

# Environmental Assessment Document

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## Initial Environmental Examination

Grant Number: 0093 NEP

February 2010

## Nepal: Rural Reconstruction and Rehabilitation Sector Development Program

### Bagbazaar-Bagarkot District Road Subproject, Dadelhura District

Prepared by the Government of Nepal

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Government of Nepal  
Ministry of Local Development  
Department of Local Infrastructure Development and Agriculture Roads  
Rural Reconstruction and Rehabilitation Sector Development Program  
[ADB Grant 0093 NEP]

# Initial Environmental Examination (IEE)

of

## **Bagbazaar-Bagarkot District Road** (Dadeldhura District, Nepal)

Submitted to:  
**Ministry of Local Development**  
Government of Nepal

Proponent:  
Office of District Development Committee/  
District Technical Office  
Dadeldhura District

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Ferb, 2010

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

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## ABBREVIATIONS

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

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# Executive Summary

## ***Background***

The proposed Bagbazaar-Bagarkot road sub project lies in Dadeldhura district of Far Western Development region of Nepal. This road starts from earthen road at Bagbazaar of Amargadhi Municipality and ends at Bagerkot bazaar of Bagarkot VDC of Dadeldhura District. Considering the importance of this road, 15th District Council has given high priority to this road and it has been proposed for the rehabilitation under Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP).

The proposed Bagbazaar-Bagarkot is a road network of VDC in West-South part of Dadeldhura. This road starts from Bagarkot of headquarter and ends at Bagerkot bazaar of Bagarkot VDC. Road formation width is 10.0 m and total length of this road is 18.20 km. The total project cost is NRs. 5,04,92,663.

Dhaghadi-Dadeldhura-Batadi Highway passes through Dadeldhura district and district headquarter, Amargadhi Municipality and other market centres with branch roads, whereas west south part of the district is connected with earthen road coming from different VDCs of Dadeldhura District. After the completion of the proposed road located in this part of the district, the road will provide accessibility to Border of Baitadi District, Border of India and other market centre of these places. Whereas West-South part of the people are connected to Municipality of Dadeldhura district. The road will also provide easy access to district headquarter and other market centres such as Pokhara bazaar, Bhatkade bazaar for the people of west south part of the district.

This road will save considerable travel time and improve income generation potentials, enhance commercial opportunities and improve market accessibility to local people especially from Municipality, Bagarkot, Bhagaswor and Rupal VDC. Moreover, this road will also provide short term employment opportunity by engaging the rural poor people in construction of the road for short term. Such people based development efforts will reinstall economic activities in the area by creating long term employment and other opportunities.

## ***The Proponent***

The District Development Committee (DDC)/District Technical Office (DTO), Dadeldhura are the executing agencies at the district level under Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) and the proponent of the Initial Environmental Examination (IEE) study for Bagbazaar-Bagarkot road sub-project.

## ***Objectives***

The main objective of the IEE study is to identify the impacts of physical, biological, socio-economic and cultural environment of the sub-project area. The specific objectives of the proposed IEE study include 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, and
- make sure that IEE is sufficient for the proposed road sub-project.

## ***Relevancy of the Proposal and Study Methodology***

The proposed Subproject will provide access to district headquarter, living in rural area of Dadeldhura district. As a result socio-economic condition of people living in that area will enhance as local products like vegetables, milk and fruits will get access to market.

The findings and conclusions of the report are based on the analysis of the information collected from the field during July, 2009 by undertaking a walk-through environmental survey along the proposed route and secondary information supplemented by information collected by the social and technical teams working on the resettlement survey and detail survey. The IEE report has been prepared according to the Environmental Protection Act, 1997 and Environmental Protection Rules, 1997 (second amendment 2007) of the Government of Nepal and Environmental Assessment Guidelines, 2003, Safeguard Policy Statement, 2009 of ADB. This report is based on the Terms of Reference (ToR) approved on 2066/01/22 by Secretary level decision of Ministry of Local Development (MoLD).

## ***Existing Environmental Condition***

This road is 1632m from sea level at Bagbazaar and 855m from sea level at Bagerkot. Various kinds of rock such as quartzite, schist etc. were observed along the road alignment. Generally, alluvium, residual and clay mixed sandy soil and boulder mixed soil are found along the road alignment. Main waterbodies found across the road alignment are Karigau kholsi, Josina kholsi and Ait kholsi. 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 forest, cultivated land and settlements.

The dominant forest species found in the road alignment are (*Alnus nepalensis*) Uttis, (*Schima wallichii*) Chilaune, (*Castanopsis indica*) Katus, (*Pinus roxburghii*) Salla and the main NTFP species found along the road alignments are (*Rubia manjith*) Majitho, (*Lindera neesiana*) Siltimur, (*Choerospondias axillaries*) Lapsi, (*Solanum surattense*) Kankari etc. There are 5 community forest. (*Sus scrofa*) Bandel, (*Panthera pardus*) Leopard, (*Hystix indica*) Porcupine, (*Muntiacus muntjak*) Mriga, (*Canis aureus*) Jackal, (*Macaca mulatta*) Monkey, (*Felis chaus*) Jungle Cat are the wild animals reported in the forests of proposed road area. Similarly birds are (*Corvus splendens*) Kag, (*Passer domesticus*) Bhanger, (*Lophura lentomelana*) Kalij Pheasant, (*Columba livia*) Pigeon 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 Municipality and Bagarkot VDCs with total population of 10,504 persons (2,039 households) and average family size of 5.2. Diverse ethnic groups such as Brahmin, Tamang, Gurung, and occupational caste (Damai, Kami, Sarki) live along the ZoI of road alignment. Occupational caste households are distributed in almost all the settlements.

The main occupation of all people residing within the ZoI of the proposed road alignment is agriculture and livestock. Due to limited transportation facilities and high altitude, 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 Kalali, Kanchanpur District and India, seasonally during slack farming season for employment.

### ***Beneficial Impacts***

The development efforts particularly the development of transportation network will have multifold beneficial impacts. The immediate beneficial impacts from road development are apparent in the construction phase like there will be various employment opportunities (7312 skilled and 112260 unskilled person days) for the local population, supports for the transfer of construction work skills and technical know-how to the local workers.

During operation stage, an improved road access will bring an improvement of food security situation and overall economic and social stability. The road will also provide cheap, safe and fast transport of goods and services from rural areas to urban centers and vice versa. The farmers will be more interested to increase agricultural production such as Milk, vegetables and Timber of sal due to market accessibility. This will contribute significantly to increase the productivity in rural areas and increased access to social services such as education, health and eventually improve the overall socio-economic condition of the people.

Once this road is on operation, trade and business activities will be further promoted. There is a possibility of increased economic opportunities and significant growth and extension of the local markets along the road alignment like in Bagbazaar, Ait, Aedhugara and Bagarkot. In addition, construction of road will lead to appreciation of land values particularly near the market and settlement areas.

### ***Adverse Impacts***

The physical adverse impacts during construction will be due to change in land use, slope instability and air, dust and water pollution, quarry sites and spoil disposal. Similarly, biological impacts during construction will be permanent loss of 2.34 ha of forest area and disturbance to wildlife and bird habitat. Total 12 numbers of trees will be cleared. Socio-economic impacts during road construction will be loss of 0.47 ha of agricultural land as well as exposure to health and safety problems in some extent during road construction.

The adverse physical impacts during road operation are slope instability and management, air and noise pollution, road safety. Likewise, biological impacts are depletion of forest resources and disturbance to wildlife. Socio-economic impacts are due to new settlement and market center development, change in social behavior etc.

### ***Mitigation Measures***

Impacts from the proposed road projects can be both beneficial as well as adverse. An effective implementation of benefit maximization measures and adverse impacts mitigation measures would optimize the benefits expected from the project and avoid/minimize the adverse impact from the project. Based on the impact assessment and identification, beneficial augmentation and adverse impact mitigation measures are presented in both constructions as well as in operation stage of the road.

### ***Environmental Management Plan***

Environmental management plan is an important tool to ensure the implementation and monitoring of mitigation measures for minimizing adverse impacts and maximizing the beneficial impacts. Similarly, environmental monitoring generates useful information and improves the quality of implementation of mitigation measures. The proponent, DDC Dadeldhura will develop monitoring mechanism to show its additional commitment for environmental improvement and mitigate undesirable environmental changes, if any during construction and operational stage. DDC will be supported by

DTO (DPO and DIST) team in the district and Environmental team from the PCU/CISC for the environmental monitoring.

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

<b><i>SN.</i></b>	<b><i>Description</i></b>	<b><i>Amount (NRs.)</i></b>	<b><i>Remarks</i></b>
1	Environmental awareness raising training and other training	200,000.00	To be included in project cost
2	Insurance of workers	100,000.00	To be included in BoQ
3	Bio-engineering	500,000.00	
4	Resettlement and Land Acquisition		To be included in Resettlement plan
5	Restoration or relocation of affected infrastructures, Spoil management, Reinstatement of quarry, stockpiling etc.	200,000.00	To be included in BoQ
6	Compensatory Plantation cost		To be included in Bio-Engineering works.
7	Health / HIV AIDS / STD prevention awareness; other awareness program such as adult literacy; support to local school etc.		To be included in Social plan, project cost
8	Occupational health and safety, Information signboard	408,000.00	To be included in BoQ
9	Monitoring	200,000.00	To be included in project cost
	<b>Total</b>	<b>16,08,000.00</b>	

### ***Conclusion and Recommendation***

The IEE study of the proposed Bagbazaar-Bagarkot road sub-project reveals that the benefits from the implementation of the proposed road project are more significant and long term in nature against the adverse impacts most of which could be mitigated or avoided. Therefore, this IEE is sufficient for approval of the proposed sub-project. This sub-project is recommended for implementation with incorporation of mitigation measures and environmental monitoring plan.

A Resettlement Plan will be required to ensure that the persons affected by the losses are properly compensated.

## ***SALIENT FEATURE***

1. Name of the Sub Project	: Bagbazaar-Bagarkot Road
2. Location	
2.1 Geographical Locations	
2.1.1 Start Point	: Bagbazaar of Amarghadhi Municipality
2.1.2 End Point	: Bagarkot bazaar of Bagarkot VDC
2.2 Geographical Feature	
2.2.1 Terrain	: Mid-hills
2.2.2 Altitude	: 1,632 m at Bagbazaar to 855 m at Bagarkot
2.2.3 Climate	: Sub-Tropical/Temperate
2.2.4 Soil	: Alluvial soil, colluvial soil
3. Classification of Road	: Rural Road Class A
4. Status of road	: Rehabilitation proposed for fair weather
5. Length of Road	: 18.20 km
6. Standard of Pavement	: Earthen
7. Construction Period	: 3 years
8. Traffic Forecast	: 20 vehicles per day
9. Design speed	: 20 km/hr
10.1 Major Settlements	: Bagbazaar, Karigau, Josina, Aet, Birday, Aiduhgara, Laakam, Ekthara, Dhigula, Aaditayarpur, Bagarkot and Dumri.
10.2 No. of Household	: 2039 HHs
10.3 VDCs along the Road	: Amarghadhi Municipality and Bagarkot VDC
11. Cross Section	
11.1 Right of way	: 5 m each side (center line)
11.2 Formation width	: 5 m
11.3 Carriageway width	: 3.5 m
11.4 Lane	: Single
12. Structures	
12.1 Retaining Structures	
12.1.1 Stone Pitching	: 14.48. Cum.
13. Bio-Engineering (NRs)	: 50000.00
14. Earth Work	
14.1 Cutting	: 308713.29 Cum
14.2 Filling	: 42666.12 Cum
15. Project cost	
15.1 Total Cost (NRs)	: 5,04,92,663
15.2 Costs per km (NRs.)	: 2617,234
16. Employment generation	
16.1 Total person days	
16.1.1 Skilled	: 7312.00
16.1.2 Unskilled	: 112260.00

## ***Name and Address of the Proponent***

The District Development Committee (DDC)/District Technical Office (DTO), Dadeldhura are the executing agencies at the district level under RRRSDP and the proponent of the Initial Environmental Examination (IEE) study for the rehabilitation of Bagbazaar-Bagerkot road sub-project.

District Development Committee (DDC)/  
District Technical Office (DTO)  
Dadeldhura  
Telephone No.: 096-420230, 096-420144.  
Fax No.: 096-420067

### ***Consultant:***

GIDA Nepal Pvt. Ltd.  
District Implementation Support Team (DIST)  
Thufandada, Dadeldhura  
Nepal  
Tel: 096-420067 Fax/Tel: 096-420067

### ***Name of the preparer***

Dilip Kumar Mandal Environmental Specialist

### ***Data collection support***

Sujeet Kumar Yadav	DIST Team Leader
Manoj Kumar Yadav	Engineer
Madan Jha	Social Specialist
Pasupati Thakur	Sub-Engineer
Prakesh Timilsina	Sub-Engineer

# 1. Introduction

## 1.1 Background

1. The Rural Reconstruction and Rehabilitation Sector Development Program (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), Swiss Development Cooperation (SDC), Nepal and OPEC Fund for International Development (OFID). Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) under the Ministry of Local Development (MLD) is the executing agency (EA). The DDCs are the Project Implementing Agencies and the DTO of each respective DDC is responsible for technical and project management. The DTO will be supported by District Implementation Support Team (DIST) which includes engineering, safeguards and social mobilization. Dadeldhura District is one of the project districts under RRRSDP. This proposal is for rehabilitation of Bagbazar-Bagerkot district road in fair weather standard in Dadeldhura District.

## 1.2 Name and Address of Proponent

2. Name of Sub Proposal: Rehabilitation of Bagbazaar-Bagerkot road sub-project, Dadeldhura.  
Name of Proponent: District Development Committee (DDC) / District Technical Office (DTO).  
Address of Proponent: Kirtipur, Dadeldhura. Tel-096-420230, 096-420067, 096-420369.

## 1.3 Relevancy of the proposal

3. An IEE of the proposed road is necessary in order to assess the environmental consequences of the proposed rural road rehabilitation and construction activities and suggest appropriate, practical and site specific mitigation and enhancement measures. This is Rural Road Class "A" District road according to Nepal Rural Road Standard (2055) as given in Annex II-2 of APPROACH for the Development of Agricultural and Rural Roads, 1999. Therefore, it is a legal requirement by the Government of Nepal (GoN) according to article 3 of Environmental Protection Act (EPA) 1997 and rule 3 of Environmental Protection Rules (EPR) 1997 (amended in 2007) as mentioned in schedule 1.

4. Preparation of IEE report by concerned District Development Committee (DDC)/District Technical Office (DTO) and approval of IEE report by the Ministry of Local Development (MLD) according to Nepali legal provision is considered sufficient subject to prior review of an agreed sample of sub-project IEEs by ADB. RRRSDP falls under category "B" project where IEE is mandatory for all sub projects according to ADB Environmental Assessment Guidelines, 2003.

5. This IEE report of Bagbazaar-Bagerkot Road sub-project in Dadeldhura district is prepared based on the Terms of Reference (ToR), approved on 2066/01/22 by the Secretary level decision of the Ministry of Local Development (MLD) which is given in Annex I. While doing detailed survey the Bagbazaar-Bagerkot Road is exceed up to 3.2 km, so this IEE draft report is prepare for 18.2 km. Rapid Environmental Assessment (REA) Checklist was also considered during IEE report preparation as given in Annex II.

## 1.4 Objectives

6. The main objective of the IEE study is to identify the impacts of physical, biological, socio-economic and cultural environment of the sub-project area. The specific objectives of the proposed IEE study include 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.

## 1.5 Methodology adopted

7. The IEE approach, methodology and procedure were generally followed the provisions of the EPA, 1997 and EPR, 1997 and the provisions of ADB. Data collection was done in July, 2009. Necessary information is collected through field study and literature review to accommodate all issues included in the approved ToR and to analyze environmental impacts on physical, biological, socio-economic and cultural issues. Secondary information is collected through reports, maps and photographs. Primary level of information is collected through questionnaires, checklist, data sheets walk-over survey and IEE team judgment. Furthermore local people are contacted and interviewed to solicit information. Numbers of focus group discussions are held in the Project area. The DDCs officials, VCDs and Community groups are also contacted to verify information to solicit their concerns.

## ***1.6 Description of the proposal***

8. The proposed 18.2km long earthen Bagbazaar-Bagerkot road Subproject lies in the South-East part of Dadeldhura District in Far Western Development Region of Nepal which links the remote area of the district to its headquarter. This Subproject starts from Bagbazaar of Amarghadhi Municipality and ends at Bagerkot Bazaar of Bagerkot VDC. In Between the road passes through different settlement of Amarghadhi municipality and Bagerkot VDC.

9. The road was opened in 2003 and vehicles play during dry season. The alignment requires widening, geometrical correction in bends, and grade improvements. The location and alignment of the road is given in Figure 1.1 and 1.2. The total project cost is NRs5,04,92,663 and per km cost is NRs. 26,17,234 as shown in Annex III.

## ***1.7 Construction Approach***

10. This road will be constructed using the labour-based, environment-friendly and participatory (LEP) approach and contractor approach, the important features of which are:

- Use of local people as labour, hand tools and small equipment, rather than heavy machinery for construction.
- Balancing cut and fill and reuse of excavated materials as construction materials, and thus not generating excess spoils, as far as possible.
- Use of bio-engineering techniques: integrated use of vegetation, simple civil engineering structures and proper water management systems for slope protection.

***Figure 1.1 Map of Nepal and Dadeldhura District showing the location of Bagbazaar-Bagarkot road Subproject in Dadeldhura District***

***Figure 1.2. Topo. Map showing the alignment of Bagbazaar-Bagerkot road***







## 1.8 Proposed Schedule for Implementation of Sub-project

11. Following table shows the proposed implementation schedule for Bagbazaar-Bagarkot road sub-project:

**Table 1.1: Sub-project implementation schedule**

SN	Activity	2008 IV	2009				2010				2011	
			I	II	III	IV	I	II	III	IV	I	II
<b>1</b>	<b>Detailed survey, design and estimate</b>											
1.1	Detailed engineering survey											
1.2	Detailed engineering design											
1.3	Centre line pegging											
1.4	Quantity, cost & report preparation											
<b>2</b>	<b>Preparation of resettlement plan</b>											
2.2	Cadastral survey											
2.3	HH census and socio-economic survey											
2.4	Data processing											
2.5	Preparation of resettlement plan											
2.6	Determining the compensation											
2.7	Disbursement of compensation											
2.8	Monitoring of progress											
2.9	Transfer of land ownership											
2.10	Life skill and income generation training											
<b>3</b>	<b>Environment feasibility and implementation</b>											
3.1	Screening and ToR preparation for IEE											
3.2	ToR for IEE submission and approval from MLD											
3.3	Notice publication for IEE and collection of deed of enquiry											
3.4	Desk review											
3.5	Field survey for data collection											
3.6	Analysis and report writing											
3.7	IEE report review and submission to MLD and ADB											
3.8	IEE report approval from MLD and ADB											
3.9	Implementation of EMP											
3.10	Environmental monitoring											
<b>4</b>	<b>Work implementation</b>											
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

## 2.0 Public consultation and information Disclosure

### 2.1 Public Consultation

12. In order to ensure the public involvement, the following procedures were followed during IEE report preparation:

- Publication of notice- a 15 days public notice was published on 2066/02/07 in the Aanapurana Post, a national daily newspaper (see Annex V) seeking written opinion from concerned VDCs, DDC, schools, health posts and related local organizations. A copy of the public notice was also affixed in the above mentioned organizations and Recommendation & suggestion, Notice pasted and deed of enquiry was collected (see Annex VI for Recommendation & suggestion, Annex VII for Notice pasted and deed of inquiry and Annex VIII for the names of organizations).
- IEE team also carried out interaction with local communities and related stakeholders like District Forest Office, District Soil Conservation Office, District Agricultural Development Office and others during field survey to collect the public concerns and suggestions (see Annex IX for the list of persons consulted). Moreover, Focus Group Discussions were conducted to collect and solicit information regarding the bio-physical and socio-economic and cultural aspects of the road. Summary of minutes of meeting with local people is given Table 2.1. The FGDs were held at different 11 major settlements along the ZoI of the road and the results of FGD are mentioned in chapter 4. Existing environmental conditions and socio-economic data are tabulated in Annex X a, b, c and d.
- Draft IEE report will be sent to Amarghadhi municipality and Bagerkot VDC for Public disclosure. Recommendation letters were also obtained from above mentioned municipality and VDC as given in Annex VI. A copy of draft IEE will also be kept in information center of DDC, Dadeldhura for Public disclosure. After reviewing draft IEE report and incorporating the suggestions from the concerned stakeholders, final IEE report will be prepared and sent to PCU for approval from MLD and ADB.

**Table 2.1: Summary of FGD Meeting**

Location	Date	No. of Participants		Issues/Suggestion
		Male	Female	
Bagbazaar, Karigau, Josina and Aeit	23/2/066	8	3	1. Irrigation channel (Kulo) should not be affected by spoil disposal. 2. Affected drinking water supply pipelines should be restored. 3. Soil erosion due to road construction should be minimized with proper means. 4. Care should be given in spoil disposal not to damaged farmland and water bodies. 5. Supplementary infrastructure such as drinking water supply and irrigation schemes is also necessary for people living in this settlement. 6. Foot trail that leads to school might be affected. And it should be repaired.
Aaeduhgara, Laakam, Ekthara, Dhigula and Birday	26/2/066	8	1	
Aadityapur, Bagerkot/Du mari	27/2/066	18	4	

Source: Field survey, 2009

### 2.2 Information Disclosure

13. Draft IEE was kept at information center of DDC Dadeldhura for public disclosure. Information was also disseminated through person to person contacts and interviews and group discussions. However, available institutions at the local level were informed through notice distribution or pasting at concerned VDCs, school, health posts and public places within the road alignment corridors. The approved IEE report will be accessible to interested parties and general public through websites of ADB, DoLIDAR and RRRSDP. Following offices will get the IEE report:

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

### 3.0 Review of Relevant Acts, Regulations and Guidelines

14. Government of Nepal has adopted various acts, regulations and guidelines to ensure the integration of development and conservation of environment. The IEE study was being guided by the requirements and provisions of the applicable acts, rules and guidelines as given in Table 3.1.

