Environmental Assessment Document

Initial Environmental Examination

Grant Number: 0093 NEP

March 2011

Nepal: Rural Reconstruction and Rehabilitation Sector Development Program

(Upgrading of) Baguwa-Pyutar-Ashrang Road Subproject, Lalitpur District

Prepared by the Government of Nepal

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Government of Nepal
Ministry of Local Development
Department of Local Infrastructure Development and Agricultural Roads
Rural Reconstruction and Rehabilitation Sector Development Program
[ADBGrant 0093NEP]

Initial Environmental Examination (IEE) Report

Of

(Upgrading of) Baguwa-Pyutar-Ashrang Road Subproject Lalitpur District

Submitted to:
Ministry of Local Development
Government of Nepal

Proponent:
District Development Committee/
District Technical Office
Lalitpur

March, 2011

Prepared By:
District Implementation Support Team (DIST)
GOEC Nepal Pvt. Ltd.

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ABBREVIATIONS

ADB Asian Development Bank
amsl Above mean sea level
AP Affected Person
BG Building Group
Ch Chainage
CBO Community Based Organization
CDC Compensation Determination Committee
CDO Chief District Officer
CEA Country Environmental Analysis
CGI Corrugated Galvanized Iron
CF Community Forest
CFUG Community Forest Users Group
CISC Central Implementation Support Consultant
CITES Convention on International Trade in Endangered Species of Flora and Fauna
DADO District Agriculture Development Office
DDC District Development Committee
DFID Department for International Development
DFO District Forest Office/Officer
DG Director General
DIST District Implementation Support Team
DIT District Implementation Team
DoLIDAR Department of Local Infrastructure Development and Agricultural Roads
DPO District Project Office
DPCC District Project Coordination Committee
DRSP District Road Support Programme
DSCO District Soil Conservation Office
DTO District Technical Office
DTMP District Transport Master Plan
EA Environmental Assistant/Assessment
EARP Environmental Assessment and Review Procedures
ES Environmental Specialist
EIA Environmental Impact Assessment
EMP Environmental Management Plan
EMS Environmental Management Section
EPA Environmental Protection Act
EPR Environmental Protection Rules
ESD Environment Screening Document
FGD Focus Group Discussion
GAP Gender Action Plan
GoN Government of Nepal
GIS Geographical Information System
Ha Hectare
HH Household
IEE Initial Environmental Examination
IPDP Indigeneous People Development Plan
IUCN International Union for Conservation Nature
Km Kilometer
LDO Local Development Officer
LEP Labour based, Environment friendly and Participatory
LEST Livelihood Enhancement and Skill Training
LRMP Land Resource Management Project
M meter
MoU Memorandum of Understanding
MoE Ministry of Environment
MoST Ministry of Science and Technology
Ml Milliliter
MLD Ministry of Local Development
NGO Non-Governmental Organization
NRs Nepali Rupees
NTFPs Non timber forest products
OFID OPEC Fund for International Development
OP Operational Plan
OPEC Organization of Petroleum Exporting Countries
PAM Project Administrative Memorandum
PCC Plain Cement Concrete
PCU Project Coordination Unit
RBG Road Building Group
RCC Reinforced Cement Concrete
RCIW Rural Community Infrastructure Works
REA Rapid Environmental Assessment
RES Rapid Environmental Screening
RIDP Rural Infrastructure Development Project
RP Resettlement Plan
RRRSDP Rural Reconstruction and Rehabilitation Sector Development Program
RS Resettlement Specialist
SAP Social Action Plan
SF Social Funding
SA Social Appraisal
SDC Swiss Agency for Development and Cooperation
SM Social Mobilizer
SMC Social Mobilization Coordinator
SMO Social Mobilization Officer
TA Technical Assistance
ToR Terms of Reference
TWS Technical Walkover Survey
VDC Village Development Committee
VICCC Village Infrastructure Construction Coordination Committee
ZoI Zone of Influence

NAME AND ADDRESS OF THE PROPONENT

Name of Proposal

(Upgrading of) Baguwa-Pyutar-Ashrang Road, Lalitpur District, Nepal

Name and Address of Proponent

District Development Committee (DDC), District Technical Office (DTO), Lalitpur District
Phone No: 01-5551637, 01-5538789

Name of Preparer

Mr. Manoj Kumar Shah (Deputy Team Leader)
Mr. Man Kumar Rai (Social Development Specialist)

Data Collection and Support

Mr. Ram Charitra Mandal (Team Leader, DIST)
Mr. Manoj Kumar Shah (Deputy Team Leader, DIST)
Mr. Man Kumar Rai (Social Development Specialist, DIST)
Mr. Narendra Kumar Rai (Sub-Engineer, DIST)
Mr. Ram Prasad Subedi (Assistant Sub-Engineer)

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ls=dL cg'dflgt nfut g]?= ^!&)*)* nfUg] b]lvG5 . The total project cost is NRs. 98,840,619 and cost per km is NRs. 6,170,808 and bridge is NRs. 40,914,109.

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EXECUTIVE SUMMARY

Background

Government of Nepal has received financial assistance from ADB, SDC, DFID and OFID for implementation of the Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP). The RRRSDP aims for reconstruction and rehabilitation of rural infrastructures damaged in the twenty conflict affected districts of the country. The Proposed 16.17 km long Baguwa-Pyutar-Ashrang Rural Road in Lalitpur District is one of the Subprojects selected under the RRRSDP. It is an existing earthen road proposed for upgrading in gravel standard.

Project Proponent

The 'Proponent' of the proposed Subproject (Proposal) is District Development Committee (DDC)/ District Technical Office (DTO), Lalitpur. Ministry of Local Development (MoLD) is the 'Concerned Agency' for approving the IEE study.

Objectives of the IEE Study

The objectives of the IEE study is to identify the impacts on the physical, biological, socio-economic and cultural environment of the project influence area from construction and operation of the Proposal, and recommend site-specific adverse impact mitigation measures and beneficial impact augmentation measures and sure whether the IEE or EIA is required for the proposed road sub-project.

Relevancy of the Proposal

The project area lies in South-Western part of Lalitpur District. It links with Kanti Rajmarga. This road helps to reduce travel time and cost of local people to access other part of the country. The area has high potential in production of vegetables like Ginger, Raddish, Potato, Cabiage, Cauliflower, Tomato; fruits like Banana, Guava; and milk. The proposed road will enhance access to market and social services to the people of the area, and will significantly contribute in their socio-economic development. Better access will also open door to new development opportunities. It helps to connectivity to the other parts of the country, all weather serviceability, safety after upgrading the road in gravel standard. Access shall also attract other development infrastructures and open door to further development opportunities in the area.

Study Methodology

The IEE study has been conducted through review of secondary information collected from relevant agencies, and primary information collected from the field survey in July 2009. The survey methods included walk-through survey along the existing alignment with checklists, conduction of sample household survey, organizing focus group discussions (FGD) in the related VDCs, and information supplemented by the resettlement and technical team of the Subproject.

The IEE report has been prepared following the Environmental Protection Act, 1997 and Environmental Protection Rules, 1997 (second amendment 2007) of the Government of Nepal (GoN); and Environmental Assessment Guidelines, 2003, and Safeguard Policy Statement, 2009 of ADB. The report follows the Terms of Reference for IEE Study approved by MoLD on 22/01/2066 BS.

Brief Description of the Subproject

The proposed road lies at the remote South-westrn part of Lalitpur district. This road links remots VDCs with Kanti Rajpath and District headquarter. Total length of road is 16.17 km. The road is currently earthen surface and vehicles ply seasonally. This road starts from Baguwa bazar of Malta Village Development Committee (VDC) and passes through Pyutar VDC ends at Chainpur Bazaar of Asrang Village Development Committee (VDC).The total project cost is NRs. 98,840,619 and cost per km is NRs. 6,170,808 and bridge is NRs. 40,914,109.

Existing Environmental Condition

The road starts from Baguwa of Malta VDC at 1480m amsl and end at Tallo Chainpur of Ashrang VDC 790m amsl. Various kinds of rock such as quartzite, schist, selate, etc. were observed along the road alignment. Generally, alluviam, residual and clay mixed sandy soil are found along the road alignment. Main waterbodies found across the road alignment are Khani Khola and Ghatte Khola. Ambient air and water quality in the proposed project area is found to be good and there's also no noise pollution. The road mainly passes through cultivated land, barren land, forest and settlements.

The dominant forest species found in the road alignment are Sal (*Shorea robusta*), Chilaune (*Schima wallichii)*, Uttis (*Alnus nepalensis*), Khote Salla (*Pinus roxburghii*), Khirra (Sapium insigne), Kutmero (Litsea monopelata) and Katus (*Castanopsis indica*). Barking deer (*Muntiacus muntijak*), Jackal (*Canis aureus*), Monkey (*Macaca mulatta*), Wild Pig (*Sus scrofa*), Jungle Cat (*Felis chaus*), Musa (*Rattus rattus*), Squirrel (*Ratufa spp*.), Nyauri Musa (*Herpestes Edwardsi*), Fox (*Vulpes Montana*) are the wild animals reported in the forests of proposed road area. Similarly birds are Kalij Pheasant (*Lophura lencomelana*), Pigeon (*Columba livia*), Crow (*Corvus splendens*), Dove - Dhukur (*Streptopelia spp.)*, Kokale (*Dendrocitta formosae*), Jungle fowl (*Gallus gallus*) etc. The road does not fall under any protected or buffer zone area.

There are 11 major settlements along the ZoI of the proposed road alignment in Baguwa, Pyutar and Ashrang VDCs with total population of 1948 persons (379 households) and average family size of 5.14. Diverse ethnic groups such as Chhetri, Brahman, Tamang, Magar and occupational caste (Damai, Kami).

The main occupation of all people residing within the ZoI of the proposed road alignment is agriculture and livestock. Due to limited transportation facilities, agriculture farming is not enough for subsistence level. Therefore, people are carrying out other economic activities like majority of the people work as labour and porters while some people work in government and non government organizations and a few are doing business. Moreover, significant section of the economically active male population also migrates to various places including Kathmandu and abroad for employment.

Major Environmental Impacts

Beneficial Impacts

The immediate benefit from this road Subproject is employment opportunities. The implementation of Subproject requires about 121327 person days, with 10982 for skilled and 110345 for unskilled labor and for bridge 33640 person days with 9092 for skilled and 24548 unskilled labor. The project will give priority to local poor, dalit, vulnerable groups and women. Other beneficial impacts include enhancement of local business, development in skills of local people from skill developing training, awareness raising training and involvement in the construction of the project.

During operation stage of road, the people from the Zone of Influence (ZoI)[1] will get easy and fast accessibility to markets, social services and other regions of the country. This road links with Kanti Rajpath road and it helps to connect to the Hetauda of Makanwapur District. This road helps to reduce travl time and cost of local people to access other part of the country. This will ensure better economic condition and food security of the people living in the ZoI of the project area. Moreover this will promote the small agro based industries that uses local resources. Easy access and opportunity of better transportation system will develop other sectors like education, health, communication, market, banking and other socio-economic sectors. This will increase the overall living condition of the people living in ZoI of project area. The better land network will result in increased land price which will be beneficial for land owners.

Adverse Impacts

During the road construction, the cutting of slopes and consequently disposal of soil and earth material, operation of quarries might result in on erosion and landslide during construction and operation. Futhermore, spoils generated during construction can create the water pollution to the nearby water sources.

During road widening and construction 0.529 ha. of cultivated land, 0.837 ha.of forest land need to be acquired. 36 nos of different type of trees will be cleared. Also during construction of road there might be possible impacts on wildlife as workers might harass/ poaching the wildlife in the nearby forests, however, such effects are very minimum.

Water supply pipelines (0+712, 1+110, 1+514, 1+830, 1+960, 2+800, 2+940, 3+356, 3+990, 5+550, 7+800, 11+150), Foot trail (2+300, 6+200, 6+900, 7+325, 8+362, 11+300), Elecrtic pole (3+450, 7+200, 13+670, 14+745) Irigation cannal (1+000, 6+250, 13+045-13+120), Water Mill(11+850), School (3+400, 7+600) and 10 house will be damaged during road construction. Labours and local people are prone to health effects and accidents relating to construction activities.

During operation stage, vehicular movement, monsoon rain and grazing of animals on the unstable slopes might result in slope instability and hence erosion and landslides might occur. The flowing water on the side drain of the road might cause erosion of soil on adjacent agricultural land. Vehicular emissions will result in air and noise pollution. Because of easy accessibility to the forest areas will deplete forest resources and wildlife. New settlement, bazaar area will be expanded and this may increase encroachment of the RoW.

[1] ZoI is one and half hour walking distance from the road and areas of related VDCs.

Mitigation Measures

The various benefit augmentation measures and adverse impact mitigation measures have been proposed in the report to make this project environment friendly. Other than land donated by local people for the projects, adequate compensation will be provided to affected poor and marginalize household for all the lands that need to acquire. The construction of road will be based on contractor and Labour-based, Environment friendly and Participatory (LEP) Approach. Affected families will be given high priority for employment and skill development trainings. Necessary measures will be taken to reduce the adverse effects that might arise from site clearance, cutting of slopes, disposal of spoils and quarrying activities. Necessary trainings and awareness programs will be conducted. Necessary measures will be adopted for protection of flora and fauna. At construction site, the workers will be provided insurance, first aid facilities and safety equipments. Compensatory plantation of trees will be done in forest areas at 1:25 ratio + 10 % and in private land at 1:1 ratio. Protected species will be given emphasis for plantation. Proper maintenance and proper drain system will be provided to prevent accumulation of water on the nearby agricultural lands during operation. Adequate road safety measures will be provided to minimize road accident. Affected private houses, Water mill, Irrigation Canal, Water Supply Pipeline, Foot Trail, Access road, School, Electric Pole will be reinstated, relocated, compensated. The cost will be included in detail project report.

Environmental Management Plan

Environmental management plan is prepared to ensure the implementation and monitoring of mitigation measures for minimizing adverse impacts and maximizing the beneficial impacts. The necessary mitigation measures together with environmental monitoring process and responsible bodies for environmental monitoring have been identified. Similarly, for environmental monitoring various sections of physical, biological, socio-economic and cultural environment have been identified to generate useful information and improves the quality of implementation of mitigation measures.

The cost for implementing environmental management plan has been identified as follows:

SN.	Description	Amount (NRs.)	Remarks
1	Environmental awareness raising training and other training	50000.00	To be included in project cost
2	Insurance of workers	300000.00	To be included in BoQ
3	Bio-engineering	3000000.00	(Cost will be finalized after detail design) To be included in BoQ
4	Resettlement and Land Acquisition	5500000.00	To be included in Resettlement plan
5	Restoration or relocation of affected infrastructures, Spoil management, Reinstate of quarry, stockpiling etc.	500,000.00	To be included in BoQ
6	Compensatory Plantation cost	150,000.00	To be included in Environment cost
7	Social Action Plan Cost	700000.00	To be included in Environment plan.
8	Occupational health and safety, Information signboard	500000.00	To be included in BoQ
9	Monitoring	2,00,000.00	To be included in Environment cost
	Total	11,150,000.00	

Conclusion and Recommendation

The identified environment impacts will be seen in limited small areas and mainly during construction period. The implementation of proposed mitigation measures for identified adverse impacts will minimize as well as mitigate the adverse impacts on environment. The Resettlement Plan and compensation to the affected households should be ensured. The implementation of measures as described in environmental management plan will mitigate the negative impacts on physical, biological, socio-economic and cultural environment. Therefore, this IEE is sufficient for approval of the proposed sub-project, and recommended for implementation with incorporation of mitigation measures and environmental monitoring plan. Therefore, the proposed Subproject does not require Environmental Impact Assessment.

1. INTRODUCTION

1.1 Background

1. The Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) focuses on immediate post conflict development priorities for accelerated poverty reduction and inclusive development, thereby enhancing the effectiveness and efficiency of the delivery of public services, and improving access of rural people to economic opportunities and social services. The Program is financed by the Government of Nepal (GoN), Asian Development Bank (ADB), Department for International Development (DFID), Swiss Development Cooperation (SDC), Nepal and OPEC Fund for International Development (OFID). The Program covers twenty districts spread over the country. Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) under the Ministry of Local Development (MLD) is the executing agency (EA). The District Development Committees (DDCs) / District Technical Office (DTO) are the Project Implementing Agencies. The DDC/DTO is supported by District Implementation Support Team (DIST) with engineering, safeguards and social mobilization responsibilities.

2. Lalitpur District is one of the project districts under RRRSDP. This Proposal is for upgrading in gravel standard of the 16.17 km long Buguwa- Pyutar- Ashrang Road in Lalitpur District.

1.2 The Name and Address of Proponent

Name of Proposal
(Upgrading of) Baguwa-Pyutar-Ashrang Road Subproject, Lalitpur District, Nepal

Name and Address of Proponent
District Development Committee (DDC), District Technical Office (DTO), Lalitpur
Phone No: 01-5551637; 01-5008031

1.3 Relevancy of the Proposal

3. The Project area is located at remote and underdeveloped south-west part of Lalitpur District. This road links with Kantirajpath feeder road. This road also links with Hetauda and Makawanpur District. The area has high potential in production of vegetables like Ginger, Raddish, Potato, Cabiage, Cauliflower, Tomato; fruits like Banana, Guava; and milk. The upgrading of road will enhance access to market and social services to the people of the area, and will significantly contribute in their socio-economic development. The fruits and vegetables produced in the project area will get access to market in Patan Bazar and Kathmandu. Better access will also open door to new development opportunities. It helps to connectivity to the other parts of the country, all weather serviceability, safety after upgrading the road in gravel standard. Access shall also attract other development infrastructures and open door to further development opportunities in the area.

1.4 Need and Objectives of the IEE Study

4. **Need:** An IEE study of the Proposal is a legal requirement according to the Environment Protection Act, , 2053 BS (1997 AD); and Environment Protection Rule, 2054 BS (1997 AD) of GON; and according to the provisions of the Environmental Assessment Guidelines, 2003; and Safeguard Policy Statement, 2009 of ADB.

5. **Objectives:** The main objective of the IEE study is to identify the impacts from the construction and operation of the Proposal on the physical, biological, socio-economic and cultural environment of the Subproject area. The IEE study recommends practical and site specific environmental mitigation and enhancement measures, prepare and implement environmental management plan and make sure whether the IEE or EIA is required for the proposed road sub-project.

1.5 Methodology Adopted

6. The IEE study has followed the provisions of the EPA, 1997 and EPR, 1997, the provisions of ADB and approved ToR for IEE Study by MoLD on 22/01/2066 BS. It follows methodology suggested in the approved Terms of Reference for IEE Study (please refer Annex I). For the collection of environmental features related to bio physical environment, maximum 100 meter distance observable from the centre of the road alignment was taken as an influence area and socio-economic and cultural environment was taken of ZoI (one and half hour walking distance from the centre line of the road) information of the Subproject area. The IEE study has been conducted through review of secondary information collected from relevant agencies, and primary information collected from the field survey in Jan 2011. Field survey, sample household survey, organization of Focus Group Discussions in the related VDCs was carried out and necessary information was collected.

The DDCs officials, VDCs and Community Groups were also contacted to verify information to solicit their concerns. Based on the analysis of information the impacts have been predicted, identified and evaluated, mitigation measures prepared and monitoring plan has been developed.

1.6 Public Consultation

7. In order to ensure the involvement of concerned stakeholders, following procedures were followed:

- Publication of Public Notice- a 15 days public notice was published on 11/02/2066 in the Naya Patrika newspaper **(see Annex V)** seeking written opinion from the concerned VDCs, DDC, schools, health posts and related local stakeholders. A copy of the public notice was also affixed in the offices of the above mentioned organizations and deed of enquiry was collected **(see Annex VII).**
- Interaction with local communities and related stakeholders like District Forest Office, District Soil Conservation Office, District Agricultural Development Office and others were carried out during field survey to collect the public concerns and suggestions. Focus Group Discussions were conducted in all three VDCs to collect and requested their suggestions on protection of bio-physical and socio-economic environment in the Zone of Influence (ZoI) of the road. Summary of minutes of meeting is given in **Table 2.1.**
- Draft IEE report was kept at information center of DDC, Malta, Pyutar and Ashrang VDCs for public disclosure. Information was also disseminated through person to person contacts and interviews and group discussions. Recommendation Letters for implementation of the Proposal were also obtained from all the concerned VDCs **(see Annex VI).**

Table 2.1: Summary of FGD Meeting Conducted Under IEE Study

Location	Date	No. of Participants		Issues/Suggestions	Decision
		Male	Female		
Baguwa Bazar	2066/05/12	7	2	• FGD program disseminated information on the project to stakeholders. • Construction activities should be done with no environment impact, if not less environment impact. • Mitigation measures or minimization should be done during road construction.	• Issues/suggestions raised during the FGD meetings will be addressed in the mitigation measures and benefit augmentation measures.
Pyutar Bazar	2066/05/14	14	3		
Ashrang VDC's Bulding in Ashrang Bazar	2066/05/16	11	7		

8. The approved IEE report is accessible to interested parties and general public through the websites of ADB and MoLD/DoLIDAR. The copy of approved IEE report has been distributed to following offices:

1. District Development Committee, Lalitpur
2. District Technical Office, Lalitpur
3. District Project Office, Lalitpur
4. District Implementation Support Team, Lalitpur
5. Ministry of Local Development, Environment Management Section
6. Department of Local Infrastructure Development and Agricultural Roads
7. Project Coordination Unit, RRRSDP
8. Asian Development Bank, Nepal Resident Mission

2. DESCRIPTION OF THE PROPOSAL

9. The proposed Baguwa –Pyutar- Ashrang road sub-project lies in the South-Western part of Lalitpur district of Central Development region of Nepal. This Subproject starts from Baguwa of Malta village Development committee (VDC) and ends at Tallo Ashrang of Ashrang VDC. The road is currently earthen surface and vehicles ply only seasonally. This road also link with Kantirajpath. (see in Figure 1.1 and 1.2). Widening, geometric correction and grade improvement, slope stabilization, graveling, and cross drainage works are planned to implement under the proposed upgrading works of the road. In this road at Khani khola (Ch. 1+077) single span steel truss bridge is proposed. The total project cost is estimated excluding bridge at average of NRs. **98,840,619**.00 and cost per km is NRs. 6170808.00 and bridge is NRs. 40,914,109.

Salient Features of the Subproject:

1. Name of the Project	:	Upgrading of **Baguwa -Pyutar -Ashrang Road Subproject**
1.1 Project Components	:	Road and Bridge
1.2 Project Activities	:	*Construction Stage* Site clearance, Gravelling work, Structures work (toe wall, retaining wall, breast wall,), Earthwork, Bio-engineering, Cross drainage works and Side drain works. *Operation Stage* Maintenance Works
2. Location		
2.1Geographical Locations		
2.1.1 Start Point	:	Baguwa of Malta VDC.
2.1.2 End Point	:	Tallo Chainpur of Ashrang VDC.
2.2 Geographical Feature		
2.2.1 Terrain	:	Hilly
2.2.2 Altitude	:	Starting point 1480m amsl, and end point 790m amsl.
2.2.3 Climate	:	Sub-Tropical
2.2.4 Soil	:	Hard soil, ordinary soil, soft rock, Medium rock.
3. Classification of Road	:	District Road (Rural Road Class B)
4. Standard of road	:	Gravelled all weather
5. Length of Road	:	16.17 km
6. Existing Traffic	:	3 Buses, 12 Trucks per day
7. Design speed	:	20 km/hr
8. Major Settlements	:	Baguwa, Gadibhanjyang, Pyutar Bazar, Khairghari, Ghattekhola, Asrangbesi, Tallo Chainpur
9. No. of Household	:	379 HHs (According to ZoI survey)
10. VDCs along the Road	:	Malta, Pyutar and Ashrang
11. Cross Section		
11.1 Right of way	:	5 m each side (center line)
11.2 Formation width	:	5 m
11.3 Carriageway width	:	3 m
11.4 Lane	:	Single
12. Structures		
12.1 Dry Stone Causeway		
12.1.1 Gabion Works	:	3367.5 cum.
12.1.2 Stone Pitching	:	96 cum.
12.2 Gabion Works		
12.2.1 Box Sizes 2*1*1	:	1740 Nos.
12.2.2 Box Sizes 1.5*1*1	:	1984.5.5 Nos.
12.3 Hum Pipe	:	187.5 Rm
12.4 Pavement Works		

12.4.1 Sub Grade	:	64069.8 Sq. m.
12.4.2 15cm thick Gravel	:	9610.47 cum.
13. Bio-Engineering	:	Final Cost for Bioengineering will be allocated after Detail Bioengineering Plan
14. Earth Work for Roadway, Drain and Structures		
14.1 Cutting	:	79991.13 Cum
14.2 Filling	:	7130.33 Cum
15. Project cost		
15.1 Total Cost (NRs)	:	NRs 98,840,619
15.2 Costs per km (NRs.)	:	NRs 6,170,808
16. Employment generartion:		
16.1 Total employment	:	121327
16.1.1 Skilled	:	10982
16.1.2 Unskilled	:	110345
17. Gradient	:	Maimum12%
18. Curve	:	Minimum Radius 10m

Salient features of Khani Khola Bridge

SALIENT FEATURES		
Name of the Project	:	Detail Engineering Survey and Detail Design of Rural Road Steel Truss Bridge Over Khani Khola
Location		
Development Region	:	Central
Zone	:	Bagmati
District	:	Lalitpur
Village / Town	:	Right Bank Axis Baguwa V.D.C (Ward no. 2) Left Bank of Bridge Axis Pyutar V.D.C (Ward no.1)
Name of the Road	:	Baguwa-Pyutar- Ashrang Road
Chainage of the Bridge site	:	About 41 Km from Tika Bhairab bazaar
Geographical Location		
Easting	:	629372.20 m
Northing	:	3042147.97 m
Classification of Road	:	District Road
Type of Road Surface	:	Earthen
Terrain / Geology	:	Hilly
Economical Information		
Construction Cost NRs.	:	40,914,109
Structure		
Total length of the Bridge	:	45.00m (steel Truss Bridge)
No of span	:	1.00
Total width of the bridge	:	4.75 m center to centre of Truss
Width of Carriage way	:	3.50 m
Width of Footpath	:	No foot path
Catchments Area	:	92.14 sq Km
Type of Structure	:	Simply Supported steel truss Bridge
Type of Bearing	:	Elastomeric Pad
Type of Abutment	:	RCC (Gravity Type)
Type of Foundation	:	Open Foundation
Design Data		
Live Load	:	IRC Class ‘A’
Net bearing capacity of soil	:	Varying at different depths
Design Discharge	:	758.09 m3/sec
Mean Scour Depth	:	3.089 m below H.F.L
Highest Flood Level	:	797.395 m
Lowest Bed Level	:	793.695 m
Concrete Grade	:	M25 – approach slab and caps M20 - Substructure
Reinforcement Bars	:	Fe 415 (Tor Steel) / TMT
Approach Slab		RCC (3.0 m)
River Training Works		Wing Walls

Employment generartion:

Total employment	33640
Skilled	9092
Unskilled	24548

2.1 Construction Approach and Activities

10. The construction approach will be Contractor Modality and Labour Based Environment Friendly and Participatory Approach (LEP) wherever possible. Contractor modality is proposed due to lack of sufficient time for construction.

