ने क्रममा सो क्षेत्रको प्राकृतिक तथा भौतिक प्रणाली, वैश्विक प्रणाली, सामाजिक प्रणाली, सांस्कृतिक प्रणाली र आर्थिक प्रणाली बीच के कस्तो प्रभाव पर्दछ भनि यकिन गर्न लुम्बिनी सांस्कृतिक नगरपालिका, वडा नं १०; तथा त्यस क्षेत्रका विद्यालय, अस्पताल, स्वास्थ्य चौकी तथा सरकारीवाला व्यक्ति वा संस्थाको लिखित राय सुझाव लिन आवश्यक भएकोले यो सार्वजनिक सूचना प्रकाशन भएको मितिले सात दिन भित्र तल उल्लिखित ठेगानामा आई पुग्ने गरी लिखित राय सुझाव उपलब्ध गराई दिनु हुन अनुरोध गरिन्छ।

राय सुझावको लागि पत्राचार गर्ने ठेगाना:

प्रस्तावकर्ताको नाम र ठेगाना	क्षेत्रीय शहरी विकास आयोजना, आयोजना समन्वय कार्यालय, शहरी विकास तथा भवन निर्माण विभाग, बबामहल, काठमाडौं ईमेल: rudp.pdsecretariat@gmail.com फोन नम्बर: ०१-४२६२९६९/४२६२५३५
परामर्शदाताको नाम र ठेगाना	Dohwa Engineering Co., Ltd. in association with ERM (P.) Ltd. (Environment and Resource Management Consultant), SILT Consultants (P.) Ltd. and Digicon Engineering Consult Pvt. Ltd. पत्राचार गर्ने ठेगाना: नयाँ बानेश्वर, काठमाडौं ईमेल: erm@ermcnepal.com फोन नम्बर: ०१-४२६२९६९/४२६२५३५



Dissemination of public notice for IEE preparation



लुम्बिनी सांस्कृतिक नगरपालिका
Lumbini Cultural Municipality
१० नं. वडा कार्यालय
10 No. Ward Office

सुपन्दी, रुपन्देही
Madhupur, Rupandehi



लुम्बिनी प्रदेश, नेपाल
Lumbini Province, Nepal

प.सं./Ref No.: १०८२/०८१
घ.सं./Dispatch No.: ६८३

मिति: २०८२/०८/१५

क्षेत्रीय शहरी विकास आयोजना,
आयोजना समन्वय कार्यालय,
शहरी विकास तथा भवन निर्माण विभाग,
बबरमहल, काठमाडौं

विषय: बस टर्मिनल आयोजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयारीको लागि सार्वजनिक सूचना टाँस गरिएको बारे।

उपरोक्त सम्बन्धमा श्री क्षेत्रीय शहरी विकास आयोजना, आयोजना समन्वय कार्यालय, शहरी विकास तथा भवन निर्माण विभाग, बबरमहल, काठमाडौंद्वारा प्रस्तावित बस टर्मिनल आयोजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयारीको लागि वातावरण संरक्षण ऐन २०७६ र वातावरण संरक्षण नियमावली २०७७ बमोजिम आयोजना क्षेत्रको जैविक तथा पारिस्थितिकिय प्रणाली, प्राकृतिक तथा भौतिक प्रणाली, सामाजिक तथा आर्थिक प्रणाली र सांस्कृतिक प्रणालीमा के कस्तो सकारात्मक तथा नकारात्मक प्रभाव पर्दछ भनि यकिन गर्न रुपन्देही जिल्ला, लुम्बिनी सांस्कृतिक नगरपालिका, वडा नं १०, र त्यस क्षेत्र भित्र रहेका विद्यालय, स्वास्थ्य संस्था तथा सम्पूर्ण सरोकारवाला व्यक्ति वा संस्थाको राय सुझाव लिन आवश्यक भएकोले सो बमोजिमको सार्वजनिक सूचना यसकार्यालयको सूचनापाटीमा टाँस गरिएको ब्यहोरा अनुरोध छ।

हस्ताक्षर:

कर्मचारीको नाम र पद:

कार्यालयको नाम र छाप:

२०८२/०८/१५
सुपन्दी कर्ण
वडा अध्यक्ष





लुम्बिनी साँस्कृतिक नगरपालिका
नगर कार्यपालिकाको कार्यालय
प्रा.स्वा.के. / स्वा.घो. / शहरी / आधारभूत
लुम्बिनी, रुपन्देही

लुम्बिनी प्रदेश, नेपाल

प.सं.: २०८२१०८२

मिति:

च.सं.: १९

बस टर्मिनल आयोजना प्रारम्भिक बातावरणीय परीक्षण प्रतिवेदन तयारीको लागि
विषय: सार्वजनिक सूचना टाँस गरिएको बारे ।

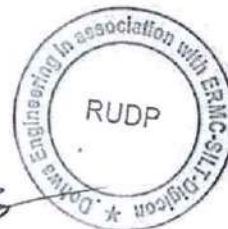
श्री क्षेत्रीय शहरी विकास आयोजना
आयोजना समन्वय कार्यालय शहरी विकास तथा
भवन निर्माण विभाग बबरमहल काठमाडौं

उपरोक्त सम्बन्धमा श्री क्षेत्रीय शहरी विकास आयोजना आयोजना समन्वय कार्यालय शहरी विकास तथा भवन निर्माण विभाग बबरमहल काठमाडौं बाट प्रस्तावित बस टर्मिनल आयोजनाको प्रारम्भिक बातावरणीय परीक्षण प्रतिवेदन तयारीको लागि बातावरण संरक्षण एन २०७६ र बातावरण संरक्षण नियमावली २०७७ बमोजिम आयोजना क्षेत्रको जैविक तथा परिस्थितिक्रिया प्रणाली प्राकृतिक तथा भौतिक प्रणाली सामाजिक तथा आर्थिक प्रणाली र साँस्कृतिक प्रणालीमा के कस्तो सकारात्मक तथा नकारात्मक प्रभाव पर्दछ भनि यकिन गर्न रुपन्देही जिल्ला लुम्बिनी साँस्कृतिक नगरपालिका वडा नं. १० र त्यस क्षेत्र भित्र रहेको मधुबनि स्वास्थ्य चौकी विद्यालय र सम्पूर्ण सरोकारवाला व्यक्ति वा संस्थाको राय सुझाव लिन आवश्यक भएकोले सो बमोजिमको सार्वजनिक सूचना यस कार्यालयको सूचना पाटीमा टाँस गरिएको व्यवहारा अनुरोध छ ।

हस्ताक्षर -
कर्मचारीको नाम पद -
कार्यालयको नाम र छाप -



फोन नं.: ०७१-५८०३०५, फ्याक्स नं.: ०७१-५८०३५०
Email: lumbinisanskritikmunicipality@gmail.com



Annex 7.3: Dissemination of public notice for IEE preparation at public space

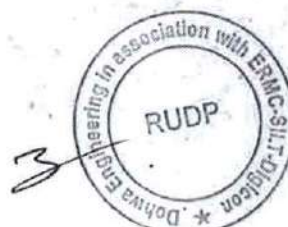
**बस टर्मिनस आयोजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयारीको
लागि सार्वजनिक सूचना टाँसको मुचुल्का**

उपरोक्त सम्बन्धमा भी क्षेत्रीय गहरी विन्यास आयोजना, आयोजना समन्वय कार्यालय, गहरी विकास तथा प्रबन्ध निर्माण विभाग, बबरमहल, काठमाडौँद्वारा प्रस्तावित बस टर्मिनस आयोजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयारीको लागि वातावरण संरक्षण ऐन २०७६ र वातावरण संरक्षण नियमावली २०७७ बमोजिम आयोजना क्षेत्रको जैविक तथा परिस्थितिकिय प्रणाली, प्राकृतिक तथा भौतिक प्रणाली, सामाजिक तथा आर्थिक प्रणाली र सांस्कृतिक प्रणालीमा के कस्तो सकारात्मक तथा नकारात्मक प्रभाव पर्नेछ भनि यकिन गर्न रूपन्देही जिल्ला, लुम्बिनी सांस्कृतिक नगरपालिका, वडा नं १०, र त्यस क्षेत्र भित्र रहेका विद्यालय, स्वास्थ्य संस्था तथा सम्पूर्ण सरोकारवाला व्यक्ति वा संस्थाको राय सुझाव लिन आवश्यक भएकोले सो बमोजिमको सार्वजनिक सूचना लुम्बिनी सांस्कृतिक नगरपालिका वडा नं. १०... को मधुवली स्थानमा हामी तपसिलका व्यक्तिहरूको रोहबरमा सबैले हेर्न देखा पाउने गरि टाँस गरिएको व्यहोरा ठिक सँचो हो भनि यस मुचुल्कामा सहि छाप गरिदियो ।

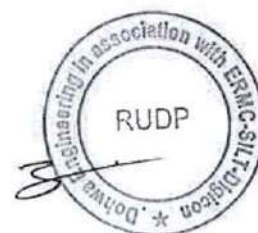
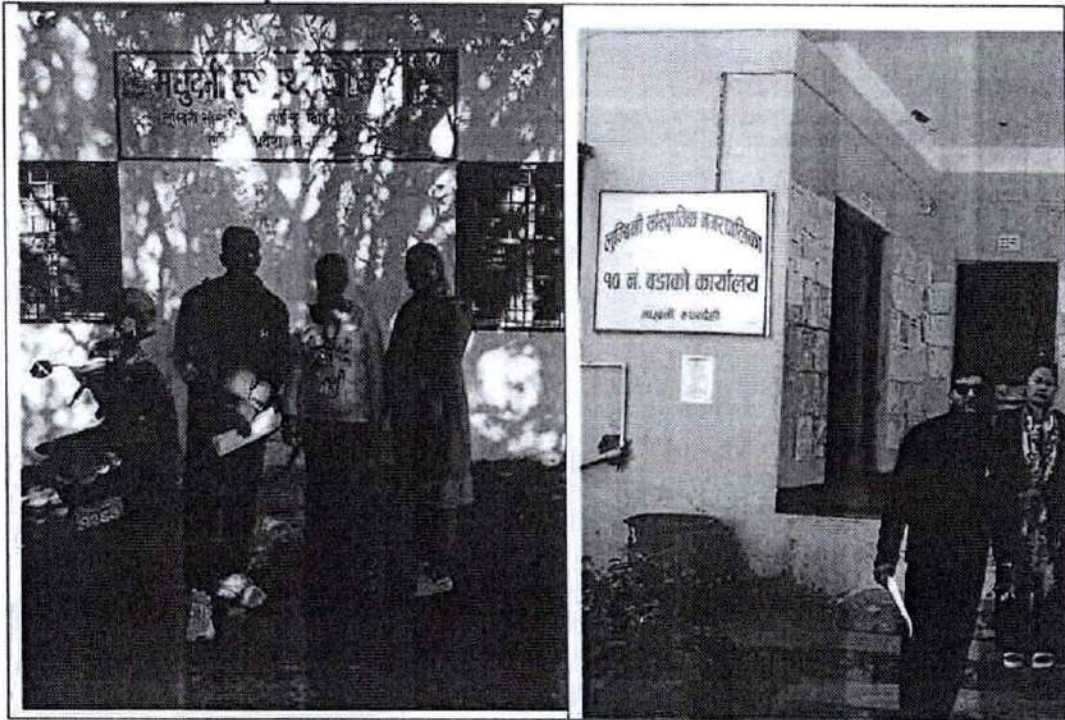
तपसिल