**Table 3.1 Review of Environmental Acts, Regulations and Guidelines**

SN	Environmental Acts, Regulations and Guidelines	Description of Requirements
1	Environmental Protection Act, 1997	Any development project, before implementation, to pass through environmental assessment, which may be either IEE or an EIA depending upon the location, type and size of the projects any development project, before implementation, to pass through environmental assessment, which may be either IEE or an EIA depending upon the location, type and size of the projects.
2	Environmental Protection Rule 1997 (amendment, 1999)	Obliges the proponent to inform the public on the contents of the proposal in order to ensure the participation of stakeholders.
3	Forest Act, 1993	Requires decision makers to take account of all forest values, including environmental services and biodiversity, not just the production of timber and other commodities.
4	Forest Rules, 1995	Elaborates legal measures for the conservation of forests and wildlife.
5	Batabaraniya Nirdeśika (Nepal; MLD), 2057	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.
6	National Park and Wildlife Conservation Act, 1973	Addresses for conservation of ecologically valuable areas and indigenous wildlife
7	Local Self Governance Act (1999) and Regulations (1999)	Empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities
8	Land Acquisition Act, 1977 and Land Acquisition Rules, 1969	Specifies procedural matters of land acquisition and compensation
9	National Environmental Impact Assessment Guidelines, 1993	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	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) guidelines, 2007	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	Suggests stepwise process of addressing environmental and social issues alongside the technical, financial and others
13	Green Roads in Nepal, Best Practices Report: An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions, 1999	Focuses on participatory, labor based and environment friendly technology with proper alignment selection, mass balancing, proper water management, bioengineering and phased construction
14	ADB Environmental Assessment Guidelines, 2003	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
15	Three Years Interim Plan, 2007/08-2009/10	Requires all projects will be formulated and constructed based on methods that optimally utilize the local skill and resources and generate employment opportunities.

## 4.0 Existing Environmental Condition

15. Baseline information on the existing physical, biological as well as socio-economic and cultural environment of the proposed sub-project are described here.

### 4.1 Physical Environment

16. This section describes the physical condition of the area that comes under the ZoI of the road section along its entire length and surrounding area. The data has been collected from both secondary and primary sources.

#### 4.1.1 Topography

17. The proposed road lies in mid-hills region. The highest elevation of the proposed road at starting point at Bagbazaar is 1,632 m and Lowest elevation at Bagarkot is 855 m. Bagbazaar-Bagarkot road alignment passes through the upper valley slope and ridge in middle hills.

#### 4.1.2 Geology and soil type

18. The road section comprises mainly of quartzite rocks. In general soil type can be found as alluvial and colluvial. The details are given in Topography, Geology and Soil type along the road of Annex XIII-a.

#### 4.1.3 Climate

19. Bagbazaar-Bagarkot road lies in the sub-tropical climate and temperate 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 1,513 mm. The general climatic condition is cold in winter and hot in summer with average minimum temperature of 3°C and average maximum temperature of 22°C. (Source: District Profile of Dadeldhura, 2050)

#### 4.1.4 Hydrology and Drainage System

20. Various streams existing along the road alignment are given in Table 4.1.

**Table 4.1 Summary of streams along the road alignment**

SN	Chainage	Name of the Stream	Stream width (m)	Type of Structure Necessary
1	2+200	Karigau Kholshi	0.85	HP
2	2+600	JosinaKholshi	0.62	HP
3	6+000	Aeit Kholshi	0.90	HP
4	6+100	Aeit Kholshi	1.00	HP

Note:-HP-Hum Pipe

Source: Field survey, 2009

21. The water supply exists along and across the road alignment. The pipes at chainage 3+900 and 10+600 (Aaidhugara settlement) of the road and may be damaged during the construction.

#### 4.1.5 Soil Erosion and Sedimentation

22. The stability of slopes along the road corridor depends upon slope angle, the material constituting the slope, rock discontinuities and hydrological conditions. Proposed alignment pass through landslides at chainage 17+640 and 17+750. The main causes for occurring slides are rock weathering, precipitation and surface runoff.

#### 4.1.6 Existing Road Condition

23. The road is earthen and motorable during dry weather. Average width of the road is 4m. The road alignment passes through cultivated land, community forest, settlement and barren land. The area covered by road is presented in Table 4.2.

#### 4.1.7 Existing Traffic Situation

24. Talking about vehicle operation, there are 10 regular passenger pick up plying on the road whereas no. of mini truck/truck/tractor/bus are 20 and no. of motorcycles are around 100 in winter season. In rainy season, traffic operating in this road reduces by half.

#### 4.1.8 Land use

25. The road passes through cultivated land, government land (Barren land), community forest and settlement as shown in Summary of Land use Pattern along the road alignment of Annex XIII-b.

26. The required additional land for widening the road is given in Table 4.2.

**Table 4.2: Summary of land use pattern along the road alignment and additional land required for widening the road.**

SN	Land use	Length(m)	Additional Area (ha)
1.	Cultivated land	1650	0.47
2.	Cummunity forest area	12600	2.34
3.	Settlement	3250	0.80
4.	Government Land(Barren Land)	800	0.02
	Total	18,200	3.63

Source: Field survey, 2009

#### 4.1.9 Air, Noise and Water Quality

27. The air quality observed was good and expected to be within national ambient air quality standards of Nepal. Dust emission during vehicle operation has become common phenomena in the existing road and it is more significant during dry and winter season. Likewise, water quality in the proposed road section is observed to be good since it is free from any kind of pollution sources. There is no defecation problem observed around the drinking water sources.

### 4.2 Biological Environment

28. This alignment does not pass through any protected area.

#### 4.2.1 Vegetation

29. The dominant forest and fodder species reported in the road alignment are (*Alnus nepalensis*) Uttis, and (*Pinus roxburghii*) Khote Salla, (*Castanopsis indica*) Katus, Mayal. The forest is sparse with dominant species are Uttis, Chilaune and Katus. Other plant species found within ZoI of the sub-project are (*Buddleja asiatica*) Bhimsen pati, (*Litsea monopelata*) Kutmiro, (*Ficus semicordata*) Khanyu, (*Lindera neesiana*) Siltimur, (*Ficus benghalensis*) Bar, (*Fraxinus floribunda*) Lankuri, (*Prunus cerasoides*) Painyu, (*Ficus religiosa*) Pipal, (*Albizia labbeck*) Sirish, (*Bauhinia vahilii*) Bhorla, (*Pisidium guyava*) Amba, (*Amomum aromaticum*) Alainchi, etc.

#### NTFPs

30. The main NTFP species found along the road alignments are: (*Lindera neesiana*) Siltimur, (*Asparagus racemosus*) Kurilo, (*Gaultheria fragrantissima*) Dhasingare, (*Solanum surattense*) Kantakari, Rubia manjith (Majitho) etc.

### Community Forest

31. There are five CFs along the proposed road alignment are given below Table 4.3.

**Table 4.3: Community Forests along road alignment**

SN	Name of Community Forest	Chainage	Length	Main Species
1	Shanti Community Forest, Amarghadhi-4	1+000 to 2+900	1900	Natural and Planted Forest ( Salla, Uttis and Mayal)
2	Aaditypur Community Forest. Amarghadhi-3	4+200 to 7+000	2800	Natural and Planted Forest ( Salla, Uttis and Mayal)
3	Bhumukhi Community Forest	7+000 to 10+300	3300	Natural and Planted Forest (

				Salla, Uttis and Mayal)
4	Sandariya Community Forest	10+900 to 13+400	2500	Natural and Planted Forest ( Salla, Uttis and Mayal)
5	Bhagaswor Community Forest	14+800 to 14+700 15+300 to 16+300	1700	Natural and Planted Forest ( Salla, Uttis and Mayal)
	Total		11700m	

Source: Field survey, 2009

### ***Private forest***

32. There is not any private forest along the road.

### ***No religious forest***

33. No religious forest was found along the road alignment.

### ***4.2.2 Wildlife***

34. *Muntiacus muntjak* (Barking deer), *Canis aureus* (Jackal), *Macaca mulatta* (Monkey), *Sus scrofa* (Bandel), *Felis chaus* (Jungle Cat), *Macacca mulatta* (Bandar), *Rattus rattus* (Musa), *Martes flavigula* (Malsanpro), *Ratufa spp.*(Lokharke), (Vulpes Montana) *Fyauro* are the wild animals reported in the forests of proposed road area. Similarly birds are *Lophura lencomelana* (kalij pheasant), *Columba livia* (Pigeon), *Corvus splendens* (Kag), *Passer domesticus* (Bhangero), *Streptopelia spp.* (Dhukur), *Kokale*, *Lampuchchhre*, *Chibe*, *Gaunthali*, (*Gallus gallus*) *Jungle fowl*, etc. However, none of these wild lives are endangered species.

### ***4.2.3 Aquatic life***

35. The road alignment passess only through seasonal streams (kholsi), no any type of aquatic life found in this kholsi .

## ***4.2 Socio-economic and Cultural Environment***

### ***4.3.1 Population, Household and Ethnicity***

36. The alignment covers one municipality and one VDC namely: Amarghadhi Municipality and Bagarkot VDC. Major settlements within ZoI of the project are Bagbazaar, Kari Gau, Josina, Aeit, Barday, Aaidhungara, Laakam, Ekthara, Dingula, Aditiyapur and Bagarkot Bazaar . Major ethnic groups are Brahmin, Chhetri, Tamang, Gurung, Newar, Damai, Kami, Sarki as given in Table 4.4.

**Table 4.4: Ethnicity and Population Composition**

<b><i>VDC</i></b>	<b><i>Major settlements</i></b>	<b><i>Caste and ethnicity composition</i></b>	<b><i>Major Occupation</i></b>
Amarghadi Municipality	Bagbazaar, Karigaun, Josina, Aeit.	Tamang, Magar, Rajbansi, Limbu, Kurmi, Sodhi, Dalit, Chhatttri, Bhrahman	Agriculture
Bagarkot VDC	Birday, Aaiduhgara, Laakam, Ekthara, Dhigula, Aaditypur, Bagarkot.	Tamang, Magar, Sherpa, Kurmi, Dalit, Limbu, Sarki, Lohar, Bhrahman, Chhatttri	Agriculture

Source: Field survey, 2009

37. There are 11 main settlements along the ZoI of the proposed road alignment in Amarghadhi Municipality and Bagarkot VDC with total population of 10,504 persons (2039 households) and average family size of 5.2 as illustrated by Table 4.5 are given below.

**Table 4.5. Settlements and population within the ZoI of road alignment**

<b><i>SN</i></b>	<b><i>Major Settlements</i></b>	<b><i>VDCs &amp; ward no.</i></b>	<b><i>Total Households</i></b>	<b><i>Total Population</i></b>
1	Bagbazaar	Amarghadi Municipality-5	560	2855
2	Karigau	Amarghadi Municipality-3	345	1833
3	Josina	Amarghadi Municipality-4	343	1752



4	Aeit	Amarghadi Municipality-2	440	2250
5	Birday	Bagarkot-7	65	338
6	Aaidhugara	Bagarkot-7	44	232
7	Laakam	Bagarkot-7	12	68
8	Ekthara	Bagarkot-7	35	182
9	Dhigula	Bagarkot-7	8	39
10	Aadityapur	Bagarkot-8	24	121
11	Bagarkot	Bagarkot-8	163	834
	Total		2039	10504

Source: Field survey, 2009

### **4.3.2 Main occupation**

38. The main occupation of all people residing within the ZoI of the proposed 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 (44.61%), labour and porters (27.1%), working in government and non government organizations (9.36%) and business (15.28%). Details of occupations of the people according to the settlements are shown in Annex X a.`

### **4.3.3 Market Centres and Business Facilities**

39. There are grocery shops and tea stalls available in the almost all settlements. Bagbazaar and Bagarkot have also some hotels and restaurants. Other smaller market centres with shops of daily commodities are Bagbazaar, Newroad bazaar, Thufandada bazaar, Pokhera bazaar. There are some places along the road alignment which may be developed as market centres after the upgradation of the road, which are at upper part of Aeit settlement near Municipality of ward no. 3, 4 and 5. Bagarkot bazaar of Bagarkot VDC.

### **4.3.4 Local Economy**

40. The economy of the area is predominantly agriculture based with practicing of a mixture of harvesting of forest products such as timber. Over 44 percent populations base upon agricultural activities for their livelihood and dairy production for another source of income for local farmers. With growing of transportation facility, cultivation of fruits, vegetables in a commercial manner seems to gain momentum. Local people have increasingly engaged in business activities in Municipality and Kalali District, Kanchanpur District, India and Western/Far-Western Region.

### **4.3.5 Agriculture pattern**

41. Major crops 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 in the project area are Mustard, Vegetables, Alainchi, Amliso, Ginger, Orange, Lemon, Nibuwa etc.

### **4.3.6 Livestock**

42. Due to availability good number of fodder trees, the project area has also the immense potentiality of goat, cow and buffalo farming for dairy production. Before 2052, people used to carry away milk on their back or hire porters to sell it to head quarter of Dadeldhura. Now, the road is motorable for fair weather except for heavy rainy days and milk sold from Bagarkot VDC are tentatively 1500 litre per day. So, Poultry farming can be also encouraged due to upgrading of road.

### **4.3.7 Trade and Commerce**

43. 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, amliso, alainchi, lapsi, vegetables, fruits, timber especially of uttis, bamboo products etc. whereas cereal crops such as rice, maize are export and import items both.

### **4.3.8 Tourism related services**

44. Some hotel, lodges are in operation at Bagbazaar and Bagarkot. 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 taal (Lake), Than (Mandir), Temple, promotion of local handicrafts and other local products.

#### ***4.3.9 Health and Sanitation***

45. Major health problems associated with local people are gastric, water borne diseases, gaeneco related diseases, bath, respiratory diseases, skin, malnutrition, typhoid, worm etc. Sanitation awareness among local people is on the rise trend and many of them have toilets in their home.

#### ***4.3.10 Public Services and Infrastructures***

46. There are various social sector facilities and infrastructure in different settlements as given below. Details about public services and infrastructures according to the settlements are shown in Annex X b.

#### ***Education***

47. The proposed project area consists of a total of 17 educational institutions ranging from primary level to college level educational institutions. Primary schools are found in majority of the settlements. In addition, there are two higher secondary schools and one campus in Amarghadhi Municipality. In talk with local people, they have realized the importance of education in their life and all of them send their childrens to school. Literacy rate in the project area has been estimated around 70 percent.

#### ***Health Facility***

48. In health sector, there are altogether 6 health posts/sub healthposts in various settlements. For serious health problem, people go to Team Hospital and district hospital in Amarghadhi Municipality.

#### ***Communication***

49. Regarding communication, there are all together 1788 numbers of communication (CDMA and Mobile). All of the settlements have telephone facilities mostly with CDMA connection and no.of CDMA/mobiles shows that popularity of mobile phones is also on the rise.

#### ***Transportation facilities***

50. The main means of transportation in the area was mule cart and some times porters were employed for the transportation of daily goods from the nearest market centres.

#### ***Electricity***

51. Almost all settlements of Amarghadi Municipality and Bagarkot VDC within ZoI are electrified through transmission line drawn from Kailali district side and NEA of Dadeldhura.

#### ***Water Supply***

52. Generally, Drinking water supply facility is available to all settlements. The water is conveyed by pipes from the sources to the public taps through gravity flow. These taps (3+350 and 16+220) are located in common places so that each serves a few households. At the chainage 16+220 public tap stand will be damaged during road construction.

#### ***Irrigation***

53. Irrigation scheme is available to most of the settlements through gravity fed canals (Kulo) where irrigation is possible only during rainy season. There are 22 farmer managed irrigation systems (kulo) within ZoI of the project and no any irrigation crossing lies along the road alignment.

#### ***Other Infrastructures/services***

54. There are no any other infrastructures.

## ***Industries***

55. There are 29 small cottage industries (mainly bamboo industries).

## ***Financial Institutions***

56. There are 14 saving and credit cooperatives found in settlements within ZoI of Amarghadhi Municipality.

## ***Community Development Facilities/Organizations***

57. There are community use structures within ZoI of the project of which school play grounds in Aet settlements. Several community based organizations, youth clubs, women's group, NGOs and water/forest users groups are also active in ZoI of the project.

***Table 4.6: Public Services and Infrastructures along the Road Alignment***

<b><i>Type of Public Service and Infrastructure</i></b>	<b><i>Chainage/ Location</i></b>	<b><i>Distance from the Road</i></b>	<b><i>Remarks</i></b>
Pipe Lines	10+200	Crossing the road	May damaged during road construction
Community Building	3+300	Adjacent	half portation of the building will be affected. Refer potographs(Annex XIV).
Pipal chautari with temple	13+220	Adjacent	Will be damaged during construction.
Tap stand	16+200	Adjacent	Will be damaged during construction.

Source: Field survey, 2009

### ***4.3.11 Land holding pattern***

58. Land holding pattern within the ZoI of the road project demonstrates that most of the population (22.3%) have 1-5 ropani (1 ha = 19.8ropani) land while one fourth households (27.6%) fall under 5-10 ropani land holding category. Very few HH (2.0%) are landless and few HHs (30.9%) have less than one ropani land. While 16.4% of the households have more than 10 ropani land and 0.8% household have land holding between 20 to 50 ropani. Details about land holding pattern are given in Annex X c.

### ***4.3.12 Food Security***

59. About half of the households (28.5%) have enough food for only for three to nine months. 26.0% households have enough food for three months, where as 24.9% HHs have enough food for less than three months. This shows the poverty situation within the ZoI of the project area. On the contrary, 18.7% of the households of the project area have food sufficiency for whole year and 1.8% households are reported as food surplus ones who are in the well off category of selling their surplus farm products. Food sufficiency condition of local people for varied time period is given in Annex X d.

### ***4.3.13 Migration pattern***

60. Permanent migration takes place in limited scale towards Amarghadi Municipality. Similarly, seasonal migration also takes place from all the settlements. Majority of them migrate during slack farming season from Mangsir to Poush mainly in Municipality and various parts of Nepal.

### ***4.3.14 Settlement Pattern***

61. Most of the settlements within ZoI of the project are scattered type. Most of them are also roofed buildings. RCC buildings have been started to appear in market centres such as Bagbazaar, Aet and Bagarkot.

### ***4.3.15 Potential Development area***

62. Many of the places, areas and settlements within ZoI of the project have the potentialities in various sectors. These sectors and their potentialities have been mentioned in given below Table 4.7.

**Table 4.7: Development Potentialities in Various Sectors**

<i>SN</i>	<i>Sector</i>	<i>Development potentiality</i>
1	Agriculture	Ginger, amliso (broom grass), potato, vegetable and fruits farming, within all major settlements.
2	Tourism Promotion	Ugratara Mandir at Bagbazaar, Ghatal Than at Aeit
3	Small Cottage Industry	Bamboo products at all major settlements, furniture at Bagbazaar.
4	Trade and business	Development several rural market centres at various places along the road alignment and main market centres at Bagbazaar and Bagarkot.

Source: Field survey, 2009

#### **4.3.16 Religious, Cultural and Historical Sites**

63. There are Ugratara mai Mandir, Bagbazaar (4km from central line) and Ghatal Than, Aeit (2.3km from central line) within ZoI.

64. Furthermore, there are Chautaras at chainage 0+000, 3+200 and 13+600 along the road alignment.

65. Religious faith of most of the people within ZoI of the project is Hinduism. Main festivals observed by local people are Dashain, Tihar, Maghe/Saune Sakranti, Tiz etc.

## ***5.0 Project Alternatives***

66. The various alternatives to achieve the project objectives with minimum environmental impacts are discussed as in the following subsections.

### ***5.1 No action option***

67. This alternative does not allow the implementation of the Proposal. An earthen road currently exists, which is only fair weather road. As the road connects few major settlements with high potential in vegetable, fruits and small cottage industries product, the no action option will increase the transportation time and cost for the local people to the district headquarter and markets and vice versa resulting into low level of productivity and prevalence of poverty. The no action option will conserve some of the environmental adverse impacts at the cost of poverty and hardship of the people.

### ***5.2 Project alternatives***

68. Construction of ropeway, airport and road could be the options for achieving the transportation and access.

69. Ropeway can be a mode of transportation to enhance accessibility of the people within ZoI. The ropeway primarily serves to transport goods and it normally does not provide facilities for human mobility except it is built with cable car facilities, is very costly. In the current power crisis situation in Nepal, cable car cannot be operated efficiently. Also, it does not connect and serve the settlements along the alignment. Hence this alternative is not feasible.

70. As air travel is very expensive thus air connection is also not feasible.

71. Considering other project alternatives, the proposed road project can be the best option to serve the purpose of efficient transportation requirement.

### ***5.3 Alternative Alignment***

72. The alignment of the Bagbazaar-Bagarkot road is an existing motor able earthen road, constructed some years ago. This road is in operation as a fair weather road and since this is the existing road and proposed for the rehabilitation, requirement to acquire land and cutting trees will be minimum than in new alignment opening. Hence, new alternative alignment is not feasible and the proposed road can be the best option.

### ***5.4 Alternative Design and Construction Approach***

73. There are two types of road design and construction methods. They are conventional and green road approach. In conventional method, heavy machineries and equipment, explosives, heavy concrete structures with the application of bituminous surfacing, side drains, bridges and culverts etc. are extensively involved.

74. Green road approach which is normally referred as a labour based, environmental friendly and participatory (LEP) focuses to conserve the delicate mountain ecology through the protection of vegetation cover as means of soil conservation. Under this approach, construction work is done manually from the local labour without using heavy machinery and explosives. Spoil disposal is balanced with cutting and filling volume. Simple dry stone walls and stone causeways will be used. Preservation of vegetation cover is maintained through application of re-vegetation and stabilization of slopes by bio-engineering.

75. The proposed road has been designed considering the both LEP and contractor 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 and process***

76. During the rainy season, the construction work is stopped to allow the natural compaction of the road. Rehabilitation and construction work will be carried out during the remaining months. The construction period is more appropriate from October to June as the local people are more or less free from farming activities. During the construction period existing traffic should be stoppe. Existing traffic will be manage by providing diversion at different location ( Ch. 0+500, 0+950, 1+500, 2+900, 3+800, 4+700, 5+100, 5+700, 6+100, 6+400, 7+000, 7+900, 8+200, 8+500, 8+800, 9+200, 9+540, 9+900, 10+200, 10+700,

10+980, 11+400, 11+900, 12+100, 12+700, 13+000, 13+500, 14+200, 15+540, 16+200, 16+800, 17+000, 17+400 and 18+000).