11. Activities included during the road construction are: Site clearance, Pavement work, Structures (Toe wall, retaining wall etc.), Earthwork, Bioengineering, Gravelling, Cross drainage works ,Side drain works and Bridge work.

2.2 Proposed Schedule for Implementation of Subproject

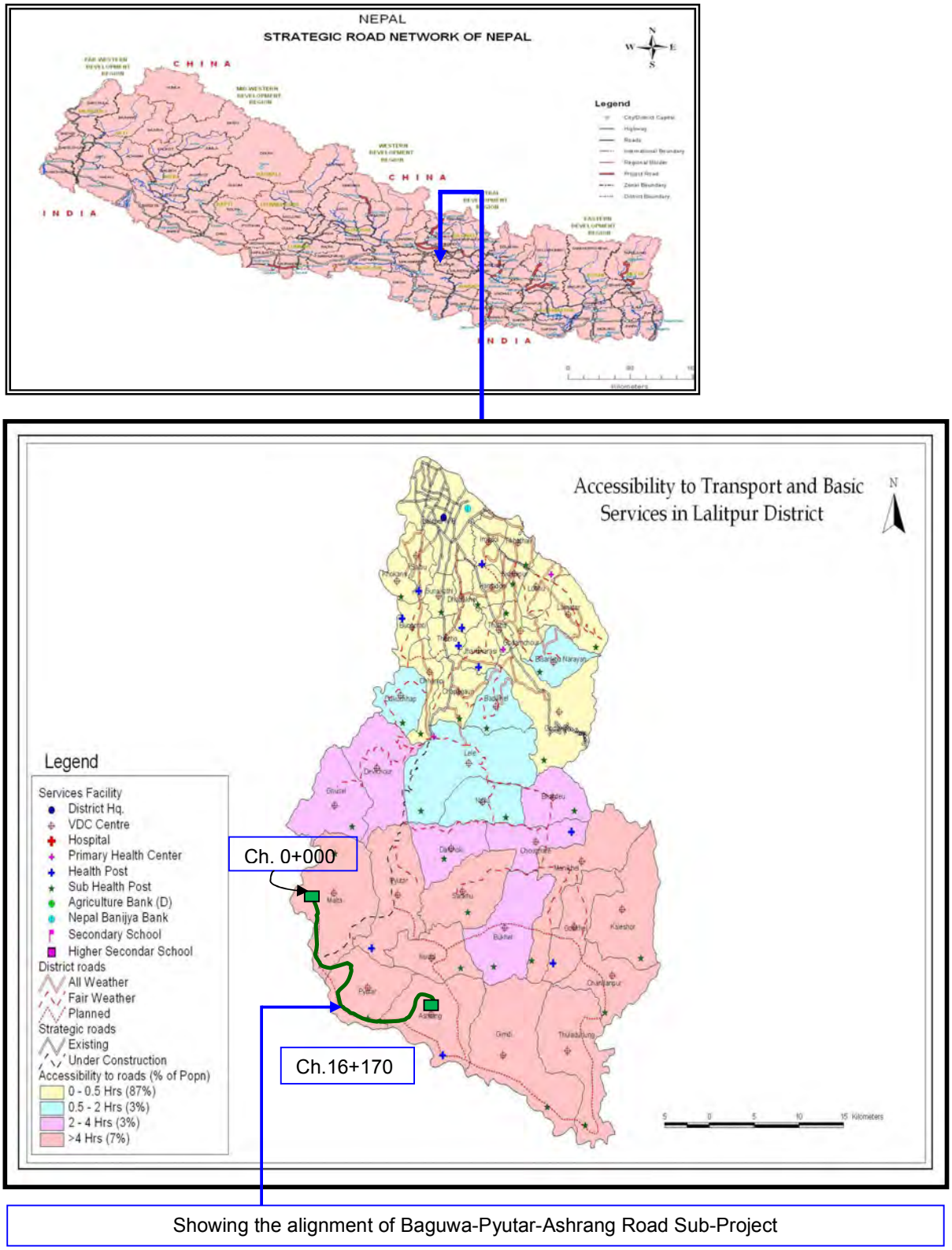
12. Following Table 1.1 shows the pcroposed implementation schedule of the Subproject:

Table 2.1: Sub-project implementation schedule

SN	Activity	2009				2010				2011				2012	
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
1	**Detailed survey, design and estimate**														
2	**Preparation of resettlement plan**														
2.1	Life skill and income generation training														
3	**Environment Assessment and implementation**														
3.1	IEE report preparation and approval from MoLD														
3.2	Implementation of EMP														
3.3	Environmental monitoring														
4	**Work implementation**														
4.1	Civil construction work by contractors														
4.2	Civil construction work by RBGs														

Note:

I - January, February, March
II - April, May, June
III - July, August, September
IV - October, November, December



Showing the alignment of Baguwa-Pyutar-Ashrang Road Sub-Project

Figure 2.1 Map of Nepal showing the location of Baguwa-Pyutar-Ashrang road Subproject in Lalitpur District

Figure 1.2: Alignment of Baguwa -Pyutar-Ashrang Road Subproject

3. REVIEW OF RELEVANT ACTS, REGULATIONS AND GUIDELINES

13. The IEE study has followed the provisions of following acts, regulations and guidelines of Government of Nepal and ADB to ensure conservation of environment during proposal implementation and operation.

Table 3.1: Review of Environmental Acts, Regulations and Guidelines

SN	Environmental Acts, Regulations and Guidelines	Description of Requirements
1	Three Years Interim Plan, 2007/08-2009/10, GoN	Requires all projects will be formulated and constructed based on methods that optimally utilize the local skill and resources and generate employment opportunities.
2	Environmental Protection Act, 2053 BS (1997 AD), GoN	Any development project, before implementation, shall pass through environmental assessment, which will be either IEE or an EIA depending upon the location, type and size of the projects.
3	Environmental Protection Rule 2054 BS (1997 AD) (amendment, 2007), GoN	The EPR and its schedules clearly provide various step-wise requirements to be followed while conducting the IEE study. It also obliges the Proponent to timely consult and inform the public on the contents of the proposal and IEE study.
4	Forest Act, 2049 BS (1993 AD) (amendment, 2007), GoN	Requires decision makers to take account of all forest values, including environmental services and biodiversity, not just the production of timber and other commodities. It includes several provisions to ensure development, conservation, management, and sustainable use of forest resources based on approved work plan.
5	Forest Rules, 2051 BS (1995 AD), GoN	Elaborates legal measures for the conservation of forests and wildlife. Expenses incurred for cutting trees and transportation shall be borne by proponent.
6	*Batabaraniya Nirdesika* (Nepal; MLD), 2057, GoN	The directive is focused in the practical implementation of small rural infrastructures through the minimization of environmental impacts. This directive includes the simple methods of environmental management in the different phases of the project cycle.
7	Local Self Governance Act 2055 BS (1999 AD) (1999) and Regulation 2055 BS (1999 AD), GoN	Empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities
8	Land Acquisition Act, 2034 BS (1977 AD) and Land Acquisition Rules, 2026 BS (1969 AD), GoN	Specifies procedural matters on land acquisition and compensation
9	National Environmental Impact Assessment Guidelines, 1993 (2050 BS), GoN	Provides guidance to project proponent on integrating environmental mitigation measures, particularly on the management of quarries, borrow pits, stockpiling of materials and spoil disposal, operation of the work camps, earthworks and slope stabilization, location of stone crushing plants etc.
10	APPROACH for the Development of Agricultural and Rural Roads, 1999 (2055 BS), GoN	Emphasizes labor based technology and environmental friendly, local resource oriented construction methods to be incorporated actively in rural infrastructure process.
11	RRRSDP Environmental Assessment & Review Procedures (EARP), 2007, GoN	For preparation of environmental assessments of future subprojects under Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP), this EARP includes: i) The process to be adopted while preparing environmental reports, ii) the potential environmental impacts that could result from undertaking the Project based on the Initial Environmental Examinations (IEEs) of sample core subprojects; iii) the proposed mitigation measures to avoid the identified impacts; iv) institutional capacity assessment and strengthening arrangements; v) legal framework for environmental assessment, domestic and the Asian Development Bank (ADB) environmental assessment and review procedures; and finally vi) the approaches to be adopted during implementation of the Project in order to ensure that environmental aspects are dealt with in a comprehensive manner.
12	Reference Manual for Environmental and Social Aspects of Integrated Road Development, 2003 (2060 BS), GoN	Suggests stepwise process of addressing environmental and social issues alongside the technical, financial and others

13	Environmental Assessment Guidelines, 2003, ADB	Requires that environmental considerations be incorporated into ADB operations where environmental assessment is the primary administrative tool to integrate environmental considerations into decision-making of all types of development initiatives
14	Safeguard Policy Statement, 2009, ADB.	ADB's Safeguard Policy Framework consists of three operational policies on the Environment, Indigenous people and Involuntary resettlement. It requires that (i) impacts are identified and assessed early in the project cycle, (ii) plans to avoid, minimize, mitigate or compensate for the potential adverse impacts are developed and implemented and (iii) affected people are informed and consulted during project preparation and implementation.
15	The Interim Constitution of Nepal, 2063 (2007).	Has provision of right regarding environment - Every person shall have the right to live in clean environment.
16	The Labor Act, 2048 BS (1992 AD)	Regulates the working environment and deals with occupational health and safety.
17	Child Labor (Prohibition and Regulation) Act, 2056 (2000)	No child having not attained the age of 14 years shall be engaged in works as a laborer.

4. BASELINE ENVIRONMENTAL CONDITION IN THE SUBPROJECT AREA

14. Baseline information on the existing physical, biological and socio-economic and cultural environment of the zone of influence (ZoI) of the proposed Subproject is described in this Chapter.

4.1 Physical Environment

4.1.1 Topography

15. The elevation of the starting point of the road at Baguwa is 1480m amsl and at Ashrang is 790m amsl and Bridge is 794 m amsl. The road alignment passes through the upper valley slopes and middle hills. The existing grade of the road varies from 2% to 18%. Major portion of the road passes along the south-east facing slope.

4.1.2 Geology and Soil Type

16. Geologically, the road alignment lies in Mahabharat range from Baguwa to Ashrang. Soil type along the alignment Colluvial, and Residual soil. Following Table 4.1 presents the geological features recorded along the road alignment.

Table 4.1: Geological Features along the Road Alignment

SN	Section	Chainage	Length (m)	Elevation (m)	Aspect	Material Types
1	Baguwa	0+000-1+060	1660	1432 to 1385	North	Colluvial, and Residual
2	Gadhibhanjyang	1+060- 3+980	1540	1385 to 1360		
3	Pyutar	3+980- 10+640	1300	1360 to 1180		
4	Ashrang	10+640- 11+500	2300	1180 to 960	South	
5	Tallo Ashrang	11+500- 16+000	3200	960 to 985		

Source: Field Survey , 2010

4.1.3 Land Use

17. Land use pattern of the area through which the road passes have been classified into three types: Agriculture land, Barren land and Forest as shown in Table 4.2.

Table 4.2: Summary of Land Use Pattern along the Road Alignment

Type of land	Chainage		Length (m)	Existing width (m)	Additional Width (m)	Existing Area (Ha)	Additional Area (Ha)
	From	To					
Agriculture Land	0+600	0+958	358	4	1	0.14	0.03
	4+718	6+191	1473	4.5	0.5	0.66	0.07
	6+230	6+334	104	4	1	0.04	0.01
	6+570	7+459	889	3.5	1.5	0.31	0.13
	9+111	9+590	479	4	1	0.19	0.04
	10+373	10+568	195	4.5	0.5	0.08	0.009
	11+168	11+577	409	4	1	0.16	0.04
	12+285	14+375	2065	4	1	0.82	0.20
Sub-Total							**0.529**
Barren Land	4+634	4+718	84	5	0	0.042	0
	5+897	5+997	97	5	0	0.048	0
	6+566	6+661	1095	5	0	0.54	0
Sub-Total							**0**
Forest Area	0+000	0+600	600	4	1	0.24	0.06
	0+994	4+540	3546	4	1	1.14	0.35
	6+444	6+551	107	3.5	1.5	0.03	0.01
	6+722	6+801	79	4	1	0.03	0.007
	7+270	9+075	1805	4	1	0.72	0.18
	9+535	10+173	638	4	1	0.025	0.06
	10+568	11+168	600	4	1	0.24	0.06
	11+513	12+285	772	3.5	1.5	0.27	0.11
Sub-Total							**0.837**
Total							

Source: Field Survey 2010

4.1.4 Climate

18. Baguwa-Pyutar-Ashrang road lies in the sub-tropical and temperate climatic region. Generally, rainy season starts from June and ends in September. The meteorological record shows unevenly distributed monsoon rain in the project area with the total average annual rainfall is 11120 mm. The general climatic condition is cold in winter and hot in summer with average minimum temperature of 5° C and average maximum temperature of 30°C. *(Source: District Profile of Lalitpur, 2006.)*

4.1.5 Hydrology and Drainage System

19. There are 10 numbers of rivers and several small seasonal streams (Kholsi) along the road. The road block some time due to high debris flow in different rivers. The proposed summary of the cross drainages along the road alignment is given in Annex XIV.

Table 4.3 Summary of streams and rivers along the road alignment

SN	Chainage	Name of the Stream	Width (m)	Type of Structure Necessary
1	1+100	Khani Khola	15	Bridge proposed
	2+050	Gadibhanjyang Khola	14	Hume Pipe
2	5+500	Khahare Khola	13	Hume Pipe
3	6+300	Pyutar Khola	11	Hume Pipe
4	6+500	Khoran Khola	12	Hume Pipe
5	9+250	Khaireni Khola	18	Cause Way
6	10+300	Gairi Khola	13	Cause Way
7	10+750	Ghatte Khola	12	Cause Way
8	11+650	Lukuni Khola	17	Cause Way
9	12+700	Asrang Khola	19	Cause Way
10	13+350	Bhalu Khola	16	Cause Way

Source: Field Survey , 2010

4.1.6 Soil Erosion and Sedimentation

20. The stability of slopes along the road corridor depends upon slope angle, the material constituting the slope, rock discontinuities and hydrological conditions. The road alignment passes through landslides at different chainages which are gien below in Table. The main causes for occurring slides are rock weathering, precipitation and surface runoff.

Table 4.4: Existing Landslides and unstable areas along the Road Alignment

Chainage	Land Use Pattern	Geological Problem
1+325	Forest Area	Landslide
1+540	Cultivated slopes	Landslide
1+930	Cultivated slopes	Landslide
2+150	Cultivated slopes	Landslide
3+300	Cultivated slopes	Slumping
5+400	Forest Area	Gully erosion due to overflow from the blocked culvert
5+840	Forest Area	Gully erosion from culvert outlet. Side slope undercut
8+375	Forest Area	Landslide
11+685	Forest Area	Landslide
13+735	Cultivated land	Erosion

Source: Field survey, 2010

4.1.7 Air, Noise and Water Quality

21. The air, noise and water quality are not measured or tested, but are observed to be within acceptable limit. Dust emission during vehicle operation has been a nuisance which becomes more significant during dry and winter seasons.

4.2 Biological Environment

22. This alignment does not pass through any national park, protected area or their buffer zones.

4.2.1 Vegetation

23. The dominant forest and fodder species reported in the road alignment are Sal (*Shorea robusta*), Chilaune (*Schima wallichii)*, Uttis (*Alnus nepalensis*), Khote Salla (*Pinus roxburghii*), Khirra (Sapium insigne), Kutmero (Litsea monopelata), and Katus (*Castanopsis indica*). Other plant species found within ZoI of the sub-project are Pipal (*Ficus religiosa*), Lapsi (*Choerospondias axillaris*), Koiralo (*Bahunia*

variegate), Sirish (*Albizia labbeck*), Amba (*Pisidium guyava*), Gogan (*Sauravia nepauensis*), Banmara (*Eupatorium adenophorum*), Amliso (*Thysanolaena maxima*),Sisnoo (Urtica dioca), Khar (Cymbopogon microtheca).

4.2.2 Wildlife

24. Barking deer (*Muntiacus muntijak*), Jackal (*Canis aureus*), Monkey (*Macaca mulatta*), Wild Pig (*Sus scrofa*), Jungle Cat (*Felis chaus*), Musa (*Rattus rattus*), Squirrel (*Ratufa spp.*), Nyauri Musa (*Herpestes Edwardsi*), Fox (*Vulpes Montana*) are the wild animals reported in the forests of project area. Similarly birds are Kalij Pheasant (*Lophura lencomelana*), Pigeon (*Columba livia*), Crow (*Corvus splendens*), Dove - Dhukur (*Streptopelia spp.)*, Kokale (*Dendrocitta formosae*), Jungle fowl (*Gallus gallus*) etc.

4.2.3 Aquatic Life

25. Aquatic life mainly found in the rivers is Hile and Budona fish.

Endangered and Protected Species

26. **Floral Species:** Sal (*Shorea robusta*) is listed as protected plant species and forest products according to Forest Act 1993 which is categorized into timber banned for felling, transportation and export for commercial purposes. Lapsi (*Choerospondias axillaris*) is listed as 'Rare' by IUCN category.

27. **Faunal Species:** Monkey (*Macaca mulatta*) and Squirrel (*Ratufa spp.*) are listed in CITES Appendix II. Jackal (*Canis aureus*) is listed in CITES Appendix III.

4.3 Socio-economic and Cultural Environment

4.3.1 Population, Household and Ethnicity

28. The demographic profile of the concerned VDCs is presented in following Table 4.5. Major castes in the area are Chhetri, Brahman, Tamang, Magar and Dalit.

29. Indigeneous People were not found within ZoI along the road sub-project.

Table 4.5: Demographic Profile of VDCs

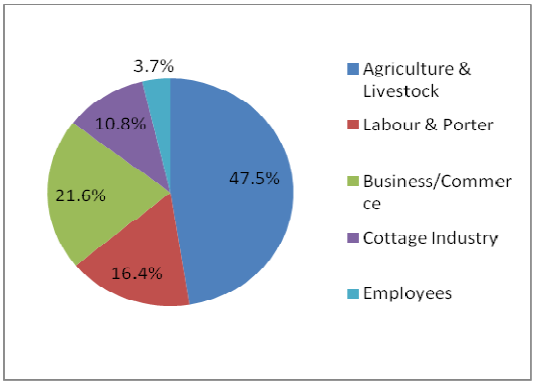
VDC	Population			HH	Average HH Size
	Male	Female	Total		
Malta	262	240	502	105	
Pyutar	499	519	1018	190	
Asrang	232	196	428	84	
TOTAL	**993**	**955**	**1948**	**379**	**5.14**

Source: Field Survey , 2010

4.3.2 Main Occupation

30. The main occupation of all people residing within the ZoI of the road alignment is agriculture and livestock. However, agriculture farming is not enough for subsistence level due to small landholding size, lack of irrigation facilities etc. Therefore, people are carrying out other economic activities like Agriculture and livestock (47.5%), labour and porters (16.4, business (21.6%), cottage industry (10.8%) and employees (8.65%).

31. Details of occupations of the people according to the settlements are shown in **Annex X a**.



Source: Field Survey , 2010

4.3.3 Market Centres and Business Facilities

32. There are grocery shops and tea stalls available in the almost all settlements i.e Baguwa, Gadhibhanjyang, Thasingtar, Pyutar, Khorang, Gharthok, Khairaghari, Dhandada, Ghattegad, Luklebesi, Tallo, Asrang and Sano Chainpur.

4.3.4 Local Economy

33. The economy of the area is predominantly agriculture based. Local people are gradually attracted towards cultivation of cash crops such as Ginger, Raddish, Potato, Cabiage, Cauliflower, Tomato; fruits like Banana, Guava, Lapsi etc. Dairy production and selling it to the market has been also another source of income for local farmers. Over 70 percent populations base upon agricultural activities for their livelihood. With growing closeness of the project area with capital Kathmandu due to transportaion facility, cultivation of fruits, vegetables in a commercial manner seems to gain momentum. Diversity in employment pattern has been also observed in recent years. Local people have increasingly engaged in business activities in Baguwa and Pyutar area.

4.3.5 Agriculture Pattern

34. Major crops that are cultivated in the project area are rice, wheat, maize, millet, potato, beans etc. Local peoples are also found to be encouraged in cash crops in recent days. Major cash crops that are grown in the project area are mustard, vegetables, coeffe etc. The area has appropriate climate and soil for farming of citrus type of fruits such as orange, lemon, nibuwa etc.

Wheat Farming in Dhandada of Pyutar VDC

4.3.6 Livestock

35. Due to availability good number of fodder trees, the project area has also the immense potentiality of cow and buffalo farming for dairy production and goat farming for meat production. Now, the road is motorable for twelve months except for heavy rainy days and milk sold from Baguwa, Pyutar and Ashrang VDC. It is expected that the trend will still increasing in the coming days with the upgradation of the road.

4.3.7 Industry

36. Some local people are engaged in weaving of bamboo products, making of furniture and tailoring. The area has the potentiality of agro-based industries such as dairy, juice production, food processing as well as furniture, bamboo products.

4.3.8 Trade and Commerce

37. Goods of daily commodities are major imports in the project area, which includes salt, sugar, packed food items, spices, clothes and other items of daily uses. Similarly, major items exported from the project area are milk, lapsi, vegetables, fruits, bamboo products etc. whereas cereal crops such as rice, what, maize are export and import items both.

4.3.9 Health and Sanitation

38. Some hotel, lodges are in operation in Baguwa and Pyutar area. Since the ZoI of the project and its surrounding area has potentiality of various types of tourism promotion, more lodge, restaurant and resorts are expected to be established in the area. People may engage themselves in various kinds of tourism related activities such as guide, cook, porter, promotion of local handicrafts and other local products.

4.3.10 Public Services and Infrastructures

Table 4.6: Infrastructure Facilities in the Project Area

Infrastructure Facilities	Details
Education	21 educational institutions ranging from primary level to 10+2 level exists in the area. Most of the families send their children to school. Female enrollment in schools is higher and male also. Literacy rate in the project area has been estimated around 85 percent.
Health	3 sub health posts exists in various settlements
Communication	All of the settlements have telephone facilities mostly with Cell phone and CDMA phone.
Electricity	All settlements in ZoI are connected with national grid transmission line
Water Supply	Piped drinking water supply is available to all settlements

Other Infrastructures	There is a Suspension Bridge, water mills; Agricultural Service Sub-Centre and Veterinary Service Sub Centre are also available in the project area
Financial Institutions	There are 2 saving and credit cooperatives in ZoI.
Community Center	11 community centres along the road alighment.