नाम	वडा/ टोल	उमेर	पेशा	सम्पर्क नं	हस्ताक्षर
गोविन्द धवल्	१०	३२	व्यापारी	९८९८४२९२४२	
अर्जुन शाह	"	४४	"	९८९१०३४०४२	

इति सम्बत २०८२ साल संक्रि. महिना १२ गते ऐज शुभम ।



Annex 7.4: Photos of public notice



Annex 8: Land ownership clarification



लुम्बिनी साँस्कृतिक नगरपालिका
Lumbini Cultural Municipality
नगर कार्यपालिकाको कार्यालय
Office of the Municipal Executive



प.सं./Ref No.: ०६९१०८०

व.नं./Dispatch No.: ५९४५

लुम्बिनी रूपन्देही
Lumbini Rupandehi

लुम्बिनी प्रदेश, नेपाल
Lumbini Province, Nepal

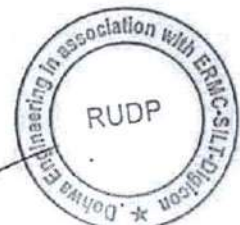
मिति:- २०८०/०३/२९

श्री DORWA Engineering Co. Ltd. in association with ERMC (P) Ltd., SILT (P), and DIGICON (P), Ltd., Kathmandu

विषय:- सार्वजनिक जग्गा यकिन गरेको सम्बन्धमा ।

प्रस्तुत विषयमा यस लुम्बिनी साँस्कृतिक नगरपालिकामा संचालित एसियाली विकास बैंकको सहयोगमा क्षेत्रीय शहरी विकास कार्यक्रम अन्तर्गत बस पार्क निर्माणको लागि प्रस्तावित जग्गा मध्ये मधुवनी ३(क) कित्ता नं. ५८०, फिन्डवुकमा ऐलनी पर्ती भएका र मालपोत कार्यालय, रूपन्देही संग भाग गरेको विवरण बमोजिम जग्गाधनी दर्ता श्रेस्ता प्रमाण मात्र नेपाल सरकारको नाममा उल्लेख भएको हुनाले उक्त जग्गा मधुवनी ३(क) कित्ता नं. ५८० सार्वजनिक जग्गा रहेको पाईयो । नापी कार्यालय र मालपोत कार्यालय रूपन्देहीले जारी गरेको फिन्डवुक र जग्गाधनी दर्ता श्रेस्ता प्रमाण यो पत्र संगै संलग्न गरिएको व्यहोरा अनुरोध छ ।

नईमूल हक मुसलमान
कार्यवाहक नगर प्रमुख
ज. नमर प्रमुख





लुम्बिनी सांस्कृतिक नगरपालिका
Lumbini Cultural Municipality

नगर कार्यपालिकाको कार्यालय
Office of the Municipal Executive

लुम्बिनी प्रदेश, नेपाल
Lumbini Province, Nepal

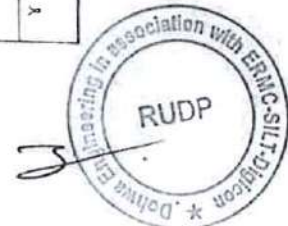
प.स. / Ref No.: ०८०/०८१
च.प. / Dispatch No.: २५१

श्री DOHWA Engineering Co. Ltd. in association with ERM-C (P) Ltd., SILT (P), and DRAGON (P) Ltd., Kathmandu

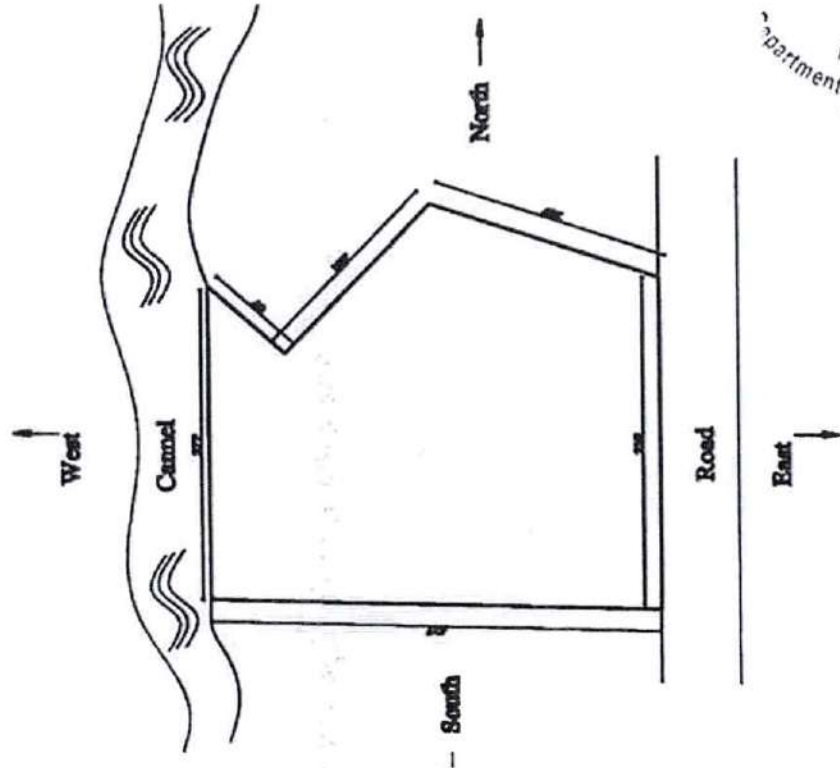
विषय:- चार किल्ला सेवा प्रमाणित गरेको सम्बन्धमा।
प्रस्तुत विवरणमा यत लुम्बिनी सांस्कृतिक नगरपालिकामा संचालित एवियाली विकास बैंकको सहयोगमा क्षेत्रीय विकास कार्यक्रम अन्तर्गत बस पार्क निर्माणको लागि प्रस्तावित ठीगाना (मधुवनी ३(क) किल्ला नं. ४८०, मधुवनी ८ किल्ला नं. २९४, मधुवनी ८ किल्ला नं. ४८५ र मधुवनी ३ (क) ३८०) स्थलको चार किल्ला सिम भएको जानकारीको गरी ब्योचरेर अनुप्रेष छ।

प्रपत्र

क्र.सं.	विवरण	किल्ला नं.	नाम	कैफियत
१	पूर्व	बाटो	-	
२	पश्चिम	कुसे		
३	उत्तर	१. मधुवनी ३ क किल्ला नं. ८०० २. मधुवनी ३ क किल्ला नं. ६९१ ३. मधुवनी ३ क किल्ला नं. ८०१ ४. मधुवनी ३ क किल्ला नं. ८०२ ५. मधुवनी ३ क किल्ला नं. ४८८ र ४८९	१. जयन बहादुर महर्जन, धनराज चौधरी, रिता चौधरी, २. शिव कुमार यादव ३. गिरीश कोण्डर, धनराज मेहता ४. प्रयाग साया ५. बिर्ज बहादुर नाउ	
४	दक्षिण	१. मधुवनी ८ किल्ला नं. ६४४ र ६४३	ईलाका प्रहरी कार्यालय	



२०८०/०८/११
विनोद कशिनोद कर्णार
महानिपत्य १०

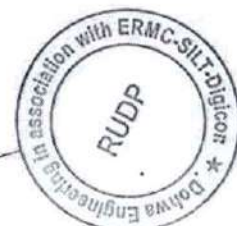


Trace Outline Of Bus-Park Area



Annex 9: Quantity of major construction material

Description	Unit	Total Quantity
Excavation in foundations in all type of soils for foundation, trenches, footing, pits etc. to the required depth including dewatering by manual or mechanical means etc. as per specifications with all contractor's own machinery and equipment's, providing crossing of track, shoring, strutting, timbering and buttressing with appropriate materials and all such measures necessary to retain in position the sides of the foundation pit and including refilling the excavated material with watering, ramming, leveling the site and disposing off the surplus/unusable earth to outside the construction premises, etc. all complete as per drawings, specifications and instructions of the Engineer.	Cu.m	404.83
Earth cutting in site using 0.8 cum capacity hydraulic excavator, in all kind of soils (soft & hard dis-integrated rock but excluding hard rock) including lift and stacking the excavated material at least 50 m from the edge of excavation as per design drawing, specifications and instructions of the Engineer, all complete (Measurement for footing of building shall be taken as per drawing).	Cu.m	4220.70
Removal of unserviceable soil including excavation, loading and disposal	Cu.m	2540.35
Back filling in foundation and sides of foundation with approved soil obtained from the excavation at site and stacked at site or brought from outside in layer not exceeding 15 cm thick (compacted thickness) including transportation of soil, spreading in required line and level, sprinkling water, ramming, compacting with mechanical rammers, testing, etc.. all complete as per drawing, specification and instructions of the Engineer.	Cu.m	2559.80
Formation of ground as per excavation, loading, transportation and unloading of soil from 4.8 km away borrow pit as per Drawing and Technical Specifications.	Cu.m	25917.28
Formation of embankment, providing, laying, spreading and compacting embankment with cutting material and compact to the required density as per Drawing and Technical Specifications. [Mechanical Means]	Cu.m	29088.78
Providing and laying uncoursed hand packed Dry Rubble Stone soling in foundation, under floor plinth without any special dressing of stone including filling interstices with suitable quarry waste or stone chips or quarry sand, watering, compacting using appropriate mechanical compaction means with all contractors materials, handling, placing etc. all complete as per drawings, specifications and instruction of the Engineer. The complete item including all lead & lift.	Cu.m	303.94
Supplying and filling sand in floor by sprinkling of water and compaction by labour including lead from 30 m distance as per drawing specification and instruction of the Consultant/Engineer all complete.	Cu.m	43.54
Providing and laying first class chimney fired brick one or more brick thick wall in cement mortar 1:6 (1 cement : 6 coarse sand) in foundation up to ground floor including the cost of single or multi stage scaffolding, soaking bricks, curing, raking joints, provision for recesses, openings, toothing etc., all complete as per drawing, specifications and instructions of the Engineer.	Cu.m	327.39
Providing and laying first class chimney fired brick one or more brick thick wall in cement mortar 1:4 (1 cement: 4 coarse sand) above ground floor including the cost of single or multi stage scaffolding, soaking bricks, curing, raking joints, provision for recesses, openings, toothing etc., all complete as per drawing, specifications and instructions of the Engineer.	Cu.m	615.84
Laying of Stone masonry upto 5m height by providng Block Stone in 1:6 Cement Sand Mortar complete, all complete as per drawing, specifications and instructions of the Engineer.	Cu.m	956.39