## **5.6    *Alternative Resources***

77. The physical resources consumed for the construction of the proposed road will mainly include boulders for gabions and stone for dry masonry wall. Stones are not easily available in nearby areas of various sections of the road whereas fine aggregates; sand has to be carried out from Sati River at the distance of 20Km.

## ***6.0 Identification of Impacts and Benefit Augmentation/Mitigation Measures***

78. 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. Several such impacts have been identified based on site observation, field survey, and information obtained from the stakeholders and few were identified on value judgment. Impacts from the proposed road sub-project can be both beneficial as well as adverse. Most of the identified impacts have been quantified to the extent possible. The impacts have been predicted in terms of their magnitude, extent and duration. The possible impacts (positive and negative) in construction and operation phase are presented in the following sub-sections.

79. An effective implementation of benefit maximization measures and adverse impacts mitigation measures are also suggested hereunder. (See also Table 7.2).

### ***6.1 Mitigation Measures During Pre-construction phase***

#### ***6.1.1 Route Selection***

80. Since, this is an existing road and proposed for rehabilitation and widening of the road formation to the specified width i.e.5m. Local conditions (structures, set-back, lay-byes, mass balancing and safe disposal site for the excess excavated material, community utilities, slopes, sensitive spots etc.) and minimizing land acquisition from forest, cultivable lands, settlement and cultural properties will be taken into due consideration to decide on where and which side should be widened.

#### ***6.1.2 Detailed Survey and Design***

81. The road design will follow the rural road standards developed by DOLIDAR. The works will be executed through labor intensive construction method as far as possible and practical in this program. Bio-engineering technique will be applied for stabilization of slopes, which is sustainable, environment friendly and can be done by using local resources, manpower and acquisition of land would be required. At the detail design stage, several alternatives were explored to avoid and minimize further land requirement by using the existing track. The survey team has selected the least valuable, least agriculturally productive land for the lay-bys and improvement and took care to avoid the demolition of houses. These changes have been designed and incorporated into the subproject detail design.

#### ***6.1.3 Land and Property Acquisition, Compensation and Resettlement***

82. ADB Guidelines has also necessary provisions for resettlement assistance including entitlements to replacement of land and other assets and/or compensation in case of involuntary resettlement, compensation cost for houses and other affected structures without deduction for salvageable materials. However, the framework of resettlement plan also allows land donations in cases where the donation is made freely in public and without coercion, does not affect household food security and where adequate income restoration support exists for the household. The voluntary contribution will be accepted if the following criteria are met: (1) The donation is unforced and not the result of community pressure (2) Donated land <10% agricultural holdings (3) Food security above 9 months (4) Full income restoration measures are in place

83. Land taken previously for the existing alignment will not be compensated for but any new land will be obtained through donation under the accepted criteria and acquired by paying compensation for those who comes outside the donation criteria. The structures and crops will be compensated at replacement cost and the lost trees will be compensated at the cost of harvesting (felling and sectioning) and transportation from the site to home. Being a governmental agency, the Proponent will assist to form Compensation Determination Committee (CDC) under the Chairmanship of Chief District Officer. The Chief of Land Revenue Office, DDC representative, DTO will be members in the CDC and other representatives from DFO, DADO, Survey Office, VDC and affected person will be invited if needed. The Committee will decide the rates applicable for compensating different types of houses, land, trees and crops in accordance to established market rates. A separate Resettlement Plan has been prepared to address land and property acquisition as well as compensation issues. As per this Plan, Land donation agreement papers have been produced for the loss of land under the 10% of total holding. The compensation for trees has been calculated based on the replacement cost principle. Compensation payments for trees, land and structures will be disbursed by cheque/cash. The concerned households whose land will be acquired for the project were informed about the land donation process and entitlements. Finally, the Memorandum of Understanding (MoU) will be prepared and households donating the land will be signed in a written agreement with DDC. If the owner of land could not be contacted an equivalent amount shall be kept separately in the DDC fund until the process is complete.

## **6.2 Beneficial Impacts and Benefit Augmentation Measures**

84. The development efforts particularly the development of transportation network will have multifold beneficial impacts. Road projects are generally intended to improve the economic and social welfare of the people. The largest beneficial impacts will be on the physical and socio-economic environment as given below:

### **6.2.1 Construction Stage**

#### ***Employment Generation and Increase in Income***

85. Impacts: One of the major direct beneficial impacts of the road during construction stage is the creation of employment opportunity to the local community. The road construction will create employment opportunities of unskilled (112260 nos.) and skilled (7312 nos.) person. Employment generation for the local people will minimize seasonal migration to other parts of the VDCs. The amount of money that is earned by the wages will directly enhance the operation of various economic activities and enterprise development. There will be direct, high, Local and short term impacts in other economic activities.

86. Measures: Benefit augmentation measures will be implemented as much as possible through the local Road Building Groups (RBGs). They will be given training to do the job and to utilize money earned from the project works, RRRSDP will implement life skill training for income generation activities to improve their livelihood to uplift the socioeconomic condition of the local people particularly poor, dalit, ethnic minority and women.

#### ***Skill Enhancement***

87. Impacts: Although many people in the project area are unskilled at present, the construction of road is likely to enhance their skills in construction, and large number of people will get practical or hands on training. Training on road construction and maintenance to the of structure will further enhance their skills. The impact is direct, medium, local and for long term.

88. Measures: Road Building Groups (RBG), Social mobilizers and supervisors. The skill and knowledge acquired from the project during construction will enhance employment opportunities such trained manpower can earn livelihoods from similar project in futures. This impact is indirect, medium, local and for long-term in nature. These skills will not only benefit the local workers by providing long-term employment opportunity but also contribute to local human resource development.

#### ***Enterprise Development and Business Promotion***

89. 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. To meet these demands, many local and outside people may operate a number of small shops and restaurants around the vicinity of the construction sites. Various farm based enterprises including wide range of agricultural and livestock products will also gain momentum as a result of increased demand by labors during construction period. This will increase local trade and business in the area. This impact is also direct, low significance, local and short terms in nature.

90. Measures: Providing support to local entrepreneurs, promotion of cooperatives and linkage with bank and other financial institutions.

#### ***Community Empowerment and Ownership***

91. Impacts: During construction period, various road construction coordination committees and road building groups will be constituted in order to proceed and implement the road construction activities. 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 among them. This impact is also indirect, low, local and short terms in nature.

92. Measures: Various coordination committees will be constituted and training will be given to them.



## ***Women and Indigenous People Empowerment***

93. Impacts: Women and indigenous people in particular may be benefited during construction period providing awareness program, training, jobs to empower them. Thus, the project will have indirect, significant, local and long-term impact in ZoI.

94. Measures: During the road construction and rehabilitation, more emphasis will be given to women, dalit and vulnerable workers. At least 40% workers will be women.

## ***6.2.2 Operation Stage***

### ***Improvement in accessibility and saving of time and transportation cost***

95. Impacts: Once the road project is completed, the people living within the road corridor will have easy access to cities and markets. This will enhance the transaction of goods and access to social services. Access to input and services will increase, which will be cheaper due to transportation facility. The impact is direct, high, regional and for long term.

96. Measures: Regular maintenance of the road will be done by the Proponent.

### ***Increase in Trade, Commerce and Development of Market centers***

97. Impact: There is a possibility of increased economic opportunities and significant growth and extension of the minor local markets along the road like in Bagbazaar, Aeit and Bagarkot and others. The farmers will be more interested to increase agricultural production due to market accessibility. Similarly, there will be diversification in occupational pattern of local people and non-farm employment will grow to those who are till now mainly dependent on subsistence farming. This will lessen pressure on local natural resources. The impact will be indirect, low, local and long term in nature.

98. Measures: DDC/VDC shall manage planned growth with required infrastructure facilities for healthy and hygienic environment in the market areas by providing drainage and sewerage systems.

### ***Appreciation of Land Value***

99. Impacts: The construction of road leads to appreciation of land values particularly near the market and settlement areas. The land price would increase due to the availability of reliable transportation facilities. This would uplift the economic condition of the local people. The impact is indirect, medium, local and long term in nature.

100. Measures: Promotion of land development activities and control of encroachment within RoW. Local people will be made aware that high value lands are acceptable to the banks and microfinance institutions to provide loans for them to start their own economic/social ventures.

### ***Increased Crop Productivity and Sale of Farm Products***

101. Impacts: Due to easy and cheaper availability of agricultural inputs and technologies, productivity will be increased along the road. Sale of farm and livestock products will be increased in the settlements along the road corridor like Bagbazaar, Aeit and Bagerkot Bazaar settlements, which are potential areas for the production of vegetables, fruits and cash crops such as ginger, Orange etc. Operation of road will further commercialize the subsistence agriculture of rural area. The economy of rural area will be further monetized and it will help the rural economy. This is the indirect, significant, local and long term impacts from the proposed road.

102. Measures: Promotion of market linkages and networking for better market price.

### ***Enhancement of Community Development Services***

103. Impacts: Due to increase in employment opportunities, trade, business and income, it is expected that there will be improvement in social service such as education, health, government offices, saving and credits. The improvement can also be expected with more frequent visit of extension workers, longer stay of professionals such as teacher, doctors to their rural duty areas. Similarly, enhanced income level will encourage local people to spend more on health and sanitation, development of education facilities by employing qualified and professional teachers and upgrading the existing health posts.

Production of educated manpower will also help to increase the number of employees in government/non government services. This is direct, significant, local and long-term impact of the proposed project.

104. Measures: The access will be kept maintained so that other development and services will follow in the project area.

## 6.3 Adverse Impacts and Mitigation Measures

### 6.3.1 Construction Stage

105. The proposed road will be constructed according to LEP approach and contractor base approach. Therefore, there will not be severe damage to environment compared to conventional construction approach. However, it is likely to occur following impacts on physical, biological, socio-economic and cultural resources of the proposed road area and respective mitigation measures are also suggested.

### Physical Impacts

#### Change in Land Use

106. Impacts: The land acquired for the implementation of the project can undergo a long-term permanent change in the land use. Changes of land use due to the construction of road are mainly conversion of agricultural land and forest into built up area. Cultivated land (0.47 ha) and Community Forest (2.34 ha) of the local people will be permanently lost during road construction. The changes in land use will have impact on loss of agricultural land, which will directly reduce the agricultural production. Similarly, there will be also some change in land use due to expansion of roadside settlements like tea shops, temporary shops and labor etc. The impact from changes in land use will be high, direct, local and long term in nature.

107. Measures: (1) Improving agricultural extension services (2) Applying additional protective measures that the remaining land will not be lost due to erosion

#### Spoil Disposal

108. Impacts: The common likely problems from the inappropriate disposal of spoils are: gulying and erosion of spoil tips especially when combined with unmanaged surface water runoff, damage to farm lands, and destruction of vegetation, crops and property at downhill through direct deposition or indirectly as result of mass flow. The impact from spoil disposal will be direct, medium, site specific and short term in nature.

109. Measures: The following mitigation measures will be adopted: (1) Wherever possible, surplus spoil will be used to fill eroded gullies, quarries and depressed areas etc. (2) Excess spoils will be disposed in specified tipping sites in a controlled manner and the tipping sites should be covered by vegetation by bio-engineering techniques after surplus material is tipped. (3) Spoils should not be disposed on fragile slopes, farmland, marshy land, forest areas, natural drainage path, canals and other infrastructures. (4) After the disposal, the site will be provided with proper drainage, vegetation and adequate protection against erosion. (5) Necessary toe walls and retaining walls will be provided to protect the disposal of soil.

**Table 6.1: Recommended Spoil disposal sites**

<i>SN</i>	<i>Chainages</i>	<i>Recommended Spoil disposal sites</i>	<i>Locatoion</i>	<i>Remarks</i>
1	0+850	Disposal site at lower side of the road	Karigau	Natural depression
2	2+300	Disposal site at lower side of the road	Aeit	Natural depression
3	4+750	Disposal site at lower side of the road	Birday	Natural depression
4	7+400	Disposal site at lower side of the road	Aedhugara	natural depression
5	9+650	Disposal site at lower side of the road	Ekthara	Natural depression
6	13+800	Disposal site at lower side of the road	Dhigula	Natural depression
7	14+880	Disposal site at lower side of the road	Aaditiyapur	Natural depression
8	16+350	Disposal site at lower side of the road	Dmuri	Natural depression

Source: Field survey, 2009

## ***Slope Instability***

110. Impacts: There are existing erosion prone area at chainages 17+640 and 17+750. 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. Majority of work will be done manually under LEP approach by RBGs and contractor approach, which is an environment friendly method. The likely impact of slope instability and soil erosion is indirect, medium, site specific and mid-term nature.

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

- Ensuring minimum cut slope
- 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, Palisades, Bamboo plantation, Live checkdam construction etc.)
- No construction work during rainy season
- Use of toe wall before disposing spoils on hill slopes
- Drainage management (Catch drain, rip-rap drain, checkdam etc.)
- Breast wall at chainage 17+640 and 17+750.

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

## ***Water Management : (Spring, Streams, Rain Water Drainage and Cross Drainage Works etc.)***

113. Impacts: As part of road construction side and cross drain will also be constructed. The concentrated water Discharged from side and cross drain can cause potential impacts to existing area by accelerating erosion. During the detail design phase, the project will design the drainage system by considering water collection, conveyance, disposal of surface water runoff from the road and motorist safety as well. The drainage system will also be designed with drainage width, depth, slopes, road alignment and protective treatment. All drainage will be joined with the natural drainage system in order to avoid possible gully formation at different location, particularly on hill slopes. Small irrigation channels (kulo) along the alignment shall be preserved, where road crosses them, cross drainage shall be provided to facilitate irrigation. The impact will be indirect, medium, site specific and medium term.

114. Measures: Roads usually generate large volumes of concentrated surface runoff. The concentrated water flowing through the road and from the outlets cause erosion and landslides, eventually affecting the stability of the road itself, in order to avoid this, the following mitigation measures are suggested:

(1) Provide adequate and appropriate numbers of drainage structures in order to have minimum interference with and impact on natural drainage pattern of the area, (2) Avoid surface water Discharge into farmland or risky locations, (3) Do not divert water away from natural water course unless it is absolutely necessary (4) Avoid blockage or diversion of natural channels due to construction of road and disposal of spoils.

115. Details about necessary structures required to mitigate the water induced adverse impacts are given in Table 6.2.

***Table 6.2: Proposed Drainage and Cross Drainage Structure along the road for Water Management***

<b><i>SN</i></b>	<b><i>Chainages</i></b>	<b><i>Necessary Structures for Mitigation Measures</i></b>
1.	0+000-0+800	Side drain
2.	0+800	Cross Humpipe drainage
3.	0+800-1+510	Side drain
4.	1+510	Cross Humpipe drainage
5.	1+510-2+200	Side drain
6.	2+200	Cross Humpipe drainage
7.	2+200-2+600	Side drain
8.	2+600	Cross Humpipe drainage
9.	2+600-3+600	Side drain

10.	3+600	Cross Humpipe drainage
11.	3+600-6+000	Side drain
12.	6+000	Cross Humpipe drainage
13.	6+000 – 6+100	Side drain
14.	6+100	Cross Humpipe drainage
15.	6+100-8+600	Side drain
16.	8+600	Cross Humpipe drainage
17.	8+600-10+700	Side drain
18.	10+700	Cross Humpipe drainage
19.	10+700- 11+600	Side drain
20.	11+600	Cross Humpipe drainage
21.	11+600-13+500	Side drain
22.	13+500	Cross Humpipe drainage
23.	13+500-14+100	Side drain
24.	14+100	Cross Humpipe drainage
25.	14+100-14+900	Side drain
26.	14+900	Cross Humpipe drainage
27.	14+900-15+900	Side drain
28.	15+900	Cross Humpipe drainage
29.	15+900-17+850	Side drain
30.	17+850	Cross Humpipe drainage
31.	17+850-18+200	Side drain

Source: Field survey, 2009

### ***Air Dust, Noise and Water Pollution***

116. Impacts: Although the air quality of the project area is not measured, the air does not appear to be polluted. During the construction of the road, there is a strong possibility of dust emission. This may affect the local people and workers, agricultural crops, markets, schools and health posts. Contractor may use heavy equipment during surfacing works, which might be source of dust nuisance. Impact on air quality will be direct, low, local and short term in nature. The project area at present does not experience high levels of noise. 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, local, reversible and short term in nature.

117. The water quality data within the project area is not tested. Nevertheless the quality of water in the water bodies, within the project area appears to be fairly good, as they are widely utilized households for drinking. During construction these water bodies may be polluted by spoil and construction wastes. The impact will be direct, low, local, short term and reversible in nature.

118. Measures: The following mitigation measures will be adopted: Use of face mask by the workers to minimize air pollution due to dust generation (2) Plantation of local species along the roadside (3) Use of ear muffs to lessen noise pollution during rock breaking and quarrying (4) Avoiding the disposal of excavated materials in the water bodies

### ***Quarrying***

119. Impacts: The construction of road particularly retaining walls and other structures will require boulders, sand and aggregates. The quarry site for these materials will be largely on local stream and rocky area near the road alignment is not provided so from sati river will be adequate to meet the requirement. Fine aggregates i.e. sand has to taken from Sati River. 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. The extraction of materials from inappropriate places or in excessive amount can cause serious damage to the local environment. Recommended quarry sites are given in Table 6.3.

120. Measures: Following mitigation measures will be adopted:

- Appropriate planning for quarry and borrow operation will be made.

- Unstable sites, erosion prone area, dense forest area, settlements, fertile farm land will be avoided for quarry operation.
- After the extraction is completed, the quarry site at the river will be rehabilitated by leveling the river bed.

**Table 6.3: Recommended Quarry sites**

<b>SN</b>	<b>Chainages</b>	<b>Recommended quarry sites</b>
1.	0+000	Stone quarry at upper side of the road in Bagbazaar in a limited scale (stone can be extracted from Sati river to bagbazaar)
2.	3+500	Stone quarry at upper side of the road in Aeit in a limited scale (stone can be extracted from Sati river to Aeit)
3.	7+500	Stone quarry at upper side of the road in Aaidhugara in a limited scale (stone can be extracted from Sati river to Aaidhugara)
4.	10+600	Stone quarry at upper side of the road in Lakaam in a limited scale (stone can be extracted from Sati river to Laakam)
5.	15+000	Stone quarry at upper side of the road in Bagarkot in a limited scale (stone can be extracted from Sati river to bagarkot)
6.	16+750	Stone quarry at upper side of the road in Dumari in a limited scale (stone can be extracted from Sati river to bagarkot)

Source: Field survey, 2009

### ***Location of Camp Sites, Storage Depots***

121. Impacts: The siting of labor camp/ storage depots by contractors for carrying out contractor-based works may cause encroachment of forest, agriculture land, alteration of drainage, disposal of solid waste, and waste water etc. which may cause degradation in the environment. The impacts due to this will be direct, low, local and short term.

122. Measures: The following mitigation measures will be adopted:

- The location of camp sites, storage depots will be kept on unproductive/ barren lands, away from forest areas as far as possible.
- Use of agricultural lands will not be allowed unless in extreme circumstances by paying adequate compensation to the owner.
- The sites will have proper management of sanitary facilities by providing Pit Latrine, Sockpit and shall not contaminate any near by water courses/drains.

Appropriate camp site should be at 5+870 near Aidhugara, at 11+500 near Ekthara, at 13+350 near Dhigula and 17+260 at Dumari.

### ***Construction Equipment Vehicles***

123. Impacts: The contractor based construction will use machineries and tools. The related negative impacts are increase in air pollution due to emission of smoke and dust, and increase in vibration due to vehicular movement. The impacts due to this will be direct, low, site specific and short term.

124. Measures: The following mitigation measures will be adopted:

- All 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.
- Materials under transportation shall be covered.

### ***Crusher Plants***

125. Impacts: The stone required for gravel work will be crushed in the crusher plants. The negative impacts are increase in air pollution due to dust emission from crushed stone, vibration caused due to operation of plants and noise pollution. The impacts due to this will be direct, low, site specific and short term.

126. Measures: The following mitigation measures will be adopted:
- Procure gravel from market as far possible.
  - If crusher plant is necessary it should be far from settlements.
  - For minimize accidental hazards, protective measures (Helmets, masks, gloves, earplugs) should be provided to the labours
- Boards should be kept to aware the people.

### ***Decline in Aesthetic Value***

127. Impacts: Landscape degradation relates particularly to poorly designed or monitored activities resulting from quarrying operations and from indiscriminate dumping of spoil material. Road induced activities may lead to the generation and mismanagement of wastes in the roadsides and create scars on the landscape. The likely will be direct, low in magnitude, local nature and short term in duration.

128. Measures: The following mitigation measures will be adopted: Indiscriminate dumping of spoil material will be discouraged (2) After the extraction is completed, the quarry site will be rehabilitated to suit the local landscape (3) Plantation of local species along the roadside

### ***Biological Impacts***

#### ***Loss or degradation of forests and vegetation***

129. Impacts: Total of 2.34 ha of forest will be permanently lost due to road construction work. Total 12 numbers of trees (with 4 pipal tree) will be removed from five CFs during road 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.

130. 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 including birds due to loss or degradation of habitat, increased hunting and other form of human pressure***

131. Impacts: The proposed area is not significant habitat for wildlife and bird species. However, the construction of road may disturb wildlife and bird species present along the road corridor due to increased noise level. The impact will be indirect, low, local and short term in nature.

132. Measures: The following mitigation measures will be adopted:  
When alignment passes through forest area, site clearance for construction shall be limited to the minimum width. No tree or vegetation shall be cut unless absolutely necessary (2) The construction activities near forest area will be appropriately managed so that there will be least disturbance to the wildlife and birds (3) Workers shall be actively discouraged from collecting fuel wood by providing kerosene from forest or hunting of birds or animals (4) Coordination with DFO and CFUGs to control the activities like illegal hunting and poaching by enforcing acts and regulations strictly.

#### ***Impacts on flora and fauna***

133. Impacts: There will be no 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, medium, low and short term.

134. Measures: As there are no such species, mitigation measures are not warranted. However, the measures as no vegetation shall be cut unless absolutely necessary and minimum site clearance, discouraging workers for collecting fuel wood from forest or hunting/harassing faunas; shall be followed to protect such species, if any. Sapling of trees at 1:25 ratio will be planted.