Source: Field Survey 2010

Table 4.7: Public Services and Infrastructures along the Road Alignment

Type of Public Service and Infrastructure	Chainage/ Location	Distance from the Road CL	Mitigation Measures
Irrigation Canal	1+000, 6+250 (HDP pipe using for Irrigation) 13+045-13+120 (Along with formation width)	Crossing Within formation width	
Access Road	0+000 (to Kanti Rajpath), 2+300, 6+200, 6+900, 7+325, 8+362, 11+300	Within formation width	
Water Mill	11+850 (Public Water Mill)	Within formation width	
Foot Trail	2+300, 6+200, 6+900, 7+325, 8+362, 11+300 (to Asrang Fat)	RoW	
School	3+400, 7+600	Within formation width, RoW	
Water supply pipelines	0+712, 1+110, 1+514, 1+830, 1+960, 2+800, 2+940, 3+356, 3+990, 5+550, 7+800, 11+150	Crossing	
Elecrtic pole	3+450, 7+200, 13+670, 14+745	Within formation width	
Temple	16+000	Outsiide formation width	

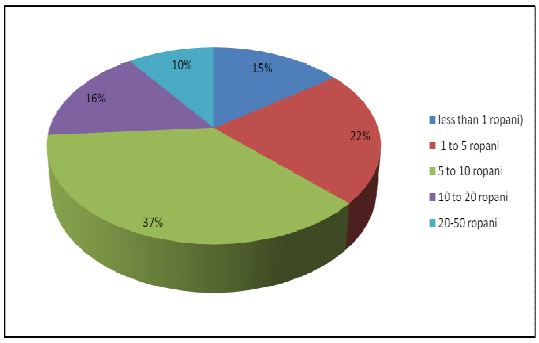
Source: Field Survey , 2010

4.3.11 Existing Traffic Situation

39. There are 3 regular passenger buses plying on the road whereas no. of mini truck/pick up are 12 and no. of of motorcycles are around 100 in winter season. In rainy season, no. of vehicles operating in this road reduces by half.

4.3.12 Land Holding Pattern

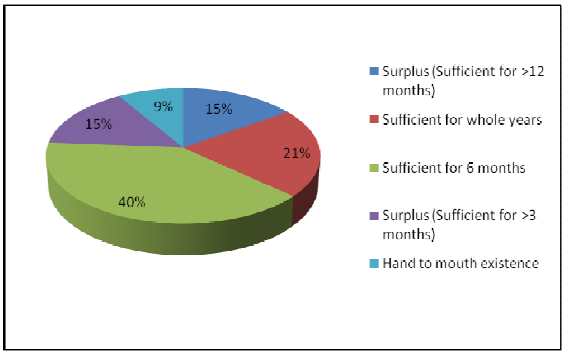
40. Land holding pattern within the ZoI of the road project demonstrates that most of the population have 5 to 10 ropani (37%) (1 ha = 19.8ropani) land while 22% Households have 1-5 ropani. 16% of the households have 10-20 ropani land, 10% HHs have 20-50 ropani land and 15% of the households have less than one ropani. Details about land holding pattern are given in **Annex X c.**



Source:Field Survey , 2010

4.3.13 Food Security

41. 40% households have enough food for for three to nine months. 15% households have enough food for three months; where as 9% HHs haing problem to hand to mouth. This shows the poverty situation within the ZoI of the project area. On the contrary, 21% of the households of the project area have food sufficiency for whole year and 15% households are reported as food surplus ones who are in the well off category of selling their surplus farm products. Details is given in **Annex Xd**.



Source: Field Survey , 2010

4.3.14 Migration Pattern

42. Temporary migration takes place towards Lalitpur, Kathmandu and abroad.

4.3.15 Settlement and Market

43. There are grocery shops available in most settlements. Other smaller market centres with shops of daily commodities are also found along the road alignment. Major settlements along the road alignment are Baguwa, Gadhibhanjyang, Thasingtar, Pyutar, Khorang, Gharthok, Khairaghari, Dhandada, Ghattegad, Luklebesi, Tallo, Asrang and Sano Chainpur is mostly one/two storied. RCC buildings have been started to appear in market centres.

4.3.16 Potential for Development

44. The potential of the Subproject area are as mentioned in Table 4.8 below.

Table 4.8: Development Potentialities in Various Sectors

SN	Sector	Devlopment potentiality
1	Agriculture	Vegetables; fruits and dairy production within the whole ZoI
2	Tourism Promotion	There are many places along the alignment in which the tourisim activities can be enhanced such as Mahadev Temple, Dhandada, Chainpurbesi etc.
3	Small and Cottage Industry	Dairy industry within the whole ZoI Khuwa production etc.
3	Trade and business	Development several rural market centres at various places along the road alignment and main market centres at Baguwa, Pyutar Bazar, Dhandada, Lukunebesi, Asrangbesi and Tallo Chainpur.

Source: Field Survey , 2010

4.3.17 Religious, Cultural and Historical Sites

45. There is a Mahadev temple at Sano Chainpur outside the RoW but will not be affected during the road construction.

5. PROJECT ALTERNATIVES

46. Assessment on alternatives of the Subproject is discussed as in the following subsections.

5.1 No Action Option

47. This alternative does not allow the implementation of the proposal. Earthen road currently exists. The road connects potential area of fruits, vegetables to the nearest markst for selling of their products. The road construction activities provide temporary employment opportunity for local people. Upgrading of the road to gravel standard will make road all-weathered which will reduce transportation cost as well as provide better access and facility with enhanced opportunity for economical enhancement and overall infrastructure development of the area without any additional significant adverse impacts. Thus, this option is not relevant for the Proposal.

5.2 Proposal Alternatives

48. Construction of other supporting roads could be the options for achieving the transportation and access. Considering other project alternatives, the proposed road project can be the best option to serve the home to home services. This is existing road will help to connect Kanti Rajpath and District Head quarter of Lalitpur. This road also links with Hetauda of Makawanpur District. This road helps to reduce travel time and cost of local people to access other part of the country.

5.3 Alternative Alignment

49. The alignment of the road is an existing motorable with earthen track of 4 m width in average and proposed for upgrading which need to acquire average 1 m. width additional land and few numbers of tree will be cleared. Hence, new alternative alignment is not feasible and the upgrading of existing alignment can be the best option.

5.4 Alternative Design and Construction Approach

50. The road has been designed considering the both LEP and Contractor based approach. The construction work will not be carried by only using the labours but equipment and machineries will also be used where manual work is not possible.

5.5 Alternative Schedule

51. During the rainy season, the construction work will be stopped. Upgrading work will be carried out during the remaining months. The construction period is more appropriate from October to June.

5.6 Alternative Resources

52. Stones and boulders for gabions, masonry and fine aggregates like sand are available in local river. The proposed construction will optimally use the local labour force and local materials.

6. IDENTIFICATION AND EVALUATION OF IMPACTS; ENHANCEMENT AND MITIGATION MEASURES

53. The identification and assessment of impacts has been carried out by considering the proposed proposal activities examined in terms of its current condition and likely impacts during construction and subsequent operation phases. The impacts have been predicted in terms of their magnitude, extent and duration. The possible impacts (positive and negative) in construction and operation phases are presented in the following sub-sections. Beneficial impacts maximization and adverse impacts mitigation measures are also suggested hereunder (see Table 7.2 in Chapter 7).

6.1 Beneficial Impacts and Benefit Augmentation Measures

6.1.1 Construction Stage

Employment Generation and Increase in Income

54. *Impacts:* Employment opportunity for local people during construction of the road, without gender biasness, is 121327 person days, with 10982 for skilled and 110345 for unskilled labor and for bridge 33640 person days with 9092 for skilled and 24548 for unskilled labor. The amount of money earned as wages will directly support various economic activities of the people, and assist to empower women and indigenous people. It will assist towards enterprise development with multiplier effect if wage is used for economic investments. This is one of the direct and significant impacts of the project but it is of short-term and local in extent.

55. Measures: Priority for employment will be given to local poor, dalit, vulnerable groups and women. They will be given training to do the job. Proponent will implement skill training, awareness, and income generation programs encouraging them to utilize their money earned through wage. Proponent will conduct Livelihood Enhancement Skills Training (LEST) program (which include Driving, Electrycian, Plumbing, Fresh Vegetable and marketing Production, Radio , Television and mobile repair, and maintenance training etc) and awareness programs. The costs of these training are included in cost of Social Action Plan.

Skill Enhancement

56. *Impacts:* Working in construction of the road is likely to enhance skills of local people in construction works. Trainings on construction and maintenance of structures will further enhance their skill. The skill and knowledge thus acquired will make them find employment opportunities in future projects. This impact is direct, medium, local and for long-term.

57. *Measures:* Training on masonry, gabion work, bioengineering works, bridge maintenance, and roadside tree plantation will be given. Livelihood Enhancement Skills Training (LEST) programs under social plan will be provided whose budget is included in Social plan.

Enterprise Development and Business Promotion

58. *Impacts:* During construction period, different types of commercial activities will come into operation in order to meet the demand of workers. Since they will have good purchasing power, they will regularly demand for different types of food, beverage and other daily necessary items. Development of market centres will be at Balguwa, Pyutar Bazar, Ashrang Bazar and Sano Chainpour settlements. This impact is direct, low significance, local and for short term.

59. *Measures:* Training in cooperatives, and promote use of local products.

Community Empowerment and Ownership

60. *Impacts:* During construction various road construction coordination committees will be constituted in order to facilitate in implementation of the road. In this process, they will be oriented and trained to build and safeguard community infrastructures which will result in community empowerment and feeling of ownership. This impact is indirect, low, local and for short term.

61. *Measures:* The coordination committees will be constituted and training will be given to them. Training such as Leadership training and other training from LEST program will be given by proponent.

Women Empowerment

62. *Impacts:* Women are particularly benefited from trainings under Gender Action Plan and, from improved access to the market centers and various service providing agencies like health centers, banks, training institutes, women development office etc. Frequency of visit to such agencies will increase awareness level and empowerment. The impact will be direct, significant, local and for long-term in ZOI.

63. *Measures:* Programs under Gender Action Plan (GAP) of social plan will be provided whose budget is included in social plan of the project. GAP includes trainings such as Offseason Vegetable Training and Gender Sensitization and Social Inclusion Training.

6.1.2 Operation Stage

Improvement in Accessibility and Saving of Time and Transportation Cost

64. *Impacts:* Upgrading of road and bridge will enhance the access of people to social services, and quick transportation of goods. After upgrading of this road, it will takes 1 hour to reach Tallo Chainpur instead of whole day and more than 70% cost will reduce. This road links with Kanti Rajpath and District head quarter. This road also link with Hetauda of Makawanpur District. This road helps to reduce travl time and cost of local people to access other part of the country.This impact is direct, high, regional and for long term.

65. *Measures:* Proponent will undertake regular maintenance of the road.

Increase in Trade, Commerce and Development of Market

66. *Impact:* Improved access will increase economic activities and minor local markets like Baguwa, Pyutar Bazar, Asrang Bazar and Sano Chainpur settlements markets will grow. Productivity such as paddy, wheat, potatao, beans, ginger, fruits and vegetables will increase due to cheaper transportation. Sale of farm and livestock products will increase in the bigger markets of District head quater. This will support the economy of rural area. The impact will be indirect, significant, local and for long term.

67. *Measures:* DDC/VDCs shall manage planned growth with required infrastructure facilities in the market areas. Agriculture extension services, market linkages and networking for better market price will be coordinated with district agriculture office.

Appreciation of Land Value

68. *Impacts:* Upgrading of road will lead to appreciation of land values by two times due to availability of reliable access facility. This will uplift the economy of local people. Financial institutions may accept their land as mortagage for lending. The impact is indirect, medium, local and for long term.

69. *Measures:* Awareness program shall be organized on use of high value land to get bank loans for setting up enterprise ventures.

Enhancement of Community Development Services

70. *Impacts:* Improved access will contribute in improvement of social services in the area such as education, health, government offices, saving and credits. Improved access will facilitate stay of extension workers, teacher, and doctor to their rural duty areas. This is indirect, significant, regional and long-term impact of the proposed project.

71. *Measures:* The access will be kept maintained so that other services will follow in the area.

6. 3 Adverse Impacts and Mitigation Measures

6.3.1 Construction Stage

72. The proposed road will be constructed according to Contractor modality and RBGs where manual works are possible. The likely impacts on physical, biological, socio-economic and cultural resources of the proposed road area and respective mitigation measures are presented hereunder.

6.3.1.1 Physical Environment

Change in Land Use

73. *Impacts:* Construction of road will convert 0.529 ha. of cultivated land, 0.837 ha.of forest land into road. Further there will be loss of 0.04 ha. of barren land during construction of bridges. The impact will be high, direct, local and for long term.

74. *Measures:* Compensation will be given for loss of private properties. Plantation of trees will be done to increase greenery in the area.

Slope Instability

75. *Impacts:* There is existing erosion prone area at chainages 1+325 1+540 1+930 2+150 3+300 5+400 5+840 8+375, 11+685 and 13+735. In addition, removal of vegetation and open cuts with exposed soil to rain may cause soil erosion as well as landslide. The road is an existing corridor, and thus the hill slopes will not be disturbed by making large and steep cuttings. Major instability areas are also not present along the road alignment. The likely impact of slope instability and soil erosion is indirect, medium, site specific and mid-term nature

76. *Measures:* The following mitigation measures will be adopted during construction:

- Selecting cut and fill slope at correct angle depending upon the soil type
- Adoption of bio-engineering techniques (Such as Grass plantation, Tree/Shrub plantation, Brush layering, Live checkdam construction etc.)
- Use of toe wall before disposing spoils on hill slopes
- Drainage management (Catch drain, rip-rap drain, checkdam etc.)
- For protection of bridge embankment, Gabion structures and Bioengineering measures (Grass plantation, Brush layering and tree plantation is proposed).
- Detail bio-enginring design is under progress.

77. Recommended engineering structures necessary at various chainages for slope stabilization have been given in Annex XV

Spoil Disposal

78. *Impacts:* Unmanaged disposal of spoil may cause blockage of natural drainage systems, loss of organic fertile top soil and farmlands, crops and forest, waterlogging. The impact from spoil disposal will be direct, medium, site specific and short term in nature.

79. *Measures:* As far as possible spoil shall be safely managed locally at excavation sites by providing toe wall in order to retain earth mass at the spot with minimum, environmental damage. Emphasis will be given to re-use of excavated materials.

- Toe walls shall be provided to retain spoil.
- Compaction and trimming the slope of disposed spoils including bioengineering measures are proposed (Grass, Shrubs, Tree plantation. Recommended spoil disposal sites are given in following table.

Table 6.1 Potential Spoil Disposal Sites

S. No	Chainage	Location
1	1+100	Near River for Bridge
2	2+150	
3	8+467	
4	9+250	
5	12+100	

Source: Field Survey 2010

Quarry/ Borrow Operation

80. *Impacts:* The construction of road (gravellingretaining walls and other structures) will require boulders, sand and aggregates. Fine aggregates sand has to taken from Mahadev besi and local boulder the extraction of materials from inappropriate places or in excessive amount can damage the local environment. The potential adverse impacts of quarrying are accelerated erosion, landslides, disturbance in natural drainage patterns, water logging and water pollution. The likely impact from the operation of quarry sites will be direct, low in magnitude, local nature and short term in duration. Recommended quarry sites are given in Table 6.2.

81. *Measures:* The mitigation measures will be

- quarry and borrow operation plan will be prepared and approved by Engineer;
- unstable sites, erosion prone area, forest area, settlements, fertile farm land will be avoided for quarry / borrow operation;
- quarry sites will be rehabilitated by providing appropriate civil engineering structures (toe wall, retaining wall) and bioengineering measures (Grass plantation, Shrub/Tree plantation, Brush layering) after the extraction is complete. Recommended quarry sites in the area are given in Table 6.2.

Table 6.2: Recommended Quarry sites

SN	Chainages	Places of recommended quarry sites
1.	1+000	Stone quarry at upper side of the road in khani Khola
2.	3+500	Stone quarry at upper side of the road
3.	7+500	Stone quarry at upper side of the road
4.	14+100	Sun Khola
5.	14+500	Stone quarry at upper side of the road in Malta

Source: Field Survey 2010

Air, Noise and Water Pollution

82. *Impacts:* Although the air quality of the project area is not measured, the air does not appear to be polluted. Dust will be major problem during both the construction and operation of the road. Impact on air quality will be direct, low, local, reversible and for short term.

83. The project area at present does not experience higher levels of noise pollution. However, during construction, the increased construction activities may increase the noise level to some extent. The impact of road construction on the noise level will be direct, low, site specific, reversible and short term.

84. The water quality in the project area appears to be fairly clean and not polluted. During construction these waterbodies may be polluted by spoil and construction wastes. The impact will be direct, low, local, short term and reversible.

85. *Measures:* The mitigation measures will include use of face mask by the workers working in the areas of high dust generation; contractor will frequently sprinkle water during surfacing of the road; avoid disposal of excavated materials in the waterbodies; cover dry material or make it wet during transportation. Both the sides of the road alignment will be planted with trees, as far as possible which will act as sound and noise barrier.

Drainage Management

86. *Impacts:* Water from the roadside drain outlets may cause erosion, affecting the stability of the road. Natural drainage may get blocked due to construction of road. The impact will be indirect, medium, site specific and for medium term.

87. *Measures:* The mitigation measures will be to provide adequate numbers of drainage structures in order to have minimum interference with natural drainage pattern of the area; channelize surface water discharge from side drains; do not block or divert water away from natural watercourse. Details about necessary structures required to mitigate the water induced adverse impacts are as given in Annex XIV.

Location of Camp Sites and Storage Depots

88. *Impacts:* Contractor approach will establish camp and they also bring labors from outside the area. Siting of camp may cause encroachment of forest, agriculture land, alteration of drainage, fuel leakage, solid waste and waste water problems. Impact will be direct, medium significance, site specific and for short-term.

89. *Measures:* The mitigation measures will be use of local labors to minimize camp; rent local house instead of camp to keep labors; siting camp away from productive lands and forest areas; pay compensation for using private farm or lands for storage or camp; fuel and chemical storage areas will be on paved surface with surrounding catch drain to protect soil from leakage. Appropriate camp site should be at 0+300(Cultivated Land of open area) near Baguwa, at 7+500 (open area) near Malta, at 14+350 (Cultivated Land of open area) near Tallo Ashrang and 1+050 (for bridge). At camp sites will be provided with drinking water and latrine facilities. For waste water and solid waste management, soak pit will be made and proper management will be done.

Construction equipment and vehicles

90. *Impacts:* Contractor will use machineries and tools (Rollers, tippers, spreader, water tanker etc.). The related negative impacts are increase in air pollution due to emission of smoke, increase in vibration due to vehicular movement. Impact will be direct, high significance, site specific and short-term.

91. *Measures:* The equipment/vehicles deployed for construction activities shall be regularly maintained. All the vehicles deployed for material movement shall be spill proof to the extent possible. Fencing for the equipments camp.

Chemical Issues

92. *Impacts*: Petrol, diesel and grease required for vehicle to operate and kerosene to workers to cook meals. Spillage of these chemicals also damage soil productivity. Storage of fuels and chemicals and operation of vehicles and machineries result in the spillage of hazardous chemicals that can pollute nearby water sources and soil; and affects health of the workers.

93. Measures: The mitigation measures will be to store fuels and chemicals on paved surface with surrounding catch drain to protect soil from leakage. Proper storage of hazardous chemicals and providing information signboards. Use of safety gears to workers during handling of chemicals and fuels. Close monitoring during operation of machineries.

6.3.1.2 Biological Environment

Loss or Degradation of Forests and Vegetation

94. *Impacts:*. Total 36 numbers of trees will be removed, out of which 4 numbers will be removed from Community Forest and other are from private land. Tree shall not be cutting for bridge construction. The adverse impacts on vegetation/forest resources due to the clearance for construction of the road have been considered to be direct, high in magnitude, local in extent and long term in duration.

95. *Measures:* The loss of trees can not be minimized; however, it can be compensated by the plantation. According to the Work Procedure for Providing the Forest Land for Other Use, 2063 of Government of Nepal, project has to carry out plantation equivalent to the forest area lost from the construction of the road or pay for the plantation and protection cost for five years to the District Forest Office. Concerned CFs will carry out plantation in their community forests with project support.

Impact on Wildlife Due To Loss of Habitat and Poaching

96. *Impacts:* The proposed area is not a significant habitat of wildlife and bird species. However, there are forest areas around the ZoI where common species of wildlife exists. Construction work may disturb these wild animals and birds. Workers may harass or kill wildlife. However, there are community forests and people are aware to protect trees and wildlife. The impact will be indirect, low, local and for short term.

97. *Measures:* The mitigation measures to be adopted will include limiting work within road width; tree shall not be cut unless absolutely necessary; construction activities near forest area will be managed to avoid disturbance to the wildlife habitat; workers shall be strictly discouraged from collecting fuelwood or poaching/harassing of wildlife.

Impacts on Flora and Fauna (as listed in CITES and IUCN Red Data Book)

98. *Impacts:* Protected floral species like Lapsi (*Choerospondias axillaris*) is found in the project area but these are not affected during road construction. Similarly, Monkey (*Macaca mulatta*), Squirrel (*Ratufa spp*.) and Jackal (*Canis aureus*) are found in the surrounding forest areas within ZoI, which will not be disturbed during the road construction. There will not be impact on flora and fauna (listed in CITES and IUCN category) as these are not reported in the proposed Sub-project area. The impacts will be indirect, local, low and medium term.

99. *Measures:* As there are no serious impacts, mitigation measures are not warranted. However, the measures as awareness to workers for collecting fuel wood from forest or poaching/harassing of faunas.

6.3.1.3 Socio-economic Environment

Loss or Degradation of Farm Land and Productivity

100. *Impacts:* There will be 0.529 ha loss of cultivated land due to road construction. This will lead to annual loss of approximately 0.61 metric tons of food grain production among the families losing lands to the project Moreover spoils on farm land will also affect the production of agricultural crops. This impact is direct, low, local and long term.

101. *Measures:* Productive land acquisition for the road alignment will be minimized as far as possible. Compensation for the loss of property will be provided to the affected people. A separate Resettlement Plan will be prepared to address land acquisition and compensation issues.

Loss of Private Properties

102. *Impacts*: The road alignment passes through nearby the settlements of Balguwa of Malta VDC, Pyutar Bazar of Pyutar VDC, Asrang Bazar and Sano Chainpour settlements of Asrang VDC. During the construction phase, the people of such settlements suffer by their property losses and damage by road construction works in some extent. The impact will be direct, high, site specific, long term. Details about property loss and damage will be described in Resettlement Plan Report.

103. *Measures:* Compensation for the loss of property will be provided to the affected people. A separate Resettlement Plan has been prepared to address land and property acquisition as well as compensation issues. The total compensation cost will be included in Resettlment Plan and tentative cost is givein in Annexx: XVI.

Impact on Community Infrastructure

104. *Impacts and Measures:* The community infrastructure that requires reconstruction/rehabilitation during construction works and the mitigation measures are as presented in following Table 6.3.

Table 6.3: Impact on Community Infrastructure and Mitigation Measures

Type of Public Service and Infrastructure	Chainage/ Location	Potential Impact	Mitigation Measures
Irrigation Canal	1+000, 6+250 (HDP pipe using for Irrigation) 13+045-13+120 (Along with formation width)	Block and damage the canals	Careful during construction, prohibit disposal of spoil near the canal, reinstate of damage sections and Lining of canals required.
Access Road	0+000 (to Kanti Rajpath), 2+300, 6+200, 6+900, 7+325, 8+362, 11+300	Starting point will be damanged during the construction period	Reinstate during road construction.
Water Mill	11+850 (Public Water Mill)	Damaged during road construction	Conpensation will be provided
Foot Trail	2+300, 6+200, 6+900, 7+325, 8+362, 11+300 (to Asrang Fat)	Damaged during road construction	Reisntand after completion of road construction.
School	3+400, 7+600	Partially damage during road construction	Conpensation will be provided
Water supply pipelines	0+712, 1+110, 1+514, 1+830, 1+960, 2+800, 2+940, 3+356, 3+990, 5+550, 7+800, 11+150	Damaged during road construction	Reinstate during road construction
Elecrtic pole	3+450, 7+200, 13+670, 14+745	Damaged during road construction	Relocate during road construction

Source: Field Survey , 2010

Health and Safety Matters

105. *Impacts:* During construction, workers will be exposed to respiration and eye diseases due to exposure to dust, risk of accident during work, polluted drinking water, unhygienic sanitary facilities, hearing loss due to high level of noise. Increased contact between local and migrated workers can cause

spread of serious health risks like STDs and HIV/AIDS. This impact is direct, high in magnitude, short term and local.