3

Providing and laying machine mixed Plain Cement Concrete of nominal mix 1:2:4 (1 cement : 2 sand : 4 coarse aggregate) for leveling course in foundations and under floor of building. etc. in all level with broken stone aggregate of size not more than 25 mm of approved quality including formwork wherever necessary, dewatering, batching, mixing, transporting, placing, compacting, curing, including all lead and lift, etc. all complete as per drawings, specifications and the instructions of the Engineer.	Cu.m	350.88
Providing and laying in position machine mixed and machine vibrated cement concrete of mix 1:1.5:3 (1 cement:1.5 sand: 3 coarse aggregate) M20 grade for reinforced cement concrete work using approved cement with 20 mm graded machine crushed stone aggregate of approved quality in various locations and heights including transportation of concrete to site of placing, compaction, finished to required line and level, protection and curing, etc. all complete as per drawings, specifications and the instructions of the Engineer, but excluding the cost of centering, shuttering, and reinforcement all complete as per drawings, specifications and instructions of the Engineer.	Cu.m	1117.64
P.C.C. in 1:1:2 (M25) work for reinforced cement concrete work with approved quality of cement and sand and crushed stone aggregate including mixing, laying, curing etc all as per instruction and specification all complete.	Cu.m	88.78
Providing and fixing in position Fe 500 steel reinforcement of various diameter conforming to relevant IS code in R.C.C. works including straightening, cutting, bending, binding with 20 SWG annealed wire for tying the reinforcement bars at each junctions (binding wire shall not be measured separately) including all waste and cut pieces, provision for adequate numbers of spacers, chairs, providing and placing cement mortar (1:1) cover blocks to keep the bars in intended position at all levels all complete as per drawings, specifications and instructions of the Engineer. (Authorized lap length and for the bar length exceeding 10 meter in length shall be measured for the payment).	Kg	139004.83
Providing and fixing tubular roof trusses with rafters, purlins, wind ties, brackets etc., made with medium class mild steel tubes and mild steel sections of required sizes, including hoisting, fixing in position with MS bed plates, shoe angles, anchor bolts etc., and concrete grouting, concreting nut bolts, fabrication, fixing and treated with two coats of anticorrosive paints all complete as per drawings, specifications and instructions of the Engineer. Rate shall include preparing shop drawings, obtaining Engineer's or Client's approval, supplying, fabricating, delivering at site, hoisting and fixing in position, temporary staging, preparation of surface, applying Zinc chromate/Phosphate primer of one coat before and one coat after erection including two coats of synthetic enamel paint of approved make and color etc. all complete as per drawing, specification and instruction of the Engineer.	Kg	21612.46
Subbase: Providing, laying, spreading, levelling and compaction of granular sub-base on prepared surface, mixing at OMC, and compacting to achieve the desired density, all complete as per drawings and technical specifications (SS-12.1).	cum	832.74
Base: Providing and laying Crusher Run Macadam on a prepared surface, spreading and mixing, watering and compacting to form a layer of Base Course as per Drawing and Technical Specifications (SS-12.7). [Mix in place method, 45 mm down]	cum	805.31
Providing and laying 40 mm thick asphalt concrete using crushed aggregates of specified grading, premixed with bituminous binder and filler all complete as per specification (SS-13.6), drawings and instruction of Engineer appointed by PCO.	cum	222.05



ANNEX 10: RECOMMENDATION LETTER FROM THE MUNICIPALITY



स्थानीय सरकार
लुम्बिनी साँस्कृतिक नगरपालिका
नगर कार्यपालिकाको कार्यालय
लुम्बिनी, रुपन्देही
लुम्बिनी प्रदेश, नेपाल



पत्र संख्या : १०८१/०८३
चलानी नं. : १८१५



फोन नं. ०७१-५८०३०५, ०७१-५८०३४९
Email: Lumbinisanskritikmunicipality@gmail.com
Website: lumbinisanskritikmun.gov.np

मिति: १०८१/१०/२३

विषय: लिखित राय, सुझाव सहित सिफारिस गरिएको सम्बन्धमा।

श्री क्षेत्रीय शहरी विकास आयोजना,
आयोजना समन्वय कार्यालय,
शहरी विकास तथा भवन निर्माण विभाग,
बबरमहल, काठमाडौं।

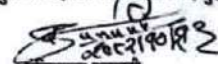
प्रस्तुत विषयमा श्री क्षेत्रीय शहरी विकास आयोजना, आयोजना समन्वय कार्यालयद्वारा मिति १०८१/०८/०८ गते प्रकाशित सूचनाअनुसार तथा मिति १०८१/०८/१५ गते सम्पन्न सार्वजनिक सुनुवाइका आधारमा रुपन्देही जिल्ला, लुम्बिनी साँस्कृतिक नगरपालिका, वडा नं. १० मा प्रस्तावित "बस टर्मिनल आयोजना" निर्माणबाट यस क्षेत्रमा देहायवर्गजिमका प्रभावहरू पर्न सक्ने देखिन्छ:

क्र.सं.	सकारात्मक प्रभावहरू	नकारात्मक/सम्भावित प्रभावहरू
१	पर्यटन प्रवर्द्धन तथा विकास	सम्भावित वातावरणीय, सामाजिक तथा साँस्कृतिक प्रभावहरूको
२	नगरपालिकाको आन्तरिक राजस्वमा वृद्धि	न्यूनीकरण (व्यवस्थापन गर्दै लागू कानून तथा मापदण्डहरूको पालना गर्ने)
३	स्थानीयस्तरमा रोजगारीका अवसर सिर्जना	

उल्लिखित प्रभावहरूको विश्लेषण गर्दा सकारात्मक प्रभावहरूको अधिकतम अभिवृद्धि गर्ने तथा सम्भावित नकारात्मक प्रभावहरूको न्यूनीकरण गर्ने उद्देश्यले वातावरणीय व्यवस्थापन योजना प्रभावकारी रूपमा कार्यान्वयन गर्दै लागू कानून, नियम तथा मापदण्डको पूर्ण पालना गर्ने सकेमा प्रस्तावित आयोजनाबाट यस क्षेत्रको समग्र विकासमा उल्लेखनीय सकारात्मक योगदान पुग्ने देखिन्छ। यस आधारमा देहायका कारणहरूका आधारमा उक्त प्रस्ताव कार्यान्वयन गर्न मिल्ने व्यहोरा उल्लेख गरी सिफारिस गरिएको छ:

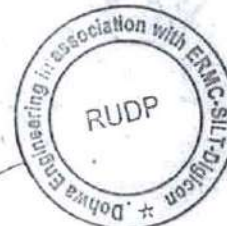
क्र.सं.	प्रस्ताव कार्यान्वयन गर्न मिल्ने आधारहरू	प्रस्ताव कार्यान्वयन गर्न नमिल्ने आधारहरू
१	पर्यटन प्रवर्द्धन तथा विकास हुने	नरहेको
२	नगरपालिकाको आन्तरिक राजस्वमा वृद्धि हुने	
३	स्थानीयस्तरमा रोजगारीका अवसर सिर्जना हुने	

अतः उल्लिखित आधार तथा सर्तहरूको पालना गरी "बस टर्मिनल आयोजना" कार्यान्वयन गर्न उपयुक्त देखिएकोले यो लिखित राय, सुझाव सहितको सिफारिस पत्र पेश गरिएको व्यहोरा अनुरोध छ।


हरिप्रसाद ज्ञवाली
उपसचिव
उपसचिव

बोधार्थ:

श्री शहरी विकास मन्त्रालय, सिंहदरबार, काठमाडौं।



ANNEX 11: Hydrological and Geological Analysis Summary

ANNEX 11.1: Hydrological Analysis

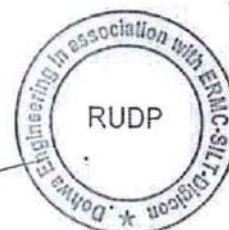
1. Background:

The ADB funded WUC project, going to be implemented in nine municipalities of Nepal has multiple sub-projects. One of the sub-projects is a Bus Terminal in Lumbini-Sanskritik Municipality which is located at the Nepal-India border in Lumbini District in Lumbini Province. The Lumbini-Sanskritik Municipality has allocated a particular parcel of land within the Municipality for this purpose; the land is located at the left bank of an abandoned irrigation canal originating from Telar River. The irrigation canal begins at latitude 27.49° north and 83.30° east. The approximate size of the trapezoidal irrigation canal is 5 m wide at the bottom, 8 m wide at the top and 3 m in depth with canal bed slope ranging from about 1 to 2%. Based on the map study, field verification, and interaction with the local residents, the canal was dug several decades ago to irrigate agriculture lands. However, with no maintenance for decades, road construction across the canal, and changing land use (agriculture lands turning into urban settlement) in the south side of the canal, the canal has been filled up with soil, dirt and dried bushes at some sections about 200 meters south of the proposed bus terminal site, and hence the canal is no longer in use.