## ***Socio-economic Impacts***

### ***Loss or degradation of farm land and productivity***

135. Impacts: There will be permanent loss of 0.47 ha of cultivated land due to road construction. This will lead to loss 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. It is clear that the loss of crops from the land acquired by the project will have adverse impact on the financial stability of the affected households who are dependent on the agricultural productivity of their land. This impact is expected to be of high in magnitude, local in extent and of long term in duration. During the construction phase due to the excavation and other construction works, the loss of the agricultural production is difficult to predict without knowing the construction schedule. This impact is direct, medium, local and long term.

136. 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***

137. Impacts: The proposed road alignment passes through nearby the settlements of Bagbazaar, Karigau, Josina, Aeit, Birday, Aiduhgara, Laakam, Ekthara, Dhigula, Aaditiyarpur and Bagerkot/Dumri. 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, site specific, short term and medium in magnitude. Details about property loss and damage will be described in Resettlement Plan Report.

138. Measures: Compensation and resettlement measures will be dealt as per decision made by Compensation Determination Committee (CDC).

### ***Impact on Community Infrastructure***

139. Impacts: The road construction along this alignment has no impact on health posts and irrigation infrastructures. But water supply pipe lines in different locations have adjacent to the road may affect during road construction. Papal chautari with temple and public tap stand have adjacent to the road will be damaged during construction of road. Community building have adjacent to the road and half portation will be damaged

140. Measures: In order to avoid any impacts, the following mitigation measures will be adopted.
- Restore all disturbed infrastructures to the condition before disturbance or improve where appropriate.
  - Schedule the construction activities during off- agriculture season.

***Table 6.4: Affected Public Services and Infrastructure with Specific Mitigation Measures***

<b><i>Type of Public Service and Infrastructure</i></b>	<b><i>Chainage/ Location</i></b>	<b><i>Distance from the Road</i></b>	<b><i>Mitigation Measures</i></b>
Pipe lines	10+200	Crossing the road	Damaged during road construction, required to reinstate.
Community building at Aeit settlement	3+300,	With in the width of the carriage way.	Will damaged during road construction, required to reinstate.
Pipal chautari with temple	13+220	With in the width of the carriage way.	Will damaged during road construction, required to reinstate.
Public tap stand	16+220	Adjacent	May damaged during construction

Source: Field survey, 2009

### ***Impacts on cultural, religious and archeological sites***

141. There are Ugratara Mandir(4km) and Ghatal Than(2.3km) in Amarghadhi Municipality. There is no impact because these are far from road. This impact is expected to be of low in magnitude, local in extent and of short term in duration. Measures: Shifting of centre line of road alignment wherever.

### ***Impacts on health and safety matters***

142. Impacts: During construction, workers will be exposed to various risks and hazards. Potential impacts to health are respiration and eye diseases due to exposure to dust, risk of accident during work. The lack of proper sanitary measures and increase in waste and water pollution can lead to an outbreak of epidemics and diseases. This impact is considered to be of the direct, high in magnitude, for short term and localized.

143. Measures: The workers will be provided with helmets, masks, muffs depending on the nature of the construction work (2) Drinking water facility and temporary pit latrine will be established at construction sites to control open defecation and pollution of water bodies by the workers (3) Workers will be provided with first aid and health facilities (4) Group accidental insurance will be done for the workers (5) First aid training will be provided to field staffs like sub-engineer, social mobilizers and supervisors.

## ***6.3.2 Operation stage***

### ***Physical Environment***

#### ***Road slope stability and management***

144. Impacts: The destabilization of slope may also be expedited due to human activities in the road neighborhood such as quarrying stones or soil, animal grazing, irrigated cultivation, opening of branch roads that will connect the road with other village settlements. This may cause damage to road section, disruption to transportation and other social impacts in the nearby areas. The inadequate maintenance of the road, blockage of drains, damages the road surface can lead to slides and slope failure. Sensitive areas for possible road slope stability problems are:

145. Periphery areas of streams/kholsis/springs/ water seepage areas, which are at chainages 2+200(Karigau kholsi), 2+600(Josina kholsi), 6+000(Aeit Kholsi) and 6+100(Aeit Kholsi). The impact will be direct, medium local and long term nature.

146. Measures: Rill and gully formations should be regularly monitored and immediately fixed at critical areas; (2) Correction of maintenance of the slope protection measures and drainage works (3) Minor landslide and mass wasting shall be immediately cleared and slope restored with appropriate technology (bioengineering) (4) Soil conservation will be promoted in the right of way and vulnerable areas beyond the road alignment (5) CFUG will be promoted to conserve and manage their CFs properly

#### ***Impact due to air, noise and water pollution***

147. Impacts: During operation period, vehicles will play along the road and will emit gaseous pollutants. This will increase the pollution level of ambient air along the road corridor. 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, the overall impact of air pollution will, thus, be direct, low, local and long term. Noise level during the operation period will increase due to the movement of vehicles and other activities. However, due to low traffic volume, the impact due to noise pollution will be direct, low, local and long term. The disposal of spoil and other construction materials and wastes, washing of vehicles in water bodies may degrade the water quality. The impact of this kind will be direct, low, local and long term.

148. Measures: (1) Community and road user awareness program will be organized to enhance public understanding (2) Plantation will be done near the settlements (3) Use of horns should be restricted near dense forest, health posts, schools and settlements (4) For control of dust nuisance, sprinkling of water, speed limit of vehicle and vegetative barrier of earthen bounds should be designed.



## ***Biological Environment***

### ***Depletion of Forest Resources***

149. Impacts: The forest resources depletion may occur due to ineffective drainage works, inappropriate spoil disposal and construction practices. The development of market centers may exert pressure on forest and eventually deplete the forest resources. To meet the increasing needs of the forest products, illegal felling/cutting of poles and trees may occur. Operation of road may increase in timber smuggling due to easy access and easy transportation facilities. The impact will be indirect, medium, local and long term in nature.

150. Measures: (1) CFUGs will be supported to conserve and manage their CFs according to operational plans (2) Encourage and support local community for controlling illegal harvesting of forest resources (3) Awareness programmes shall be organized to educate local people on the conservation of forest.

### ***Disturbance to the Wildlife and Illegal Hunting***

151. 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 hunting during operation period by the people from outside due to easy accessibility. The impact will be indirect, low, local and long term in nature.

152. Measure: (1) Prohibition of blowing horns in the dense forest areas (2) Potential areas for wildlife crossing

## ***Socio-economic and Cultural Impacts***

### ***New Settlement and Market Center Development***

153. Impacts: The existing trend is to settle along the road side for the economic activities through the establishment of shops, restaurants, stalls and hotels. Expansion of settlement area and market can be observed in Bagerkot, Ait and Bagbazaar. This may trigger the practice of encroaching right of way (RoW). Consequently, this will reduce road capacity and increase road accidents. The increasing trend of roadside settlement is likely to increase household waste as well as wastewater on the road. The impact will be direct, medium, local and long term in nature.

154. Measures: (1) Awareness raising programme through local organizations to plan proper settlements (2) Regulate settlement growth with proper planning/zoning along RoW (3) Plantation of trees along the road.

### ***Change in Social behavior***

155. Impacts: People may leave their family in their villages to do well near the new spots for economic incentives. This may ultimately affect the traditional bonds, norms and functions of the family. This may also cause impact on social and cultural transition. However, on the other side, there will be also increased interdependence among diverse social groups and interlinkage between different geographical areas which will promote the social cohesion and culture of tolerance among people. The impact will be indirect, medium, local and short term in nature

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

### ***Impact on Livelihood and economic activities***

157. The adverse impact on local economy can be mitigated by generating income generating activities. Like in road project, local people explore potential of the area after access to market on one hand and there will be expansion of potential existing business, trade and cottage industries. There is potential for bamboo based cottage industries, agroforestry (Uttis and cardamom), vegetables and horticulture farming. Besides, there is potential for Non-Timber Forest Products other than bamboo such as Chiraito, Lokta or Kagate in upper hills.

## ***Road safety Measures***

158. Impacts: Movement of vehicles in the road will invite accidents. Inadequate provisions of road safety measures like no provisions of signals and lack of enforcement of traffic rules during operation period may invite accidents. The impact will be direct, medium, local and long term in nature.

159. Measures: The mitigation measures adopted will be:

- Applying appropriate road safety measures with the help of 3-Es i.e. Engineering, Enforcement and Education.
- Required safety signs will be used along the road

## 7.0 Environmental Management Plan

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

### 7.1 Institutions and Their Roles

**Table 7.1: Institution and their roles**

<b>Institution</b>	<b>Role</b>	<b>Responsibility in the Project</b>	<b>Remark</b>
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, executive agency and concerned agency as per EPA/EPR. Environment Management Section is responsible to look into safeguard matters for the ministry.	<ul style="list-style-type: none"> <li>To review IEE ToR and Report, and give approval.</li> <li>Coordinate with project on safeguard issues</li> <li>Conduct environmental monitoring from central level.</li> </ul>	
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 Executing Agency.	<ul style="list-style-type: none"> <li>Prepare IEE ToR and submit for approval to PCU/MLD</li> <li>Conduct IEE Study, Public Consultation, and prepare IEE Report</li> <li>Receive comments from PCU/ADB/MLD and modify accordingly. Get final approval from MLD.</li> <li>Conduct environmental safeguard monitoring</li> <li>Reporting</li> </ul>	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.	
Central Implementation Support Consultant (CISC)	Support consultants at central level	Technical and management support to PCU	
District Implementation Support Team (DIST)	Support consultants at district level	Technical and management support to DPO	

161. 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 ZoI.

They carry out the construction works that can be conducted manually. Contractor will be appointed for works requiring higher skill and mechanized support.

## 7.2. Reporting and Documentation

162. As part of EMP, reports will be produced at regular time intervals. Three monthly progress reports will be prepared and submitted to the DDC, and DDC will forward it to the PCU and DoLIDAR. Monitoring checklist will be developed as per the Environment Management Action Plan (EMP). The checklist will be used for regular monitoring and included in the Progress Report.

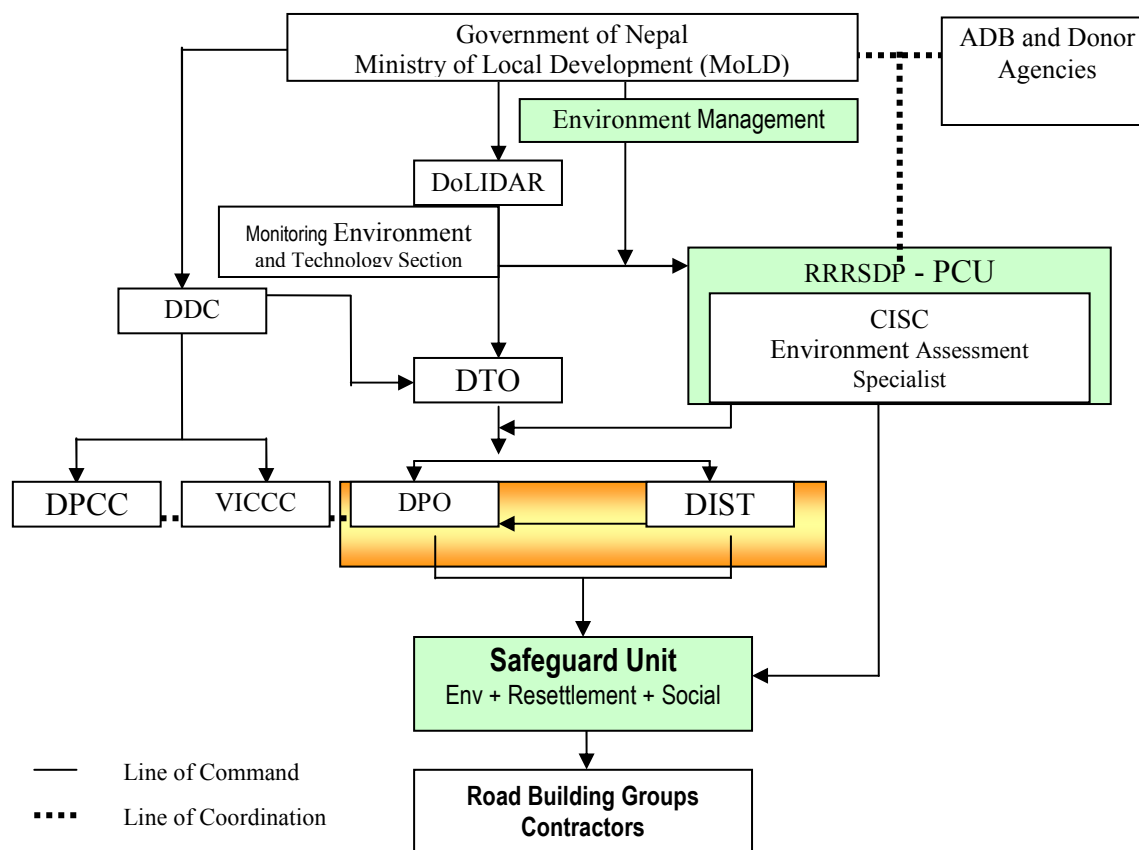
163. The Contract with contractor will clearly state that the DDC/DTO must approve the road building groups/contractor's arrangements for environmental protection, health and safety, waste management and other environment related actions identified during the detailed design phase.

164. The DIST through DPO will inform the DDC/DTO in case of non-compliance and of any other environmental issue that requires immediate attention. The contract will detail the remedies for non-compliance by the Contractor. The 'Naik' (Leader) of RBGs will be given orientation training on ensuring environmental protection measures. Routine monitoring of such measures will be carried out through supervision staff (environmental, social and technical staff).

165. 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 remedial actions.

166. The trimester environment monitoring report will be submitted for the first year of operation of the road by the Proponent (DDC/DTO, Dadeldhura) to EA, 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**



### ***Environmental Management Plan***

167. 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 environmental safeguard and ensure the implementation of mitigation measures and according to EMAP. Overall implementation of the EMP will become proponent's responsibility. Framework for implementing environmental management plan is shown by Table 7.2.

**Table 7.2: Likely Beneficial Impacts and Proposed Enhancement Measures**

Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies		
			Nat	Ma g	Ext	Dur		Executing Agency	Supporting Agency	
Construction Stage										
Construction of road	Employment Generation and Increase in Income	Increase in income level	D	H	L	ST	Involve local people to the extent possible to implement manual works through labour-based approach.	DDC/DTO/ DIST	DPCC / VICCC / CISC	
On the job training to local labour	Skill Enhancement	Increase in income generating activities, employment opportunities	IN	M	L	LT	Priority to Affected Peoples (APs) and vulnerable groups, job training on various constructions works.	DPO/DIST	DDC/DTO / CISC	
Construction of road	Enterprise Development and Business Promotion	Enhancement in local economy	D	L	L	ST	Provide support to local entrepreneurs, promotion of cooperatives and linkage with financial institutions.	DDC/DTO	DIST/ CISC	
Construction coordination committee and RBG program	Community Empowerment and Ownership	Increase in income and ownership.	IN	L	L	ST	Provide skill trainings	DPO/DIST	DDC/DTO / CISC	
Construction of road	Women and Indigenous People Empowerment	Empower the women and indigenous people	IN	H	L	LT	Priority to women, dalit and vulnerable workers. At least 40% workers will be women.	DDC/DTO	DIST/VICCC	
Operation Stage										
Operation of Road	Improvement in Accessibility and Saving of Time and Transportation Cost	Saving in travel time and travel cost	D	H	R	LT	Proper maintenance (regular, emergency) , continuation of bioengineering	DDC/DTO	DDC / DoLIDAR	
Operation of Road	Increase in Trade, Commerce and Development of Market centers	Shifts towards improved commercial agriculture and increase in non-agricultural occupation	IN	L	L	LT	Manage planned growth with required infrastructure facilities for healthy and hygienic environment in the market areas providing drainage and sewerage systems.	DTO	DDC/VDC	
Operation of Road	Appreciation of Land Value	Improvement in local economic condition	IN	M	L	LT	Land development & management, observe that RoW is not encroached. Locals will be made aware on this fact so that they can rip its benefit.	DDC/DTO	DDC/VDC	
Operation of Road	Increased Crop Productivity and Sale of Farm Products	Enhancement in local economy	IN	H	L	LT	Promotion of market linkages and networking for better market price.	DDC/DTO	DDC/VDC	

Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies	
			Nat	Mag	Ext	Dur		Executing Agency	Supporting Agency
Operation of Road	Enhancement of Community Development Services	Socioeconomic development and raise in quality service	D	H	L	LT	Encourage local people in local decision making regarding development and social services facility	Local people, DDC, VDC	DDC, VDC

**Table 7.3: Likely Adverse Impacts and Proposed Mitigation Measures**

Table No. 1: Entry Adverse Impacts and Proposed Mitigation Measures										
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										
Physical Environment										
Construction of Road, site clearance	Change in land use	Loss of agricultural land, production, loss of property	D	H	L	LT	IR	Avoid fertile land, forest, settlement areas etc.	DDC/DT O/DPO	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 management of spoils and waste, provision of proper drainages, toe walls Proposed spoil disposal sites are 0+850, 2+300, 4+750, 7+400, 9+650, 13+800, 14+880, 16+350.	DDC/DT O/DPO	DIST/VIC CC/ VDC
Site clearance, excavation	Slope Instability (esisting land slide at cahinage 17+640 and 17+750)	Erosion, landslide, loss of property	IN	M	SS	MT	Re	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.)Breast wall at chainage 17+640 and 17+750 should be provided.	DDC/DT O/DPO	DIST
Construction of Road	Water Management, generation of large volume of surface runoff	Erosion, landslide, damage to farmland	IN	M	SS	MT	Re	Proper drainage structures and proper spoil disposal, Avoid blockage or diversion of natural channels due to construction of road and disposal of spoils.	DDC/DT O/DPO	DIST
Construction works, operation	Air pollution due to dust from exposed surface, from	Affect on local people and workers health and affect	D	L	L	ST	Re	Use of face mask while working on dust prone areas, covering of dust sources	DDC/DT O/DPO /	DIST

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
of construction vehicles, material hauling and unloading etc. Slope cutting, spoil and waste disposal.	construction equipments and vehicles	onagriculture.							RBGs	
	Noise pollution	Disturbance and annoyance around school, health posts, forest areas.	D	L	L	ST	Re	Restrict horn near school, health posts etc.	DDC/DT O/DPO / 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	Proper spoil management, and prevention of leakage and spills of construction chemicals, restriction in urination and defecation in open areas	DDC/DT O/DPO/ Contractor/RBGs	DIST/VIC CC
Cutting of slopes	Quarry operation and its potential effect on instability, landslide	Water pollution, damage to farmland, disturbance in natural drainage	D	L	L	ST	Re	Proper selection and management of quarry sites, rehabilitation of quarry sites after completion of work. Recommended quarry sites are Ch 0+000, 3+500, 7+500, 10+600, 15+000, 16+750 (Sati river)	DDC/DT O/ Contractor/RBGs	DPO/DIST / VICCC
Construction of road	Location of Camp Sites, Storage Depots	Encroachment of forest, agriculture land, alteration of drainage, disposal of solid waste, and waste water	D	L	L	ST	Re	Proper selection of camp sites away from forests, proper sanitary facilities by providing Pit Latrine, sockpit. Appropriate camp site should be at 5+870 near Aidhugara, at 11+500 near Ekthara, at 13+350 near Dhigula and at 17+260 at Dumari.	DDC/DT O/DPO/ Contractor	DIST/VIC CC
Construction of road	Construction Equipment Vehicles	Dust and Noise pollution and health risks to workers	D	L	SS	ST	Re	Cover of materials under transportation, facility of safety measures for workers, vigilance and monitoring. Procure gravel from market as far possible.	DDC/DT O/ DPO/Contractor	DIST
Operation of heavy equipments	Crusher Plants	Dust and Noise pollution and health risks to workers	D	L	SS	ST	Re	Sprinkling of water to reduce dust nuisance, banners and boards for awareness, facility of safety measures for workers (Such as Helmets, masks, gloves etc.)	DDC/DT O/ DPO/Contractor	DIST/CIS C
Construction of road, quarrying operation, spoil	Decline in Aesthetic Value	Scars of Landslide	D	L	L	ST	Re	Discourage indiscriminate dumping of spoil, rehabilitation of quarry, plantation of local species along the roadside	DDC/DT O/ DPO/Con	DIST/CIS C



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
disposal									tractor	
<b>Biological Environment</b>										
Clearance of vegetation necessary for road formation	Loss or Degradation of Community Forests and Vegetation (2.34 Ha, and 12 nos tree )	Loss of environmental benefits from vegetation, disturbance in ecological function (dust and noise absorbance, aesthetic value etc.)	D	H	L	LT	Re	Minimize cutting of tree and vegetation, compensatory plantation of trees in ratio 1:25 and Bio-engineering measures.	DDC/DT O/DPO/DFO	DFO/CFU Gs/DIST
Construction activity	Impact on Wildlife Due To Loss of Habitat and Hunting	Loss of biodiversity and valuable species of wildlife	IN	L	L	ST	Re	Work only in day time, do not disturb wildlife, aware workers	DDC/DT O/DPO/DFO	DFO/CFU Gs/DIST
Construction activity	Impacts on Flora and Fauna	Loss of biodiversity	IN	M	L	ST	Re	Minimum site clearance, discouraging workers for collecting fuel wood from forest or hunting/harassing faunas	DDC/DT O/DPO/DFO	DFO/CFU Gs/DIST
<b>Social Economics</b>										
Acquisition of land for maintaining road width*	Loss or Degradation of Farm Land and Productivity (0.03 Ha)	Reduced production, hardship, food shortage	D	M	L	LT	IR	Minimize productive land acquisition through alignment selection, Compensation for affected people	DDC/DT O/DPO	CFC1 DIST/VIC CC
Acquisition of land and property for maintaining road	Loss of Private Properties	Displacement of people, hardship	D	M	SS	ST	IR	Compensation and resettlement to the owner as described in resettlement plan	DDC/DT O/DPO	CFC2/DIST

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

<sup>1</sup> The Land Acquisition Guidelines, 1991 specify the establishment of an Acquisition and Rehabilitation Committee (also known as Compensation Fixation Committee, "CFC") for fixing the rate of compensation of private properties to be acquired, consisting of the concerned Chief District Officer (Chair), Land Revenue Officer, representative of the DDC and the Project Manager and others as deemed necessary.