106. *Measures:* Make mandatory the use of helmets, safety belts, masks, gloves and boot by workers depending on nature of work; sprinkle water at high dust sites; provide clean drinking water at sites and camp; pit toilets at sites and camp; first aid facilities at sites and camp with training to use them; provide group accidental insurance for workers. Awareness generation to local people and workers on HIV AIDS and other communicable diseases.

Decline in Aesthetic Value

107. *Impact:* Landscape degradation and scar on topography due to the road; quarrying operations; and indiscriminate dumping of spoil on open land and hill slopes. The likely impact will be direct, low in magnitude, local in extent and short term in duration.

108. *Measures:* Discourage indiscriminate dumping of spoil material; quarry sites will be properly closed to suit the local landscape and cover by plantation of local species trees.

Impacts on Cultural, Religious and Archeological Sites

109. Impacts: There are Mahadev temple, at Sano Chainpur which is near RoW. During construction period dust pollution will increase. This impact is expected to be of low in magnitude, local in extent and of short term in duration.

110. *Measures:* Contractor will frequently sprinkle water during surfacing of the road; cover dry material or make it wet during transportation. Both the sides of the road alignment will be planted with trees, as far as possible which will act as sound and noise barrier.

6.3.2 Operation Stage

6.3.2.1 Physical Environment

Road Slope Stability and Management

111. *Impacts:* Sensitive areas for possible slope stability are at chainages 1+325, 1+540, 1+930, 2+150, 3+300, 5+400, 5+840, 8+375, 11+685, 13+735. The impact will be direct, medium, local and long term.

112. *Measures:* The mitigation measures to be adopted include immediate clearance of slides and restoration of slopes; clear drainages; restoration of rill and gully formation; and conservation of soil.

Impact Due to Air, Noise and Water Pollution

113. *Impacts:* Dust will be generated from the earthen road and vehicles emit gaseous pollutants. Continued dust pollution may cause adverse health impact to the people living in the vicinity. As the road is of district road category and the vehicular movement is not expected to be very high. Thus, the impact will be direct, low, local and long term.

114. Noise during operation of road will increase. However, due to low traffic volume, the impact due to noise pollution will be direct, low, local and long term.

115. The disposal of spoil and household wastes, washing of vehicles in water bodies may degrade the water quality. The impact will be direct, low, local and long term.

116. *Measures:* Measures to be adopted will include plantation of trees on both sides of road as far as possible; restrict horn near forest, health posts, schools and settlements; provide speed limit for vehicle at sensitive areas.

6.3.2.2 Biological Environment

Depletion of Forest Resources

117. *Impacts:* The forest resources may deplete due to human pressure on forest to meet increasing needs of heating and cooking, illegal felling/cutting of trees for timber. The impact will be indirect, medium, local and long term.

118. *Measures:* The mitigation measures recommended are support District Forest Office and VDCs to encourage and support local community in controlling illegal harvesting of forest resources; awareness *programs* organized to educate local people on the importance of forest conservation.

Disturbance to the Wildlife and Illegal Poaching

119. *Impacts:* Although the wildlife population is reported low, they may be disturbed due to the frequent movement of the vehicles. Vehicular movement, blowing of horn in the forest area will have adverse impact on the wildlife and bird species. There may occur illegal Poaching during operation period by the people from outside due to easy accessibility. The impact will be indirect, low, local and long term in nature.

120. *Measure*: Prohibition of blowing horns in the dense forest areas; Information signboard at potential areas for wildlife crossing.

6.3.2.3 Socio-economic and Cultural Impacts

Unplanned New Settlement and Market Center Development

121. *Impacts:* Expansion of settlement area and market can be observed at Dhandada, Pyutar and Sannochainpur. Encroachment of RoW may take place. This will reduce road capacity, increase road accidents, and adversely impact road. The impact will be direct, medium, local and for long term.

122. *Measures:* The mitigation measures to be adopted include regulation of settlement with proper planning; plantations of trees in the RoW so that it is not encroached; Awareness raising program and authorities and VDCs will control encroachment of RoW.

Change in Social Behavior

123. *Impacts:* Access facilities may bring social nuisance like increase in alcohol consumption, gambling, prostitution, and may increase girl trafficking. The impact will be indirect, medium, local and long term in nature.

98. *Measures:* The mitigation measures recommended will be facilitating awareness raising programs to the communities about negative social behavior like gambling, excess use of alcohol.

Issues on Safety Measures

124. *Impacts:* Movement of vehicles and inadequate road safety measures may invite accidents. The impact will be direct, medium, local and long term.

125. *Measures:* The mitigation measures to be adopted will be applying appropriate road safety measures such as delineator post in high embankment and necessary safety signs will be used along the road.

7. ENVIRONMENTAL MANAGEMENT PLAN

126. The EMP is prepared to guide implementation of mitigation measures and monitoring requirements.

7.1 Institutions and Their Roles

Table 7.1: Concerned Institutions and Their Roles

Institution	Role	Responsibility in the Project	Remark
Ministry of Environment	Mandated to formulate and implement environmental policies, plans and programs at national level	Facilitate when needed on environmental safeguards	No direct responsibility in the project
Ministry of Local Development (MLD)	It is concerned line ministry and concerned agency as per EPA/EPR. Environment Management Section is responsible to look into safeguard matters for the ministry.	▪ To review IEE, ToR and Report, and give approval. ▪ Conduct environmental monitoring from central level.	
Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR)	Department under MLD responsible to execute infrastructure projects under MLD. Provides back-up support to DDCs in technical matters through DTO.	RRRSDP is being executed under overall coordination and supervision of the Department for the Ministry. It is also supporting DDCs through DTOs to implement the project.	
RRRSDP- Project Coordination Unit	Project specific unit.	Technical Unit to support and coordinate all activities for implementation of RRRSDP. Review, comment, and forward IEE ToR and report for review to ADB and for approval to MLD	First Class Officer / DDG of DoLIDAR has been heading the PCU.
District Development Committee / District Technical Office	DDC/DTO is Project Implementing Agency.	▪ Prepare IEE ToR and submit for approval to PCU/MLD. ▪ Conduct IEE Study, Public Consultation, and prepare IEE Report ▪ Receive comments from PCU/ADB/MLD and modify accordingly. Get final approval from MLD ▪ Conduct environmental safeguard monitoring ▪ Reporting	District Technical Officer is the Project Manager
District Project Office	Project implementation office working directly under DDC/DTO.	Responsible for overall activities related to implementation of the works at field level.	Implementing Agency
Central Implementation Support Consultant (CISC)	Support consultants at central level	Technical and management support to PCU	Consultant
District Implementation Support Team (DIST)	Support consultants at district level	Technical and management support to DPO	Consultant

127. To support for smooth implementation of the project, there are various district level committees and groups including District Project Coordination Committee (a sub-committee of DDC), Village Infrastructure Construction Coordination Committee (to coordinate at VDC level). Road Building Groups are formed under participation of local people from Zol. They carryout the manual construction works. Contractor will be appointed for works requiring higher skill and mechanized support.

7.2 Reporting

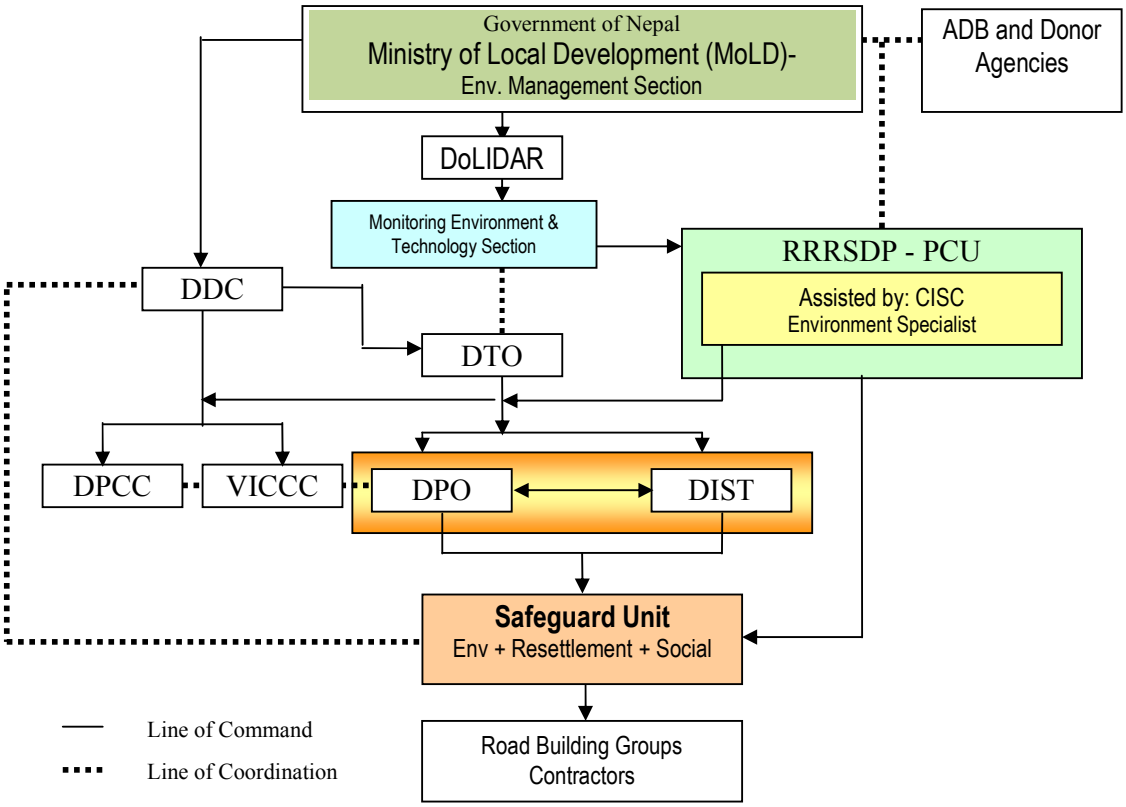
128. Monitoring checklist will be developed as per the Environment Management Plan (EMP). The checklist will be used for regular monitoring. Trimerserly EMP compliance report will be prepared and submitted to the DDC, and DDC will forward it to PCU / DoLIDAR.

129. The monthly reports will be based on recurrent site inspections and will report on the effectiveness of the mitigation measures; the contractor's compliance with the environmental

specifications; measures recommended in the events of non-compliance, and recommendations for any other corrective plan.

130. The trimester environment monitoring report will be submitted for the first year of operation of the road by the Proponent (DDC/DTO) to Executing Agency (PCU/DoLIDAR), who will forward the report to ADB. This is to ensure that post project monitoring is also carried out at least for one year.

Fig. 7.1: Environmental Management Organization Structure



7.3 Environmental Management Plan

131. The DDC/DTO with support of DPO/DIST at local level and PCU/CISC at central level will be responsible for conducting careful and routine monitoring of EMP compliance. Overall implementation of the EMP will be the responsibility of the Proponent. Framework for implementing environmental management plan is shown in Table 7.2.

Table 7.2: Beneficial Impacts and Proposed Enhancement Measures of Road Subproject

Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies	
			Nat	Mag	Ext	Dur		Executing Agency	Supporting Agency
Construction Stage									
Construction of road	Employment Generation and Increase in Income; 121327 person days, with 10982 for skilled and 110345 for unskilled labor and for bridge 33640 person days with 9092 for skilled and 24548 for unskilled labor	Increase in income level	D	H	L	ST	Priority for employment will be given to local poor, dalit, vulnerable groups and women. They will be given training to do the job. Proponent will implement skill training, awareness, and income generation programs encouraging them to utilize their money earned through wage. Proponent will conduct Livelihood Enhancement Skills Training (LEST) program.	DDC/DTO/ DIST	DPCC / VICCC / CISC/PCU
Construction of road	Skill Enhancement	Increase in income generating activities, employment opportunities	D	M	L	LT	Training on masonry, gabion work, bioengineering works, and roadside tree plantation will be given. Livelihood Enhancement Skills Training (LEST) programs under social plan will be provided whose budget is included in Social plan.	DPO/DIST	DDC/DTO / CISC/PCU
Construction of road	Enterprise Development and Business Promotion	Development of market centres will be at Balguwa, Pyutar Bazar, Ashrang Bazar and Sano Chainpour settlements. Enhancement in local economy	D	M	L	ST	Training in cooperatives, and promote use of local products.	DTO/DPO	DIST/ CISC/PCU
Construction coordination committee and RBG program	Community Empowerment and Ownership	Increase in income and ownership.	IN	L	L	ST	Coordination committees will be constituted and training will be given to them.	DPO/DIST	DDC/DTO / CISC/PCU
Operation of Road	Women Empowerment	Women are particularly benefited from trainings under Gender Action Plan and, from improved access to the market centers and various service providing agencies like health centers, banks, training institutes, women development office	D	H	L	LT	Programs under Gender Action Plan (GAP) of social plan will be provided whose budget is included in social plan of the project. GAP includes trainings such as Offseason Vegetable Training and Gender Sensitization and Social Inclusion Training.	VDC / DDC	VDC / DDC
Operation Stage									
Operation of Road	Improvement in Accessibility and Saving of Time and Transportation Cost	After upgrading of this road, it will takes 1 hour to reach Tallo Chainpur instead of whole day and more than 70% cost will reduce	D	H	R	LT	Proponent will undertake regular maintenance of the road	DTO/DDC	DoLIDAR
Operation of Road	Increase in Trade, Commerce and Development of Market centers	Minor local markets in Baguwa, Pyutar Bazar, Asrang Bazar and Sano Chainpur settlements will grow .Shifts towards improved commercial	IN	H	L	LT	Manage planned growth with required infrastructure facilities in the market areas. Agriculture extension services, market linkages and networking for better market price.	DPO	DDC/VDC

Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies	
			Nat	Mag	Ext	Dur		Executing Agency	Supporting Agency
		agriculture and increase in non-agricultural occupation							
Operation of Road	Appreciation of Land Value	Improvement in local economic condition	IN	M	L	LT	Promotion of land development activities and control of encroachment within RoW. Awareness program shall be organized on use of high value land to get bank loans for setting up enterprise ventures.	DDC/DPO	DDC/VDC
Operation of Road	Enhancement of Community Development Services	Ease of access to social service and raise in quality service	IN	H	R	LT	Keep road maintained to ensure access facility that will attract development of other social services facilities	Local people, DDC, VDC	DDC, VDC

Table 7.3: Adverse Impacts and Proposed Mitigation Measures of Road Subproject

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measures	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Construction Stage										
Physical Environment										
Construction of Road, site clearance	Change in land use Additional land (0.529 ha. of cultivated land, 0.837 ha.of forest land.)	There will be change in land use due to expansion of roadside settlements like tea shops, temporary shops and labor/camp sites.	D	H	L	ST	IR	Compensation will be given for loss of private properties. Plantation of trees will be done to increase greenery in the area.	DDC/DTO	DIST
Construction of Road, earth excavation	Spoil Disposal and imposed weight of spoil on fragile slopes	Gully erosion, landslide, disruption of road, damage to farmland, water pollution etc.	D	M	SS	ST	Re	Proper site selection and management of spoil at designated areas approved by Engineer; provision of proper drainages, toe walls; Proposed spoil disposal sites are Ch 1+100, 2+150, 8+467, 9+250, 12+100.	DDC/DTO	DIST/VICCC/ VDC
Site clearance, excavation	Slope Instability	Erosion, landslide, loss of property. Areas of concern are ch1+325 1+540 1+930 2+150 3+300 5+400 5+840 8+375, 11+685 and 13+735.	IN	M	SS	MT	Re	Civil structures with bio-engineering application (Such as Grass plantation, Tree/Shrub plantation, Brush layering, Palisades, Bamboo plantation, Live checkdam construction etc.) shall be used to stabilize the slopes. Drainage management (Catch drain, rip-rap drain, checkdam etc.)	DDC/DTO	DIST
Construction of Road	Drainage Management, generation of large volume of surface runoff	Erosion, landslide, damage to farmland	IN	M	SS	MT	IR	Provide adequate numbers of drainage structures in order to have minimum interference with natural drainage pattern of the area; channelize surface water discharge from	DDC/DTO	DIST

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measures	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
								side drains.		
Construction works, operation of construction vehicles, material hauling and unloading etc. Slope cutting, spoil and waste disposal.	Air pollution due to dust from exposed surface, from construction equipments and vehicles	Affect on local people and workers health and affect on agriculture.	D	L	L	ST	Re	Use of face mask while working on dust prone areas, covering of dust sources, Both the sides of the road alignment will be planted with trees, as far as possible which will act as sound and noise barrier	DDC/DTO / RBGs	DIST
	Noise pollution	Disturbance and annoyance around school, health posts, forest areas.	D	L	SS	ST	Re	Restrict horn near school, health posts, settlement, and forest areas.	DDC/DTO / Contractor	DIST
	Water pollution due to sediment level, spills and leakage of oils and chemicals to water bodies	Risk of water borne diseases	D	L	L	ST	Re	Avoid disposal of excavated materials in the water bodies, and prevention of leakage and spills of construction chemicals.	DDC/DTO/ Contractor	DIST/VICCC
Cutting of slopes	Quarry/borrow operation and its potential effect on instability, landslide	Change in river regime, instability, land slide; damage to forest, farmland and property; water pollution	D	L	SS	ST	Re	Proper selection and management of quarry sites, rehabilitation of quarry/borrow sites after completion of work. Recommended quarry sites are Ch 1+000, 3+500, 7+500, 14+100, 14+500,	DDC/DTO/ Contractor	PCU/CISC/DIST/ VICCC
Construction of road	Location of Camp Sites, Storage Depots	Encroachment of forest, agriculture land, solid waste,and waste water may cause pollution	D	M	SS	ST	Re	Locate camp site away from productive land and forest area (Appropriate camp site should be at 0+300(Cultivated Land of open area) near Baguwa, at 7+500 (open area) near Malta, at 14+350 (Cultivated Land of open area) near Tallo Ashrang and 1+050 (for bridge) ; use local labor and local houses as camp; pay compensation to land owner of camp area; At camp sites will be provided with drinking water and latrine facilities. For waste water and solid waste management, soak pit will be made and proper management will be done.	DPO assisted by DIST/ Contractor	DIST/VICCC
Operation of construction equipments	Construction equipment and vehicles (Rollers, tippers, spreader, water tanker etc.)	Air pollution due to emission of smoke, increase in vibration and noise pollution	D	H	SS	ST	Re	Equipment/vehicles deployed for construction activities shall be regularly maintained. All the vehicles deployed for material movement shall be spill proof to the extent possible	DPO assisted by DIST/ Contractor	DIST/CISC/PCU
Operation of construction vehicles fuel, Kerosene and spoil productivity.	Storage of Petrol, diesel and grease for vehicles. Kerosene for workers to used for light.	Water sources and soil are polluted. Affects health of the workers.	IN	L	SS	ST	IR	Store fuels and chemicals on paved surface with surrounding catch drain to protect soil from leakage. Proper storage of hazardous chemicals and providing information signboards. Use of safety gears to workers during handling of chemicals and fuels. Close monitoring during operation of machineries.	DIST/Contractor	DIST/CISC/PCU

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measures	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Biological Environment										
Clearance of vegetation necessary for road formation	Loss or Degradation of Forests and Vegetation	Loss of green cover; loss of 36 nos tree will be removed	D	H	L	LT	Re	Cutting of tree only in formation width, compensatory plantation of local species of tree at 1:25 ratio + 10 percent.	DDC/DTO/DFO	DFO/CFUGs/DIST/VDC
Construction activity	Impact on Wildlife Due To Loss of Habitat and Poaching	Killing and harrasing of wildlife	IN	L	L	ST	Re	Workers shall be strictly discouraged from collecting fuelwood or Poaching/harassing of wildlife.	DDC/DTO/DFO	DFO/CFUGs/DIST
Construction activity	Impacts on Flora and Fauna	Loss of biodiversity	IN	L	L	MT	IR	Minimum site clearance, discouraging workers for collecting fuel wood from forest or Poaching/harassing faunas	DDC/DTO/DFO	DF/CFUGs/DIST
Social-economic Environment										
Acquisition of land for maintaining road width*	Loss or Degradation of Farm Land and Productivity (0.529 ha)	Reduced production, hardship, food shortage	D	M	L	ST	IR	Compensation for the loss of property will be provided to the affected people	DDC/DTO	CDC DIST/VICCC
Acquisition of land and property for maintaining road width	Loss of Private Properties	Displacement of people, hardship	D	H	SS	LT	IR	Compensation and resettlement to the owner as described in resettlement plan. A separate Resettlement Plan has been prepared to address land and property acquisition as well as compensation issues. In this plan, direct cost of NRs. 6500000.00 has been proposed.	DDC/DTO	CDC/DIST
Demolition of structures along road alignment	Impact on Community Infrastructure	Loss of services Irrigation Canal: 1+000, 6+250 (HDP pipe using for Irigation) 13+045-13+120 (Along with formation width), Access Road: 0+000 (to Kanti Rajpath), 4+000 (to Simle and 2+050 (to Gotikhel)6+150 (to Deurali) 9+250 (to Khaireghari), Drinking Water Crossings: 0+712, 1+110, 1+514, 1+830, 1+960, 2+800, 2+940, 3+356, 3+990, 5+550, 7+800, 11+150, Foot Trail: 0+300, (to Baguwa Bazar) Gadibhanjyang), 5+000 (to Thangsingtar gaun),13+150 (to Asrang Fat), Water Mill (11+850), School (3+400, 7+600), Elecrtic pole (3+450, 7+200, 13+670, 14+745)	D	M	SS	ST	Re	Necessary mitigation measures will be provided, restoration or relocation of affected infrastructures:	DDC/DTO	PCU DIST/CISC/VICCC/VDC

* Activities that will be carried out during pre-construction period

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measures	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Construction of road	Health and safety matters	Injury, fatal accidents, outbreak of epidemics and diseases, decline in capacity to work	D	H	L	ST	IR	Occupational health and safety regulations, first aid facility at sites with health treatment arrangements, contingency planning; Proper drinking water and toilet facility for construction crew	DDC/DTO / Contractors	DIST/CISC
Construction of Road	Decrease in aesthetic value	Disturbances in working areas and scar on topography	D	L	L	ST	Re	Discourage indiscriminate dumping of spoil material; quarry sites will be properly closed to suit the local landscape and cover by plantation of local species trees.	DPO in assistance by DIST / Contractors	PCU / CISC / Users Committee / VDC
Construction of Road	Impacts on Cultural, Religious and Archeological Sites	Dust pollution will increase	D	L	L	ST	Re	Contractor will frequently sprinkle water during surfacing of the road. Both the sides of the road alignment will be planted with trees, as far as possible which will act as sound and noise barrier	DPO in assistance by DIST / Contractors	Users Committee / VDC
Operation Stage										
Physical Environment										
Quarrying, operation of construction equipments	Road Slope Stability and Management	Slides and slope failure, Disturbance to traffic flow, pollution of water bodies, impacts on agriculture land, loss of vegetation.	D	M	L	LT	Re	Regular maintenance of slope protection structures at chainages 1+325, 1+540, 1+930, 2+150, 3+300, 5+400, 5+840, 8+375, 11+685, 13+735.	DDC/DTO/VDC	DoLIDAR , DFO, District Watershed and Soil Conservation Office (DWSSC)
Operation of vehicles, Inadequate drainage	Air, Noise and Water Pollution	Dust ,Noise and water pollution	D	L	L	LT	IR	Plantation of trees on both sides of road as far as possible; restrict horn near forest, health posts, schools and settlements; provide speed limit for vehicle at sensitive areas	DDC/DTO	DoLIDAR/Local administration
Biological Environment										
Road operation	Depletion of Forest Resources	Loss of timber, pressure on forest forest resources	IN	M	L	LT	IR	The mitigation measures recommended are support District Forest Office and VDCs to encourage and support local community in controlling illegal harvesting of forest resources	DFO/ CFUGs/VDCs	DDC/CDO
Road operation	Disturbance to the Wildlife and Illegal Poaching	Collision of wildlife with vehicles, disturbance in their normal activities, Loss of biodiversity	IN	L	L	LT	IR	Prohibition of blowing horns in the dense forest areas; Information signboard at potential areas for wildlife crossing.	DTO/ CFUGs	DDC/CDO / DFO
Social-economic Environment										
Easy Access by road operation	Unplanned New Settlement and Market Center Development	Encroachment of RoW, increased accidents, delay in traffic movement, depletion of local resources, water pollution	D	M	L	LT	IR	Awareness program, enforcement of law, planning of land development, plantation of trees.	DDC/DTO	CDO / VICCC
Operation of Road	Change in Social behavior	Social and cultural conflicts	IN	M	L	LT	Re	Support awareness raising programs and strengthen communities against such	DTO	DDC/DoLIDAR

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measures	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
								nuisances		
Operation of Road	Road Safety Measures	Increase in accidents	D	M	L	LT	IR	Appropriate road safety measures, Safety signs along the road.	DTO	DDC/DoLIDAR