A large section of the canal embankment at the north-west corner of the bus park site has been breached and created its own path along the north side of the bus park site to join a local ditch in the east side which drains to Koilihawa River; a new road has been constructed above the ditch with a box culvert to drain the water coming from the irrigation canal to the ditch during rainy season. The canal water flows close to the north boundary of the bus terminal site. A few houses have been constructed just across the north boundary of the bus terminal site.

Construction of a bus terminal at the proposed site will provide better transportation management facility to the Lumbini-Sanskritik Municipality. The DUDBC has entrusted the Consultant to develop a technical design of the Bus terminal to ensure year-round operation of the Bus terminal, avoid inundation of the Bus terminal in rainy season, and safely divert the water coming to the bus terminal from the irrigation canal by constructing a new canal along the north-boundary of the Bus terminal.

The Consultant has prepared a draft design of the Bus terminal with all the necessary components including a provision of elevating the Bus terminal area by up to two-meter to prevent inundation, link the Bus terminal with the Madhubani-Lumbini road in the east side at the same elevation (current ground elevation of the Bus terminal is lower than the road elevation), and a canal running along the north boundary of the Bus terminal. This section consists of the hydrological aspect of the design of the Bus terminal, with focus on potential inundation of the Bus terminal during high intensity rainfall, necessity and adequacy of the proposed hydraulic design to safely pass the water in high intensity rainfall event and



the effect of the canal on the private land and houses located across the north boundary of the Bus terminal.

2. Location and Sources of Water:

The Bus terminal is located 1.6 km south of Taulihawa Road and 1 km east of eastern boundary of the Lumbini Development Trust Area. The east boundary of the Bus terminal is along the road linking Madhubani with the Lumbini-Sanskritik Municipality Office building in Lumbini Bazar. The distance from the starting location (latitude 27.49° north and 83.30° east) of the irrigation canal to the Bus terminal is 1463 m. The primary source of water coming to the Bus terminal is the Telar River. The irrigation canal brings water towards the Bus terminal, and since the canal is blocked about 200 m downstream from the Bus terminal, the water in the canal is diverted to the Bus terminal through a breach in the embankment at the north-west corner of the land allocated for the Bus terminal. The water coming to the Bus terminal flows in the east direction along the north boundary of the Bus terminal and is eventually discharged to a local ditch connected to Koilihawa River.

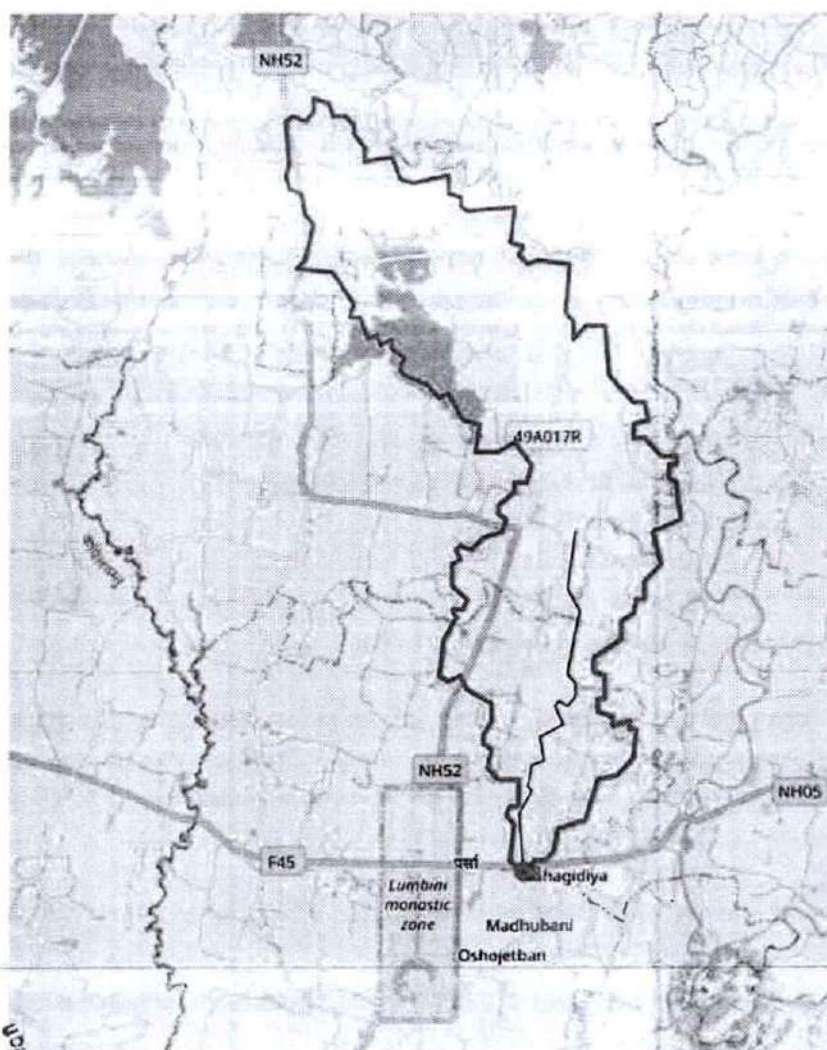


Figure 1: Catchment delineation of Telar River at irrigation canal junction, Lumbini Sanskritik Municipality

The MGHydro software was used to delineate the Telar River catchment at the junction of Telar River with the irrigation canal. The Telar River catchment is elongated in shape from north to south direction, as shown in the figure 1. The total catchment area of Telar River at this location is 50 km². Major portion of the catchment is covered with agricultural fields, as shown in figure 2; the change in land use in Telar River catchment is provided in table 1.

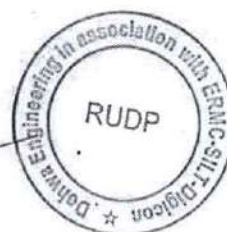


Figure 2: Land use change in Telar River catchment from 2000 to 2020

Table 1: Land use change in Telar River catchment from 2000 to 2020

Land Cover Type	Area in 2000, km ²	Area in 2020, km ²	Change
Cropland	40	43	7%
Built-up	5.0	6.6	31%
Dense short vegetation	6.9	2.5	-63%
Tree cover	2.4	2.3	-5%
Open surface water	0.1	0.5	600%
Wetland + dense short vegetation	0.5	0.1	-80%

Source: GLAD: *Global Land Cover and Land Use Change, 2000-2020* (Popatov et al. 2022)



The average annual precipitation over the Telar River catchment is 1,550 mm/year. Some of this water leaves the watershed surface via evaporation and transpiration, or the loss of water from plants. Annual evapotranspiration is estimated at 646 mm/year. The basin *climatology*, or the monthly average precipitation and evapotranspiration, is shown in Figure 3.

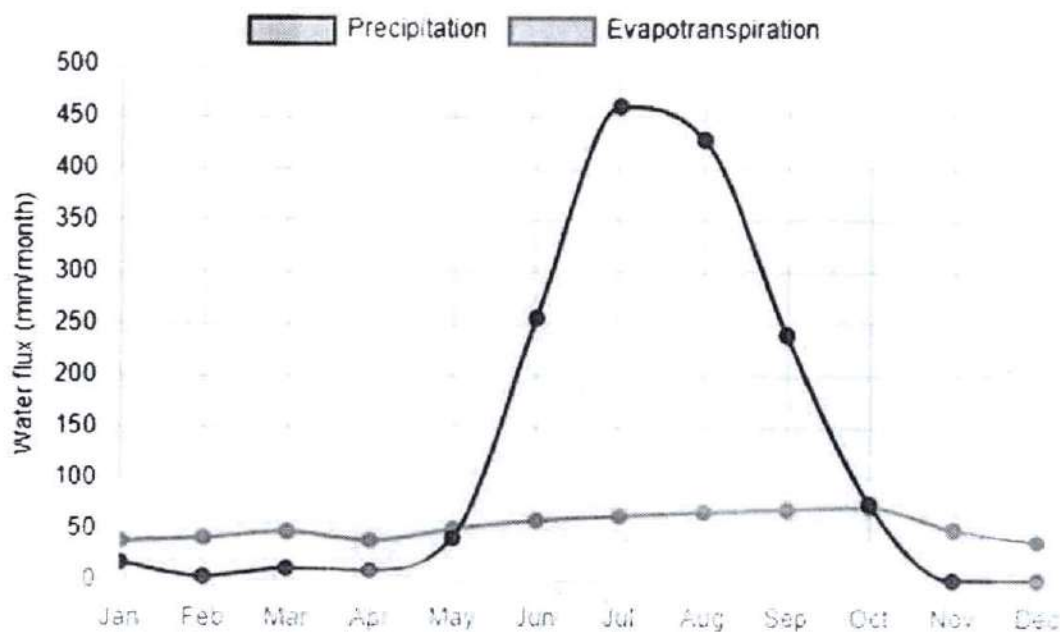


Figure 3: Telar River catchment climatology: monthly average precipitation and evapotranspiration over the catchment

A significant portion of the water during high flood flows downstream in the Telar River from the junction with the irrigation canal. However, since the junction between the Telar River and the canal is ungated, some portion of the flow is diverted to the irrigation canal and eventually ends up at the Bus terminal.

Table 1: Summary of the Telar River catchment at the Bus terminal

Catchment Area: 50 km ²	River Length: 22.97 km
Highest River Elevation: 145 m	Lowest River Elevation: 116 m
Average River Slope: 0.1%	

3. Excess Water Management Options at the Bus terminal:

Three different options were considered to address the excess water management issues.

Option I: Since the irrigation canal is already blocked and no longer in use, the canal can be filled at upstream site of the Bus terminal to prevent the water coming to the Bus terminal.

Stopping the water from entering into the irrigation canal will prevent the proposed bus terminal area from flooding since only water coming in the bus terminal is the rainwater over the Bus terminal area, which can be addressed by constructing a small side canal along the periphery of the Bus terminal area. This option will be financially efficient. However, at this stage of the project design, this option is perhaps beyond the scope of work.

Option II: If Option I is not possible what some reason, repair the breached embankment and clear the blockage in the irrigation canal. This will prevent the water from the irrigation canal entering the Bus terminal, and the downstream agricultural areas will have access to water. If this option can be implemented, the Bus terminal will not need large canal to drain out the water coming to the Bus terminal from the irrigation canal.