<sup>2</sup> The Land Acquisition Guidelines, 1991 specify the establishment of an Acquisition and Rehabilitation Committee (also known as Compensation Fixation Committee, "CFC") for fixing the rate of compensation of private properties to be acquired, consisting of the concerned Chief District Officer (Chair), Land Revenue Officer, representative of the DDC and the Project Manager and others as deemed necessary.

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
width										
Demolition of structures along road alignment	Impact on Community Infrastructure:	Loss of services provided by them	D	M	SS	ST	Re	Restoration or relocation of affected infrastructures: Pipe Lines (10+200) locations, Tap Stand 16+220) and community building at Aeit (3+300), Pipal chautari with temple (13+220) will damaged during road construction.	DDC/DT O/DPO	PCU DIST/CIS C/VICCC/ VDC
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	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/DT O /DPO/ Contractors	DIST/CIS C
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	IR	Regular maintenance of slope protection structures, Selection of healthy upland farming techniques	DDC/DT O/DPO/V DC	DoLIDAR , DFO, District Watershed and Soil Conservation Office (DWSSC)
Operation of vehicles, Inadequate drainage	Air, Noise and Water Pollution	Disturbance to students, patients, wildlife, effect to nearby agriculture land and crops	D	L	L	LT	RE	Speed limit for vehicles, no horn signs, use vegetation barrier.	DDC/DT O	DoLIDAR/ Local administration
Biological Environment										
Road operation	Depletion of Forest Resources	Loss of timber, forest resources and benefits	IN	M	L	LT	Ir	Enforcement of law, vigilance and monitoring, participation of community	DFO/ CFUGs/V DCs	DDC/CDO

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
Road operation	Disturbance to the Wildlife and Illegal Hunting	Collision of wildlife with vehicles, disturbance in their normal activities, Loss of biodiversity	IN	L	L	LT	Ir	Warning traffic signal, Awareness training to driver to limit speed and horn use ,Enforcement of law, vigilance and monitoring	DTO/CFUGs	DDC/CDO / DFO
Social Economic Environment										
Easy Access by road operation	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/DT O	CDO / VICCC
Operation of Road	Change in Social behavior	Social and cultural conflicts	ID	M	L	ST	Re	Awareness, Enforcement of law and order, Provision of training for skill	DDC/DT O	DDC/DoLI DAR
Operation of Road	Road Safety Measures	Increase in accidents	D	M	L	LT	IR	Appropriate road safety measures, Safety signs along the road.	DDC/DT O	DDC/DoLI DAR

\* 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

168. The estimated cost for beneficial 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 face masks, helmets, muffles, accidental insurance, bioengineering measures, plantation, land slide rehabilitation shall be incorporated in the design and cost estimates. 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**

<i>SN.</i>	<i>Environmental Protection Measures</i>	<i>Estimated Budget (NRs.)</i>	<i>Remarks</i>
<b>1. Benefits Augmentation Measures</b>			
1.1	Training to DC/DTO/DPO/DIST to conduct environmental monitoring and reporting	50,000.00	To be included in project cost
1.2	Training to Naik of RBGs	50,000.00	To be included in project cost
1.3	Enhancement in Technical Skills (Bio-engineering)	100,000.00	To be included in project cost
	Sub-Total (1)	200,000.00	
<b>2. Adverse Impacts Mitigation Measures</b>			
2.1	Bio-engineering work	500000.00	To be included in BoQ
2.2	RBG Insurance	100,000.00	To be included in BoQ
2.3	Information Signboard	8,000.00	To be included in BoQ
2.4	Compensation for properties		To be included in Resettlement plan
2.5	Restoration or relocation of affected infrastructures including tap stand, spoils disposal site management and rehabilitation, reinstate of quarry etc.	200,000.00	To be included in project cost
2.7	Compensatory plantation Re-plantation / Re-forestation		Included in Bio-engineering works
2.8	Health / HIV AIDS / STD prevention awareness; other awareness program such as adult literacy; support to local school etc.		To be included in Social plan, project cost
2.9	Occupational health and safety; First aid boxes, campsite sanitation (Pit latrine); solid waste management, Safety measures for workers (Helmets, gloves, masks, boots, etc.)	400,000.00	To be included in project cost
	Sub-Total (2)	12,08,000.00	
	Total	14,08,000.00	

## 7.5. Implementation of Mitigation Measures

169. The mitigation measures will be integrated into project design and tender documents. Using this approach, the mitigation measures will automatically become part of the project construction and operation phase. By including mitigation measures in the contract or in specific items in the Bill of Quantities, monitoring and supervision of mitigation implementation could be covered under the normal engineering supervision provisions of the contract. The project contractor will be bound by the parameters identified in the environmental assessment pertaining to specific mitigation measures in the contract. The final acceptance of the completed works should not occur until the environmental clauses have been satisfactorily implemented.

170. The tender instruction to bidders will explicitly mention the site-specific mitigation measures to be performed, the materials to be used, labor camp arrangements, and waste disposal areas, as well as other site specific environmental requirements. Action to be taken against failure to comply with EMP requirements will also be clearly agreed in the contract agreement document.

## **7.6. Environmental Monitoring**

171. The IEE prescribes the mitigation measures in order to minimize adverse impacts and to enhance beneficial impacts. Environmental monitoring plan is an important tool to ensure the implementation of mitigation measures.

### **7.6.1 Monitoring Responsibility**

172. Monitoring is an integral part of the project proponent. The Proponent, DDC/DTO Dadeldhura will develop in-built monitoring mechanism to safeguard environment construction and operational stages. DDC/DTO will be supported by District Implementation Team (DPO and DIST) team in the district and Environmental Management Specialist from the CISC will ensure meaningful monitoring and undertaking corrective actions.

173. According to EPR, 1997, the MLD/DoLIDAR is responsible for monitoring and evaluation of the impact of the implementation of the project. The MLD/DoLIDAR checks whether the DDC/DTO is carrying out monitoring activities as per the IEE, and if the prescribed mitigation measures are being implemented. Total cost estimated for central level environmental monitoring is NRs. 50,000.

174. DDC/DTO with support from PCU/CISC will make arrangements for sub-project level monitoring. It will constitute a monitoring team. Project's district management team should be responsible for forming the monitoring team, financing the monitoring works, providing logistics and other necessary support. Thus, it is recommended that an external team hired by DDC/DTO take responsibility for periodic monitoring of the environmental performance, in addition to the regular supervision and guidance provided by the DIST at the site. The sub-project specific monitoring plan as given in Table 7.5 and 7.6 shall be followed. At least one monitoring in each construction season is necessary.

176. The sub-project level monitoring team should submit its report to RRRSDP district management, which should forward a copy to the RRRSDP-PCU. Total cost of environmental monitoring (field visits, observation, review of reports and report preparation) is estimated NRs.200,000.00 as given in Table 7.5.

**Table 7.5: Environmental Monitoring Cost**

<b>S. No.</b>	<b>Detail</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate</b>	<b>Total (NRs.)</b>
1	Environmental Management Specialist	Man-month	1	55000.00	Included in cost of DIST
2	Sociologist / Public Relation Expert	Man-month	1	40000.00	Included in cost of DIST
3	Stationary and Computer		LS	20000.00	70000.00
4	Printing and Photocopies		LS	20000.00	30000.00
5	Transportation		LS	25000.00	50000.00
6	Cost for Monitoring by MoLD/DoLIDAR		LS	50000.00	50000.00
	<b>TOTAL</b>				<b>200,000.00</b>

177. Thus, total environmental monitoring and management cost is NRs. 16,08,000.00

### **7.6.2 Types of Monitoring and Monitoring Parameters**

178. Monitoring is an on going component of the environmental assessment process and subsequent environmental management and mitigation activities. There are basically two types of environmental monitoring:

- Compliance Monitoring - It verifies whether contract environmental clauses and the mitigation measures are properly implemented in the field. The frame work for compliance monitoring is given in the Table 7.7.
- Impact Monitoring - It confirms whether the environmental mitigation measures specified in the project design and contract are correctly formulated. The frame work for impact monitoring is given in the Table 7.8.

**Table 7.6: Monitoring Indicators Selected for IEE**

<b>Monitored Sector</b>	<b>Parameters Selected for Monitoring</b>
Soil, Landslide, Erosion Waste management sites	<ul style="list-style-type: none"> <li>▪ Number, location and extent of slope failures</li> <li>▪ Cause analysis for slope failure, natural/man-made</li> <li>▪ Area (ha.) of land, forest and properties affected</li> <li>▪ Nos. and extent of gully erosions and pavement failures</li> <li>▪ Nos. and extent of road subsiding effects</li> <li>▪ Suitability of corrective/bio-engineering measures</li> <li>▪ Nos. of days and nature of traffic delays due to slides</li> <li>▪ Sites and suitability for safe disposal of wastes and garbage</li> </ul>
Bio-engineering	<ul style="list-style-type: none"> <li>▪ Nos. and plant species selected for bio-engineering, disaggregated by protective function</li> </ul>
Water Pollution, Water Resources and their uses: Surface/ ground water Irrigation water Drinking water Public taps	<ul style="list-style-type: none"> <li>▪ Nos. and extent of water-logging at operative and/or decommissioned construction sites</li> <li>▪ Blockage of waterways - extent and secondary impacts</li> <li>▪ Water pollution incidents due to unsafe disposal of waste and spoil, analyzing effects on local fisheries</li> <li>▪ Damage to farm lands due to water shortage or pollution</li> <li>▪ Use of field kit for drinking water quality, determining pH, particulates, turbidity etc.</li> </ul>
Air and Noise Level in relation to traffic volume	<ul style="list-style-type: none"> <li>▪ Assessment of noise level in site by direct observation and interview with stakeholders</li> <li>▪ Visual assessment of dust development at selected sites/sensitive spots and interview with local stakeholders</li> <li>▪ Traffic volume measurements</li> </ul>
Road Safety	<ul style="list-style-type: none"> <li>▪ Speed measurements at selected spots</li> <li>▪ Nos. and type of road accidents recorded in the Traffic Police and in local health service centers</li> <li>▪ Suitability of local road signs</li> <li>▪ Records on public and driver road safety awareness campaigns</li> </ul>
Wildlife/ Habitat Disturbance Impacts on Forest resources	<ul style="list-style-type: none"> <li>▪ Nos. and extent of road accidents inflicting wildlife</li> <li>▪ DFO records of illegal timber extraction and wildlife trade</li> <li>▪ Observations and handling of invasive species</li> </ul>
Socio-economic Development near Road alignment	<ul style="list-style-type: none"> <li>▪ Demographic, economic and education data</li> <li>▪ Nos. and extent of new settlements /types and ethnic groups</li> <li>▪ Nos. and extent of new businesses</li> <li>▪ Nos. and extent of new services and utilities</li> </ul>
Resettled Households and livelihood restoration	<ul style="list-style-type: none"> <li>▪ Nos. of HHs resettled</li> <li>▪ HH questionnaire to identify livelihood conditions of resettlers</li> <li>▪ Income situation and opportunities for the resettlers</li> <li>▪ Verification of compensation and assistance to resettlers</li> </ul>
Community awareness programs relating to environment protection and avoidance of social conflicts	<ul style="list-style-type: none"> <li>▪ Nos./schedule of campaigns and nos. of beneficiaries</li> <li>▪ Revision of training agenda &amp; propagated information material</li> <li>▪ Questionnaire evaluation, interviewing selected participants on the impacts of the training provided by associated NGOs and Contractors</li> <li>▪ Nos. of beneficiaries having received awareness training against the spread of HIV/AIDS and girl/boy trafficking</li> <li>▪ Records from locals and local police concerning social conflicts</li> </ul>

179. The nature and purpose of environmental monitoring will be different in the pre-construction, stage, construction stage and operation stage of the project.

### ***Pre-construction Stage***

180. Monitoring at this stage of project is to:

- Confirm that plan, route selection and design of the road has considered the recommendation made by IEE
- Judge the level of preparation for implementing the construction related mitigation, and
- Prepare up-to-date environmental status of specific site where the impacts are assessed to be significant

### ***Construction Stage***

181. This stage of monitoring is to check compliance with the best practices, norms and standards and on implementation of the mitigation measures prescribed by IEE. The following parameters will mainly be focused on:

- Disposal of spoil and construction wastes and its consequences
- Disruption of natural water courses, drainage work and its consequences
- Slope protection measures
- Loss, stratification or degradation of forest vegetation
- Care, sensitivity or disruption of community infrastructures
- Loss or degradation or threat to private properties
- Care, sensitivity or disruption to cultural sites
- Quarrying and borrow pits

### ***Operation Stage***

182. The monitoring in this stage is mainly related to road features, road induced activities and their impacts on receiving environment. The following parameters are mainly monitored during operation stage:

- Drainage structures, their outfall and damage to private properties, community properties and natural resources
- Effectiveness of the slope protection and soil erosion measures
- Encroachment into road side, public land, forest or marginal land
- Status of waste disposal sites, quarry sites, and borrow pits
- Road accidents
- Symptoms of emergence of road side settlements, changes in agricultural pattern
- Activities of road neighboring communities
- Illegal felling of trees and hunting of wildlife

**Table 7.7: Compliance Monitoring for Bagbazaar-Bagerkot Road Construction Works**

<i>Parameters/Issues</i>	<i>Responsible Implementing Agency</i>	<i>Verifiable Indicators</i>	<i>Verification Methods</i>	<i>Schedule</i>	<i>Responsible Monitoring Agency</i>
Final alignment selection as per IEE /EMP recommendation	DIST	Incorporation of IEE / EMP recommendations into alignment selection process and design document	Walkthrough along final road alignment, verifying sensitive areas	Initial stage preconstruction phase	Proponent through CISC; DoLIDAR
Land and property acquisition and compensation	Proponent with assistance of DIST	Cadastral records, Land and properties acquisition procedures; Procedures followed during voluntary donation of Land; Preparation of inventory of infrastructures likely to be affected	Public consultation, photos; geo-referencing; Check inventory against cadastral records and DISTuss with people	Initial stage pre-construction phase - well ahead of construction	CFC / PCU (CISC) / DOLIDAR / MLD
Resettlement, assistance and compensation	Proponent / DIST	Legal provisions by GoN; Compensations paid	Check compliance to legal procedures	Well ahead of construction	CFC / PCU (CISC) / DOLIDAR / MLD
Site selection and preparation of construction logistics	Proponent / VICCC	Project's arrangement for materials storage, and construction activities	Site observation, geo-referencing and photographic documentation	Beginning of construction period	DIST/ DPO
Use of local labour, particularly vulnerable groups and women	DPCC / VICCC / DIST	Specifications which obligate the contractors/BG to observe certain quotas for employing local labour, specially vulnerable groups and women, prohibition of child labour	Records and coordinates the process for local people's employment, interviews	During the entire period where labour work is contracted, trimester	Proponent / DPO
Awareness and orientation training on road construction to technicians, and locally employed labourers	Proponent in assistance of DIST	Training programmes for skill development, occupational safety and environmental protection associated with road construction works	Specifications; Training records, check training programme reports, assess feedback from participants	Beginning of construction and during construction	DIST / Proponent (DTO)
Compliance to Occupational health and safety matters	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, First Aid, Emergency Rescue	Spot checks at work sites, photos, accident records, interviews	throughout construction activities, trimester	Proponent / DPO
Compliance to Environmental Protection Measures, including pollution prevention, water and soil management, slope stabilisation, cut and fill, waste management, spoils, sensitive	Contractor / RBG/ DIST	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. Training programmes for labourers to prevent impacts on wildlife sensitive habitats,	Site inspection, Discussion with Project management, consultants, and local people. Quantifying site-specific impacts, photos, laboratory tests where required.	Before and during construction period	DPO/Proponent



<i>Parameters/Issues</i>	<i>Responsible Implementing Agency</i>	<i>Verifiable Indicators</i>	<i>Verification Methods</i>	<i>Schedule</i>	<i>Responsible Monitoring Agency</i>
habitats and critical sites, protection of fauna and flora		forests and fuel wood use.	Existing patrol, control and enforcement mechanisms, enforcement records		
Vegetation clearance	Contractor / RBG / DIST	Actual number of trees felled during construction works; Location (in Formation Width or RoW	Record, inspection and interview with local people and CFUGs	After detail design and before construction work	DPO CFUGs / Proponent
Measures to avoid pressure on forest and wildlife	Contractor / RBG / DIST	Use of firewood or fossil fuel by construction crew, events of hunting and poaching of wildlife	Inspection, interview with local people and CFUGs	Once a month during construction	DPO / CFUGs / Proponent
Measures to protect environment from air & noise pollution	Contractor / RBG / DIST	Dust level and noise level at work sites, major settlements and sensitive spots like health centres and schools	Visual observation, Observation of good construction practices and Discussion with residents and workers	Once in a month during construction	Proponent / DPO
Measures to protect water bodies from pollution	Contractor / RBG / DIST	Visual observation, observation of open defecation/waste/spoil disposal around water sources near construction sites ; Parameters like pH, hardness, DO, Turbidity etc.	Site inspection, test of site-selected samples of local streams water using standard field kit, interview	Once in a month during construction; Upon demand for testing with field kit	Proponent / DPO
Restoration, rehabilitation, reconstruction of all infrastructure services disrupted or damaged by the proposal activities	Contractor / RBG / DIST	Continued services by the facilities and functional public life	Site observation; VDC records; Public Consultation Meetings; Photos	Once in 15 days during construction	Proponent / DPO
Adequate technical and environmental supervision	DIST	Adequate number of technicians regularly at site Ability to implement labour based road construction concept	Check number and type of technicians available at site; Skill of work carried out; Discussion	Twice a month during construction	DPO , Proponent
Clean up and reinstatement of the construction sites (camps, quarries, borrow pits)	Contractor / RBG / DIST	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 and CBOs	At end of construction period	Proponent / DPO

**Table 7.8: Impact / Effect Monitoring for Bagbazaar-Bagerkot Road Construction Works**

<b>Parameters /Issues</b>	<b>Verifiable Indicators</b>	<b>Verification Methods</b>	<b>Location</b>	<b>Schedule</b>	<b>Responsible Implementation and Monitoring Agency</b>
Slope stability and erosion	Inclination, slope failures causes; Drainage facilities such as catch drain, side drains and functionality of cross drainage structures; Fresh gullies and erosion; Success/failure of bio-engineering solutions	Site observation, photos Discussion with people and technicians	Near steep slopes and at landslide areas and sites where bio-engineering failed	Continuously during construction and operation	DIST during construction; Proponent / DPO / Soil Conservation Office during operation
Bio-engineering of disturbed slopes	Re-vegetation through bio-engineering application on disturbed slope; Establishment of nursery	Site observation; Inspection of nursery and its production rate, photos, measurements	Cut slope area, where vegetation is cleared; Nursery	During and at end of Project construction	DIST/ Proponent
Disposal of Spoils and construction wastes	Affected aesthetic value, affected forest and agriculture, initiated land erosion by local blocked drainage, hazard to downhill slope residents and agricultural lands	Site observation and interviews, photos, geo-referencing sites	At specific locations where such sites occur	During construction	DIST/ Proponent
Quarrying of construction materials	Initiated erosion, changes in river regime, erosion by river systems, landslide due to quarrying, degradation of vegetation, water logging, waterborne diseases	Site observation, photos, records from local health centres	Quarry site areas	During construction	DIST/ Proponent
Disruption of drainage system	Status of rehabilitation Service status of irrigation and water supply system; Operation and maintenance requirement	Observation and interviews, photos, fisheries data, wildlife records	Disrupted aquatic system, irrigation schemes	During construction	DIST / Proponent
Loss or degradation of farmland , houses and properties	Status of road side land; Production / yield; Status of road side houses; Status of standing crop along alignment	Observation, data collection and analysis and interview with stakeholders	Road side land and houses	During construction	Proponent / DIST/ VICCC
Water quality	observation of open defecation and waste disposal around water sources near construction sites ; Parameters like pH, hardness, DO etc.	Visual observation, measurement of water sample using standard field kit	local streams	During construction; Upon demand for testing with field kit	DIST / Proponent
Air quality	Dust level in ambient air	Visual inspection and comparison with baseline condition	At construction sites and at sensitive spots (schools, health spots, major settlements)	During construction and operation	DIST / Proponent
Forest and vegetation	Numbers of trees, presence of ground vegetation, signs of illicit logging and extraction of NTFPs	Observations, DFO records, photos; interview with CFUGs members	In and around the construction sites, markets,	During construction and operation	DIST/ CFUGs/DFO during construction; CFUGs / DFO during operation
Wildlife	Wildlife hunting trapping and poaching by work force, trade of wildlife,	Interview with local people / DFO/ CFUGs members, photos,	Forest areas at roadside	Twice a year during construction	DIST during construction;

<i>Parameters /Issues</i>	<i>Verifiable Indicators</i>	<i>Verification Methods</i>	<i>Location</i>	<i>Schedule</i>	<i>Responsible Implementation and Monitoring Agency</i>
	biological survey on selected biota, road accidents inflicting wildlife	observations		and routine during operation	CFUGs/DFO during operation
Change in economy	Numbers of people employed by the Project during construction Numbers of women in work forces	Records kept by the Project management, DISTussion with stakeholders	Project Area	Trimester during construction phase	DIST /Proponent
Trade and commerce	Numbers of shops increased or decreased, rental of houses and land spaces	Records, interviews, observations, photos	Project Area	Throughout Project, once in a year	Proponent / VDC
Cottage industries	Establishment of industries in the vicinity of Project Area	Records and interviews, photos	Project Area/ zone of influence	Throughout Project period	Proponent / VDC
Occupational safety and hazard	Type and number of accident occurred during construction; Adequacy of occupational safety measured provided; Compensation provided in case of fatal accidents or invalidity	Observations, photos, spot checks, contractors' and health centre records interview with labourers	Project Area	During construction	DIST/Proponent
Change in socio-economic structure	No and extent of new settlements / types and ethnic groups; Nos and extent of new businesses; Nos and extent of new services and utilities, social conflicts	Observations, interview with local people, DDC Police and VDC records	Project Area	During operation	Proponent / VDC
Ribbon settlement	Congestions to road users Nos. of accidents, RoW encroachment	Records, observations	Project Area	During operation	DDC/CDO

## ***8.0 Conclusion and Recommendations***

### ***8.1 Conclusion***

183. The IEE study of the proposed Bagbazaar-Bagarkot road sub-project does not pass through any environmentally sensitive area and have minimal detrimental effects associated with loss of forest and agricultural land. Most of the adverse impacts predicted are of low significance and short term as well as of reversible nature. The beneficial impacts with the facility of access to market centers and location of social services will enhance productivity in rural area and improve the quality of life of the people. In addition, local people will get direct employment as workers which will contribute significantly in improving their livelihood. These benefits from the implementation of the proposed road project are more significant and long term in nature against the adverse impacts most of which could be mitigated or avoided.