Table 7.4: Beneficial Impacts and Proposed Enhancement Measures of Bridge

Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies	
			Nat	Mag	Ext	Dur		Executing Agency	Supporting Agency
Construction Stage									
Construction of bridge at 1+077	Employment Generation and Increase in Income, temporary tea stall, shop 9092 for skilled and 24548 for unskilled	Increase in income level	D	H	L	ST	Involve local people to the extent possible; They will be given training.	DDC/DTO/DIST	DPCC / VICCC / CISC/PCU
On the job training to local labour	Skill Enhancement	Increase in income generating activities, employment opportunities	IN	M	L	LT	Training on Bridge maintenance.	DDC/DPO/DIST	CISC/PCU
Operation Stage									
Operation of bridge	Improvement in Accessibility and Saving of Time and Transportation Cost	Saving in travel time and travel cost. Easy transportation of goods and daily commodities and local people gets transport facilitites in all weather condition.	D	H	R	LT	Proper maintenance , river training works	DTO/DDC	DoLIDAR

Table 7.5. Adverse Impacts and Proposed Mitigation Measures of Bridge

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Construction Stage										
Construction of bridge, site clearance, at 1+077	Change in land. Loss of 0.04 ha. of barren land	Loss of barren land for site clearance.	D	H	L	LT	IR	Project site is selected to minimum loss or damage of agriculture land, forest, private land or property.	DDC/DTO	DIST/ ACAP

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Construction of bridge, earth excavation	Spoil disposal	Gully erosion, landslide, disruption of road, water pollution etc.	D	M	SS	ST	Re	Proposed spoil disposal sites are Ch 1+100.	DDC/DTO	DIST/VICCC/VDC
Construction of bridge	Water Management	Affected on river flow, Erosion, landslide, damage to farmland	IN	M	SS	MT	Re	Site is selected maximum flow of water location for bridge so water can easily flow out and events of flooding, and further damage of the road and other nearby infrastructures can be prevented. No affect on river flow during bridge construction. Bridge protection work such as Bio-engineering, Gabion protection work, Lunching apron are proposed.	DDC/DTO	DIST
Construction works, material hauling and unloading etc.	Air , dust, noise and water pollution	Affect on local people and workers health, excavated material of bridge affect on rivers aquatic life	D	L	L	ST	Re	Use of ear muffles, helmet to lessen noise pollution during rock breaking and quarrying and bridge works. Strictly follow excavated materials will be disposed in proposed location. No impact is envisaged the aquatic life.	DDC/DTO/ Contractor	DIST
Collection of Construction materials	Quarry site, or boulder, sand and aggregates	Water pollution, disturbance in natural drainage damage forest and vegetation	D	L	L	ST	Re	The bridges will be regular steel structure rested on abutment. So minimum require construction materials, rehabilitation of quarry sites after completion of work. Recommended quarry sites is 1+000	DDC/DTO/ Contractor	CISC/DIST/ VICCC/ ACAP
Construction of Bridge	Location of Camp Sites, Storage Depots	Encroachment of forest, agriculture land, disposal of solid waste, and waste water	D	L	L	ST	Re	Proper sanitary facilities by providing Pit Latrine, sockpit. Appropriate camp sites for bridge is at 1+050.	DDC/DTO/ Contractor	DIST/VICCC
Occupational health and safety aspects	Health and safety matters	Injury, fatal accidents, outbreak of epidemics and diseases, decline in capacity to work	D	H	L	ST	Re	During bridge construction safety measures (ear muffles, helmet, boots) will be provided to workers, first aid facility at sites with health treatment arrangements, contingency planning; Proper drinking water and toilet facility for construction crew.	DDC/DTO / Contractor	DIST/CISC/PCU
Operation Stage										
Operation of bridge	River bank erosion near bridge site.	Slides and slope failure	D	L	L	ST	R	Up-stream and down-stream river protection shall be done to stabilize river banks.	DDC/DTO	VDC, CBMC

* Legend *Value in parenthesis is level of significance*:
Nature- IN= Indirect; D= Direct
Magnitude- L= Low ; M= Medium ; H= High ;

Extent- SS= Site Specific ; L= Local; R= Regional ; N= National ; CB=Cross-boundary
Duration- ST= Short Term ; MT= Medium Term ; LT= Long term
Re=Reversible; IR= Irreversible

7.4 Mitigation Cost

132. The estimated cost for benefit augmentation measures like awareness raising program, skill training, promotion of small scale industries, and income generation activities will be covered by the Community Empowerment Component and Livelihood Enhancement Skills Training (LEST) program of the RRRSDP. Costs for income generation and awareness program activities for Affected Persons (APs) are included in Social Action Plan. The design and cost estimate for most of the suggested mitigation measures such as slope stabilization, quarry site management, spoil disposal, supply of safety gears, accidental insurance of RBGs, bio-engineering measures, tree plantation, land slide rehabilitation will be incorporated in the project cost. Therefore, most of the mitigation measures suggested would be a part of main project cost. All proposed mitigation measures will be integrated in the project design so that these measures may automatically form part of the construction and operational phases of the project. The indicative cost for environmental enhancement and mitigation is presented in the **Table 7.4**.

Table 7.4: Cost Estimate for Environmental Enhancement and Mitigation Measures

SN.	Environmental Protection Measures	Estimated Budget (NRs.)	Remarks
1. Benefits Augmentation Measures			
1.1	Training to Naike of RBGs	50,000.00	To be included in project cost
1.2	Enhancement in Technical Skills (Bio-engineering)	50,000.00	
	Sub-Total (1)		
2. Adverse Impacts Mitigation Measures			
2.1	Bio-engineering work- Road site plantation.	3000000.00	To be finilised after detail design.
2.2	RBG Insurance	300,000.00	To be included in project cost
2.3	Occupational health and safety; First aid boxes, campsite sanitation (Pit latrine); solid waste management, Safety measures for workers (Helmets, gloves, masks, boots, etc,) Information Signboard (40 nos)	500,000.00	To be included in BoQ
2.4	Compensation for properties	5500000.00	T o be included in Resettlement plan
2.5	Restoration or relocation of affected infrastructures, spoils disposal site management and rehabilitation, reinstate of quarry etc.	500000.00	
2.7	Compensatory plantation Re-plantation / Re-forestation	150,000.00	
	Information signboard, traffic safety	500, 000.00	
2.8	Social Cost	700000.00	To be included in Social Cost of Project
	Sub-Total (2)	10,850,000.00	
	Total	10,950,000.00	

7.5 Implementation of Mitigation Measures

133. The mitigation measures will be integrated into project design and tender documents so that the mitigation measures will automatically become part of the project implementation and operation. Mitigation measures will be included as separate items in the Bill of Quantities, and monitoring will be done based on these. The Proponent and the contractor will be bound by the parameters identified in the IEE Report and specific mitigation measures spelled in the contract. The final acceptance of the completed works will not occur until all the environmental clauses have been satisfactorily implemented.

134. The contract agreement document will explicitly mention the penalising action to be taken against failure to comply with EMP requirements.

7.6 Environmental Monitoring

7.6.1 Monitoring Responsibility

135. The Proponent will develop in-built monitoring mechanism to safeguard environment during construction and operation stages. The DPO will be supported by DIST in the district, and PCU will be supported by CISC at center to ensure effective monitoring and undertaking corrective actions, as required. A Safeguard Unit will be established in DPO. The social, resettlement and environment specialists / officers from DPO/DIST will work in cooperation under the Safeguard Unit. They will undertake Subproject level monitoring under supervision and coordination of Specialists from PCU/CISC.

136. MoLD/DoLIDAR will be responsible for central level monitoring of EMP compliance. A provision of NRs. 50,000 will be allocated for the periodic monitoring by the center.

137. The Safeguard Unit at Subproject level shall submit monthly monitoring report to the PCU, who will forward a copy to ADB, NRM. Total cost of environmental monitoring (field visits, observation, review of reports and report preparation), excluding the cost of personnel, is estimated at NRs.200,000.00 as given in Table 7.5.

Table 7.5: Environmental Monitoring Cost

S. No.	Detail	Unit	Quantity	Rate	Total (NRs.)
1	Environmental Management Specialist	Man-month			Included in the Cost of DIST
2	Sociologist / Public Relation Expert	Man-month			Included in the Cost of DIST
3	Report preparation		LS		100,000.00
4	Cost for Monitoring by MoLD/DoLIDAR		LS		100,000.00
	TOTAL				**200,000.00**

138. Thus, total environmental monitoring and management cost is NRs. ----------.

7.6.2 Types of Monitoring and Monitoring Parameters

139. Monitoring is an on going component of the environmental assessment process and subsequent environmental management and mitigation activities. There are basically three types of environmental monitoring: Baseline Monitoring, Compliance Monitoring and Impact Monitoring. Environmental Monitoring for this subproject are:

a. Compliance Monitoring – that verifies whether the EMP provisions are properly implemented in the field. The framework for compliance monitoring is given in the Table 7.6.

b. Impact Monitoring - that confirms the result of implementing mitigation measures. The framework for impact monitoring is given in the Table 7.7.

Table 7.6: Compliance Monitoring for Baguwa-Pyutar-Ashrang Road Construction Works

Parameters/Indicators	Responsible Implementing Agency	Verifiable Indicators	Verification Methods	Schedule	Responsible Monitoring Agency
Final alignment selection as per IEE /EMP recommendation	DPO / DIST	Alignment incurs minimum requirements to acquire land from forest, agri. land, and minimum nos. of tress to clear.	Look the alignment on topo map with landuse resources; verify it by walkthrough along final road alignment	Preconstruction phase	PCU / CISC; DoLIDAR
Land and property acquisition and compensation Voluntary land acquisition	Proponent with assistance of DIST	Cadastral records, Land and properties acquisition procedures; Procedures followed during voluntary donation of Land; Preparation of inventory of structures likely to be affected Payment of compensation	Public consultation, photos; geo-referencing; Check inventory against cadastral records and discuss with land owners Check record of pending compensation	Preconstruction phase before construction begins	CFC / PCU (CISC) / DOLIDAR / MoLD
Compliance to Environmental Protection Measures, including pollution prevention, water and soil management, slope stabilisation, cut and fill, waste management, spoils, sensitive habitats and critical sites, protection of fauna and flora	Contractor /RBG	Arrangement specified in the Code of Practice and in Manuals relating to environmental protection; EMP detail in IEE Document; records and observations on pollution, waste management, spoil deposit. Protection of wildlife and sensitive habitats, forests; and Use of fuelwood for heating and cooking.	Site inspection; Discussion with local people; Records; Photos; Sampling and laboratory tests.	During construction period and include in monthly report	DPO / DIST at district and PCU/CISC at center
Protect environment from air & noise pollution	Contractor / RBGs	Dust level and noise level at work sites, major settlements and sensitive spots like health centres and schools; Crusher operated during night	Visual observation, Observation of good construction practices and discussion with residents and workers; DIST to measure air/noise level at sensitive spots.	Once in a month during construction; measurement once during peak construction	DPO / DIST at district and PCU/CISC at center
Protect water bodies from pollution	Contractor / RBG DPO / DIST	Visual observation, observation of open defecation and pit toilets at work sites/waste management/spoil disposal around water sources; Parameters like pH, hardness, DO, Turbidity for drinking water.	Site inspection, test of site-selected samples of local streams water using standard field kit, record of waterborne disease	Observation once in a month during construction; Upon demand for testing with field kit	DPO / DIST at district and PCU/CISC at center
Use of local labour, particularly vulnerable groups and women	DPCC / VICCC / RBGs / Contractor	Percentage of employment of local labour, especially vulnerable groups and women and their wage rate.	Verification from records	During the entire period where labour work is contracted	DPO / DIST at district and PCU/CISC at center
Awareness and orientation training on road construction locally employed labourers	DPO / DIST	Training programmes for skill development, occupational safety and environmental protection associated with road construction works; employment generation skill	Training records, assess feedback from participants	Beginning of construction and during construction	DPO / DIST at district and PCU/CISC at center (DTO)

Parameters/Indicators	Responsible Implementing Agency	Verifiable Indicators	Verification Methods	Schedule	Responsible Monitoring Agency
Compliance to occupational health and safety matters	DPO / DIST; Contractor (if involved)	Health and safety regulations, first aid and medical arrangements, contingency plan, number and type of safety equipments such as mask, helmet, glove, safety belt.	Spot checks at work sites, accident records, safety equipement at site; discussion with workers	Throughout construction stage	DPO / DIST at district and PCU/CISC at center
Vegetation clearance	Contractor; DPO / DIST	Actual number of trees felled during construction works	Record, inspection and interview with local people and CFUGs	Before construction work	DPO / DIST at district and PCU/CISC at center; CFUGs
Measures to avoid pressure on forest and wildlife	Contractor / RBG / DIST	Use of firewood or fossil fuel by construction crew, events of Poaching and poaching of wildlife	Record verification, interview with local people and CFUGs	Once a month during construction	DPO / DIST at district and PCU/CISC at center / CFUGs
Restoration, rehabilitation, reconstruction of all infrastructure services disrupted or damaged during the construction work	Contractor / RBG / DIST	Continued services by the facilities and functional public life	Site observation; Public Consultation Meetings	Once in 15 days during construction	DPO / DIST at district and PCU/CISC at center
Clean up and reinstatement of the construction sites (camps, quarries, borrow pits)	Contractor	Decommissioned sites indicate no adverse/residual environmental impacts, and are rehabilitated to the satisfaction of the supervisor and land owners	Site observation; Comparing photos; Consultation with land owners	At end of construction period	DPO / DIST at district and PCU/CISC at center
Proper storage of chemicals; prevent pollution of soil and water.	Contractor	Storage of chemicals on paved surface. Provision of safety gears during chemical handling by workers. Spillage during operation of machineries.	Site inspection; consultation with workers.	During the construction stage	DTO/DIST/Contractor

Table 7.7: Impact / Effect Monitoring for Baguwa-Pyutar-Ashrang Road Construction Works

Parameters /Indicators	Verifiable Indicators	Verification Methods	Location	Schedule	Responsible Implementation and Monitoring Agency
Slope stability and erosion	Slope failures & their causes; Fresh gullies and erosion; Success/failure of bio-engineering solutions	Site observation, photos discussion with people and technicians	At landslide areas and sites where bio-engineering failed	Continuously during construction and operation	DIST during construction; Proponent / DPO / Soil Conservation Office during operation
Disposal of Spoils and construction wastes	Damage to forest and agriculture land, blocked drainage, hazard to downhill residents and agricultural lands	Site observation and interviews, photos	At specific locations where such sites occur	During construction at monthly basis	DPO / DIST at district and PCU/CISC at center
Quarrying of construction materials	Erosion, changes in river regime, bank cutting, landslide due to quarrying on slope	Site observation, photos	Quarry site areas	During construction at monthly basis	DPO / DIST at district and PCU/CISC at center
Disruption of drainage system	Blocked drainage, waterlogging, slope cutting and erosion by water	Observation, photos	Site specific areas	During construction at rainy season	DPO / DIST at district and PCU/CISC at center
Loss of farmland , houses and properties	Decline in productivity; Quality of life of compensated people	Observation, and interview with stakeholders	Construction areas	During construction in quarterly basis	DPO / DIST at district and PCU/CISC at center / VICCC
Water quality	Water borne disease; adverse impact on aquatic life	Record of disease, measurement of water sample using standard field kit; impact to fish in streams	Construction sites; local streams	During construction at quarterly basis	DPO / DIST at district and PCU/CISC at center
Air quality	Dust level increase	Discussion with people at sensitive locations	At construction sites and at sensitive spots (schools, health post, market and settlements)	During construction at dry season	DPO / DIST at district and PCU/CISC at center
Change in economy	Nos. of new houses built; shops opened; New enterprises by local people	Discussion with local people	Project Area	Yearly during construction phase	DPO / DIST at district and PCU/CISC at center
Occupational safety and hazard	Type and number of accident occurred during construction	Records and interview with labourers	Project Area	During construction	DPO / DIST at district and PCU/CISC at center
Social conflict and nuisance	No of social conflicts between project and people; new 'Bhatti' and prostitution proliferation.	Observations, interview with local people	Project Area	During construction	DPO / DIST at district and PCU/CISC at center / VDC
Ribbon settlement	RoW encroachment	Records, observations	Project Area	During operation	DDC/CDO
Chemical pollution	Spillage of chemicals during storage; and operation of machineries. Events of health hazards due to chemicals.	Inspections, Rords	Project Area	During Construction	DPO/DIST/Contractor

8. CONCLUSION AND RECOMMENDATION

8.1 Conclusion

140. The IEE study of the proposed Baguwa-Pyutar-Ashrang Road Subproject does not pass through any environmentally sensitive area, and have minimal adverse impact associated with loss of forest and agricultural land. Most of the adverse impacts predicted are of low significance and short term as well as reversible. The upgrading road will provide better access to market and social services, and is expected to enhance productivity and improving quality of life of the people. Local people will get direct employment opportunity as workers during construction works, which will contribute in improving their income. This road also link with Kanti Rajpath. This is shortest route to Hetauda of Makawanpur District. This road helps to reduce travel time and cost of local people to access other part of the country. The beneficial impacts from the implementation of the proposed road are more significant and long term in nature against the adverse impacts most of which could be avoided or minimized or compensated.

141. The IEE has shown that none of the anticipated environmental impacts of constructing the proposed road is significant enough to need a detailed follow-up EIA study. Therefore, this IEE is sufficient for approval of the Subproject.

8.2 Recommendation

142. A key consideration in selecting the road alignment is to minimize the acquisition of valuable agricultural and forest land. The proposed road project is recommended for implementation with incorporation of mitigation measures and environmental management plan.

REFERENCES

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ANNEXES

Annex I: Terms of Reference

नेपाल सरकार
स्थानीय विकास मन्त्रालय
स्थानीय पूर्वाधार विकास तथा कृषि सडक विभाग (डोलिडार)
ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना
आयोजना समन्वय इकाई
ज्यामाडेल, ललितपुर

प.स. ०६५/६६
च.नं.: १०९०

मितिः २०६६।१।२९

विषयः प्रारम्भिक वातावरणीय परीक्षण (IEE) को स्वीकृत कार्य सूचि पठाईएको सम्बन्धमा ।

श्री जिल्ला प्राविधिक कार्यालय
ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना
जिल्ला आयोजना कार्यालयः
ललितपुर ।

उपर्युक्त सम्बन्धमा त्यस जिल्लामा निर्माण हुने भर्देउ-चन्दनपुर सडक, बगुवा-प्युटार-आसराङ्ग-थटिभञ्ज्याङ्ग सडक र दल्चोकी-साँखु- इकुडोल सडक उप आयोजनाको प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्य सूचि (ToR) नेपाल सरकार (सचिव स्तर) को मिति २०६६।१।२२ को निर्णय अनुसार स्वीकृत भएकोले स्वीकृत ToR यसै साथ संलग्न गरी सो अनुसार आवश्यक कार्वाहीको लागि अनुरोध छ ।

नारायण प्रसाद बराल
प्रोजेक्ट इञ्जिनियर

बोधार्थः
श्री जिल्ला विकास समितिको कार्यालय,
ललितपुर ।

(RRRSDP)

फोनः ५५४३१९७, ५०००१२८ (डाइरेक्ट), ५५५५००१, ५५४६३५५ (एक्स्टेन्शन- २०५, २०७, २०८), फ्याक्सः ५०००००७
Website: www.dolidar.gov.np, E-mail: rrrsdp@dolidar.gov.np

Terms of Reference (ToR)

for

Initial Environmental Examination (IEE)

of

Baguwa-Pyutar-Asharang -Thatibangyang.
Road Sub-Project

Submitted to:

Ministry of Local Development,
Government of Nepal

Proponent:

District Development Committee (DDC)/
District Technical Office (DTO)
Lalitpur

Telephone No. – 01-5539358
Fax No. –

April 2009

GCEC Nepal
Estd. 1999
Kathmandu

Chief District Engineer

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TABLE

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FIGURE

Figure 1. Map of Nepal Showing Location of Baguwa-Pyutar-Asharang Sub-Project in Lalitpur District ..... ERROR! BOOKMARK NOT DEFINED.
Figure 2. Map of Lalitpur District Showing Baguwa-Pyutar-Asharang Road Sub-Project ..... ERROR! BOOKMARK NOT DEFINED.

Engineer

ABBREVIATIONS

ADB	Asian Development Bank
Ch	Chainage
CF	Community Forest
CISC	Central Implementation Support Consultants
CITES	Convention on International Trade in Endangered Species of Flora and Fauna
DDC	District Development Committee
DG	Director General
DIST	District Implementation Support Team
DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DPO	District Project Office
DPCC	District Project Coordination Committee
DTO	District Technical Office
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management Section
EPA	Environmental Protection Act
EPR	Environmental Protection Rules
FGD	Focus Group Discussion
GoN	Government of Nepal
IEE	Initial Environmental Examination
IUCN	The World Conservation Union
Km	Kilometer
LEP	Labour based, environment friendly and participatory
MLD	Ministry of Local Development
NGO	Non-Governmental Organization
PAM	Project Administrative Memorandum
PCU	Project Coordination Unit
REA	Rapid Environmental Checklist
RRRSDP	Rural Reconstruction and Rehabilitation Sector Development Project
SF	Social Funding
SDC	Swiss Agency for Development and Cooperation
SDS	Social Development Specialist
SM	Social Mobilizer
TA	Technical Assistance
ToR	Terms of Reference
VDC	Village Development Committee
ZoI	Zone of Influence

Engineer

District Engineer

1.0 NAME AND ADDRESS OF THE PROPONENT

The District Development Committee (DDC)/District Technical Office (DTO), Lalitpur is the executing agency at the district level and the proponent of the Initial Environmental Examination (IEE) study for the rehabilitation of Baguwa-Pyutar-Ashrang road sub-project. The Ministry of Local Development (MLD) is the concerned authority for the approval of IEE study report.

Address of the Proponent:
District Development Committee (DDC)
District Technical Office (DTO)
Manbhawan, Lalitpur
Telephone No. :- 01-5539358
Fax No. :-

2.0 INTRODUCTION

2.1 GENERAL INTRODUCTION

The Rural Reconstruction and Rehabilitation Sector Development Programme (RRRSDP) covers 20 districts spread over the country, which focuses on immediate post conflict development priorities for accelerated poverty reduction and inclusive development, thereby enhancing the effectiveness and efficiency of the delivery of public services, and improving access of rural people to economic opportunities and social services.

The RRRSDP is financed by the Government of Nepal (GoN), Asian Development Bank (ADB), Department for International Development (DFID), OPEC Fund for International Development (OFID) to improve the connectivity, enhance economic and employment opportunities, increase access to market and social services of rural communities. The coordinating government department is the Department for Local Development and Agricultural Roads (DoLIDAR) under the Ministry of Local Development (MLD).

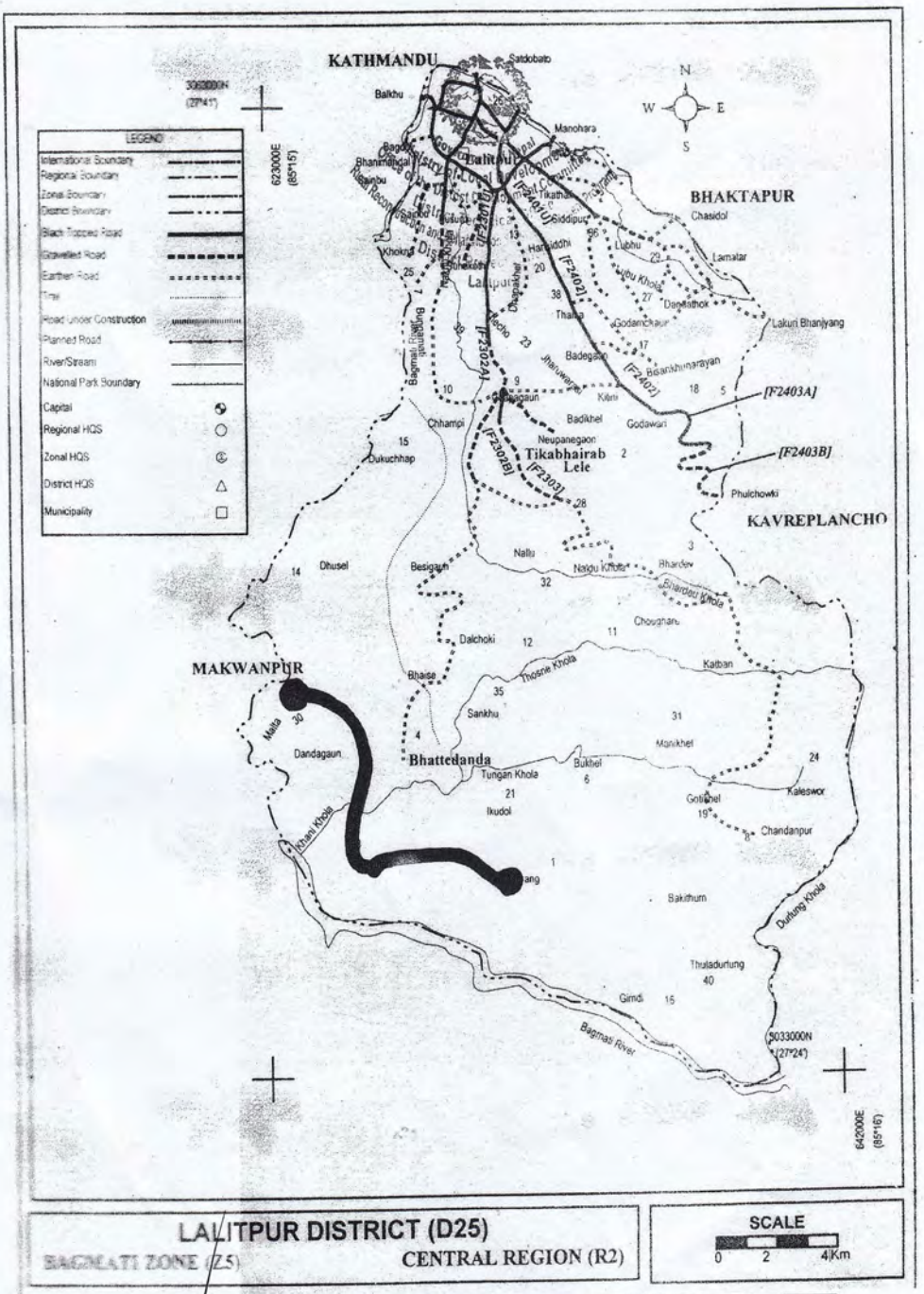
The DDCs is the Project Implementing Agencies at the district level. The DTO of each respective DDC is responsible for technical and Project management matters in the district. The DTO will be supported by the DIST which includes engineering, safeguards, and social mobilization staff.