However, since the area downstream of the Bus terminal has been urbanized with large settlements and road network crisscrossing the area, and the irrigation canal has been abandoned for several years, implementing this option may be a challenging to the Municipality. Also, at this stage of the project design, this option is perhaps beyond the scope of work.

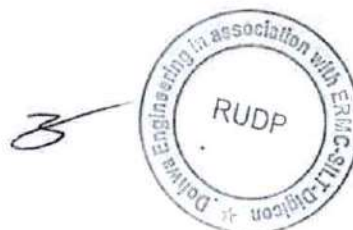
If Option I or Option II can be implemented the canal size in the Bus terminal can be reduced significantly.

Option III: If the Option I or Option II cannot be implemented cannot be implemented for some reason, then the canal design in the Bus terminal should be able to drain out the maximum flow coming to the Bus terminal from the breached section of the irrigation plus the water flowing from the adjacent agricultural lands to the Bus terminal.

Based on the discussion with the locals and other officials concerned, the Option I or Option II are unfeasible. The Consultant designed the canal within the Bus terminal to cater to the requirement of draining all the water coming to the Bus terminal from the irrigation canal. The following section deals with the hydraulic analysis of the canal within the Bus terminal.

4. Hydraulic Analysis of Bus Park:

The hydrological analysis of Telar River is complex. The river water is diverted for various purposes at different locations upstream of the Bus terminal. During high flood the water from neighboring catchments enters the Telar River, and vice versa, due to multiple crisscrossing canals, and very flat nature of the catchment (average river slope 0.1 percent). The reliability of the flow analysis with assumption of natural hydrological river flow with natural conditions will be low. The Telar River catchment is ungauged, there are no hydrological or meteorological stations within the catchment. The high vegetation growth in the irrigation canal connecting the Telar River with the Bus terminal, due to abandonment for many years, further complicates the magnitude and velocity of flood flow in the canal. Hence the flood discharge in the canal entering the Bus terminal will not be reliable.



As such, the hydraulic analysis of the Telar River and the irrigation canal is conducted for the worst-case scenario of the irrigation canal flowing full at the Bus terminal site. If more water enters the irrigation canal from the Telar River, it will overflow the canal embankments at the upstream site and will not enter the Bus terminal. The details of the calculations of the velocity and discharge in the irrigation canal, when the flow in the canal is full, are given in table 2.

Table 2: Details of the calculations of velocity and discharge in the irrigation canal at full capacity

Bottom width	5	m	Slope	0.0055
Depth	3	m	Manning's n	0.145
Top Width	8	m	Wetted perimeter	11.71 m
Flow Area	19.5	m ²	Hydraulic Radius	1.67 m
Distance	300	m	Velocity	0.72 m/s
Head drop	1.65	m	Discharge	14.02 m ³ /s

As shown in table 2, when the canal is in full capacity, the discharge in the canal is about 14 m³/s. The Consultant designed the concrete canal in the Bus terminal area to safely discharge the full capacity flow from the irrigation canal. The following is the summary of the calculations of the conveyance capacity of the canals in the Bus terminal in the open canal part and in the box-culvert part.

Conveyance capacity of the culvert designed to discharge water coming to the Bus terminal from the irrigation canal:

Open Canal Part 1:

Size: 3.6 m x 3 m (No. 5 + 6.9); Figure 5-9

Canal length: 106.9 m; Slope: $(93.8-93.6)/106.9 = 0.002$

Manning's n = 0.035; Velocity: 1.33 m/s; Q = 14.5 m³/s

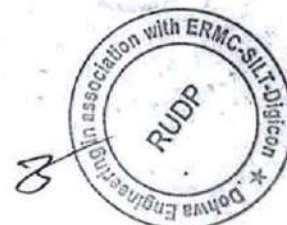
Closed Canal Part 2:

Size: 3.3 m x 3 m (No. 7); Figure 5-9

Canal length: $(140.0-106.9) \text{ m} = 33.1 \text{ m}$; Slope: $(93.6-93.5)/33.1 = 0.003$

Manning's n = 0.035; Velocity: 1.56 m/s; Q = 14.1 m³/s

The comparison of the flood discharge in the worst-case scenario of the earthen irrigation canal (connecting Telar River with the Bus terminal) flowing full (14.02 m³/s) and the conveyance capacity of the designed concrete canal in the Bus terminal (14.5 m³/s in the open canal part and 14.1 m³/s in the box culvert part) shows that the designed canal is able to safely discharge the flow from the irrigation canal to the ditch which is connected to the



In the case of extremely high intensity rainfall events, the irrigation canal will overflow and spill over in the agricultural fields in the upstream side of the Bus terminal. The discharge from the irrigation canal to the Bus terminal in such a situation will still be $14.02 \text{ m}^3/\text{s}$.

The canal inside the Bus terminal premises is designed with concrete structure, and the canal size, shape and slope are designed to be able to safely carry the flood flow entering the Bus terminal area from the irrigation canal, the construction of the canal alignment along the north border of the Bus terminal area will have no negative consequence to the private land and the private houses constructed near the north border of the Bus terminal.

5. Conclusions:

The following conclusions are drawn based on the hydrological/hydraulic analysis of the flooding and inundation potential of the Bus terminal site and the adequacy of the canal size to safely discharge the flood water coming to the Bus Park area from an abandoned irrigation canal.

1. The maximum flow carrying capacity of the exiting irrigation canal is $14 \text{ m}^3/\text{s}$. If more than $14 \text{ m}^3/\text{s}$ water enters the irrigation canal, it will overflow in the upstream side of the Bus Park.
2. The hydraulic evaluation of the designed canal inside the Bus terminal is able to safely discharge the flood water entering the Bus terminal area from the irrigation canal. The conveyance capacity of the canal is $14.5 \text{ m}^3/\text{s}$ in the uncovered part of the canal and $14.1 \text{ m}^3/\text{s}$ in the box-culvert part of the canal.
3. The construction of the concrete canal along the north border of the Bus terminal will have no negative consequences (structurally) to the private land and private houses constructed near the north border. A boundary wall at the north end (left bank) of the canal is designed to be constructed (Figure 5-9); this wall will prevent people or materials falling into the canal.

ANNEX 11.2: Geological Analysis

For the Bus Terminal site, the soil investigation revealed a stratigraphy that begins with layers of silty clay at the surface, which are soft to medium stiff, underlain by stronger deposits of medium to coarse sand mixed with gravels. Boreholes were drilled to depths of 12–15 meters, and groundwater was encountered at relatively shallow levels, around 2.5 to 3.5 meters below ground. Standard Penetration Tests (SPT) were carried out, with values corrected for overburden pressure and standardized to N60, showing that soil strength increases with depth.



3





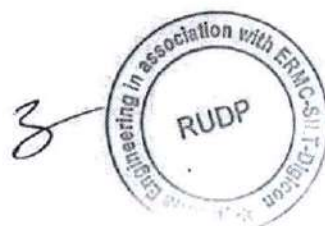
Google image of the project area with bore hole locations

The bearing capacity analysis indicated that shallow foundations can be safely designed, with calculated safe bearing capacities ranging from about 120 to 176 kN/m² for isolated footings depending on their size and depth. For raft foundations, the allowable values were slightly lower, around 105 to 154 kN/m². A sample calculation for a 3×3 m footing at 1.8 m depth yielded a safe bearing capacity of approximately 126 kN/m².

Seismic considerations were also addressed: the site lies in a moderate hazard zone with a seismic factor of about 0.3g. Liquefaction analysis confirmed that the soils at the Bus Terminal site are not susceptible to liquefaction under expected seismic loads.

Recommendations for construction include maintaining excavation slopes at about 45° for stability, filling any soft pockets with granular material, and ensuring proper compaction during backfilling. The site has been classified as Soil Type D – Very Soft Soil Sites under NBC 105:2020, which guides foundation design parameters.

In summary, while the Bus Terminal site has softer clay layers near the surface, the underlying sandy strata provide adequate strength. With adherence to the recommended bearing capacities and construction practices, the site is suitable for safe foundation design and development.



ANNEX 12: EMERGENCY RESPONSE PLAN

The proposed Bus Terminal Project at Madhubani, Ward No. 10 of Lumbini Sanskritik Municipality, is being developed under URLIP to improve local and regional transport services. The terminal will include bus bays, parking, ticketing counters, waiting areas, public toilets, restaurant, garage, storage, and other passenger facilities. Since the project will involve construction works and later daily movement of buses, passengers, workers, vendors, and visitors, possible emergencies such as accidents, fire, traffic incidents, flooding/waterlogging, spills, and security-related issues may occur. This ERP has therefore been prepared to guide timely response, protect people and property, and coordinate with concerned authorities during emergencies.

1. Purpose

The ERP has been prepared to ensure timely and effective response to possible emergency situations during project construction and operation phase. The plan aims to protect workers, visitors, local people, project property, and the surrounding environment from accidents, injuries, fire, flooding, spills, security incidents, and other emergencies.

2. Possible Emergency Situations

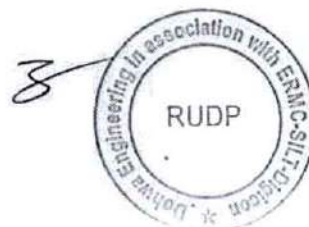
The following emergency situations may occur during project implementation and operation:

- Occupational accidents and injuries
- Fire or electrical short circuit
- Flooding, waterlogging, or heavy rainfall events
- Fuel, oil, or chemical spills
- Traffic accidents or vehicle-related incidents
- Security incidents, disputes, or crowd-related problems
- Earthquake, storm, or other natural hazards

3. Emergency Response Procedure

In case of any emergency, the response will follow the "Protect-Alert-Aid" approach. It means, at first the affected person and nearby people will be protected from further risk. The unsafe area will be isolated, and unnecessary movement will be restricted. Then, the Site Supervisor, Safety Officer, contractor, municipality, police, fire brigade, or health facility will be informed as required. First aid will be provided immediately by trained personnel, and injured individuals will be taken to the nearest health facility if needed.