184. 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 or special environmental study. Therefore, this IEE is sufficient for approval of the sub-project.

### ***8.2 Recommendation***

185. The proposed road project is recommended for implementation with incorporation of mitigation measures and environmental monitoring plan.

186. A key consideration in selecting the road alignment is to minimize the acquisition of valuable agricultural and forest land. However, some agricultural and forest land and possibly some built areas will have to be acquired for construction of the proposed road. A Resettlement Plan will be required to ensure that the persons affected by these losses are properly compensated.

## 9.0 *Miscellaneous*

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**Annex I**  
**Terms of Reference**

**Terms of Reference (ToR)**  
for  
Initial Environmental Examination (IEE)  
of  
**Bagbazaar-Bagarkot Road Sub-Project**

2055/9/22

Submitted to:  
**Ministry of Local Development,**  
**Government of Nepal**

2055/9/22

2055/9/22



Proponent:  
**District Development Committee (DDC)/**  
**District Technical Office (DTO),**  
**Dadeldhura**  
Telephone No. - 096-420067; Fax No. - 096-420067



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## 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

### ***NAME AND ADDRESS OF THE PROPONENT***

The District Development Committee(DDC)and District Technical Office (DTO),Dadeldhura is the implementing agency at the district level and the proponent of the initial Enviromental Examination (IEE) study for the rehabilitation and construction of Bagbazar-Bagarkot sector road sub-project. The Ministry of Local Development (MLD) is the concerned authority for of the approval of IEE study report.

#### ***Address of the Proponent***

District Development Committee, Dadeldhura  
District Technical Office(DTO), Dadeldhura  
Telephone No. – 096-420230, 096-420144.  
Fax No. – 096-420067  
Consultant:  
GIDA Nepal Pvt. Ltd.  
District Implementation Support Team

### ***INTRODUCTION***

#### ***General Introduction***

The Rural Reconstrution and Rehabilitation Sector Development program (RRRSDP) is to be financed by Goverment of Nepal (GON), Asian Development Bank (ADB), OPEC Fund for international Development (OFID) to improve the connectivity, enhaced economic and employment oppourtunities, increased access to market and social services of rural communities.The project components include:-

- (a) Improve rural roads
- (b)Development and improved community based supplementary rural infrastructures.
- (c) Enhacend equity, employment and income opportunities for the poor and disadvantaged.
- (d)Strengthened institutional capacity of the Ministry of Local Development (MLD), The Deperment of local infrastructure Development and Agricultural Roads(DOLIDAR) and District Development committees (DDCs) of project district.
- (e) Improved project management.

The project will focus on twenty district among them Dadeldhura is one.in this Dadeldhura, the project will improve and upgrade 40km of rural road in different VDC. However, the total increase to 60km of rural road in differentVDC.

This terms of reference (ToR) is prepared to conduct an IEE of Bagbazar-Bagerkot sector road of sub-project in Dadeldhura District. This road has been selected after the wallover survey of Bagbazar-Bagerkot sector road from the sub-list on the basis of prioritization criteria. This is a high priority road in DDC of Dadeldhura district and is proposed for construction under DIST.

#### ***Background of the Proposal***

The project lies in the southern part of the Mahakali Zone and the Far Western Development Region of Nepal and named as Dadeldhura district. It is located in between 800 12' and 800 47' longitude and in between 290 01' and 290 26' latitude. It is surrounded by Doti District in east, Baitadi District and Utter Pradesh (India) in west, Baitadi District in north and Kanchanpur and Kailali districts in south. The elevation of district varies from 457m. to 2,439m. above sea level. It has different soil and vegetation patterns from south to north. The southern part of the district is situated in Churia range and Inner Dun Valley. It has Siwalik group soil, mid-Miocene, Pleistocene, Conglomerate, Sandstone and Shale's. The vegetation of this area is mainly Sal, Sisam, Khaur, etc. The middle part of the district is located in Mahabharat range having Dadeldhura group soil maily kalikot formation, Salyani gad formation and Melmura formation. The north-eastern part of the district has damaged formation soil. Some other places has Granite and Gneiss's. In Mahabharat range the main vegetation is Chir, Deodar, Uttis, Laliguras(Rhododendrum arbereum), Katus and Chilaune. The main rivers of the district are Mahakali, Seti, Rongoon and Surnaiya Gad. The main streams of the district are Chama Gad, Siling Gad, Sailesworī Gad, Roduwa Gad, Doti Gad, Puntura Gad, Byauri Gad, Galpha Gad, Rupali Gad, Ashigram Khola, Sandhani Khola, Ghatal Khola, Sirsh Khola, Gankhet Khola, Bantal Khola, Chaud Khola, Siroli Gad, Daunne Khola, etc. The main lakes of the district are Ali Tal, Jhilmila Tal, Ganyap Tal and Sundeo Tal. Total area of district is 1954 KM2. The district is divided into 9 Ilakhs, and 20 VDCs. The total population of the district is 119366, among which 57,493 are Male and Female are 61,873. The total household in the district is 21,103. The main castes of the district's are Brahmin and Chhetri. The other's are Thakuri, Magar, Gurung, Kami, Sunar, Damai, Sarki, etc. The main religion is Hindu, although Buddhists and Christians are in minority. The

main occupation of the people of this district is agricultural farming. The agricultural land in this district covers only 22.46%, in total land area while forest land area covering 69.66% of the total area, Grazing land area is about 3.9%. The land used by settlement is very small i.e. 0.5%. Rivers and mines take nearly 3.1% of the total land area. This district does not have large industries.

Having all above characteristics, this project location named as Dadeldhura District. In this district, 20VDCs and one municipality are political division. Municipality named as Amargadhi municipality. Headquarter of the district is Amargadhi municipality. It is the main trade centre of the district. The extent and the nature of these VDCs are based on their topography and locations. The southern VDCs are large in size and densely populated. The VDCs in the northern area are smaller in size and scarcely populated. The district is divided into 9 Ilakas for the election of DDC body. There is one constituency representing the Lower House of the Parliament.

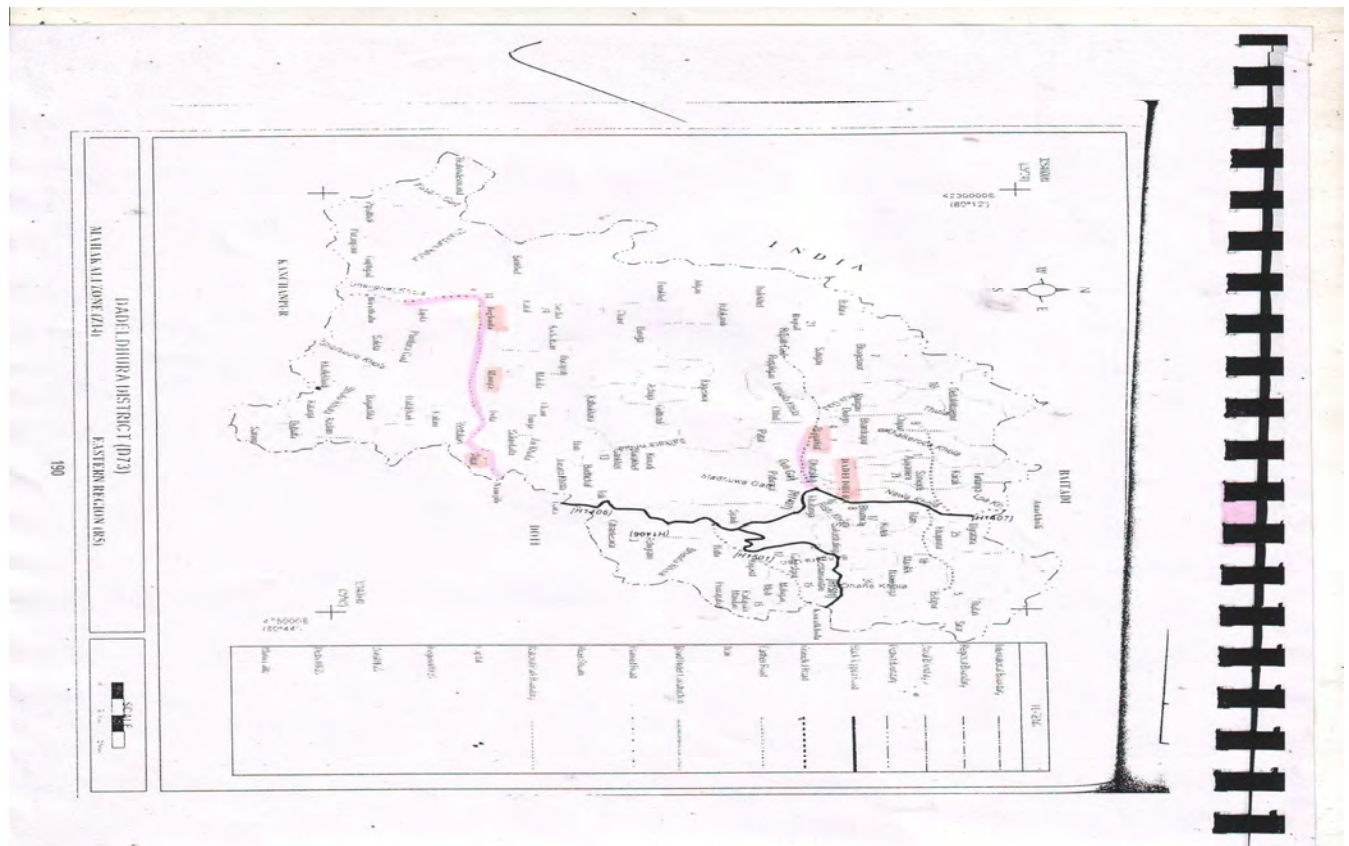
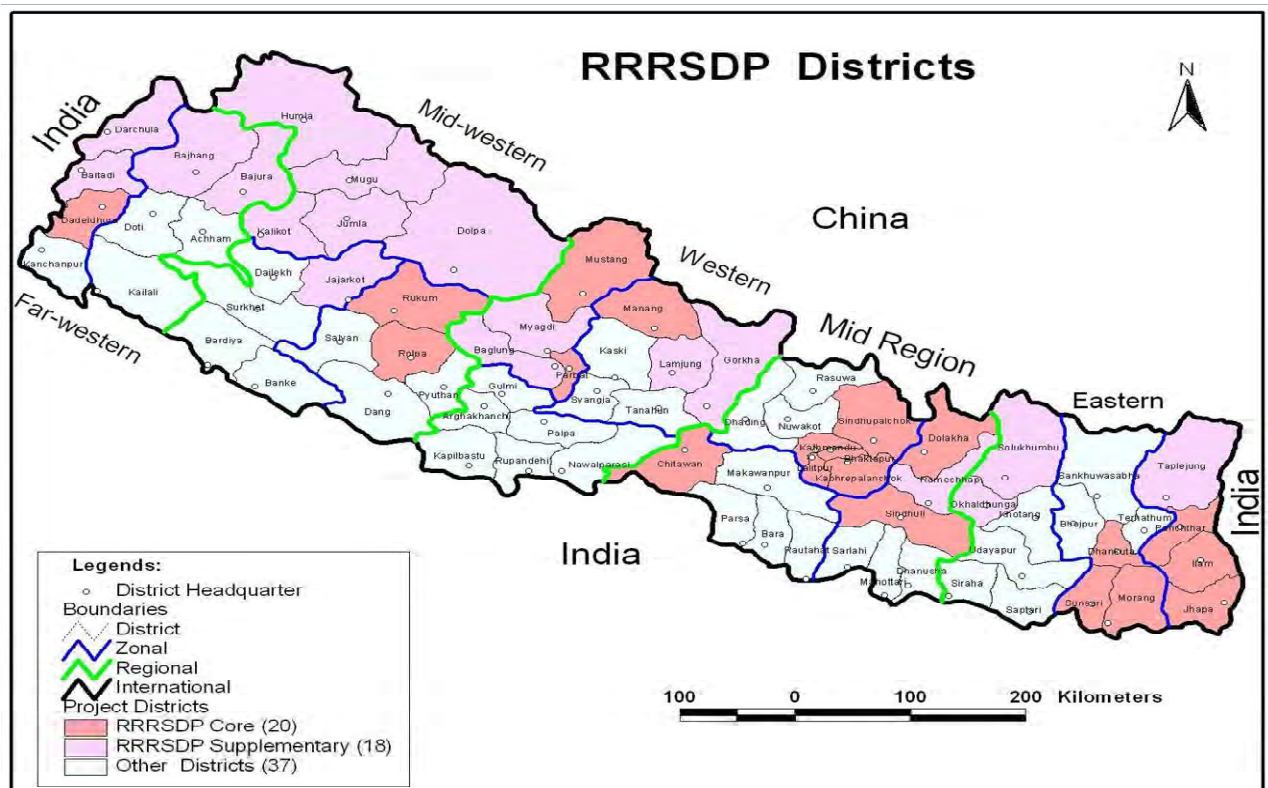
Construction of Bagbazar – Bagarkot Sector Road which is most important Road & given No. 1 Priority in DDC of Dadeldhura district is selected as Sub Project for RRRSDP, Dadeldhura. The proposed road is the shortest possible corridor to links the VDC of this municipality. Bagabazaar-Bagarkot starts from district headquarters of Dadeldhura and passes through Aita, Aidungra and Lakam. It provides services to some parts of Amargadhi municipality, Bagarkot VDC, Bhageswor VDC, Rupal VDC and some parts of Chipur, Bhadrapur, and Dewal Dibyapur VDCs. The total proposed length of this road is 15Km. The construction of road was start in 2050 B.S. by rural road program, DOR & RCIW. About 6km from Aidungra to Bagarkot track is opened from RCIW program. Completed portion of the road is as per Nepal Rural Road Standards 2055 class ‘A’ road.

Bagbazar lies in Amargadhi municipality which is the district headquarters of Dadeldhura district. It is connected with other parts of nation by Dhangdhi-Dadeldhura Highway, Dipayal-Silgadhi Highway and Dadeldhura-Baitadi Highway. There are all government’s district level offices, one team hospital, central grid electricity and telephone services in the growth centre.

Bagarkot is the headquarters of Bagarkot VDC. It lies on the way to Rupal, Bhageswor, Dewal Dibyapur, Chipur and Bhadrapur VDCs. The growth centre has 10 households, a high school, a health post, a VHF telephone, one bank, four tea shops one cloth shop. 329 ha. Of total horticultural lands is assumed to be used for Horticulture. The main Horticulture productions of this area is citrus fruits(Orange, Lemon & Junar). Annual fruits production of this area is 1600MT. This VDC is also playing a leading role in vegetable productions in the district. About 180 MT. Of vegetables (tomato, cabbage, cowli-flower, chilly, bean, brinjal, ladies finger, etc.) are production in Lakam, Bagarkot, Aidungra, Ekthara, Dhadani, Ghoradi & Golai villages annually in 60ha. In the same way, Amargadhi municipality has good market for vegetables. Amargadhi municipality is the second important place after Bagarkot for the production of the citrus fruits. Selagaun, Bhaliya, Jiloda, Doti Ghatal, Rai and Pokhara are the main villages of Amarghadi, popular for Orange and Lemon productions. There is about 68 ha. Land used for this purpose.

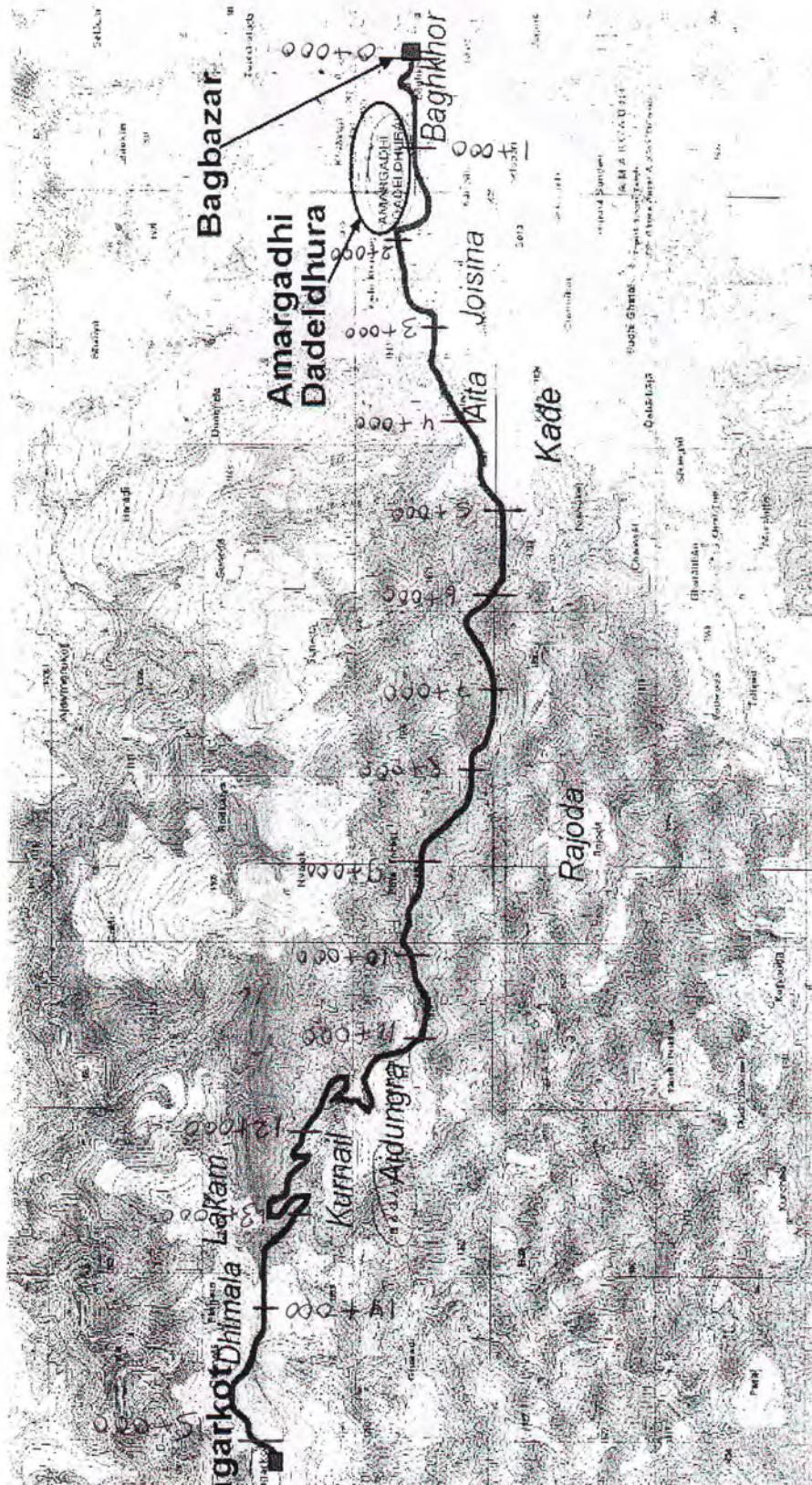
The total length of proposed road alignment is about 15 Km from Bagbazar of Amarghadi municipality to Bagarkot of Bagarkot VDC. It is already track opened up to 15 Km. It maintain proper widening, width varies from 3 to 4.5m. This section contains specially some dry stone, hard stone, shoft soil, mixed boulder soil and numbers of tree.

The road is already constructed up to Bagarkot by DDC. However, track opened has not maintained proper width in that section, the DDC has decided to rehabilitate this section by RRRSDP fund and after that the Bagabazar – Bagarkot section shall be constructed by the contribution of DOLIDAR Sub-project as new construction.





Topographical Map Bagbazar-Bagarkot Road Sub-Project.  
Dadeldhura.







## **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,  
identify any environmental problems/difficulties that are existing now due to the existing road, and assess nature/extent/significance of the problems/difficulties,  
identify the significant environmental issues/ concerns (physical, biological, and socio-economic, cultural) that can arise from the proposed rehabilitation and construction activities,  
recommend practical and site specific environmental mitigation and enhancement measures, prepare and implement environmental monitoring plan for the sub-project, and  
recommend whether the IEE is sufficient for the proposed road or whether EIA will be required as a result of the environmental issues that may arise due to the project implementation.

### **2.0 Relevancy of the Proposal**

The proposed road will connect Amarghadi Municipality and different VDC of this district and Amarghadi municipality to Dhanghadi and Mahendra Nagar through Highway. This road starts from Bagbazaar of Amarghadi municipality of Dadeldhura of nation Highway Dhangdhi-Dadeldhura Highway and Dadeldhura-Baitadi Highway, which is a small settlement likely to be changed to a bazaar area due to economical growth. The end point of the road deserves the possibility of being market centre for several VDCs.

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 (EPA, 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 assessment (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

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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

### **B. 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.

### **C. 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
- 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			■	■				

SN	Activities	Week							
		1	2	3	4	5	6	7	8
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.								

#### ***D. 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 from DIST team Dadeldhura, 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 3 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 behavior
- Impact on livelihood and economic opportunities
- Road safety measures

**10.0 BENEFIT AUGUMENTATION/MITIGATION MEASURES**

The IEE study will propose site-specific benefit augmentation 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 augmentation 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)
- E. Executive Summary that includes:
  - Background
  - Project Proponent
  - Objective
  - Relevancy of the Proposal
  - Project Description
  - Existing Condition
  - Identification of Impacts and Benefit Augumentation/Mitigation Measures
  - Environmental Management Plan
  - Conclusions and recommendations
- F. 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 Consultation 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 Augmentation/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

##### 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 condition
  - 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
- List of persons and institutions consulted

## 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.

Project Title:

Rural Reconstruction and Rehabilitation Sector Development Program

Sub-project:

Bagbazaar-Bagerkot Road Sub-project.