GOEC Pvt. Ltd. is the District Implementation Support Team (DIST) for RRRSDP and has the responsibility of providing technical assistance in Lalitpur district.

This Terms of Reference (ToR) is prepared to conduct an IEE study of Baguwa- Pyutar – Ashrang road sub-project in Lalipur District.

2.2 Background of the sub-project

The proposed of Baguwa-Pyutar-Ashrang road sub-project lies in the Soth Eastern part of Lalitpur district of Middle Development region of Nepal. This sub-project starts from Malta VDC ward no 2 and ends at Tallo Ashrang of Asrang VDC. Major settlements along the road alignment are Baguwa, Gadhi Bhanjyang, Thasingtar, Pyutar, Khorang,



District Engineer

GOEC Nepal
Estd 1999
Kathmandu

Pandur
Bhatteḍāḍā
Mās Bhanjyāo
Yāspā
Khāmḍāḍā
Hāsibhir
Pahuṇḍāḍā
BHATTEDĀDA
Ghwmpāsalle
Bhisḍāḍā
KUDOL
Chillethumkā
Kalwān
Sānu Chille
Dhāribās
Thulo Chille
Salledāḍā
Salledāḍā
Baserini
Byun
Mājhkhaṇḍa
Chuwārekholā
Motithumkā
Mixed forest
Barkyūn
Pokharegāḍā
PYUTĀR
Kāshghāri
Māthillo Āsrān
ĀSRĀN
Bāudidāḍā
Beḍḍol
Dhandāḍā
Khairenī
Ghartidāḍā
Lukundāḍā
Tallo Āsrān
Syāuī
Khairenibosi
Lukni
Kerābāri
Mixed forest
Thumki
20
21
12
13
14
15
167000

Mixed forest
Baguwa
Dādāgāu
Kāule
Pāndur
Gothdādā
Yāspā
Kālche
Trikhandi
MĀLTĀ
BHATUEDĀDĀ
Bhākharichaur
Sāno Simle
Mixed forest
Salledādā
Thulo Simle
Gadhi Bhanjyān
Motithumkā
Mixed forest
Thānsiṭār
PYUTĀR
Khorān
Chaukiṭār
Dālinṭār
Pyuṭār
Kāshghāri
ĀPANCHAKANYĀ
Bāudādādā
Deurāli
Phurkedādā
Gangaṭe
Thāṭi
Khairenibesi
Khairenī
Tāmachaur
Chipleṭi
Kerābāri

Gharthok, Khyargahri, Dhandada, Lukle besi, Tallo Ashrang etc. Total length of the road alignment is 16.0 km.

The road starts from Baguwa of Malta VDC - 2. The raod section branches from Kanti Rajpath of Lalitpur District. The road section is approximately 60 km far from district headquarter of Lalitpur. Up to 1.00 km section, the road width is 4.5 m or more because of gabion wall construction at different sections. For the remaining length of the road, width is 4.0 m in general, but some sections of road are having 3.5m to 5.5 m width also. Almost all alignment of the road passes from upper valley to lower valley. Out of 16.00 km, approximately 0.5km long stretch is needed to be realigned for grade improvement of the road.

The people in this project area are having many types of transportation problems due to the steep topography. Local people have no access to the market centres of the district to fulfill their daily needs. Hence, the locally produced materials like Vegitables, Milk etc are getting low prices than it may fetch. Other development facilities are also far from the reach of people because it is very difficult to create a system like water supply, electricity, bio-gas plant and telephone without a road corridor. Having lots of transportation difficulties, people of the road corridors initiated to construct a road by using excavating machine through DDC from FY 062/063.

The rehabilitation of road will mainly enhance the transportation of Vegitables, Milk etc produced in remote areas of Pyutar and other VDCs and it will also extend physical and economical access to the people within the immediate zone of influence. For the road construction, use of local labour will generate immediate employment to local people and minimise migration to Kathmandu in search of work. Consequently, local people will get long-term benefit which will enhance their economic status within the ZoI of road corridor.

This road is identified as a priority road in the District Transport Master Plan (DTMP). Rehabilitation Of this road will provide physical and economical access to the people of south-eastern part of the district with district headquarter and other part of Nepal.

2.3 OBJECTIVES

The objectives of the proposed IEE study includes to:

- identify the major issues that may arise as a result of proposed works on bio-physical, socio-economic and cultural environment of the project area.
- recommend practical and site specific environmental mitigation and enhancement measures, prepare and implement environmental monitoring plan for the sub-project,
- make sure that IEE is sufficient for the proposed road sub-project, and
- Provide information on the general environmental setting of the sub-project area as baseline data.

2.4 RELEVANCY OF THE SUB-PROJECT

The proposed road will connect Baguwa, Gadhibhanjyang, Thasingtar, Pyutar, Khorang, Gharthok, Khairghari, Dhandada, Gathekhola, Lukle besi, Tallo Ashrang etc.with trails to

the Chapagaun of Lalitpur Municipality through Kanti - rajpath. This road starts from Baguwa of Kanti rajpath. Then the road runs towards north-east direction to uphill side through ridges of Mahabharat range. The end point of this rehabilitation section of road is Tallo Ashrang, which is near from *Vegetable collection* point. The end point of the road deserves the possibility of being market centre for Ashrang VDC.

An IEE of the proposed road is necessary in order to assess the environmental consequences of the proposed rural road construction activities and suggest appropriate, practical and site specific mitigation and enhancement measures. Since this is a district road, an IEE is a legal requirement according to Environmental Protection Act, 1997 (EPR, 1997) and Environmental Protection Rules, 1997 (EPR, 1997). Preparation of IEE report by concerned District Development Committee (DDC) and approval by the Ministry of Local Development (MLD) according to Nepali legal provision is considered sufficient by the ADB. However, rapid environmental assesment (REA) checklist will also be considered during IEE report preparation based on ADB Environmental Guideline.

3.0 REVIEW OF RELEVANT LAWS, RULES AND GUIDELINES

Government of Nepal has adopted various acts, regulations and guidelines to ensure the integration of development and conservation of environment. The IEE study will be guided by the requirements and provisions of the following acts, rules and guidelines as applicable.

- Environment Protection Act, 1997 and Environment Protection Rules, 1997 (amended 1999)
- Forest Act, 1993 and Forest Rules, 1995
- *Batabaraniya Nirdesika* (Nepal; MLD), 2057
- National Park and Wildlife Conservation Act, 1973
- Local Self Governance Act, 1999 and Local Self Governance Rules, 2000
- Land Acquisition Act, 1977 and Land Acquisition Rules, 1969
- National Environmental Impact Assessment Guidelines, 1993
- APPROACH for the Development of Agricultural and Rural Roads, 1999 (DoLIDAR)
- RRRSDP Environmental Assessment & Review Procedures (EARP) Guidelines, 2007
- REFERENCE MANUAL for Environmental and Social Aspects of Integrated Road Development, 2003, Department of Road.
- Green Roads in Nepal, Best Practices Report – An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions. GTZ, SDC, 1999.
- ADB Environmental Assessment Guidelines, 2003
- Three Years Interim Plan, 2007/08-2009/10

4.0 PROCEDURE TO BE ADOPTED WHILE PREPARING THE REPORT

The IEE approach, methodology and procedure should generally follow the provisions of the EPA and EPR. In this connection, following approach and methodology will be adopted during the IEE report preparation.

4.1 DESK REVIEW

The following steps will be followed during the desk review:

- Collection and review of secondary sources of information from various sources
- Initial interaction and consultation with the local community and district level stakeholders
- Delineation of geographical boundary of the Zone of Influence (ZoI) on the topographical map
- Preparation of project specific checklist

4.2 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

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

- Publication of notice- A public notice of 15 days will be published in a national level daily newspaper seeking written opinion from concerned VDCs, DDC, school, health posts and related local organizations. A copy of the public notice will be affixed in the above mentioned organizations and deed of enquiry (*muchulka*) will be collected.
- Recommendation letter from concerned VDCs and/or municipality will also be obtained.
- IEE team will also carryout interaction with local communities and related stakeholders and will also collect the public concerns and suggestions.
- Draft IEE report will be sent to concerned VDCs for information disclosure.
- The approved IEE report will be made accessible to interested parties and general public through information center of DDC and websites of ADB, DoLIDAR and RRRSDP.

4.3 FIELD WORK

The IEE team will walk through along the road alignment visiting the significant environmental features in the probable influence corridor, and make necessary measurements, inspect/observe and discuss it with the local stakeholders. The information collection will be made covering physical, biological, socio-economic and cultural aspects of the environment.

5.0 ALTERNATIVES FOR THE IMPLEMENTATION OF THE PROPOSAL

Alternative analysis has been considered as an integral part of IEE study, which involves an alternative ways of achieving the objectives of a proposed sub-project. The aim of alternative analysis is to arrive at a development option, which maximizes the benefits while minimizing the unwanted impacts.

The study team will conduct alternative analysis considering the following issues:

- No action option
- Project alternatives
- Alternative alignment
- Alternative design and construction approach
- Alternative schedule and process

Engineer

- Alternative resources

6.0 REQUIREMENT OF THE IEE STUDY

This includes time schedule, estimated budget and appropriate manpower (experts) for conducting IEE study.

6.1 TIME SCHEDULE

IEE report will be completed within eight weeks after the approval of ToR. An indicative time frame for conducting IEE is given in the **Table 1** below:

Table 1. Proposed work schedule for conducting IEE study

SN	Activities	Week							
		1	2	3	4	5	6	7	8
1	Orientation training to the team								
2	Desk study and review								
3	Public notice publication								
4	Field visit for survey and consultation with community								
5	Collection of suggestions and recommendations from stakeholders								
6	Analysis and interpretation								
7	Draft report preparation								
8	Comments on draft report								
9	Final Report preparation and submission								
10	Approval of the final report.								

6.2 ESTIMATED BUDGET AND STUDY TEAM

Most commonly an IEE of an infrastructure sub-project in the district need expert inputs from the following sectors:

- Landslides, slope stability, bio-engineering and erosion
- Forestry and wildlife
- Geology
- Road engineering
- Social, economic and culture.

The IEE will be carried out and prepared by DIST Environmental Specialist, with support form DIST team Lalitpur, Environmental Specialist from CISC and District Project Office (DPO). CISC Environmental Specialist will provide necessary training to DIST for the environmental assessment procedures. The activity of IEE preparation will be supervised by DPO office. Since, the IEE report will be prepared by the DIST team with the support of the CISC, no separate budget and manpower is required. However, specific subject matter experts will be hired for short term basis if needed.

7.0 ENVIRONMENTAL BASELINE

This will describe environmental setting of the project location and surrounding areas and will contain information on relevant bio-physical, socio-economic and cultural factors and features. The updated, processed and analyzed information and data on each of the relevant bio-physical, socio-economic and cultural aspects will be presented in the IEE study. As far as possible, other environmental features, such as sensitive area, population and settlements, forests, geological features will be shown in the map.

8.0 ANALYSIS AND INTERPRETATION

Both secondary and primary information and data collected will be analyzed and interpreted. The bio-physical information will be tabulated to the extent possible. The socio-economic, cultural and religious information will be cross checked and analyzed.

9.0 IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT

The identification and prediction of impacts shall be carried out by considering the proposed project actions/activities in terms of rehabilitation and construction of the road project. The impacts of the activities shall be on bio-physical, socio-economic and cultural resources in a defined zone of influence (i.e.1.5 hours walking distance from the road alignment or 5 km distance).

The impacts shall be classified in terms of extent (site specific, local and regional), magnitude (low, medium and high) and duration (short term, medium term and long term) as well as reversible, irreversible, severe, moderate and significant. The likely impact shall be assessed covering both adverse and beneficial ones. The methodology adopted for impact identification and prediction will be checklists and matrix method. The likely impacts of the proposed road construction as well as operation are described in the following sections.

9.1 BENEFICIAL IMPACTS

Beneficial impacts due to the construction of the road shall be assessed by the study team in terms of impacts on physical, biological, socioeconomic and cultural systems of the project area. The impacts shall also be assessed in the category of extent, duration and magnitude. Based on the identification and prediction of the impacts, the suitable enhance measures to maximize the project benefits shall be explored and designed. The largest beneficial impacts will be on the physical and socio-economic environment as given below:

9.1.1 Construction Stage

- Employment Generation and Increase in Income
- Skill Enhancement
- Enterprise Development and Business Promotion
- Community Empowerment and Ownership

9.1.2 Operation Stage

- Access to Inputs and Services
- Development of Market centers
- Appreciation of Land Value

- Increased Crop Productivity and Sale of Farm Products
- Enhancement of Community Development Services
- Promotion of Tourism Activity
- Women and Indigenous People Empowerment

9.2 ADVERSE IMPACTS

The likely adverse impacts during construction and subsequent operation and maintenance in terms of physical, biological, socioeconomic, cultural and religious aspects due to project actions shall be identified, predicted and evaluated. Based on the identified impacts, appropriate mitigation measures shall be recommended.

9.2.1 Construction Stage - Though the sub-projects will apply LEP approach to the extent possible during the implementation, it may not be possible to avoid all likely impacts; the study shall take into account the following issues:

Physical environment

The issues and concerns generally related to physical environment typically include, but not necessarily limited to:

- Change in Land Use
- Spoil Disposal
- Slope Instability
- Water Management works i.e. springs, streams, rain water (Drainage and Cross Drainage Works
- Air Dust, Noise and Water Pollution
- Quarrying and Borrow Pit
- Decline in Aesthetic Value

Biological environment

The issues and concerns generally related to biological environment typically include, but not necessarily limited to:

- Loss or degradation of forests and vegetation.
- Impact on wildlife including birds due to loss or degradation of habitat, increased hunting and other form of human pressure.
- Impacts on flora and fauna (as listed in CITES and IUCN Red data book)

Socio-economic and cultural environment

The issues and concerns generally related to socio-economic and cultural environment typically include, but not necessarily limited to;

- Loss or degradation of farm land and productivity
- Loss or degradation of private properties such as houses, farm sheds, and other structures, crops and fodder/ fruit trees
- Impact on community infrastructure such as irrigation, water supply, schools, health post, trail and trail bridges
- Impacts on cultural, religious and archeological sites
- Impacts on health and safety matters.

9.2.2 Operation stage - The following issues will be taken into account during operation and maintenance stage:

Physical environment

- Road slope stability and management
- Impact due to air, noise and water pollution

Biological environment

- Depletion of forest resources
- Disturbance to wild life and illegal hunting

Socio-economic and cultural environment

- New settlement along the road alignment
- Change in social behaviour
- Impact on livelihood and economic opportunities
- Road safety measures

10.0 BENEFIT AUGUMENTATION/MITIGATION MEASURES

The IEE study will propose site-specific benefit augumentatin and mitigation measures to optimize the benefits expected from the sub-project and minimize/mitigate avoid or control of proposal's adverse impacts. The benefit augumentation and mitigation measures will be selected based upon appropriateness and cost analysis and these will be suggested for pre-construction, construction and post construction phase of the project. Mitigation measures will be proposed for the impacts on physical, biological, socio-economic and cultural environment.

11.0 ENVIRONMENTAL MANAGEMENT PLAN

The study will ensure the implementation and monitoring of mitigation measures for minimizing adverse impacts and maximizing the beneficial impacts. This plan will also identify the key environmental monitoring indicators with respect to activities, methods and responsibilities in order to monitor the environmental condition and adoption of suitable mitigation measures.

12.0 IEE report format

This format will be in line with provision made in the Schedule 5 of EPR, 1997 and should be adapted to project specific situation. The IEE report will contain the following sections:

i. Cover page with name of the proposal and proponent and address

ii. Table of content

iii. List of Abbreviation (acronyms)

iv. Executive Summary that includes:

- Background
- Project Proponent
- Objective
- Relevancy of the Proposal
- Project Description
- Existing Condition
- Identification of Impacts and Benefit Augumentation/Mitigation Measures

Engineer

- Environmental Management Plan
- Conclusions and recommendations

v. Salient Features of the Project

vi. Introduction: This section should describe the project in simple terms and concisely, without missing relevant points but avoiding unnecessary details. The project description should provide following information:

1. Background
2. Relevancy of the proposal
   - Objectives
   - Methodology adopted
3. Name and Address of the Proponent
4. Description of the Sub-project
5. Construction Approach
6. Proposed Schedule for Implementation of Sub-project

vii. Public Cunsultation and Information Disclosure

viii. Review of Relevant Acts, Regulations and Guidelines: During the study relevant policies, legislations and guidelines should be reviewed and their salient features should be mentioned in this section. Similarly related institutions should be consulted.

ix. Existing Environmental condition: Baseline information on the existing physical, biological as well as socio-economic and cultural resources of the proposed sub-projects is described here. Environmental features such as sensitive areas, population and settlements, forests should be shown in a map

x. Project Alternatives: This section summarizes the alternatives by environmental comparison. This may include the following sub-headings.

a. Project alternative
b. Alternative routes
c. Alternative design and construction approach
d. Alternative schedule and process
e. Alternate resources
f. Any other alternatives

xi. Identification of Impacts and Benefit Augumentation/Mitigation Measures: This section contains the process, findings and conclusions of analysis and interpretations. The impacts are predicted in terms of their magnitude (minor, moderate and high), extent (site specific, local and regional) and duration (short, medium and long term) and appropriate benefit enhancement and mitigation measures are suggested as following:

a) **Physical Impacts**: such as land, air, water, noise, infrastructure impacts and other factors

b) **Biological Impacts**: such as flora, and fauna, population, and natural habitats and ecosystems

Engineer

c) **Socio-economic-cultural impacts**: such as agricultural land, human health, social, cultural and religious values, implications of physical and biological impacts and other relevant socio-cultural-economic impacts.

This section also summarizes the recommended mitigation measures including basis for selection and cost if possible.

xii. Environmental Management Plan: This section summarizes the recommended implementation of IEE, monitoring parameters/indicators, activities, methods and responsibilities.

xiii. Conclusion and Recommendations: This section should clearly indicate whether IEE report is sufficient or further assessment is needed. Likewise, it should also be recommended that what aspects should be covered if further environmental assessment is needed.

xiv. Miscellaneous: Reference materials should be mentioned here if used during IEE report preparation in standard format.

xv. **Annex**

- ToR of IEE
- Rapid Environmental Assessment (REA) Checklist
- Abstract of cost
- RRRSDP environmental checklist
- Public notice
- Deed of enquiry (*muchulka*)
- Name of the organizations
- List of person contacted
- Meeting minutes of community consultation
- Recommendation letters from municipality and VDC's
- Existing condtion
    - a. Distribution of household by major occupation
    - b. Summary of public services and infrastructures according to settlement
    - c. Land holding pattern of settlements within ZoI
    - d. Number of households belonging to different food security category
- List of trees
- Maximization of slope cutting and preservation of vegetation cover
- Photographs

Government of Nepal
Ministry of Local Development
Office of the District Development Committee
District Technical Office
Rural Reconstruction and Rehabilitation Sector Development Program
District Project Office
Lalitpur

GOEC Nepal
Est. 1992

Annex II: Rapid Environmental Assessment (REA) Checklist

Rapid Environmental Assessment (REA) Checklist

Instructions:

- This checklist is to be prepared to support the environmental classification of a project. It is to be attached to the environmental categorization form that is to be prepared and submitted to the Chief Compliance Officer of the Regional and Sustainable Development Department.
- This checklist is to be completed with the assistance of an Environment Specialist in a Regional Department.
- This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development.
- Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: Nepal / RRRSDP

Name of the sub Project: Baguwa-Pyutar-Asrang Road Sub-Project

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Sitting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		✓	
▪ Protected Area		✓	
▪ Wetland		✓	
▪ Mangrove		✓	
▪ Estuarine		✓	
▪ Buffer zone of protected area		✓	
▪ Special area for protecting biodiversity		✓	
B. Potential Environmental Impacts Will the Project cause…			
▪ Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		✓	
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?		✓	
▪ Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		✓	

SCREENING QUESTIONS	Yes	No	REMARKS
▪ Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		✓	
▪ Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?		✓	
▪ Noise and vibration due to blasting and other civil works? ▪ Dislocation or involuntary resettlement of people		✓	
▪ Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		✓	
▪ Hazardous driving conditions where construction interferes with pre-existing roads?		✓	
▪ Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		✓	
▪ Creation of temporary breeding habitats for mosquito vectors of disease?		✓	
▪ Dislocation and compulsory resettlement of people living in right-of-way?		✓	
▪ Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?		✓	
▪ Increased noise and air pollution resulting from traffic volume?		✓	
▪ Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?		✓	

Source: Field survey, 2010

Annex III: Abstract of Cost

Road:Baguwa-Pyutar-Aasrang Road
Chainage: 0+000 to 16+17

Item No.	Description of Works	Unit	Quantity	Rate (NRs.)	Amount (NRs.)
A	**General**				
1	Insurance of Works, equipments, contractor's workmen and employees and third party Insurance against damage to other persons and property	LS	1		1,000,000.00
2	Provide and maintain traffic safety, control measures and temporary diversion during construction as instructed by an engineer	LS	1	Item	500,000.00
3	Carrying out additional tests for material and workers as required and instructed by the engineer	PS	1	Item	100,000.00
4	Vehicle for supervision team (bike and four wheel)	PS			5,000,000.00
5	Relocation of services and dismelting as required and instructed by engineer	PS	1		1500000
6	Provision and maintenance of labor camps payable monthly in equal installments	LS	1		300,000.00
	Sub-Total				**8,400,000.00**
	For RBG Package				
7	Site Clearance Work (Including cutting of trees upto 30cm dia. Greath	Sq.m	3771.81	11.00	41,489.94
	Sob-Total				**41,489.94**
8	Excavation in Roadway, drain and foundation of structures in				
	Ordinary soil	m^3	3,165.08	137.50	435,199.18
	Hard soil	m^3	10,945.61	165.00	1,806,025.68
	Soft Rock	m^3	1,855.19	550.00	1020353.494
	Medium Rock	m^3	2,400.48	1,100.00	2,640,527.53
	Hard Rock	m^3	185.52	4,675.00	867,300.47
	Sub-Total				**6,769,406.36**
9	Backfilling and compaction	m^3	1,381.29	68.75	94,963.96
	Sub-Total				**94,963.96**
10	**Gabion works**				
	Assembling of gabion baskets and placing them in position including stretching, binding them together and tying down lids				
	Box size 2*1*1	m^3	204	49.50	10,098.00
	Box size 1.5*1*1	m^3	153	27.00	4,131.00
	Stone Packing in Gabion Crates Including quarrying and transportation from:				
	Box size 2*1*1	m^3	204	3,176.75	648,056.35
	Box size 1.5*1*1	m^3	153	1,786.92	273,398.77
	Dry stone Wall				