4. Roles and Responsibilities



The Contractor will be primarily responsible for emergency preparedness and response during construction. A Site Supervisor or Safety Officer will act as the Emergency Coordinator. The Emergency Coordinator will manage the response, inform concerned authorities, arrange evacuation if required, and maintain emergency records.

Workers will immediately report any emergency to the supervisor and follow instructions. Trained first aiders will provide first aid support. The municipality/PIU will supervise the implementation of the plan and coordinate with local authorities when required.

5. Emergency Measures

The following measures will be maintained at the project site:

- First aid box will be available at the site.
- Emergency contact numbers will be displayed at visible locations.
- Fire extinguishers will be provided in risk-prone areas.
- Safe evacuation routes and assembly points will be identified.
- Workers will be briefed on emergency response procedures.
- Fuel, oil, and chemicals will be stored safely to avoid spills.
- Spill control materials such as sand, absorbent material, shovel, and container will be kept at the site.
- Access for ambulance, fire brigade, and emergency vehicles will be kept clear.
- Emergency incidents will be recorded and reported to the PIU/municipality.

6. Response to Specific Emergencies

Accident or Injury:

Work will be stopped immediately in the affected area. First aid will be provided, and the injured person will be taken to the nearest health facility if required. The incident will be reported to the Site Supervisor and PIU.

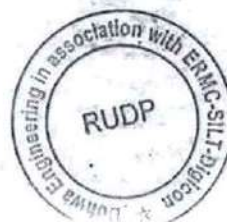
Fire:

The fire source will be isolated if safe to do so. Fire extinguishers will be used only by trained individuals. If the fire cannot be controlled, workers and visitors will be evacuated, and the fire brigade will be informed.

Flooding or Waterlogging:

During heavy rainfall, work in unsafe areas will be stopped. Temporary drainage will be maintained to safely divert stormwater. Workers and equipment will be moved to safe areas.

Fuel, Oil, or Chemical Spill:



Handwritten signature or mark.

The spill area will be isolated. The spilled material will be contained using sand or absorbent material. Contaminated soil or material will be collected and disposed of safely. The incident will be reported to the supervisor.

Traffic or Vehicle Accident:

The movement of vehicles will be stopped or controlled immediately. Injured individuals will be supported, and traffic police or local authorities will be informed where necessary.

Security Incident or Dispute:

The Site Supervisor or terminal/site management will intervene to control the situation. If the issue cannot be resolved at site level, local police and municipal authorities will be informed.

7. Emergency Contact List

The following emergency contact list will be prepared and displayed at the site before construction starts:

Contact Person/Agency	Contact Number
Site Supervisor / Emergency Coordinator	To be updated by contractor in SEMP
Contractor Representative	To be updated by contractor in SEMP
PIU / Municipality Focal Person	To be updated by contractor in SEMP
Nearest Health Facility	To be updated by contractor in SEMP
Ambulance	To be updated by contractor in SEMP
Fire Brigade	To be updated by contractor in SEMP
Police / Traffic Police	To be updated by contractor in SEMP

8. Training and Review

The Contractor will provide basic orientation to workers on emergency response, first aid, fire safety, evacuation routes, and reporting procedures. The Emergency Response Plan will be reviewed and updated as needed, especially after any major incident or change in site condition.



ANNEX 13: DECLARATION

Title of the Report	IEE of Bus Terminal Project in Lumbini Sanskritik Municipality
Name and Address of the Project Proponent	Regional Urban Development Project (RUDP) Project Coordination Office (PCO) Department of Urban Development and Building Construction (DUDBC) Babarmahal, Kathmandu, Nepal Phone: 01- 5356651 E-mail: rudp.pdsecretariat@gmail.com

I hereby declare that I have conducted the study professionally using acceptable and standard methodologies; the study findings are correct to the best of my knowledge, and have not been altered in any manner; the mitigation measures and approaches proposed, the best of my knowledge, are reliable, practical and adequate to comply with the relevant legal requirements; and I shall be accountable for any misleading information in the part of this report to my areas of study.



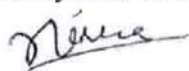
Dr. Akhanda Raj Upreti

Team Leader/ Environmental Specialist



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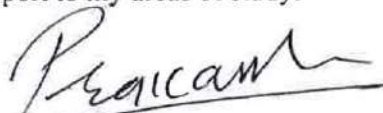


Dr. Nirina Khadgi
Environmental Specialist




Title of the Report	IEE of Bus Terminal Project in Lumbini Sanskritik Municipality
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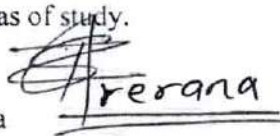
Prakash Panday
Sociologist



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Prerana Shrestha
Forestry Specialist

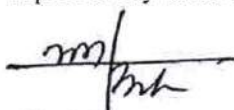

Prerana



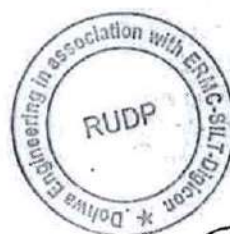


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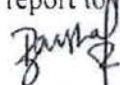


Bibek Gautam
Senior Architect



Title of the Report	IEE of Bus Terminal Project in Lumbini Sanskritik Municipality
Name and Address of the Project Proponent	Regional Urban Development Project (RUDP) Project Coordination Office (PCO) Department of Urban Development and Building Construction (DUDBC) Babarmahal, Kathmandu, Nepal Phone: 01- 5356651 E-mail: rudp.pdsecretariat@gmail.com

I hereby declare that I have conducted the study professionally using acceptable and standard methodologies; the study findings are correct to the best of my knowledge, and have not been altered in any manner; the mitigation measures and approaches proposed, the best of my knowledge, are reliable, practical and adequate to comply with the relevant legal requirements; and I shall be accountable for any misleading information in the part of this report to my areas of study.



Barsha Gautam
Environmental Analyst



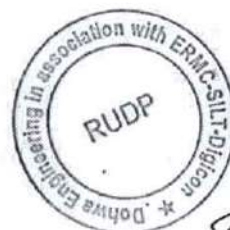

Declaration of the Proponent

Title of the Report:	IEE of Bus Terminal Project in Lumbini Sanskritik Municipality
Name and Address of the Project Proponent:	Regional Urban development Project (RUDP) Project Coordination Office (PCO) Department of Urban Development and Building Construction Babarmahal, Kathmandu, Nepal Phone: 01-5356651 E-mail: rudp.pdsecretariat@gmail.com

We hereby declare that; the study has been conducted by a qualified and experienced team of professionals using acceptable and standard methodologies and the study findings are correct to the best of our knowledge, and have not been altered in any manner; the mitigation measures and approaches proposed, to the best of our knowledge, are reliable, practical and adequate to comply with the relevant legal requirements.



Project Director



ANNEX 14: APPROVAL LETTERS FOR TERMS OF REFERENCE (TOR)



नेपाल सरकार
शहरी विकास मन्त्रालय
सिंहदरबार, काठमाडौं



प.सं. :- ०८२/८३

च.नं. :- २५४

मिति :- वि.सं. २०८२/०५/२३

वे.सं. :- ११४५ अलग, १ संमन्त्र

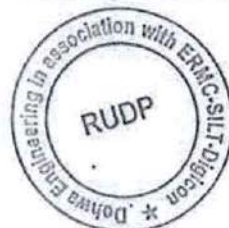
विषय: प्रारम्भिक वातावरणीय परीक्षणको कार्यसूची (TOR) प्रतिवेदन स्वीकृत सम्बन्धमा।

श्री शहरी विकास तथा भवन निर्माण विभाग
ववरमहल, काठमाडौं

प्रस्तुत विषयमा तह विभाग मार्फत श्री क्षेत्रीय शहरी विकास आयोजना, ववरमहल, काठमाडौं प्रस्तावक तथा श्री Dohwa Engineering Co.Ltd. (Republic of Korea) in association With ERMS(P) LTD, SILT Consultants (P.) Ltd. and DIGICON (P) Ltd. परामर्शदाता भई पेश भएको रूपन्देही जिल्लाको "Bus Terminal Project" को प्रारम्भिक वातावरणीय परीक्षण (IEE) तयार गर्ने कार्यसूची (TOR) प्रचलित कानूनको विपरित नहुने गरी प्रस्तुत TOR मा कार्यान्वयन र पालना गर्ने भनी प्रतिवद्धता जनाइएका विषयहरूको पूर्ण कार्यान्वयन, वातावरण संरक्षण ऐन, २०७६ र वातावरण संरक्षण नियमावली, २०७७ मा प्रारम्भिक वातावरणीय परीक्षणको सम्बन्धि भएको व्यवस्था तथा तपशिल बमोजिमका शर्तहरू समेत पालना गर्ने गरी वातावरण संरक्षण ऐन, २०७६ को दफा ५ तथा वातावरण संरक्षण नियमावली, २०७७ को नियम ५ को उपनियम ५ बमोजिम मन्त्रालयको मिति २०८२/०५/२० गतेको निर्णयानुसार (सचिवस्तरिय) स्वीकृत भएको व्यहोरा जानकारीका लागि अनुरोध छ।

तपशील:

- कार्यसूची तथा अनुसूचीमा संलग्न कागजात तथा विवरणहरूको अधिकारीकताको सम्बन्धमा प्रस्तावक र परामर्शदाता स्वयं जिम्मेवार तथा जवाफदेही हुनुपर्ने छ।
- प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्यसूची पुनरावलोकन समितिले दिएको राय/सुझाव/टिप्पणी प्रारम्भिक वातावरणीय अध्ययनको अंश हुने।
- प्रारम्भिक वातावरणीय परीक्षण (IEE) को अध्ययनका क्रममा कुनै नयाँ थप सवाल पहिचान हुन आएमा तिनलाई समेत प्रतिवेदनमा सम्बोधन गर्नु पर्ने तथा प्रस्तावित आयोजना निर्माणका क्रममा निस्कने फोहोर तथा काम नलाग्ने वस्तुहरूको व्यवस्थापन कसरी र कसले गर्ने भन्ने स्पष्ट खाका, सम्भावित विपद् व्यवस्थापन कार्ययोजना प्रतिवेदनमा समावेश गर्नुपर्ने।
- विजुलीको पोल, खानेपानी तथा अन्य पूर्वाधारमा असर परेको /नपरेको स्पष्ट खुलाउने।
- प्रस्तावित आयोजना स्थल संरक्षित क्षेत्र, आरक्षण, निकुञ्ज वा अन्य प्रतिवन्धित क्षेत्र भएर जाने/ नजाने यकिन गरी स्पष्ट खुलाउने।