SCREENING QUESTIONS	Yes	No	REMARKS
G. Project Siting			
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		√	

SCREENING QUESTIONS	Yes	No	REMARKS
<ul style="list-style-type: none"> <li>Special area for protecting biodiversity</li> </ul>		√	
H. Potential Environmental Impacts			
Will the Project cause...			
<ul style="list-style-type: none"> <li>Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Encroachment on precious ecology (e.g. sensitive or protected areas)?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Noise and vibration due to blasting and other civil works?</li> <li>dislocation or involuntary resettlement of people</li> </ul>		√	
<ul style="list-style-type: none"> <li>Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Hazardous driving conditions where construction interferes with pre-existing roads?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Creation of temporary breeding habitats for mosquito vectors of disease?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Dislocation and compulsory resettlement of people living in right-of-way?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Increased noise and air pollution resulting from traffic volume?</li> </ul>		√	
<ul style="list-style-type: none"> <li>Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?</li> </ul>		√	



## Annex III

### ABSTRACT OF COST

Name of Road: Bagbazaar-Bagarkot

Chainage:0+000-18+200Km

S.N.	Description of Work	Unit	Quantity	Rate	Amount
1.	Insurance of works for construction, equipments and against to workman including third party insurance.	LS	1	100000	100000
2	Additional testing of materials as instructed by engineer if required.	PS	1	40000	40000
3	Relocation of services	PS	1	40000	40000
4	Restoration or relocation of affected infrastructures, spoils disposal site management and rehabilitation, reinstate of quarry etc.	L.S.			200000.00
5	Occupational health and safety; First aid boxes, campsite sanitation (Pit latrine); solid waste management, Safety measures for workers (Helmets, gloves, masks, boots, etc.)	L.S.			400000.00
6	Road way and drain excavation works				
	Excation in roadway, retaining structures and drain including removal and satisfactory disposal of all materials up to lead of 50m.				
6.1	Hard soil	Cub.mtr	28389.36	101.97	2894863.09
6.2	Ordinary soil	Cub.mtr	1700	33.90	57630
7	Construction of roadway embankment and backfilling of structure with materials from roadway excavation including average transportation distance of 50m.	Cub.mtr	2560	42.49	108774.4
8	Suppling and laying of sub-base materials obtained from necessary screening at the quarry site including mixing with binding materials to maximum thickness of 150mm in one layer, spreading, watering and compaction all complete.	Cub.mtr	7875	1780.85	14024193.75
9	Un-coursed random rubble masonry work in 1:4 cement sand mortar.	Cub.mtr	5652	3296.19	18630065.88
10	Dry stone pitching work.	Cub.mtr	14.48	537.03	7776.19
11	Laying fitting and fixing of 600mm Humepipe including materials, labours and other incidentals to complete the works and joining of pipes with 1:2 cement sand mortar.	Cub.mtr	40.00	5062.39	202495.07
12	Bio-engineering works.	L.S.			500000.00
13	Miscellaneous works				
14	Supply and installation of standard size sign board at different locations all complete	Nos.	4.00	2000	8000
	Sub-total				37213798.85
	Vat @13%				4837793.85
	Contractor over head @ 15%				5582069.83
	Total				47633662.53
	Per KM				2617234.205
	Land and Property compensation	LS	1	2859000	2859000

	Grand total	50492662.53
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## Annex IV

### RRRSDP Environmental Checklist

#### I. GENERAL SOCIO-ECONOMIC SITUATION OF THE INFLUENCE AREA<sup>3</sup>

##### J. Overview of settlements in the zone of influence (Zol) area

Settlement Code*	Name of Settlement and address	Household and Population	Caste/ethnic distribution	General Comment
A				
B				
C				
D				
E				
F				
G				
H				
I				
J				
K				

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

##### K. Economic activities/main occupation

Settlement Code	Number of HH and Percentage of Population engaged in					
	Agriculture & Livestock	Labour & Porter	Business/Commerce	Cottage Industry	GO/NGO Employees	Others (specify)
A						
B						
C						
D						
E						
F						
G						
H						
I						
J						
K						

##### L. Existing services and infrastructures

S N	Service/Infrastructure	Settlement Code
-----	------------------------	-----------------

	Category	A	B	C	D	E	F	G	H	I	J	K
<b>1</b>	<b>EDUCATION</b>											
1.1	Campus (no.) Students (no.)											
1.2	High School (no.) Students (no.)											
1.3	Primary School (no.) Students (no.)											
<b>2</b>	<b>HEALTH</b>											
2.1	Hospital/health centre (no) Capacity (beds)											
2.2	Health Post (no.) Sub-Health Post (no.)											
<b>3</b>	<b>COMMUNICATION</b>											
3.1	Telephone/fax											
3.2	Mobile/CDMA											
3.3	Post Office											
<b>4</b>	<b>ELECTRICITY SUPPLY</b>											
4.1	from Micro-hydro											
4.2	from Mini-hydro											
4.3	from National Grid											
4.4	from Solar System											
4.5	from Diesel Generator											
<b>5</b>	<b>BUSINESS &amp; COMMERCE</b>											
5.1	Hotels & Lodges (no.)											
5.2	Restaurant & Tea Stall(no)											
5.3	Grocery Shops (no.)											
5.4	Other Shops (no.) (e.g. stationery, medicine, tailoring, etc.)											
<b>6</b>	<b>DRINKING WATER SUPPLY SCHEMES</b>											
6.1	Gravity-Flow Scheme (capacity)											
6.2	Tube-wells (no.)											
6.3	Spring/Dug-wells (no.)											
<b>7</b>	<b>IRRIGATION SCHEMES</b>											
7.1	Surface Irrigation (ha.)											
7.2	Groundwater (ha.)											
<b>8</b>	<b>OTHER INFRASTRUCTURES</b>											
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) ...											

S N	Service/Infrastructure Category	Settlement Code										
		A	B	C	D	E	F	G	H	I	J	K
<b>9</b>	<b>INDUSTRY</b>											
9.1	Weaving Industry (no.)											
9.2	Rice & flour Mills (no.)											
9.3	Other Industries (specify)											
<b>10</b>	<b>FINANCIAL INSTITUTIONS</b>											
10.1	Bank (no.)											
10.2	Cooperative											
<b>11</b>	<b>COMMUNITY USE</b>											
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 (HH No.)											Remarks
	A	B	C	D	E	F	G	H	I	J	K	
Landless												
less than 1 ropani												
1 to 5 ropani												
5 to 10 ropani												
10 to 20 ropani												
20-50 ropani												
> 50 ropani												

#### 5. Food grain availability (HH no.)

Availability Status	Settlements (HH No.)											Total
	A	B	C	D	E	F	G	H	I	J	K	
Surplus												
Sufficient for whole year												
Sufficient for three to nine months												
Sufficient for three months												
Less than three months												

#### 6. 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	J	K
<b>1.0</b>	<b>CEREALS</b>											
1.1	Rice											
1.2	Wheat											

1.3	Maize											
1.4	Millet											
1.5	Junelo											
1.6	Phaper											
1.7	Others (list)											
2.0	<b>CASH CROPS</b>											
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	<b>LIVESTOCK &amp; FISHERIES</b>											
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	K

Name of settlement:

(b.1) 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			

**8. 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. 1	Name of Area	Description of Development Potential

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

S. No.	Sectors to get direct benefit	Describe how it will benefit

**M. . HISTORIC AND CULTURAL RESOURCES WITHIN THE SETTLEMENT**

Type of Resource	Name/specification	Affecting activities	Location from project

## **Annex V**

### **Public Notice**

**Public Notice in Anapurna Post Newspaper (National News paper)**



जारमा बिहान आठ  
खुलेका छन्।  
यकतालाई बिनासर्त  
सम्मका लागि भन्दै  
पाँचथर जिल्लामा  
उद्योगधन्दा बन्दको  
निकासीका पाँचथर  
मा जारी विज्ञप्तिमा

स्थित लोकतान्त्रिक  
न राज्य परिषद्को  
मप्री लुटेर लागेको  
का २१ कार्यकर्ता

## गे सूचना

एको अन्दाजी ६८  
३ एनीट उचाई,  
मात्रा छोट भएको  
ललितपुर जिल्ला  
मालाबाट हराएको  
बोझिको पहरी  
१८८७५०५ र  
गरिदिनु भएमा  
छ ।

## घण्टा)

सी सम्म  
बहानको  
नभूला ।

## मेगाहउ

४३२८९३

प्रहरीले जनाएको छ। घर्तीका एक  
पत्नी, एक छोरा र एक छोरी छन्।

Clothing at disappearance :  
सम्भावित रूपः

यस उल्लेखित वानकको कुनै जानकारी प्राप्त भएमा  
CPCS NGO को Emergency Line  
०१-४२११०२६ मा यस्तो कुरा जनाइदिनु कृपया गरिदिनु



नेपाल सरकार  
स्थानीय विकास मन्त्रालय  
जिल्ला विकास समितिको कार्यालय  
जिल्ला प्राविधिक कार्यालय  
डडेल्धुरा

अन्नपूर्ण पोष्ट

## प्रारम्भिक वातावरणीय परीक्षण सम्बन्धि राय सुझावका लागि सार्वजनिक सूचना

(प्रकाशित मिति २०६६/०२/०७ गते ।)

ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना (RRRSDP) अन्तरगत एशियाली विकास बैंक, डिफिड तथा स्विस  
सरकार विकास नियोगको अनुदान सहयोग तथा औफिडको ऋण सहयोग तथा नेपाल सरकार, जिल्ला विकास समिति  
र लाभग्राही समेतको लगानीमा निर्माण गर्ने प्रस्ताव गरिएको बागबजार-बगरकोट, बुडर- जोगबुडा र जोगबुडा-लिप्जा  
सडक उपआयोजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरण सम्बन्धी  
नियमावली २०५४ (पहिलो संशोधन, २०५५) को नियम ७ (२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ ।

प्रस्तावकको नामः जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, डडेल्धुरा

प्रस्तावित सडकले प्रभाव पार्ने गाविसहरुः

- १) अमरगढी नगरपालिका, बगरकोट गा.वि.स.
- २) छतिवन, अलिताल र जोगबुडा गा.वि.स.हरु
- ३) जोगबुडा गाविस

### प्रस्तावको विवरणः

१) प्रस्तावित बागबजार-बगरकोट सडक उपआयोजना अमरगढी नगरपालिकाको बागबजार बजारबाट शुरू भई बगरकोट  
गाविसको बगरकोट बजारमा टुगिन्छ । यो सडक बागबजार अ र बगरकोट बस्तीहरु भएर जान्छ । यस सडकको जम्मा  
लम्बाई १५ कि.मि. रहेको छ र यसलाई स्तरोन्नति गर्नका लागि प्रस्तावित गरिएको छ ।

२) प्रस्तावित बुडर-जोगबुडा सडक उपआयोजना बुडरको बुडर बजारबाट शुरू भई जोगबुडा गाविसको जोगबुडा बजार  
टुगिन्छ । यो सडक बुडर, बस्ती, बसैनी, धरेलु, कैनाधारी, रजौली, गोदाम, मीरीखेत, सिलिंग, स्यालचौरी, लामिजाला,  
म्यामपानी, तुलाबाढी, आमपानी, लालढुंगे र जोगबुडा बस्तीहरु भएर जान्छ । यस सडकको जम्मा लम्बाई ३१ कि.मी  
रहेको छ र यसलाई स्तरोन्नति गर्नका लागि प्रस्तावित गरिएको छ ।

३) प्रस्तावित जोगबुडा-लिप्जा सडक उपआयोजना जोगबुडाको जोगबुडा बजारबाट शुरू भई जोगबुडा गाविसको लिप्जा  
बजारमा टुगिन्छ । यो सडक गोटाहाल्डु, पुन्तुरा, गाडबध्ने, सतघाट, सिलिगाढा, नडला र लिप्जा बस्तीहरु  
भएर जान्छ । यस सडकको जम्मा लम्बाई १४ कि.मी. रहेको छ र यसलाई स्तरोन्नति गर्नका लागि प्रस्तावित गरिएको छ ।

उक्त प्रस्तावकको कार्यान्वयनबाट वातावरणमा पर्ने सक्ने प्रभावको बारेमा सम्बन्धित गाविस, विद्यालय, स्वास्थ्य चौकी,  
वन उपमोक्ता समिति तथा अन्य सरोकारवाला व्यक्ति वा संस्थाले यो सूचना अन्नपूर्ण पोष्ट राष्ट्रिय दैनिक पत्रिकामा  
प्रकाशित भएको मितिले १५ (पन्ध्र) दिन भित्र आफ्नो राय सुझाव पठाई सहयोग गरिदिनुहुन अनुरोध गरिन्छ । साथै  
यसै बमोजिमको राय सुझाव स्थानीय पूर्वाधार विकास तथा कृषि सडक विभाग, जावलाखेल तथा स्थानीय विकास  
मन्त्रालय पुल्चोक, काठमाण्डौमा पनि पठाउन सकिनेछ ।

### राय सुझाव पठाउने ठेगानाः

जिल्ला विकास समितिको कार्यालय, डडेल्धुरा  
टेलिफोन नं. : ०९६-४२०१४४  
फ्याक्स नं. : ०९६-४२०४६१

जिल्ला प्राविधिक कार्यालय, डडेल्धुरा  
टेलिफोन नं. : ०९६-४२०३६९  
फ्याक्स नं. : ०९६-४२०४६१

## Annex VI Recommendation & Suggestion





सका स्वच्छ हरियर सुन्दर नगर, सम्पूर्ण नगरवासीको नैतिकपूर्ण रहने

**अमरगढी नगरपालिका कार्यालय**  
अमरगढी, डडेल्धुरा  
२०७४

पत्र संख्या :- ०३६/३३  
चलानी नम्बर :- १८२६

०६६-१२०२२२  
१२०१२२  
१२०१२३

०६६/३३/१७०  
मिति :-

विषय :- बाग बुझाउने सम्बन्धमा

श्री जिल्ला विकास समितिको कार्यालय  
डडेल्धुरा।

उपरोक्त सम्बन्धमा जमागित फोनमार्फत तथा पुर्तगावमा  
कमिजमा केबलमा बागबजार-नगरकोट सडक क्रमांकमा  
मार्गमा बागबजारमा परिसरमा बागबजारमा सुकाउने  
मार्गमा मिति ०६६/३३/१७० को प्रारम्भमा डडेल्धुरा सडक  
मार्गमा जाने मार्गमा सुकाउने प्रकृतिमा बाग नपरेको  
वर्षमा सुकाउने छ।

११/१०/२०७४  
२०७४/१०/२०७४

११/१०/२०७४  
२०७४/१०/२०७४

नेपाल सरकार  
प्रतिष्ठान विकास मन्त्रालय  
नापी विभाग  
नापी, धनकुटा  
२०७४

पत्र संख्या :- ०६४/६६  
चलानी नम्बर :- १७६८

०६६-१२०२२२  
१२०१२२  
१२०१२३

०६६/३३/१७०  
मिति :-

विषय :- सुकाउने पठाएको बारे।

श्री जिल्ला विकास समितिको कार्यालय  
डडेल्धुरा।

उपरोक्त सम्बन्धमा यस जिल्ला विकास समिति  
को कार्यालय डडेल्धुराको मिति २०६६/३३/१७० मा भनिएको  
मितिमा प्रकाशित सुकाउने अनुसार बागबजार-नगरकोट  
१४ कि.मी. बुझा-जोगबुडा ३९ कि.मी. र जोगबुडा-जोग  
१४ कि.मी. सडकमा निर्माण पूर्ण गर्ने प्रारम्भिक बागबजारमा  
पार्श्वमा लाग्ने सर्वजनिक सुकाउने गरिएकोमा उक्त सडकमा  
यस क्षेत्रमा निर्माण गरमा यस क्षेत्रमा जग्गाको जिवनस्तर मा  
सुकाउने सुकाउने खासि बागबजारमा सुकाउने नगरमा सुकाउने  
नपरेको वर्षमा जनताको उदाहरण।

११/१०/२०७४  
२०७४/१०/२०७४

११/१०/२०७४  
२०७४/१०/२०७४

नेपाल सरकार  
प्रतिष्ठान विकास मन्त्रालय  
जिल्ला वन कार्यालय, डडेल्धुरा  
२०७४

पत्र संख्या :- ०६४/०६६  
चलानी नम्बर :- २०७८

०६६-१२०२२२  
१२०१२२  
१२०१२३

०६६/३३/१७०  
मिति :-

विषय :- सुकाउने पठाएको बारे।

श्री जिल्ला विकास समितिको कार्यालय,  
डडेल्धुरा।

उपरोक्त सम्बन्धमा जिल्ला विकास समितिको कार्यालय डडेल्धुराको मिति  
२०६६/०६/०० मा अनुसूचित पोल्टा रान्धुप दैनिक पोचमा प्रकाशित बागबजार-नगरकोट १४ कि.मी. बुझा-  
जोगबुडा ३९ कि.मी. र जोगबुडा-जोग १४ कि.मी. सडकको स्तर उन्नति सम्बन्धमा सुकाउने प्रकृतिमा  
सम्बन्धमा प्रस्तावित सडक अमरगढी नगर, नगरकोट, बागबजार, जोगबुडा मा वि.स. तथा डीटी जिल्लाको  
जिल्ला विकास समितिमा मिति ०६६/०६/०० मा प्रकाशित बागबजारमा सुकाउने प्रकृतिमा बाग नपरेको  
वर्षमा सुकाउने सुकाउने खासि बागबजारमा सुकाउने नगरमा सुकाउने नपरेको वर्षमा जनताको उदाहरण।

११/१०/२०७४  
२०७४/१०/२०७४

११/१०/२०७४  
२०७४/१०/२०७४

## Annex-VII



[illegible][illegible]

- ③ गान्धि-ए.न.बन मोरापुरा → *गान्धि*
- ④ डी. प्रहरी ~~मोरापुरा~~ मोरापुरा →
- ⑤ जन कार्यालय, मोरापुरा →
- ⑥ युवा सेवा कार्यालय →
- ⑦ ग्रामोपयोगिता समूह (नगरपालिका) → ~~मोरापुरा~~
- ⑧ स्वास्थ्य चौकी →
- ⑨ कृषि सेवा कार्यालय →
- ⑩ मयूरपुरी नद →
- ⑪ शान्तिनिकु हाउस (बजारस्थान) →
- ⑫ विभिन्न नदुपुरी वनालय → ~~मोरापुरा~~ *बजारस्थान*
- ⑬ समाज सेवा → *मोरापुरा* ~~मोरापुरा~~ *मोरापुरा*
- ⑭ उम्मा शान्तिनिकु वन → *मोरापुरा* ~~मोरापुरा~~ *मोरापुरा*

[illegible]

## Annex-VIII

### Name of the Organizations

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

SN	Name or Organization	Address	Remarks
1.	Sundari Community Forest-Bagaswor	Bagarkot/ Bagerkot VDC	
2.	Tribani Mulipul Campus	Amarghadhi Municipality	
3.	Samag Sawa	Amarghadhi Municipality	
4.	Umsara Community Forest	Amarghadhi Municipality	
5.	Rural Village Environmental	Amarghadhi Municipality	
6.	District Technical Office	Amarghadhi Municipality	
7.	District Development Communnity Office	Amarghadhi Municipality	
8.	Agricultural Development Office	Amarghadhi Municipality	
9.	Water supply and Sanitation Office	Amarghadhi Municipality	
10.	District Domastic Office	Amarghadhi Municipality	
11.	Amrghdhi Municipality	Amarghadhi Municipality	
12.	Homopathic Hospital	Amarghadhi Municipality	
13.	District Hospital	Amarghadhi Municipality	
14.	District Police Sector	Amarghadhi Municipality	
15.	Rastra Banijay Bank	Amarghadhi Municipality	
16.	Ugratara Community Transport	Amarghadhi Municipality	
17.	District Forest Office	Amarghadhi Municipality	
18.	Napi Office	Amarghadhi Municipality	
19.	Women Development office	Amarghadhi Municipality	
20.	Royal Nepal Samaj Klyan Sung	Amarghadhi Municipality	
21.	District Vu.Snrakchan Office	Amarghadhi Municipality	
22.	UNDP office	Amarghadhi Municipality	
23.	Maalpota Office	Amarghadhi Municipality	
24.	Kosh tha lekha niyantran office	Amarghadhi Municipality	
25.	VDC. Bagarkot	Bagarkot/Bagerkot VDC	
26.	Shop( Staionary shop)	Bagarkot/ Bagerkot VDC	
27.	VDC Alital	Alital/A.Municipality	
28.	Police post	Alital/A.Municipality	
29.	Krishana Kalika Ma. Bi. Vhimnagar	Alital/A.Municipality	
30.	Sub-health post	Alital/A.Municipality	
31.	Aaurbahdhi Medicine	Alital/A.Municipality	
32.	Durga Ma. Bi. Be. Alital	Alital/A.Municipality	