11	Stone masonry work for Dry wall	m^3	663	1,080.44	716,215.01
	Sub-Total				**1,651,899.12**
	Grand Total				**8,557,759.38**
	For Contractor Package				
12	**Site Clearance Work (Including cutting of trees upto 30cm dia. Greath**	Sq.m	16250.00	12.65	205,562.50
	Sob-Total				**205,562.50**
13	**Excavation in Roadway**				
	Ordinary soil	m^3	13,469.79	75.33	1,014,612.20
	Hard soil	m^3	34,094.90	92.58	3,156,335.68
	Soft Rock	m^3	8,233.60	205.95	1695746.695
	Medium Rock	m^3	5,032.05	713.00	3,587,852.23
	Hard Rock	m^3	608.90	2,179.25	1,326,954.92
	Sub-Total				**10,781,501.73**
14	**Backfilling and compaction**	m^3	5,749.04	79.06	454,533.71
	Sub-Total				**454,533.71**
15	**Excavation in drain and foundation of structures in**				
	Ordinary soil	m^3	2,814.51	158.13	445,044.98
	Hard soil	m^3	4,250.37	189.75	806,279.46
	Soft Rock	m^3	1,013.73	632.50	640899.9463
	Medium Rock	m^3	673.48	1,265.00	851,812.73
	Hard Rock	m^3	75.93	5,376.25	408,109.69
	Sub-Total				**3,152,146.80**
16	**Backfilling and compaction**	m^3	337.11	79.06	26,652.85
	Sub-Total				**26,652.85**
17	**Gabion works**				
	Assembling of gabion baskets and placing them in position including stretching, binding them together and tying down lids				
	Box size 2*1*1	m^3	1,536.00	186.61	286,631.22
	Box size 1.5*1*1	m^3	1,831.50	139.96	256,330.61
	Sub-Total				**542,961.83**
	Stone Packing in Gabion Crates Including quarrying and transportation from:				

	Box size 2*1*1	m^3	1,536.00	3,760.33	5,775,864.45
	Box size 1.5*1*1	m^3	1,831.50	2,115.18	3,873,960.84
	Sub-Total				**9,649,825.30**
	Fabrication of gabion boxes including rolling, cutting, weaving and supply to the site (Hexagonal Mesh Size: 100mm*120mm, selvedge wire-7swg, mesh wire-10 swg & binding wire-12 swg, all heavy coated)				
	Box size 2*1*1	m^3	1740.00	2917.24	5,075,992.12
	Box size 1.5*1*1	m^3	1984.50	2098.61	4,164,688.80
	Sub-Total				**9,240,680.93**
18	**Drain works**				
	Stone Masonry work in (1:4) in Drain work along the road	Cum.	1750.34	4185.80	7,326,561.08
	Stone soling work in drain foundation	Cum.	2618.08	1088.59	2,850,022.20
	Sub-Total				**10,176,583.28**
19	**Drain cover for settlement area (total 120nos.)**				
	PCC for RCC(1:2:4)	Cum.	6.00	2599.41	15,596.48
	form work	sq.m	42.00	279.74	11,748.98
	Steel	Kg	704.00	77.70	54,698.61
	Sub-Total				**82,044.07**
20	**Dry stone Wall**				
	Stone masonry work for Dry wall	m^3	1,928.64	1,269.27	2,447,962.86
	Sub-Total				**2,447,962.86**
21	**Hum Pipe**				
	Earthwork excavation in foundation	m^3	176.40	189.75	33,471.90
	PCC in (1:3:6)	m^3	20.48	2,543.71	52,082.53
	Stone masonary work(1:4)	m^3	142.71	4,185.80	597,364.18
	Granular material on beding	m^3	78.75	42.72	3,364.11
	Back filling work	m^3	412.15	79.06	32,585.95
	Laying, Fitting, and Fixing of Hume Pipe with Trasportation at Site,with all complete Work for 60cm Dia	Rm.	187.50	4,134.88	775,290.54
	Sub-Total				**1,494,159.21**
22	**RCC Causeway**				
	15cm thick 1:2:4 PCC	Cum.	33.60	2,599.41	87,340.31
	Dry stone solling work for foundation	Cum.	33.60	1,090.62	36,644.95
	Reinforcement	MT	1.85	77,696.89	143,453.32
	Local wood form	Sqm.	4.40	279.74	1,230.85
	Earth Work in excavation (HS)	Cum.	33.60	189.75	6,375.60
	Sub-Total				**275,045.03**

23	**Stone pitching**				
	Excavation in Hard soil	Cum.	96.00	189.75	18,216.00
	20 cm thick stone pitching on the prepared bedding including supply of stone and river spalls for sealing of voids	Cum.	96.00	1,088.59	104,504.86
	Sub-Total				**122,720.86**
24	**Pavement Work**				
	Subgrade preparation work	sq.m	64,069.80	31.63	2,026,207.43
	15 cm thick gravelling work (63mm down)	Cum.	9,610.47	1,362.19	13,091,329.86
	Sub-Total				**15,117,537.28**
	Total				**72,169,918.23**
	Total of RBIC and Contractor				**80,727,677.61**
	For Bio-engineering				2,421,830.33
					83,149,507.94
	Tools for RBG				**1,500,000.00**
	Total				**84,649,507.94**
	13% VAT excluding				**9,891,927.31**
	Total				**94,541,435.25**
	Contingencies @ 5% of (N) Total				**4,299,183.79**
	Total				**98,840,619.05**
	Total per km				**6,170,808.65**

Project : Khani Khola Steel Truss Bridge (45 m Span)							
S.N.	**SPEC REF.**	**Description of Items**	**Unit**	**Quantity**	**Rate (NRs.)**	**Amount**	**Remarks**
A		General items					
A.1	GCC 13	Insurance of works, equipment, Contractor's workmen and employees and Third party Insurance against damage to other persons and property.	PS	1	350000	350000	
A.2		Provision and maintenance of labor camps payable monthly in equal installments.	LS	1	50000	50000	
A.3	SSP100	Supply and place standard size sign board for contract information.(1500)	no	2	8,000.00	16000	
A.4	SSP100	Supply and place standard size sign board for permanent bridge information.(1500)	no	2	6,000.00	12000	
A.5	SSP100	Photography of bridge site	LS	1	15,000.00	15000	
A.6	SSP500	Carry out additional tests for materials and works as required and instructed by the engineer	PS	1	50,000.00	50000	
A.7	SSP100	Preparation of as Built Drawings of the Bridge with digital Photographs specified in the special Provision of the Contract	LS	1	100,000.00	100000	
A.8	SSP100	Establishment of temporary site office during construction for the technical staff assign by office as per special Provision to the Standard Specifications	PS	1	200,000.00	200000	

A.9	SSP1500	Supply and place Delineater posts	No	20	900.00	18000	
A.10	Special 100	Providing and maintaining one four wheel Supervision vehicle as per Special Provision of the Contract with all necessary commodities, driver, fuel and lubricants etc	days	365	4,000.00	1460000	
A.11	Special 100	Providing and maintaining one Supervision Motor bike as per Special Provision of the Contract with all necessary commodities, fuel and lubricants etc	days	365	560.00	204400	
	Sub Total of A.					2,475,400.00	
B		Bridge					
B.1	SSP 900	Earthwork in foundation excavation of abutments up to a depth of 4m in all type of soil materials (inclusive of boulder mixed soil) including disposal of excavated material at approved environmentally safe tipping sites.	m^3	409.89	814.35	333,793.9	
B.2	SSP 2000	Providing and placing machine mixed M15 cement concrete for the foundation as a levelling course etc. including compaction, curing, testing and lead 30m. etc. all complete as per specification and drawing.	m^3	11.24	7,805.03	87,728.5	
B.3	SSP 2000	Providing and placing machine mixed M20 cement concrete for the foundation, footing and approach slab etc. including compaction, curing, testing and lead 30m. etc. all complete as per specification and drawing.	m^3	224.11	8,743.83	1,959,579.7	
B.4	SSP2000	Providing and placing machine mixed M25 cement concrete for the super structure, deckslab, etc. including compaction, curing, testing and lead 30m. etc. all complete as per specification and drawing.	m^3	62.98	10,462.06	658,900.5	
B.5	SSP 2000	Providing and laying Reinforcement including cutting, bending, binding, fixing in position and lead 30m. etc. all complete as per specification and drawing.	mt	22.56	94,404.42	2,129,763.7	
B.6	SSP 1800	Providing , Preparing and Installing form work including necessary supports and removing after completion for foundation and footings.	m^2	350.65	350.84	123,022.0	
B.7	SSP 900	Backfilling behind abutments by sand and gravel spreading layers including sprinkling water and compaction with haulage 10m inlcuding all transports	m^3	34.80	1,073.53	37,358.8	
B.8	SSP600	Supply and place geotextile behind the abutments and wing walls	m2	69.60	350.38	24,386.4	
B.9	SSP900	Dewatering works all complete	LS	1.00	100,000.00	100,000.0	
B.10	SSP1800	Providing and assembling in position form works and falsework for the construction of RCC superstrcture and removing after completion including design & drawings as per specification.	m^2	296.96	1,038.63	308,431.6	
B.11	SSP1900	Supply and place expansion joints; all complete as per drawings	rm	9.40	31,625.00	297,275.0	

B.12	SSP1900	Supply and place rocker (two) and roller (two) steel bearings; all complete as per drawings	nos	4.00	100,000.00	400,000.0	
B.13	SSP3105	Supplying and fixing 50 mm G.I. pipe railing with necessary fittings.	rm	91.60	1,325.10	121,379.2	
B.14	SSP700	Supply and fixing 100mm G.I. Pipe, medium class for drainage spout necessary accessory as per drawing including all transports.	nos	20.00	5,075.73	101,514.6	
B.15		Preparation of shop drawings as per drawings and specifications	Kg	99113.40	1	99,113.4	
B.16	SSP2200	Supply, fabrication, of structural steel (IS-226 &I S2062 with yield stress; fy = 250 N/mm2)work for 45 long span Pratt Truss Bridge as per drawings and specifications	kg	99113.40	107.54	10,658,655.0	
B.17	SSP2200	Galvanization of fabricated structural steel member as per specification.	Kg	99113.40	55	5,451,237.0	
B.18	SSP2200	Supply of required size of hot dip galvanized nuts and bolts of 8.8 grade along with flat and tapered washer as per requirement	kg	3360.64	280	940,979.2	
B.19		Transportation of steel members and nut bolts to the bridge site	Kg	102474.04	9.055	927,902.4	
B.20	SSP2200	Erection of steel members and nut bolts at site according to drawings and specification.	Rm	45	31600	1,422,000.0	
		Sub Total of B.				26,183,020.9	
C		Approach Road and bank protection works					
C.1	SSP900	Formation of embankment including compaction in layers not exceeding 150mm. Compacted depth, watering and haulage 10m. etc. all complete as per specification.	m^3	1039.09	450.4	468,006.1	
C.2	SSP900	Earthwork excavation in Road way, drain and trenches including shoring, struting, bracing, sheeting and disposal upto 10 m and lift upto 1.5 m etc. all complete as per specification	m3	1491.89	325.7	485,908.6	
C.3	SSP900	Earthwork excavation of foundation for drain and trenches including shoring, struting, bracing, sheeting and disposal upto 10 m and lift upto 1.5 m etc. all complete as per specification	m3	213.75	488.6	104,438.3	
C.4	SSP1200	Providing, laying, spreading, watering, levelling and compaction of natural sand gravel sub base grading as per table 12.1 of standard specification for Road and bridge work	m^3	170.40	1,522.0	259,348.8	
C.5	SSP2800	Providing and placing grass turfing including watering and spreading chemical manure.	m^2	426.00	139.40	59,384.4	
C.6	SSP2600	Providing and laying Random rubble stone masonry in cement mortar [cement(1) : sand(4)] including scaffolding, curing, preparation of mortar etc. all complete.	m3	111.60	5,650.33	630,576.8	
C.7	SSP3109	160 mm dia HDP pipes for weep holes for protection walls	rm	60.00	840.31	50,418.6	

C.8	SSP2800	Supply,Fabrication of hexagonal mesh type 100mm x 120 mm Gabion boxes(3*1*1),(2*1*1),(2*1*.5) and (1*1*1) / mattresses with diapharagms, with binding wire 12 swg, mesh wire 10 swg and selvedged wire 7 swg , including rolling, cutting and weaving ; assembling Gabion boxes mattresses, palcing in position and providing in filling stone/boulder etc. including dressing, bending and bonding all complete .	cum	340.00	3,505.72	1,191,944.8	
C.9	SSP2801	Back filling in layers by suitable excavated material behind the bank protection walls.	cum	150.00	371.34	55,701.0	
			Sub Total of C.			3,305,727.40	
					Total(A+B+C)	31,964,148.30	
		Provision for price escalation @ 10% of Total				3,196,414.83	
		VAT @ 13%				4,155,339.28	
		Contingencies @ 5% of Total				1,598,207.42	
		Grand Total(Including VAT)				*40,914,109.83*	

Annex IV: RRRSDP Environmental Field Checklist

A. GENERAL SOCIO-ECONOMIC SITUATION OF THE INFLUENCE AREA[2]

1. Overview of settlements in the zone of influence (ZoI) area

VDC	Name of Settlement	Household and Population	Caste/ethnic distribution	General Comment

* Use the same codes as in strip map and topographical map.

2. Economic activities/main occupation

VDC	Settlement	Number of HH and Percentage of Population engaged in					
		Agriculture & Livestock	Labor & Porter	Business/ Commerce	Cottage Industry	GO/NGO Employees	Others (specify)

3. Existing services and infrastructures

S N	Service/Infrastructure Category	Settlement Code											
		A	B	C	D	E	F	G	H	I			
1	**EDUCATION**												
1.1	Campus (no.)/Higher secondary Students (no.)												
1.2	High School (no.)/ Lower secondary Students (no.)												
1.3	Primary School (no.) Students (no.)												
2	**HEALTH**												
2.1	Hospital/health centre (no)Capacity (beds)												
2.2	Health Post (no.) Sub-Health Post (no.)												
3	**COMMUNICATION**												
3.1	Telephone/fax												
3.2	Mobile/CDMA												
3.3	Post Office												
4	**ELECTRICITY SUPPLY**												
4.1	from Micro-hydro												
4.2	from Mini-hydro												
4.3	from National Grid												
4.4	from Solar System												
5	from Diesel Generator												
5	**BUSINESS & COMMERCE**												
5.1	Hotels & Lodges (no.)												
5.2	Restaurant & Tea Stall (no)												
5.3	Grocery Shops (no.)												
5.4	Other Shops (no.) (e.g. stationery,												

S N	Service/Infrastructure Category	Settlement Code											
		A	B	C	D	E	F	G	H	I			
	medicine, tailoring, etc.)												
6	**DRINKING WATER SUPPLY SCHEMES**												
6.1	Gravity-Flow Scheme (capacity)												
6.2	Tube-wells (no.)												
6.3	Spring/Dug-wells (no.)												
7	**IRRIGATION SCHEMES**												
7.1	Surface Irrigation (ha.)												
7.2	Groundwater (ha.)												
8	**OTHER INFRASTRUCTURES**												
8.1	Micro-hydro scheme (no. & capacity.....kw)												
8.2	Water Mill (no.)												
8.3	Suspension Bridges (no.)												
8.4	Wooden Bridges (no.)												
8.5	Other Bridges (specify)												
9	**INDUSTRY**												
9.1	Weaving Industry (no.)												
9.2	Rice & flour Mills (no.)												
9.3	Other Industries (specify)												
10	**FINANCIAL INSTITUTIONS**												
10.1	Bank (no.)												
10.2	Cooperative												
11	COMMUNITY USE												
11.1	Ghat (no.)												
11.2	Hatia/Bazaar (no.)												
11.3	Playground (no.)												
11.4	Community Centre (no.)												
11.5	Others (specify)												

4. Land holding pattern

Land holding Pattern	Settlement Code (HH No.)												Remarks
	A (19)	B (46)	C (45)	D (94)	E (97)	F (78)	G (72)	H (21)	I (18)				
Landless													
< 1 ropani													
1 to 5 ropani													
5 to 10 ropani													
10 to 20 ropani													
20-50 ropani													
> 50 ropani													

7 Food grain availability

SN	VDC	Settlement	Number of HHs having food sufficiency for					Total HHs
			Surplus (Sufficient for > 12 months)	Sufficient for whole years	Sufficient for 6 months	Sufficient for 3 months	Hand to mouth existence	
2								
3								

Source: field survey, 2009

8 Major existing agriculture production (denotes the most dominant by 1, second dominant by 2 and so on).

S. No.	Type of Agriculture Production	Settlements									
		A	B	C	D	E	F	G	H	I	
1.0	**CEREALS**										
1.1	Rice										
1.2	Wheat										
1.3	Maize										
1.4	Millet										
1.5	Junelo										
1.6	Phaper										
1.7	Others (list)										
2.0	**CASH CROPS**										
2.1	Oil Seeds										
2.2	Beans/Dal										
2.3	Tobacco										
2.4	Potato										
2.5	Vegetables										
2.6	Fruits										
2.7	Tea/Coffee										
2.8	Amliso										
2.9	Sericulture										
2.10	Others (list)										
3.0	**LIVESTOCK & FISHERIES**										
3.1	Cattle (cows & buffaloes)										
3.2	Horses, Mules										
3.3	Yak										
3.4	Goat										
3.5	Sheep										
3.6	Rabbit										
3.7	Pig										
3.8	Fisheries										
3.9	Poultry										
3.10	Bee-keeping										
3.11	Others										

7. Migration for employment

(a) No. of HHs from where at least one person (may be HH head) is away from home for more than 6 months. Also mention the place.

Settlement (No. of HH)									
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**

Name of settlement:

(b) Seasonal migration in search of work.

Month	No. of Total HH	Destination	Purpose
Baisakh			
Jestha			
Ashad			
Shrawan			
Bhadra			
Ashwin			
Kartik			
Marga			
Poush			
Magh			
Falgun			
Chaitra			

9. Dominant off-farm occupation in the settlement in descending order

B. DEVELOPMENT POTENTIAL ACCORDING TO SETTLEMENT

B.1. Areas which have significant potential for development, for instance, high agricultural production, tourism development, local mines, etc. (indicate these areas in map/sketch).

S. N.	Name of Area	Description of Development Potential
1	Upradang gadhi	Tourism
2		

B.2. Scope of the proposed linkage in view of promoting socio-economic development (communication, agricultural production, education and health).

S.N.	Sectors to get direct benefit	Describe how it will benefit
1	Agriculture production	
2		

C. HISTORIC AND CULTURAL RESOURCES WITHIN THE SETTLEMENT

Type of Resource	Name/specification	Affecting activities	Location from project
Temples			
Monuments			

Annex V: Public Notice

नेपाल सरकार
स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
जिल्ला प्राविधिक कार्यालय
ग्रामीण पुननिर्माण तथा पुनस्थापना आयोजना
जिल्ला आयोजना कार्यालय, ललितपुर

नयाँ सूचना
२०६६।२।११

प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावका लागि सार्वजनिक सूचना

(सुचना प्रकासित मितिः २०६६/०२/११)

यस जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, ग्रामीण पुननिर्माण तथा पुनस्थापना आयोजना, जिल्ल आयोजना कार्यालय ललितपुरद्धारा निर्माण गर्न प्रस्ताव गरिएका निम्न सडकहरुको प्रारम्भिक वातावरणीय परीक्षण (IEE प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४(पहिलो संसोधन २०५५ समेत) को निय ७२(२) अनुसार यो सार्वजनिक सुचना प्रकासित गरिएको छ।

प्रस्तावकको नामः जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय ललितपूर

सि.नं.	आयोजनाको नामः	आयोजनाले प्रभावित पार्ने गा.वि.स.हरु
१.	बगुवा प्युटार आस्राङ्ग ठाटी भञ्ज्याङ्ग सडक	माल्टा,प्युटार,आस्राङ्ग,गिम्दी,ठुलादुर्लुङ्ग
२.	दलचोकी शंखु ईकुडोल सडक	दलचोकी,शंखु,ईकुडोल
३.	लेले चन्दनपुर सडक (भारदेव चन्दनपुर खण्ड)	भारदेव,चौघरे,मानिखेल,गोटीखेल,कालेश्वर,बुखेल,ठुलादुर्लुङ्ग, पिम्दी, श

उक्त प्रस्तावको कार्यान्वयनबाट वातावरणमा पर्न सक्ने प्रभावका बारेमा सम्बन्धित गा.वि.स.,विद्यालय, स्वास्थ्य चौ वन उपभोक्ता समिति तथा अन्य सरोकारवाला व्यक्ति वा संस्थाले यो सुचना प्रकाशित भएको मितिले १५(पन्ध्र) दि भित्र निम्न ठेगानामा आफ्नो राय सुझाव पठाई सहयोग गरी दिनु हुन अनुरोध गरिन्छ।

राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय मानभवन, ललितपुर फोन न ५५२३४१० फ्याक्स ५५३३२१५	**जिल्ला प्राविधिक कार्यालय, ललितपूर** फोन नं ५५५१६३७ ईमेल: dtolalitpur@rrr.gov.np

Annex VI – Deed of Enquiry(*Muchulka*)

नेपाल सरकार
स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
गाउँबिकास समितिको कार्यालय, माल्टा
ललितपुर

च.नं.- ५५
प.सं.-०६५/०६६

मिति: ०६६/०५/१२

श्री जिल्ला प्राविधिक कार्यालय,
ग्रामीण पुनः निर्माण पुनःस्थापना कार्यक्रम
ललितपुर

विषय: सार्वजनिक सुनुवा रोक गरिएको सम्बन्धमा

उपरोक्त सम्बन्धमा ग्रा.पु.पु.प्रा. कार्यालयको DIST ललितपुर बाट खटी आएका कर्मचारी श्री निरुता श्रेष्ठले प्रारम्भिक वातावरणीय परिक्षण सम्बन्धी राय सुझाव दिनुभएपछि प्रकाशित सार्वजनिक सुनुवा यस कार्यालयमा मेरो सेहवमा रोक गरिएको व्यहोरा जानकारी गराउछु।

.....
गा.बि.स. सचिव

नेपाल सरकार
स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
गाउँबिकास समितिको कार्यालय, प्युटाँर
ललितपुर

च.नं.:-
प.सं.:-०६५/०६६

मिति ०६६/०५/१४

श्री जिल्ला प्राविधिक कार्यालय,
ग्रामीण पुन: निर्माण पुन: स्थापना अयोजना
ललितपुर

विषय: सार्वजनिक सुचना टाँस गरिएको सम्बन्धम

उपरोक्त सम्बन्धमा ग्रा. पु. पु. आ. कार्यालयको DIST ललितपुर बाट खटी आएका कर्मचारी श्री मिङमा शेर्पाले प्रारम्भीक वातावरणीय परिक्षण सम्बन्धी राय सुझावका लागी प्रकाशित सर्वजानिक सुचना यस कार्यालयमा मेरो रोहवरमा टाँस गरिएको व्यहोरा जानकारी गराउदछु /

गा.बि.स. सचिव

नेपाल सरकार
स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
गाउँबिकास समितिको कार्यालय, आथ्राड.
ललितपुर

गाउँ विकास समितिको कार्यालय
आथ्राड, ललितपुर
२०४७

च.नं.-_____
प.सं.-०६५/०६६

मिति :- २०६६/०५/१६

श्री जिल्ला प्राविधिक कार्यलय
ग्रामिण पुर्ननिर्माण तथा पुर्नस्थापना आयोजना
ललितपुर

बिषय :- सार्वजनिक सुचना टाँस गरिएको सम्बन्धमा ।

उपरोक्त सम्बन्धमा ग्रामिण पुर्ननिर्माण तथा पुर्नस्थापना आयोजना कार्यलयको ठाडा ललितपुरबाट खटि आएको कर्मचारी श्री राम प्रसाद सुवेदी ले प्रारम्भिक वातावरणिय परिक्षण राय सुझावका लागि प्रकासित सार्वजनिक सुचना यस कार्यलयमा मेरो रोहबरमा टाँस गरिएको व्यहोरा जानकारी गराउन चाहन्छु ।

गा.बि.स. सचिव

Annex VII - Name of the organizations

Name of the Organizations (notice pasted and deed of inquiry obtained)

SN	Name or Organization	Address	Remarks
1	Community Building in Baguwa Settlement	Malta	
2	Saraswati Temple in Pyutar Settlement	Pyutar	
3	Gadhibhanjyang Primary school, Gadhibhanjyang	Pyutar	
4.	Community Building in Ashrang Settlement	Ashrang	
5	Kalidevi Higher secondary school, Pyutar	Pyutar	
6.	Balkanya Primary School, Ashrang	Ashrang	

List of persons consulted

SN	Name	Designation	Address(VDC)
1	Krishna Tamang	Business man	Malta
2	Gopal Tamang	Farmer	Malta
3	Purna Chandara Tamang	Business man	Malta
4	Dhana Bahadur Lama	Farmer	Malta
5	Sita Maya lama	House wife	Malta
6	Indu lama	Teacher	Malta
7	Som maya tamang	Student	Malta
8	Damber Ghimire	Social worker	Pyutar
9	Manju ghimire	Studentnt	Pyutar
10	Jamuna ghimire	Student	Pyutar
11	Basant lama	Farmer	Pyutar
12	Thakur Ghimire	Social worjer	Asrang
13	Dhan Kumar Lama	House wife	Asrang
14	Bhuwan Sign Lama	Bussiness	Asrang