नेपाल सरकार
शहरी विकास मन्त्रालय
सिंहदरबार, काठमाण्डौ



६. प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्यसूची प्रतिवेदन तयारीका क्रममा गरिने सार्वजनिक सुनुवाईमा स्थानीय तहका प्रतिनिधि एवं अल्पसंख्यक समुदायको सहभागिता गराई सो सम्पुष्टि हुने कागजात संलग्न हुनुपर्ने।
७. स्थानीय तहको सिफारिस संलग्न गर्दा वातावरण संरक्षण नियमावली, २०७७ को नियम ७ को उपनियम (२) र (३) को प्रक्रिया सम्पन्न भएको भित्ति पश्चातको हुनु पर्ने।
८. प्रारम्भिक वातावरणीय परीक्षण (IEE) को प्रतिवेदन तयार गर्दा वातावरण संरक्षण नियमावली, २०७७ को नियम ७ को उपनियम (७) बमोजिमको भाषामा, सोही नियमावलीको अनुसूची १३ बमोजिमको विज्ञ मार्फत र अनुसूची ११ बमोजिमको ढाँचामा तयार गर्नुपर्ने।
९. प्रतिवेदनको अनुसूचीमा स्वीकृत कार्यसूची पनि अनिवार्य रूपमा समावेश हुनुपर्ने।
१०. प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन पेश गर्दा अनिवार्य रूपमा आयोजनाको स्वीकृत DPR संलग्न गरिनुपर्ने।
११. आयोजना कार्यान्वयन हुने क्षेत्र संरक्षित क्षेत्र, आरक्षण निकुञ्ज वा अन्य प्रतिवन्धित क्षेत्रमा पर्ने र नियामक निकायबाट स्वीकृति लिनुपर्ने भए कानून बमोजिम सहमति/स्वीकृति पत्र अनिवार्य संलग्न गरिनुपर्ने।
१२. आयोजना अध्ययन, कार्यान्वयन वा दुवैका लागि जग्गा भोगाधिकार/अनुमति आवश्यक पर्ने भएमा कानून बमोजिम सो को स्वीकृति लिएर मात्र आयोजनाको काम अगाडी बढाउनुपर्ने।
१३. प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्यसूची पुनरावलोकन समितिले दिएका तथा प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदनमा समावेश गरिने भनिएको राय/सुझाव/टिप्पणीहरू उल्लेख गरिएबमोजिम गर्ने।

प्रमाणित डिजिटल हस्ताक्षर गर्ने व्यक्तिको
Bijay Regmi
eebijayregmi@gmail.com

(विजय रेग्मी)

इन्जिनियर

सोपानार्थः

श्री क्षेत्रीय सहर विकास आयोजना

ववरमहल



Bus Terminal Sub-Project को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदनमा समावेश गर्नुपर्ने राय/सुझावहरु

S.N.	Comments	Where & how incorporated?	Remarks
1.	On the project features the area covered by terminal is indicated as 11,68.41 sqm. Whereas total land area is 15,048 sqm. If the total built up area is only 2,087.49 sqm, it is better to show them in a site plan to avoid any possible confusion.	Annex 1.8, page no. 144	
2.	Though suggested during TOR presentation, a comparative table of building parameters on the basis of proposed and permissible indicators of built-up area, set back, ground coverage, height of building ect.is still mission.	Section 3.2.2, page number 20	
3.	It is recommended to replace the area of hard pavement with alternative permeable solution of pavement, wherever possible.		It has been designed according to the requirement to bear heavy load as vehicles will repeatedly come. Greenery is maintained as possible as shown in Annex 1.6, page number 150
4.	Proper calculation of water requirement and waste generation, based on the number of intended users, for both of the construction and operation phases, should be incorporated along with possible modes of water supply and methods of waste disposal, both liquid and solid wastes.	Revised water requirement; Section 3.7.6, page no. 32 to 35. For liquid waste, a PSTP has been proposed (Section 3.7.10). Page no. 39. For the solid waste, 19 dustbins (page no. 38) have been proposed which will be managed as per the municipal system.	Ground water supply has been proposed.



2

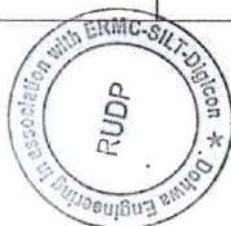


S.N.	Comments	Where & how incorporated?	Remarks
5.	No policy and legal framework review is attached, though mandatory according to EPR.	Section 3.9.2, page no. 59 onwards	
6.	The report indicates that the proposed land is currently designated as agricultural land. If so, changing the land use from agriculture to any other land use may become an issue for the authorities from land and agriculture related public entities. A practical approach is sought henceforth.	The proposed land lies in a barren land leased by municipality and not used as an agricultural land. It is corrected accordingly.	Land related letters in Annex 8.
7.	Settlement related issues of filled material and abstractions created by filling up must be addressed.		It will be done following a standard method required by DUDBC for filling, thus no issue will be created.
8.	परियोजनाको बातावरणीय अध्ययनको कार्यसूची स्वीकृत हुँदा सो कार्यसूचीमा उल्लेख गरिएका सुझाव/शर्तहरू के, कहाँ, कसरी समावेश गरिएका हुन्? तालिका वनाएर उचित खण्डमा राखे।		A table is added below this table to address the comments from ToR.
9.	प्रस्तावित परियोजनाले प्रयोग गर्ने जग्गाको स्वमित्व/भोगाधिकार प्रष्ट हुने कागजात प्रतिवेदनको अनुसूचीमा समावेश गर्ने।	The land ownership letters are included in Annex 8, page no. 180	किता न. ५८०
10.	प्रस्तावित परियोजनाको औचित्यता तथा सान्दर्भिकता समावेश गर्ने, निर्माण तथा सञ्चालनले स्थानीय वासिन्दाको सामाजिक तथा आर्थिक गतिविधिमा कसरी प्रभाव पार्छ ? स्पष्ट रूपमा उल्लेख गर्ने।	Relevance has been added in Section 3.5. page no. 28	

Government of Nepal
Ministry of Urban Development and Construction
Department of Urban Development
National Urban Development Project Coordination Unit



S.N.	Comments	Where & how incorporated?	Remarks
11	परियोजनाको Socio-Economic Benefit Analysis, Economic Rate of Return को बारेमा उल्लेख गर्ने।	It is included in Section 3.5	The total estimated cost of the bus terminal project is NPR. 292,865,071.86, primarily allocated to civil, building, and electrical works, along with environmental and social mitigation costs. Revenue sources include rental income from leased spaces, sanitation service fees, and vehicle parking and entry charges. The economic analysis indicates a base case Economic Internal Rate of Return (EIRR) of 11%, exceeding the Economic Opportunity Cost of Capital (EOCC) of 9%, confirming economic viability. However, sensitivity analysis shows that financial viability is limited, as the project does not generate sufficient cash flow to recover its investment within the 20-year time frame. Despite this, since the project serves a broader community benefit, it remains justifiable. With proper an extended project lifespan, the government can effectively manage costs and benefits to maximize its long-term outcome.
12	निर्माण पश्चात सञ्चालन चरणको व्यवस्थापन तथा मर्मत सम्भारको पद्धति तथा खाकको बारेमा स्पष्ट रुपमा प्रतिवेदनमा समावेश गर्ने।	Section 3.3.3, page no 26	
13	दाहसंस्कार घाट, क्रियापुत्री भवन, मठ-मन्दिर तथा अन्य सार्वजनिक संरचनाको व्यवस्थापन र मर्मत सम्भारको लागत नर्म्स अनुसार तयार गरी अनुसूचीमा		This comment is not applicable for this project.



S.N.	Comments	Where & how incorporated?	Remarks
	समावेश गर्ने तथा वातावरणीय व्यवस्थापन योजनामा समावेश गर्ने।		
14	सार्वजनिक सुनुवाइ तथा अन्य छलफलका क्रममा उठेका सवालहरु के, कहाँ, कसरी सम्बोधन गरियो? सो को विवरण प्रतिवेदनको अनुसूचीमा समावेश गर्ने।	Section 3.9.4, page no. 67, 68 for the public concerns during the public hearing. Other information of public hearing in Annex 7.	
15	माटो भरणको मात्र धेरै देखिएको, प्रस्तावको निर्माणको खर्चमा माटो भरण कार्य अत्यधिक रहेको हुनाले, माटो कम प्रयोग हुने वातावरणमैत्री विकल्पको विश्लेषण गर्नु पर्ने।		As the project is the construction of bus terminal and it shouldn't submerge in rainy season, hence filling is done to align with the level of road to prevent obstruction.
16	प्रतिवेदनमा माटोको स्रोतको रूपमा पहिचान गरिएको स्थल खोलाको वगर रहेको हुदाँ सो क्षेत्रको माटो इन्जिनियरिङ्ग हिसाबले भरणको लागि उपयुक्त हुने/नहुने एकीन गरी नहुने अवस्था रहेमा वैकल्पिक व्यवस्था गर्नु पर्ने।	The mentioned site is appropriate (location in page no. 21 and 22) but the municipality needs to get environmental clearance for the site in the form of Brief Environmental Study or Initial Environmental Examination or Environmental Impact Assessment.	
17	स्थानीय सीमान्तकृत महिलाहरूलाई रोजगारीमा प्रार्थमिकता दिइने र उनीहरूलाई आवश्यकता अनुसारको तालिम प्रदान गरिने भन्ने उल्लेख छ। तालिम प्रदान गरिन्छ वा गरिंदैन? कसरी कुन कुन		The training for enhancement of skill and environmental awareness will be provided as a part of EMP. However, training on environmental awareness will be separately.

S.N.	Comments	Where & how incorporated?	Remarks
	तालिम दिने हो? सो कुरा स्पष्ट हुनुपर्ने। Training on environment awareness, Training on solid waste management लगायत धेरै विषयमा तालिम प्रदान गरिने भन्ने उल्लेख भएकोले कुन Specific विषयमा तालिम प्रदान गरिने हो। स्पष्ट गर्ने।		given by WUC project as a component of the overall project.
18	लैङ्गिक विभेद / लैङ्गिक हिंसा लगायतका विवाद र गुनासोको सम्बन्धमा आन्तरिक विवाद समाधान संयन्त्र गठन गर्नुपर्ने।	Page number 114, Grievance Redressal Mechanism	
19	आयोजनाको वास्तविक प्रस्तावक को हो ? शहरी विकास मन्त्रालय र विभागको भूमिका के कति हो? केवल बजेट व्यवस्थापन र खरिद प्रक्रिया गरेको कारण सम्पूर्ण जिम्मेवारी बहन गर्न सम्भव छ/छैन? स्पष्ट पार्ने।	Section 3.9.1-page no. 58	
20	आयोजनामा निर्माण हुने संरचनाहरूबारे उल्लेख छ तर आयोजना सञ्चालनका चरणमा गरिने Activities बारे समेत स्पष्ट खोल्नुपर्ने।	Section 3.3.3, page no. 26, O/M phase added	
21	प्रस्तावको प्रभाव क्षेत्र के-कस्तो छ? पहिचान गरी क्षेत्र निर्धारण गर्ने।	Annex 3.1	
22	प्रत्यक्ष र अप्रत्यक्ष प्रभाव क्षेत्र भित्र रहेको वस्ती, घरधुरी र सार्वजनिक संरचनाहरू के कति छन् ? उल्लेख गरेर तिनमा पर्ने प्रभाव समेत विश्लेषण गर्ने।	Annex 3.3 and 3.4 for Household survey (only few houses in the DIA), Section 3.8.3-page no. 44 for other	

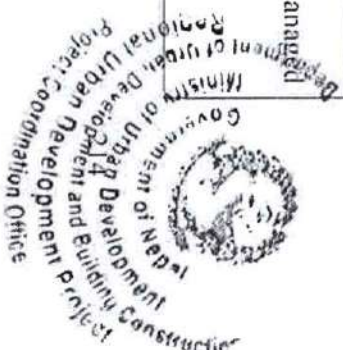
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Project: Lumbini Sanskritik Municipality
Office: Lumbini Sanskritik Municipality

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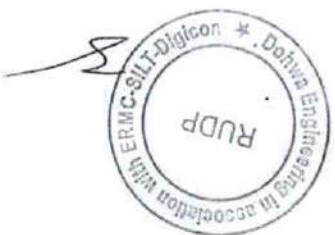
S.N.	Comments	Where & how incorporated?	Remarks
27	Land use change का कारण drainage pattern मा आउने Change बारे उल्लेख गर्ने।		There is no substantial change in drainage pattern due to this project. Hydrological analysis was conducted. Summary of analysis in Annex 11.1, page no. 185
28	Waste water treatment plant को विद्यमान व्यवस्था र आयोजनामा यसको आवश्यकता रहे/नरहेकोबारे उल्लेख गर्ने।		There is no wastewater treatment currently and PSTP is required for the treatment of waste water generated by the project.
29	Multistoried parking को विषय समेटेर विकल्प अध्ययन गर्नुपर्ने।		The multistorey parking alternative was not considered feasible due to the space and operational requirements of large buses. Long-route buses require a clear headroom of about 4.5 m, and after allowing for beams, slab depth, and services, the floor-to-floor height would be nearly 6 m. To achieve this height safely, a ramp with a preferred gradient of 4-5% would require a length of about 120 m for a 6 m rise. This would significantly increase the building footprint and circulation area. Therefore, the multistorey option would be inefficient in terms of land use, construction cost, bus circulation, and day-to-day operation, and was not considered a practical alternative for the proposed bus terminal.
30	EV Charging Station को सुविधा आयोजनामा समावेश गर्नुपर्ने।	Added in design. Page no. 144, Figure A11	The project proposes installation of five dual-gun EV fast charging stations, each capable of charging two electric vehicles simultaneously using CCS2 technology. The chargers will



S.N.	Comments	Where & how incorporated?	Remarks
31	सबै प्रक्रिया र चरणमा स्थानीय तह संलग्न हुनुपर्नेमा ल्यो भएको देखिँदैन। सम्बन्धित स्थानीय तहसँग समन्वय गरी निर्माण तथा सञ्चालन खाका तयार गरी प्रस्तुत गर्ने।	The consultations during feasibility stage are presented in Annex 3.5	operate on a 3-phase 400 V power supply and will be suitable for outdoor public and commercial use. The system will include weatherproof and vandal-resistant features, safety protections, emergency shutdown, remote monitoring, mobile app/RFID access, software updates, and backend connectivity. The work includes supply, installation, testing, commissioning, earthing, and a 5-year warranty.
32	बसपार्कसम्म Pick up & drop को लागि Taxi park को व्यवस्था के हो ? सो उल्लेख गर्नु पर्ने।	Car parking (629.27 m ²) is shown in Annex 1.8, page no. 144	
33	आयोजना क्षेत्रको प्रमुख नदी टेलार नदी हो ? यसले के अर्थ दिन्छ ? तेलार हो कि टेलार नदी प्रष्ट पार्नुपर्ने।	टेलार नदी हो । कार्यकारी सारांशमा पनि मिलाइएको छ ।	
34	यति धेरै लगानीमा निर्माण हुने आयोजनामा पार्किङ गर्न मिल्ने सवारी साधनको संख्या थोरै देखिन्छ। यसमा स्पष्ट भई लगानी योग्य हो को होइन प्रष्ट पार्नुपर्ने।		The project is economically feasible. The project is proposed for a managed urbanization for the municipality



S.N.	Comments	Where & how incorporated?	Remarks
35	आयोजनाको Hydrological/geological/geotechnical analysis पनि समावेश गर्ने।	Annex 11	
36	आयोजनाको DPR स्वीकृत भएको पत्र र DPR का मूल्य तथा महत्वपूर्ण विवरणहरू अनुसूची मा समावेश गर्ने।		The DPR isn't approved yet, as IEE is also a part of it. The design drawings are finalized which are included in Annex 1.3, 1.4, 1.6 and 1.7.
37	प्रतिवेदनमा अध्ययन टोलीका सदस्यहरूको नाम तथा सहि द्वाप र अध्ययन टोली र प्रस्तावको स्व:घोषणा समावेश गर्ने।	Annex 10	
38	भाषिक शुद्धतामा ध्यान दिनुपर्ने।		It has been checked thoroughly and corrected.



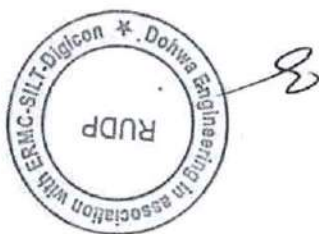
Comments from ToR

S.N.	Comments	Where incorporated in the IEE	Remarks
1.	आयोजनाको सञ्चालन, मर्मत सभार एवं कोष व्यवस्थापनको विधि र जिम्मेवारी उल्लेख गर्ने।	Page no-26, section 3.3.3: Operation and Maintenance	
2.	आयोजनाको छेउछाउका वस्ती, सार्वजनिक स्थल/विद्यालय आदि पर्ने असरहरूको न्यूनीकरणका उपायहरू उल्लेख गर्ने।	Page no 99,100, Table 6-2: EMP matrix of Adverse Impacts, Impact on Community Health and Sanitation	
3.	Charging Station (Electric) को व्यवस्थापन पनि सम्बोधन गर्नु पर्ने।	Annex 1.8, Figure A11, page no. 144	
4.	Fill 25.917 m3 कहाँबाट कसरी ल्याउने? (With co-ordinate detail) high etc. Should reflect in salient features.	Page no. 21 and 22, Section 3.2.4	
5.	Fill Dano river बाट ल्याउने तर with cost or free if not approved for borrow pit, then what will be the scenario.		The location of borrow pit are Site 1 (27°31'22.83"N 83°20'51.30"E) and Site 2 (27°30'21.22"N 83°20'6.48"E) but the municipality needs to get environmental clearance for the site in the form of Brief Environmental Study of Initial Environmental Examination or Environmental Impact Assessment.



S.N.	Comments	Where incorporated in the IEE	Remarks
6.	Borrow pit को बोरमा assure हुनु पर्ने। Dano river बाट ल्याउने Quantity को Volume र त्यसको Co-ordinate राख्ने।	A total of 10,586 m ² from site 1(27°31'22.83"N 83°20'51.30"E) and total of 18,851 m ² from Site 2(27°30'21.22"N 83°20'6.48"E) as shown in Figure 3-1, page no. 21 and 22.	The municipality needs to get environmental clearance for the site in the form of Brief Environmental Study or Initial Environmental Examination or Environmental Impact Assessment.
7.	Borrowing river को IEE भएको छ कि छैन प्रमाण राख्ने?		
8.	Add a comparative table of building parameters on the basis of proposed and permissible indicators of built-up area, set back, ground coverage etc.	Section 3.2.2, page no. 20	
9.	All water and waste related issues (volume required or generated and their supply and disposal) including GWR and RWH in the building facilities should be covered by the report.	Page no 35, Section 3.7.8 Waste output from the Bus Terminal 3.7.9: Solid waste (sludge), Page no 36, 3.6.9 Liquid Waste, 3.7.11 Wastewater Treatment Technology, page no. 39	
10.	Indicate the volume of major construction materials and their sources, including quarries, if any.	Page no 30, Section 3.7.3 Construction materials requirement for the project	
11.	Add multi-hazard related DRM provisions and related issues.	Issue on Page no 80, Section 4.2.2.7 Flooding/Flash flood/Erosion issues, DRM in page no 106, Table 6-2: EMP matrix of Adverse Impact, Flash flood/Erosion	Emergency Response plan in Annex 12
12.	Add labor camp related water and waste management at construction phase based on the estimated number of labor personnel respectively.	Page no. 105, Table 6-2: EMP matrix of Adverse Impact, Impact on water and Issues relate to waste generation	
13.	लुम्बिनी सांस्कृतिक नगरपालिकाले दाना नदीबाट निर्माण सामग्री उत्खनन गर्ने सहमति दिएको छ कि छैन ? आवश्यक कागजात वा पत्र पेश गर्ने।		The municipality needs to get environmental clearance for the site in the form of Brief Environmental Study or Initial Environmental Examination or Environmental Impact Assessment.





IEE of Bus Terminal Project in Lumbini Sanskritik Municipality