Source: Field Survey, 2009

Annex VIII - Meeting minutes

आज मिति २०६६ साल माह १२ गते का दिन बुधवार मालश जा०वि०स० को बुधवा बजारका ग्रामीण पुनःनिर्माण तथा पुनःस्थापना आयोजना (RRRSDP) को बुधवा-पुथा आकाङ्क्षा सडक खण्ड-आयोजनाको छुट्टा तथा स्तरोन्नतिका लागी श्री राम बहादुर बमजन को अध्यक्षतामा बैठक बसी तपसिल बमोजिमका व्यक्तिहरुको उपस्थितिमा सामुहिक छलफल गरी निर्णय गरियो ।

उपस्थिती

क्र.सं.	सहभागीको नाम	हस्ताक्षर
१.	राम ब० बमजन	
२.	जयराज तिमलसेना	
३.	कृष्ण पाण्डेय	
४.	केदारमान गुरुङ	
५.	विजय कु. लो.	
६.	आस्थामाया वि.क.	
७.	अर्मिला घिंड.	
८.	शाकुरमान लामा	
९.	राजु घिसिङ	

छलफलका विषय र प्रस्तावहरु

१. आयोजनाको बारेमा जानकारी
२. वातावरणीय प्रभावको सम्बन्धमा

निर्णय हरु:

१. प्रस्ताव नं. १ माथि विस्तृत तथा दृष्टिकोण - छलफल गर्दा RRLSDP को कार्यक्रम को बारेमा कार्यालयको कार्यालय DIST और कार्यक्रम Environment, Social, Resettlement and Technical Team को कार्यक्रमको विषय तथा मिति सम्बन्धी जानकारी दिए बैठकमा उपस्थित सबैले कार्यालय को सम्बन्धमा जानकारी भएको निर्णय गरियो।

२. प्रस्ताव नं. २ माथि छलफल गर्दा सडक निर्माणका क्रममा देखिएका वातावरणलाई प्रभाव पर्ने गरि कुनैपनि कार्य गरिने छैन। यदि प्रभाव पर्ने भएमापनि अत्यन्त न्यून प्रभाव पर्ने गरि कार्य गर्ने निर्णय गरियो।

आज मिति २०८०/भाद्र १४ गतेका दिन यस प्युठान गा.वि.स. को प्युठान बजारमा ग्रामीण पुन निर्माण तथा पुनस्थापना कार्यक्रम (RRRDP) अन्तर्गत पशुवा - प्युठान - आशाडांड सडक उप-आयोजनाको सुधार तथा स्तरोन्नतीका लागी गाउँस्तरीय स्वीकृत निर्माण समन्वय समितिको उपाध्यक्ष श्री सोना लामा ज्यूको अध्यक्षता बैठक बसी तपसिल बमोजिमको उपस्थितीमा सामूहिक छलफल गरी निर्णय गरियो।

उपस्थिति

१- सोना लामा
२- इन्द्र कन्धलान
३- दुलीमाया घोले
४- बिजुली नेपाली
५- रामभाया घले
६- ठाकुर लामा
७- भानु किमिरे
८- राकेश लामा
९- प्रविन किमिरे
१०- रोहित लामाछ
११- सरोज नेपाली
१२- आकाश घले
१३- सुदेश किमिरे
१४- अन्जान लामा
१५- बृजेश किमिरे
१६- हरि नेपाली
१७- श्याम यादव
१८- मनोज कु. शाह
१९- देवेन्द्र यादव

प्रस्तावहरु

१- आयोजनाको बारे जानकारी सम्बन्धमा।
२- वातावरणीय प्रभावको सम्बन्धमा।

निर्णयहरु

१- प्रस्ताव नं १ माथी छलफल गर्दा RRRSDP को कार्यक्रम को बारेमा आयोजना कार्यालय DIST बाट अएका वातावरणीय विज्ञ तथा प्राविधिक टीमले आयोजना निर्माण लै पार्नसक्ने प्रभाव तथा वातावरणीय नकारात्मक प्रभाव न्यूनगर्न आयोजनाले अंगालेको विधि तथा नीति सम्बन्धमा जानकारी दिई हामी बैठकमा उपस्थित सबैलाई आयोजनाको समग्र पक्षको बारेमा जानकारी गराएको निर्णय गरियो।

२- प्रस्ताव नं २ माथी छलफलगर्दा आयोजना संचालन गर्ने समयमा संकटापन्न वातावरणमा नकारात्मक असर नपर्ने विधि अवलम्बन गर्ने तथा यदि प्रभाव पर्ने परिस्थिती देखिएमा त्यसको रोकथाम तथा न्यूनिकरण गरि कार्य गर्ने निर्णय गरियो।

आज मिति २०६६ भाद्र १६ गतेका दिन चार आषाढ़ गा.वि.स. को आषाढ़ बजार मा ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना कार्यक्रम (RRRSTP) को कडुवा स्थुपार आषाढ़ उप-आयोजना को सुधार तथा स्तरोन्नतिको लागि लोक प्रसाद संगेल को अध्यक्षतामा बैठक बसी निम्न उपस्थितीमा निर्णय गरियो।

उपस्थिति

क्र.सं	सहभागिको नाम	हस्ताक्षर
१.	लोक प्रसाद संगेल	
२.	सरस्वती गोतम	
३.	पुतली गोतम	
४.	कान्छि माया भुलन	
५.	लाल माया घिमिरे	
६.	रासिबे घिमिरे	
७.	मनोज घिमिरे	
८.	रोहित भुलन	
९.	तमराज गोतम	
१०.	काली नेपाली	
११.	राधा भुलन	
१२.	सुनिता गोतम	
१३.	रमेश संगेल	
१४.	कुमार लामा	
१५.	मनोज कुमार आंछा	
१६.	श्याम कुमार यादव	
१७.	नरेन्द्र कुमार राई	

प्रस्तावहरू

१. आयोजनाको बारे जानकारी सम्बन्धमा
२. वातावरणीय प्रभाव सम्बन्धमा

निर्णयहरू

१. प्रस्ताव नं. १ माथि छलफल गर्दा RRRSDP को कार्यक्रमको बारेमा आयोजनाको कार्यक्रम DIST बाट आएका Social Resettlement, Technical Team ले कार्यक्रमको सिमा तथा मिति सम्बन्धी जानकारी दिंदा बैठकमा उपस्थिती सबैले आ-आफ्नो योजनाको सम्बन्धमा जानकारी भएको निर्णय गरियो।

२. प्रस्ताव नं २ माथि छलफल गर्दा सडक निर्माणको क्रममा सकेसम्म वातावरणलाई प्रभाव पर्न नदि कुनै पनि कार्य गरिने छैन। यदि प्रभाव पर्न भएमा पनि अत्यान्त न्यून प्रभाव पर्ने गरि कार्य गर्ने निर्णय गरियो।

Annex IX - Recommendation and Suggestion

नेपाल सरकार
स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
गाउँबिकास समितिको कार्यालय, माल्टा
ललितपुर

च.नं.- ४४
प.सं.-०६५/०६६

मिति: २०६६/०४/१२

विषय:- सिफारिस पठाईएको वारे ।

श्री ग्रामीण पुनिर्माण तथा पुनर्स्थापना कार्यक्रम
जिल्ला आयोजना कार्यालय
ललितपुर

उपरोक्त सम्वन्धमा जिल्ला विकास समितिको कार्यालय तथा जिल्ला प्राबिधिक कार्यालय अर्न्तगत संञ्चालित ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना कार्यक्रम ललितपुर द्वारा संचालित उप-आयोजना वगुवा-प्युटार-आश्राङ्ग सडक खण्डको मिति २०६५।०५। ११ गतेका दिन नयाँ पत्रिकामा प्रकाशित प्रारम्भिक वातावरणीय परिक्षण सम्बन्धि सूचनाको एक प्रति यस गा बि.स. मा राय सुझावका लागी टाँस गरिएको र वाताबरणीय रुपमा पर्नसक्ने असर सम्बन्धि कुनै पनि गुनासोहरु प्राप्त नभएको हुदा सो सडकको निर्माण कार्यबाट यस गाउँ विकास समिति मा कुनै प्रकारको नकारात्मक प्रभाव नपर्ने व्यहोरा सिफारिस साथ अनुरोध गरिन्छ ।

.....
गा.बि.स. सचिव

नेपाल सरकार
स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
गाउँबिकास समितिको कार्यालय, प्युटाँर
ललितपुर

गाउँ विकास समितिको कार्यालय
प्युटार, ललितपुर
२०४७

च.नं.-_____
प.सं.-.०६५/०६६

मिति: २०६६/०४/१२

विषयः- सिफारिस पठाईएको वारे ।

श्री ग्रामीण पुनिर्माण तथा पुनर्स्थापना कार्यक्रम
जिल्ला आयोजना कार्यालय
ललितपु

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याद
गा.वि.स. सचिव/अध्यक्ष

गा.बि.स. सचिव

नेपाल सरकार
स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
गाउँबिकास समितिको कार्यालय, आथ्राड.
ललितपुर

गाउँ विकास समितिको कार्यालय
आथ्राड, ललितपुर
२०४७

च.नं.-_____
प.सं.-०६५/०६६

मिति: २०६६/०४/१२

विषयः- सिफारिस पठाईएको वारे ।

श्री ग्रामीण पुनिर्माण तथा पुनर्स्थापना कार्यक्रम
जिल्ला आयोजना कार्यालय
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यादव राज पहाडी
गा.बि.स. सचिव

ANNEX X

X a. Distribution of households by major occupation
X b. Summary of public services & infrastructures
X c. Land holding pattern of settlements within ZoI
X d. Number of households belonging to different food security category

Xa. Distribution of households by major occupation

Settlement Name	Number of HH in (in percentage)					
	Agriculture & Livestock	Labour & Porter	Business/Commerce	Cottage Industry	Employees	Others (specify)
Baguwa	8	5	5	5	2	
Gadhibhanjyang	21	4	6	2	1	
Thasingtar	24	5	7	4	1	
Pyutar	11	4	9	2	2	
Khorang	36	5	7	5	1	
Gharthok	12	6	6	3	2	
Khairaghari	11	4	5	4	0	
Dhandada	9	6	8	6	1	
Ghattegad	8	5	7	2	2	
Luklebesi	10	5	6	3	1	
Tallo Asrang	13	7	9	2	0	
Sano Chainpur	17	6	7	3	1	
Total	**180**	**62**	**82**	**41**	**14**	**379**
Percentage	**47.5**	**16.4**	**21.6**	**10.8**	**3.7**	**100**

Source: Field survey, 2010

Xb. Summary of public services and infrastructures according to settlement

Settlement Name/ Public services and Infrastructure	School (no)	Health post (no)	Post office (no.)	Communication(no) CDMA/Mobile	Hydro power (no)	Solar (no)	Shops/lodge (no)	Water supply (no)	Irrigation (kulo)	Mill (no)	Bridge (no)	Community organization (no)	Fin. Institution (no)	Community Centre	Industry (no)
Baguwa	2	1	1	310	-	-	12	9	2	2	-	2	2	2	-
Gadhibhanjyang	2		-	57	-	1	2	3	-	1	-	2	1	-	-
Thasingtar	2	1	-	208	-	2	11	8	2	1	-	2	2	-	-
Pyutar	3	1	-	102	-	2	2	11	2		-	1	1	-	-
Khorang	1		-	30	-	-	2	6	1	1	-	7	1	1	-
Gharthok	1		-	104	-	-	9	12	5	1	-	11	-	1	-
Khairaghari	3		-	115	-	-	1	12	15	-	1	9	8	3	-
Dhandada	3	1	-	60	-	-	4	7	1	3	-	3	1	1	-
Ghattegad	3		-	12	-	-	12	10	3	-	-	5	-	1	-
Luklebesi	1	1	-	715	-	7	21	32	4	-	-	16	1	1	-
Tallo Asrang	4	1	1	205	-	-	20	20	20	1	-	12	2	1	-
Sano Chainpur	2	1	1	207	-	6	12	20	7	1		11	1	1	-
Total	27	7	3	2125		18	108	141	62	11	1	81	20	10	-

Source: Field survey, 2010

X c. Land holding pattern of settlements within ZoI

Settlement Name	Number of HH							
	Landless	<one ropani	1-5 ropani	5-10 ropani	10-20 ropani	20-50 ropani	>50 ropani	Total HH
Baguwa	0	12	16	26	9	2	0	65
Gadhibhanjyang	0	6	8	11	3	2	0	30
Thasingtar	0	4	6	9	4	3	0	26
Pyutar	0	6	8	11	8	5	0	38
Khorang	0	3	4	9	4	2	0	22
Gharthok	0	3	5	9	4	3	0	24
Khairaghari	0	3	4	8	4	2	0	21
Dhandada	0	4	6	11	5	4	0	30
Ghattegad	0	3	6	10	5	4	0	28
Luklebesi	0	5	7	11	5	4	0	32
Tallo Asrang	0	5	8	13	5	4	0	35
Sano Chainpur	0	3	6	11	5	3	0	28
Total	**0**	**57**	**84**	**139**	**61**	**38**	**0**	**379**
Percentage	**0**	**15**	**22**	**37**	**16**	**10**	**0**	**100**

Source: Field survey, 2010

X d. Number of Households Belonging to Different Food Security Category

Settlement Name	*Surplus*	*Sufficient for whole year*	*Sufficient for 3-9 months*	*Sufficient for three months*	*Less than three months*	*Remarks*
Baguwa	12	16	23	11	3	
Gadhibhanjyang	5	7	12	4	2	
Thasingtar	4	5	11	3	3	
Pyutar	5	7	13	8	5	
Khorang	3	5	9	3	2	
Gharthok	3	5	11	3	2	
Khairaghari	2	3	9	5	2	
Dhandada	5	6	14	3	2	
Ghattegad	4	7	10	4	3	
Luklebesi	6	8	13	3	2	
Tallo Asrang	5	7	12	6	5	
Sano Chainpur	4	5	13	4	2	
Total	**58**	**81**	**150**	**57**	**33**	**379**
Percentage	**15**	**21**	**40**	**15**	**9**	

Source: Field survey, 2010

ANNEX XI

List of trees to be removed

SN.	Chainage		Common name	Scientific Name	Total number
	From	To			
1	4+718.45	4+755.02	Katus		3
2	5+267.30	5+364.69	Khair		1
3	5+364.69	5+487.21	Kutmiro		2
4	4+802.56	4+802.56	Siris		4
5	4+884.85	5+015.94	Uttis		5
6	6+125.86	6+177.67	Lapsi		4
7	6+570.30	6+661.74	Amala		4
8	11+851.38	11+985.49	Tanki		5
9	13+474.05	13+559.20	Chilaune		7
10	14+700.50	14+734.00	Khangiyo		1
			Total		36

Annex XII
Photographs

Starting Point at Ch.0+000, Baguwa of Malta VDC

Showing tha road alignment at Ch. 1+800 at Malta VDC

Affected School at Ch ,3+400 Gadibhanjyan at Pyutar VDC

Agriculture land at Ch. 4+600 , Pyutar VDC

Affected House at Ch. 5+972 , Pyutar VDC

Affected Pipeline at Ch. 6+260 at Pyutar VDC

Road alignment passing through settlement at Ch.6+710,

Ghatte Khola at Ch. 10+780, at Asrang VDC

Affected House at Ch. 13+460, Asrangbesi at Asrang VDC

End Point at Ch. 16+00, Sanochainpur of Asrang VDC

Annex XIII: Community Forests along road alignment

SN	Name of Community Forest	Chainage	Main Species
1	Forest	0+000-0+600	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
2	Shantipur Community Forest	0+994-4+540	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
3	Ganga Malla Community Forest	6+772-6+801	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
4	Janki Community Forest	7+459-8+744	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
5	Girasaeni Community Forest	8+775-9+075	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
6	Ragani Community Forest	9+590-10+373	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
7	Bharab Kali Community Forest	10+568-11+168	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
8	Sada Bahar Community Forest	11+375-11+851	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
9	Shidha Bhagwati Community Forest	12+667-13+367	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
10	Bhawani Shawar Community Forest	13+712-14+350	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
11	Churani Community Forest	12+465-12+730	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
12	Shiddhanath Community Forest	14+350-14+700	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)
13	Maha Laxmi Bhawani Community Forest	14+734-15+300	Natural and Planted Forest (Salla, Uttis, Khair, Shal and Khanayo)

Annex XIV: Water Management

S.N.	Chainage	Length	Dia.	Quantity	Remarks
		m	m	no.	
1	230	7.5	0.6	3	
2	615	7.5	0.6	3	
3	2050	7.5	0.6	3	
4	3000	7.5	0.6	3	
5	4630	7.5	0.6	3	
6	4800	7.5	0.6	3	
7	5200	7.5	0.6	3	
8	5520	7.5	0.6	3	
9	5850	7.5	0.6	3	
10	6300	7.5	0.6	3	
11	6550	7.5	0.6	3	
12	6630	7.5	0.6	3	
13	6940	7.5	0.6	3	
14	7250	7.5	0.6	3	
15	8950	7.5	0.6	3	
16	9180	7.5	0.6	3	
17	10040	7.5	0.6	3	
18	10650	7.5	0.6	3	
19	11850	7.5	0.6	3	
20	13250	7.5	0.6	3	
21	13900	7.5	0.6	3	
22	14250	7.5	0.6	3	
23	15120	7.5	0.6	3	
24	15720	7.5	0.6	3	
25	15900	7.5	0.6	3	
Total		**187.5**		**75**	RM

Item :RCC Causeway

SN	Chainage	Length	Earthwork		20 cm Dry Stone Soling		20 cm thick PCC(1:2:4)	
			Area	Quantity	Area	Quantity	Area	Quantity
		m	sq.m.	cu.m.	sq.m.	sq.m.	sq.m.	cu.m.
1	9260	10	35.00	7.00	35.00	7.0	35	7.0
2	10280	8	28.00	5.60	28.00	5.6	28	5.6
3	10750	10	35.00	7.00	35.00	7.0	35	7.0
4	11650	8	28.00	5.60	28.00	5.6	28	5.6
5	12700	6	21.00	4.20	21.00	4.2	21	4.2
6	13350	6	21.00	4.20	21.00	4.2	21	4.2
Total		**48.00**		**33.60**	**168.00**	**33.6**		**33.6**
Earthwork (HS)				**33.60**				

Source: Field Survey, 2009

Annex XV: Recommended structures necessary for slope stabilization

Road:Baguwa-Pyutar-Aasrang Road

Chainage: 0+000 to 16+017

S.N.	Chainage		Length	Height	X-section	Volume	Remarks
	from	to	m	m	m^2	m^3	
1	100	0+110	10	3	4.486	44.86	Right side
2	388.57	0+396	7	2.5	3.494	24.46	Right side
3	460	0+471	11	3	4.486	49.35	Right side
4	480	0+492	12	3	4.486	53.83	Right side
5	2437.4	2+445	8	3	4.486	35.89	Left side
6	3040	3+051	11	2.5	3.494	38.43	Right side
7	3260	3+269	9	3	4.486	40.37	Right side
8	3267.61	3+278	10	2.5	3.494	34.94	Right side
9	3380	3+391	11	3	4.486	49.35	Right side
10	4097.97	4+108	10	3	4.486	44.86	Right side
11	4481.54	4+492	10	3	4.486	44.86	Right side
12	5193.86	5+204	10	3	4.486	44.86	Right side
13	5200	5+211	11	3	4.486	49.35	Right side
14	5525.97	5+536	10	2.5	3.494	34.94	Right side
15	5540	5+549	9	2.5	3.494	31.45	Right side
16	6320	6+328	8	2.5	3.494	27.95	Right side
17	6380	6+388	8	2	2.145	17.16	Right side
18	6400	6+409	9	2.5	3.494	31.45	Right side
19	6760	6+769	9	3	4.486	40.37	Right side
20	6780	6+789	9	3	4.486	40.37	Right side
21	6960	6+970	10	2.5	3.494	34.94	Right side
22	7060	7+069	9	3	4.486	40.37	Right side
23	7080	7+091	11	3	4.486	49.35	Right side
24	7320	7+331	11	3	4.486	49.35	Right side
25	7523.09	7+533	10	3	4.486	44.86	Right side
26	7740	7+751	11	2.5	3.494	38.43	Right side
27	7840	7+851	11	3	4.486	49.35	Right side
28	7852.36	7+860	8	2	2.145	17.16	Right side
29	7873.44	7+881	8	2.5	3.494	27.95	Right side
30	8210.56	8+219	8	3	4.486	35.89	Right side
31	8225.92	8+234	8	3	4.486	35.89	Right side
32	8304.39	8+312	8	3	4.486	35.89	Right side
33	8332.25	8+340	8	2.5	3.494	27.95	Right side
34	8340	8+351	11	2.5	3.494	38.43	Right side
35	9020	9+032	12	2.5	3.494	41.93	Right side
36	9320	9+329	9	2	2.145	19.31	Right side
37	9327.63	9+337	9	2	2.145	19.31	Right side
38	9378.25	9+386	8	2	2.145	17.16	Right side
39	9380	9+389	9	2.5	3.494	31.45	Right side
40	9399.73	9+410	10	2	2.145	21.45	Right side
41	9400	9+408	8	2	2.145	17.16	Right side
42	10780	10+791	11	3	4.486	49.35	Right side
43	11140.62	11+151	10	2.5	3.494	34.94	Right side
44	11340	11+349	9	3	4.486	40.37	Right side
45	11400	11+411	11	2.5	3.494	38.43	Right side
46	11416.92	11+427	10	3	4.486	44.86	Right side
47	11420	11+429	9	2.5	3.494	31.45	Right side
48	12700	12+708	8	3	4.486	35.89	Right side

49	12701.65	12+712	10	3	4.486	44.86	Right side
50	12720	12+731	11	3	4.486	49.35	Right side
51	12740	12+748	8	2.5	3.494	27.95	Right side
52	12880	12+891	11	2	2.145	23.60	Right side
53	12892.78	12+903	10	2.5	3.494	34.94	Right side
						1928.64	
For RBIC Package							
54	13178.81	13+191	12	2	2.145	25.74	Right side
55	13200	13+209	9	2.5	3.494	31.45	Right side
56	13207.51	13+218	10	2.5	3.494	34.94	Right side
57	13540.88	13+551	10	2.5	3.494	34.94	Right side
58	13560	13+569	9	2.5	3.494	31.45	Right side
59	13678.45	13+688	10	2.5	3.494	34.94	Right side
60	13700	13+711	11	2.5	3.494	38.43	Right side
61	13710.33	13+720	10	2.5	3.494	34.94	Right side
62	13900	13+909	9	2.5	3.494	31.45	Right side
63	13990.39	14+000	10	2.5	3.494	34.94	Right side
64	14080	14+092	12	2.5	3.494	41.93	Right side
65	14099.01	14+109	10	2.5	3.494	34.94	Right side
66	14100	14+108	8	2.5	3.494	27.95	Right side
67	14720	14+729	9	3	4.486	40.37	Right side
68	15030	15+037	7	3	4.486	31.40	Right side
69	15034.31	15+039	5	3	4.486	22.43	Right side
70	15750.03	15+760	10	3	4.486	44.86	Right side
71	15960	15+969	9	3	4.486	40.37	Right side
72	15966.13	15+971	5	2.5	3.494	17.47	Right side
73	15970	15+978	8	2.5	3.494	27.95	Right side
Total quantity						**662.89**	

Annex XVI: Summary of Resettlement Cost

Item		Unit	Total loss	Amount (NRs)	Remarks
1.	**DIRECT COSTS**				
1.1	Compensation for private land	(sqm)	604.11	238000.00	
1.2	Compensation for structures	No.	11.00	5500000.00	
1.3	Dismantling Costs for Structure	No.	10.00	500000.00	
1.4	Cost for Private Trees	Nos.	36	150000.00	Harvesting and Transportation
	Sub-Total			**6388000**	
2.	**INDIRECT COSTS**				
2.1	Movement Allowance	LS:	11 HHs	20000.00	
2.2	Rental Stipend	LS:	11 HHs	100000.00	
2.3	Deed Transfer Assistance	LS:	69 HHs	300000.00	74 Plots
2.5	Official Deed Transfer fees	LS	69 plots	150000.00	
2.6	Appreciation Program for APs	LS:	69 HHs	120000.00	
	Sub Total			**690000.00**	
3	Livelihood Enhancement Skills Training (LEST)	**LS:**		**900000.00**	For APs
	Total (1+2+3)			**7978000.00**	
4	Contingency (5%)			**398900.00**	Heading (2+3)

	Grand Total NRs.			**8376900.00**	

Source: Tentative Resettlement Plan Cost of Baguwa-Pyutar-Ashrang Road