## Annex IX

### List of persons consulted

#### List of persons consulted

SN	NAME	DESIGNATION	ADDRESS
1.	KARMA BAHADUR BISTTA	TEACHER	AMARGHADHI NAGARPALIKA
2.	MIN BAHADUR BISTTA	TEACHER	AMARGHADHI NAGARPALIKA
3.	CHET RAJ BHATTA	TEACHER	AMARGHADHI NAGARPALIKA
4.	SURENDRA BHANDARI	POLICE	AMARGHADHI NAGARPALIKA
5.	AJAY SING BHAL	FARMER	AMARGHADHI NAGARPALIKA
6.	SHER RAJ BHATTA	FARMER	AMARGHADHI NAGARPALIKA
7.	RAJ SHARKI	BUSINESS	AMARGHADHI NAGARPALIKA
8.	PADAM BAHADUR BISTA	BUSINESS	AMARGHADHI NAGARPALIKA
9.	SHIDI RAJ YOGI	BUSINESS	AMARGHADHI NAGARPALIKA
10.	DAMBER DEVI BHANDARI	BUSINESS	AMARGHADHI NAGARPALIKA
11.	DEEPAK RAWAL	BUSINESS	AMARGHADHI NAGARPALIKA
12.	GYANU RAWAL	BUSINESS	AMARGHADHI NAGARPALIKA
13.	JYNTI SHAHU	FARMER	AMARGHADHI NAGARPALIKA
14.	LAXMAN KUWAR	FARMER	AMARGHADHI NAGARPALIKA
15.	JAGDIS SING RAWAL	BUSINESS	AMARGHADHI NAGARPALIKA
16.	LOK RAJ BHATTA	LABOUR	AEIT-4, AMARGHADHI NAGARPALIKA
17.	RAMESH SAHUD	TEACHER	KARIGAU-2, AMARGHADHI NAGARPALIKA
18.	KASWB PANT	FARMER	KARIGAU-2, AMARGHADHI NAGARPALIKA
19.	LAL BAHADUR RAWAL	TEACHER	AEIT-2, AMARGHADHI NAGARPALIKA
20.	RUPA MALLA	LABOUR	AEIT-2, AMARGHADHI NAGARPALIKA
21.	DUMBER MALLA	BUSINESS	AEIT-2, AMARGHADHI NAGARPALIKA
22.	DILLI RAJ JOSHI	BUSINESS	JOSINA-2, AMARGHADHI NAGARPALIKA
23.	HARIDATT YOGI	BUSINESS	JOSINA-2, AMARGHADHI NAGARPALIKA
24.	MAINA DEVI JOSHI	TEACHER	KARIGAU-2, AMARGHADHI NAGARPALIKA
25.	KALPANA JOSHI	TEACHER	KARIGAU-2, AMARGHADHI NAGARPALIKA
26.	DURGA DEVI PANT	TEACHER	KARIGAU-2, AMARGHADHI NAGARPALIKA
27.	BIMASWOR PANT	FARMER	JOSINA-2, AMARGHADHI NAGARPALIKA
28.	DAMRU DEVI PANT	FARMER	JOSINA-2, AMARGHADHI NAGARPALIKA
29.	BIMLA DEVI PANT	BUSINESS	JOSINA-2, AMARGHADHI NAGARPALIKA
30.	KARUNAKAR JOSHI	BUSINESS	JOSINA-2, AMARGHADHI NAGARPALIKA
31.	PRAKESH BAHADUR SHARKI	BUSINESS	JOSINA-2, AMARGHADHI NAGARPALIKA
32.	DEV BAHADUR SHARKI	BUSINESS	JOSINA-2, AMARGHADHI NAGARPALIKA
33.	JOG RAJ PANT	BUSINESS	AEIT-2, AMARGHADHI NAGARPALIKA

34.	AMAR BAHADUR VHUL	BUSINESS	AEIT-2, AMARGHADHI NAGARPALIKA
35.	RATAN SING SHARKI	FARMER	AEIT-2, AMARGHADHI NAGARPALIKA
36.	HIKMAT BAHADUR SHARKI	FARMER	AEIT-2, AMARGHADHI NAGARPALIKA
37.	JYANTI PARKI	BUSINESS	AEIT-2, AMARGHADHI NAGARPALIKA
38.	KAMLA PARKI	LABOUR	AEIT-2, AMARGHADHI NAGARPALIKA
39.	GYANU BHANDARI	TEACHER	AEIT-2, AMARGHADHI NAGARPALIKA
40.	RAM BAHADUR SHARKI	FARMER	AAEDHUGARA, BAGERKOT VDC
41.	GARI DEVI SAUDH	TEACHER	LAAKAM, BAGERKOT VDC
42.	RATAN SING	LABOUR	LAAKAM, BAGERKOT VDC
43.	TULSHI	BUSINESS	EKTHARA, BAGERKOT VDC
44.	TEZ DAMAE	BUSINESS	BIRDAY, BAGERKOT VDC
45.	AMAR BAHADUR BISTTA	BUSINESS	AAEDHUGARA, BAGERKOT VDC
46.	CHET RAJ BHATTA	FARMER	AAEDHUGARA, BAGERKOT VDC
47.	UDHAV SING SAUDH	FARMER	LAAKAM, BAGERKOT VDC
48.	SHER BAHADUR BHAT	FARMER	LAAKAM, BAGERKOT VDC
49.	BHIM SHARKI	FARMER	EKTHARA, BAGERKOT VDC
50.	RAJ SHARKI	FARMER	BIRDAY, BAGERKOT VDC
51.	KAMALA GURUNG	FARMER	LAAKAM, BAGERKOT VDC
52.	SITA DEVI SHAHU	FARMER	EKTHARA, BAGERKOT VDC
53.	GANU RAWAL	FARMER	BIRDAY, BAGERKOT VDC
54.	RATAN BAHADUR BISTTA	VDC, SACHIV	BAGARKOT, BAGERKOT VDC
55.	KLAN KARKI	TEACHER	BAGARKOT, BAGERKOT VDC
56.	TEK BAHADUR KOGI	OFFICER	AADITIYAPUR, BAGERKOT VDC
57.	KAMALA MALI	FARMER	AADITIYAPUR, BAGERKOT VDC
58.	DEV RAJ BHATTA	TEACHER	BAGARKOT, BAGERKOT VDC
59.	HIRA TAMATA	STUDENT	BAGARKOT, BAGERKOT VDC
60.	KALAWTI CHATAUT	STUDENT	BAGARKOT, BAGERKOT VDC
61.	GANGA SING BHANDARI	STUDENT	DHIGULA, BAGERKOT VDC
62.	SITA THAPA	FARMER	BAGARKOT, BAGERKOT VDC
63.	KHAGRAJ GIRI	TEACHER	BHADRAPUR, BAGERKOT VDC
64.	DHRAM DEV PANT	BUSINESS	AADITIYAPUR, BAGERKOT VDC
65.	TEZ DAMAI	BUSINESS	BAGARKOT, BAGERKOT VDC
66.	KESWOV KAMI	BUSINESS	BAGARKOT, BAGERKOT VDC
67.	SAMIKCHA SHRESTHA	BUSINESS	BAGARKOT, BAGERKOT VDC
68.	ESWORI DEVI OADH	BUSINESS	DHIGULA, BAGERKOT VDC
69.	BAHADUR SING TER	BUSINESS	DHIGULA, BAGERKOT VDC
70.	LAXMI DEVI SHARKI	BUSINESS	DHIGULA, BAGERKOT VDC
71.	JAMUNA BISTTA	BUSINESS	BAGARKOT, BAGERKOT VDC
72.	GANESH SING BHADHAIR	BUSINESS	BAGARKOT, BAGERKOT VDC
73.	RAM BAHADUR THAKURATHI	TEACHER	BAGARKOT, BAGERKOT VDC
74.	HIKMAT SHRESTHA	DISTRICT AGRICULTURE DEVELOPMENT OFFICE	DISTRICT AGRICULTURE DEVELOPMENT OFFICE , DADEL DHURA
75.	KRANTI KUMAR GUPTA	LAND SURVEY OFFICER	DISTRICT LAND SURVEY SECTION, DADEL DHURA
76.	KRISHANA BHATT	DISTRICT HEALTH OFFICER	DISTRICT HEALTH OFFICER, DADEL DHURA
77.	PRAMOD SHA	DISTRICT FOREST OFFICER	DISTRICT FOREST OFFICE, DADEL DHURA

## ANNEX X

### X a. Distribution of households by major occupation

### X b. Summary of public services & infrastructures according to settlement

### X c. Land holding pattern of settlements within Zol

### 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	Employ ees	Others (specify)
Bagabazaar	26	21	25	2.32	24	4
Karigau	46.38	32.46	10.14	0.58	5.22	5.22
Josina	46.6	32.07	9.62	0	6.71	5.54
Aeit	29.55	22.27	25.45	1.14	17.05	4.55
Birday	64.62	18.46	4.62	0	3.08	9.23
Aaidhugara	50	27.27	13.64	0	4.55	4.55
Laakam	58.33	25	16.67	0	0	0
Ekthara	31.43	37.14	22.86	0	8.57	0
Dhigula	75	12.50	0	0	12.50	0
Aditypur	33.33	50	12.50	0	4.17	0
Bagarkot	29.45	19.63	27.61	2.45	17.18	3.68
Average	44.61	27.1	15.28	0.59	9.36	3.343

#### X b. 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)/(in ha)	Mill (no)	Bridge (no)	Community organization (no)	Fin. Institution (no)	Community CENTRE	Industry (no)
Bagarbazaar	14	4		1600	-	15	207	4	20	3	-	3	14	1	8
Karigau	-	-		30	-	-	10	1	3	1	-	1	-	-	2
Josina	-	-		29	-	1	5	1	11	-	-	1	-	-	1
Aeit	1	1		39	-	5	24	2	3	-	2	1	-	-	3
Birday	-	-		13	-	2	6	1	9	-	1	1	-	-	1
Aaidhugara	-	-		7	-	1	9	3	6	2	1	1	-	-	1
Laakam	1	-		6	-	2	7	1	14	-	2	1	-	-	2
Ekthara	-	-		10	-	3	6	1	16	2	1	1	-	-	2
Dhugala	-	-		10	-	2	10	2	12	-	1	1	-	-	1
Aaditypur	-	-		17	-	1	4	1	9	-	-	1	-	-	2
Bagarkot	1	1		27	-	15	16	3	2	4	2	2	-	-	6
TOTAL	17	6		1788	0	47	304	20	105	12	10	14	14	1	29

#### Xc. Land holding pattern of settlements within Zol

Settlement Name	Number of HH						
	Landless	<one ropani	1-5 ropani	5-10 ropani	10-20 ropani	20-50 ropani	>50 ropan i
Bagarkot	10	182	120	160	82	6	0
Karigau	3	75	62	115	88	2	0
Josina	5	96	60	98	82	2	0

Aeit	6	134	109	132	54	5	0	440
Birday	2	23	13	15	12	0	0	65
Aaidhugara	4	8	20	12	0	0	0	44
Laakam	2	8	2	0	0	0	0	12
Ekthara	0	14	12	7	2	0	0	35
Dhigula	3	3	2	0	0	0	0	8
Aditypur	0	9	6	6	3	0	0	24
Bagarkot	5	78	48	18	12	2	0	163
<b>Total</b>	<b>40</b>	<b>630</b>	<b>454</b>	<b>563</b>	<b>335</b>	<b>17</b>	<b>0</b>	<b>2039</b>
<b>Percentage</b>	<b>1.96</b>	<b>30.9</b>	<b>22.26</b>	<b>27.61</b>	<b>16.43</b>	<b>0.8</b>	<b>0</b>	

**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	Total HHs
Bagarkot	11	120	140	159	130	560
Karigau	8	66	118	81	72	345
Josina	5	64	109	94	71	343
Aeit	6	88	128	96	122	440
Birday	0	8	14	13	30	65
Aaidhugara	0	6	10	18	10	44
Laakam	0	0	4	3	5	12
Ekthara	0	0	15	12	8	35
Dhigula	0	0	0	5	3	8
Aditypur	0	2	8	5	9	24
Bagarkot	7	28	36	44	48	163
<b>Total</b>	<b>37</b>	<b>382</b>	<b>582</b>	<b>530</b>	<b>508</b>	<b>2039</b>
<b>Percentage</b>	<b>1.81</b>	<b>18.73</b>	<b>28.54</b>	<b>25.99</b>	<b>24.9</b>	

## ANNEX XI

### List of trees to be removed

SN.	Common name	Scientific Name	Chainage	Total number
1	Pipal	Ficus religiosa	0+000	1
2	Salla tree	Pinus roxburghii	0+850 to 2+850	2
3	Pipal	Ficus religiosa	3+100	1
4	Salla tree	Pinus roxburghii	3+300 to 7+007	2
5	Salla tree	Pinus roxburghii	7+007 to 7+948	1
6	Salla tree	Pinus roxburghii	11+720 to 13+000	1
7	Pipal	Ficus religiosa	13+450	1
8	Salla tree	Pinus roxburghii	14+100	1
9	Salla tree	Pinus roxburghii	16+200	1
10	Pipal	Ficus religiosa	16+300	1
	Total			12



## Annex XII

### Minimisation of slope cutting and preservation of vegetative cover

#### *Minimisation of Slope Cutting and Preservation of Vegetative Cover*

Construction of road on a natural mountain slope involves slope cutting that can be compared to an injury on human body. The bigger the injury, the greater are the treatment costs and the time necessary for healing. Therefore the Green Road Concept tries to inflict minimum injury to the natural mountain slope that can be cured fast by self-healing process.

Vegetation cover acts as a "skin" to the slope body. Fast re-vegetation of exposed earth surface acts as an ointment to the injury. Utmost attention to the conservation of natural vegetation is paid in order to reduce future problems and this adopts preventive measures for causing minimum damage to the existing vegetative cover, such as:

- Bush clearing is done only within the formation width, not to the edge of the right-of-way.
- Uncontrolled disposal of excavated material downhill the road is prohibited, but instead, mass balancing and controlled tipping of excess excavated material is practised. Toe walls are constructed to withhold excess materials.
- Felling of trees (approval of which is required from District Forest Office) even in the middle of the road is done only in the last phase just before vehicles begin to ply.
- Suitable planting materials are extracted during the construction works and used for bioengineering purposes.

#### *Mass Balancing*

Mass balancing is the most crucial – as well as the most fundamental -- principle in the Green Road Concept, yet, technically, it is the most difficult one to achieve properly. Mass balancing poses pragmatic problems in implementation if there is no sufficient technical supervision and improper labour management. In addition, non-availability of appropriate tools and materials, lack of funds and proper supervision, and improper technical know-how further influence mass balancing negatively.

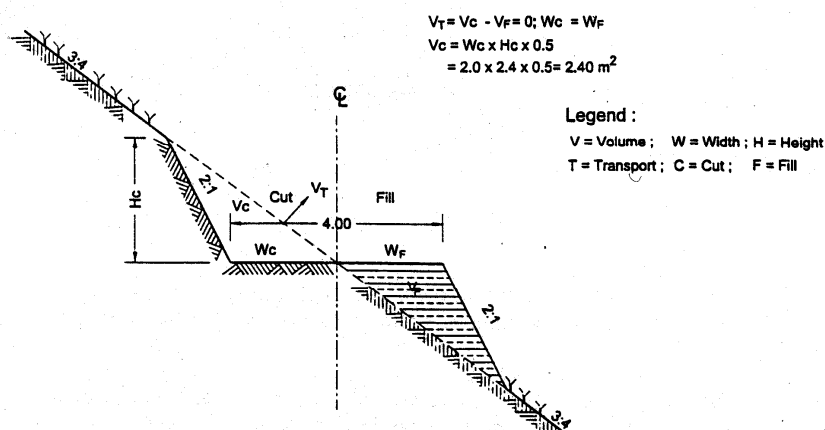


Figure showing mass "cut and fill" balancing within a typical cross section

The conventional road construction practice of developing the road width by full cutting and throwing the excavated material downhill, referred to as mass wasting, causes great damage to the vegetation cover. The

barren soil creates excessive soil erosion and gully formation. In conventional construction practice for a hill slope of 3:4, where the cut volume is approximately 9.6 cubic meter per meter of road length. This earth volume alone is more than enough to cause unaffordable environmental damage through inundation of large parts of mountain slope. In addition to the large cut volume, the cut height is also larger than the road width, which causes excessive risks of slope failure.

The Green Road Concept on the other hand, attempts to balance the volume of cut and fill and prevent mass wasting. This technique is referred to as mass balancing as illustrated in figure the above figure. For controlling the wastage of fill volume, dry stone or gabion retaining structures are built on the valley side. In this way construction of road can be made possible without wasting even a single particle of soil. However, the fill material needs time for monsoon assisted self-compaction. For making self-compaction more effective, vehicles are not allowed to ply on the road at least one year after completion.

In the cut-and-fill method, the cut slope height becomes half as smaller as compared to cut and throws approach, thereby making the cut slope much more stable and safe. In addition, the Green Road is developed in phases, which helps manage the excavated material easily without posing any environmental hazard.

Mass balancing is not just a two-dimensional issue, but extends to three dimensions. It is therefore not always possible within the cross section alone to achieve mass balancing. Sometimes the excess soil has also to be used somewhere along the longitudinal alignment. Transportation of soil mass sometimes can be a major item for obtaining optimum mass balancing, which is best done by using pneumatic wheelbarrows. Excess excavated material can be properly disposed off at specified tipping sites and gullies. Necessary passing bays and switchbacks can be developed by using such excess materials.

#### ***Re-use of Excavated Material as Construction Materials***

All excavated material is considered as potential construction material and is thus re-used. The idea is to produce minimum wastage and minimum damage to the environment.

Excavated stone blocks, for instance, are stockpiled at the time of collection and re-used for constructing stone structures such as dry stone walls in the later phase. If these stones are rolled down the hill at the time of excavation, existing natural resources are wasted. Later, at the time of need, significant amount of financial resources is required to procure the same, which was once wasted.

## ANNEX XIII

### XIII a-Topography, geology and soil type along the road

### XIII b-Summary of Land use Pattern along the road alignment

### XIII c- Recommended structures necessary for slope stabilization at various places

#### Topography, geology and soil type along the road

SN	Section	Chainage	Length(m)	Elevation(m)	Aspect	Geology	Soil type
1	Bagbazaar-Karigau	0+000 to 1+500	1500	1632 to 1560	West	Quartzite	Shoft soil
2	Karigau-Josina	1+500 to 2+100	600	1560 to 1480	North West	Quartzite	Shoft Soil
3	Josina-Aeit	2+100 to 2+900	800	1480 to 1150	North West	Quartzite	Shoft rock
4	Aeit-Biraday	2+900 to 6+200	3300	1150 to 1356	West South	Quartzite	Shoft soil
5	Birday-Aaeduhgara	6+200 to 10+100	2700	1356 to 1489	West South	Quartzite	Shoft soil
6	Aaeduhgara-Laakam	10+100 to 12+800	3900	1489 to 1520	West South	Quartzite	Shoft soil
7	Laakam – Ekthara	12+800 to 13+400	600	1520 to 1052	West South	Quartzite	Shoft soil
8	Ekthara -Dhigula	13+400 to 13+800	400	1052 to 925	West South	Quartzite	Shoft soil
9	Dhigula-Aaditiyapur	13+800 to 14+900	1100	925 to 894	West South	Quartzite	Shoft soil
10	Aaditiyapur-Bagarkot/Dumri	14+900 to 18+200	3300	894 to 855	West South	Quartzite	Shoft soil

Source: Field survey, 2009

#### 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	13+900	14+200	300	3.5	2	0.105	0.06
	16+300	17+200	900	2.7	2.8	0.243	0.252
	17+450	18+000	550	2.7	2.8	0.1485	0.154
<b>Sub-Total</b>			<b>1750</b>			<b>0.4965</b>	<b>0.466</b>
Built up Land	00+000	00+900	900	3.5	2	0.315	0.18
	02+900	04+100	1200	3.5	2	0.42	0.24
	10+300	10+800	500	3.5	2	0.175	0.1
	13+400	13+900	500	3.5	2	0.175	0.1
	14+200	15+300	1100	5	0.5	0.55	0.055
	17+200	17+450	250	2.7	2.8	0.0675	0.07
	18+000	18+200	200	2.7	2.8	0.054	0.056
<b>Sub-Total</b>			<b>4650</b>			<b>1.7565</b>	<b>0.801</b>

Government Land	00+900	01+000	100	3.5	2	0.035	0.02
<b>Sub-Total</b>			<b>100</b>			<b>0.035</b>	<b>0.02</b>
Community Forest	01+000	02+900	1900	3.5	2	0.665	0.38
	04+100	07+000	2900	3.5	2	1.015	0.58
	07+000	10+300	3300	3.5	2	1.155	0.66
	10+800	13+400	2600	3.5	2	0.91	0.52
	15+300	16+300	1000	3.5	2	0.35	0.2
<b>Sub-Total</b>			<b>11700</b>			<b>4.095</b>	<b>2.34</b>
<b>Total</b>			<b>18200</b>			<b>6.383</b>	<b>3.627</b>

Source: Field survey, 2009

**Recommended structures necessary for slope stabilization at various places**

SN	Chainages	Necessary structures/Mitgation Measures
1.	0+000-0+020	Retaining wall
2.	0+650-0+665	Retaining wall
3.	1+000	Retaining wall
4.	1+500	Retaining wall
5.	3+000	Retaining wall
6.	7+900	Retaining wall
7.	7+200	Retaining wall
8.	8+800	Retaining wall
9.	9+100	Retaining wall
10.	9+800	Retaining wall
11.	11+600	Retaining wall
12.	12+100	Retaining wall
13.	16+500-16+600	Retaining wall
14.	17+640	Erosion control works required along with breast wall
15.	17+750	Erosion control works required along with breast wall

Source: Field Survey, 2009



## Annex XIV Photographs



Starting Point of Bagbazaar-Bagerkot Road



Road Alignment



Community Building Within Formation Width, Needs to Relocated(Ch-3+300)



Showing Natural Drain



Road Alignment with Curve



End Point of Bagbazaar-Bagerkot Road

**Annex XV**  
**Comments from ADB and Modification made by proponent.**  
Rural Reconstruction and Rehabilitation Sector Development Project (RRRSDP)  
Initial Environmental Examination (IEE) of Bagbazaar-Bagerkot Rural Road  
Dadeldhura District

**B. Specific Comments**

S.N	Comments from ADB	Modification made by Proponent
B.	Specific	
1.	Change cover page as per the sample attached provided at end of the comments.	Refer cover page and changes have been made accordingly.
2.	Properly format abbreviations.	Refer abbreviations and changes have been made accordingly.
3.	The page nos. (refer 1.1, 1.2.2, Map 1.1 and Map 1.2)	Refer Map 1.1, Map 1.2. and Changes have been made accordingly.
4.	In Nepali/English Summaries, it state "30 skilled and 150 unskilled person-days will be available during the construction of the subproject". The figure seems too low. In relation to this, Salient Feature no. 16 mentions different figures (300 skilled and 150 unskilled). Please check and make the figures consistent. Similarly, under 'Adverse Impacts', it states "a total of 4.18 ha of forest land will be lost, whereas, it also says only 15 trees need to be removed. Please clarify. Please also include the species of trees to be removed. Please note that the land of the existing road should not come under the area to be accured by the subproject. Please check and confirm if 4.18 ha. of forest land is needed to be accured for rehabilitation of the road. Under 'Relevancy of the Propesal and Methodology of Study', Please include IEE has been prepared following the requirements of the Environmental Protection Act 1997, and the Environmental Protection Rule 1997 of Government of Nepal; and Environmental Assessment Guidelines 2003 and Safeguard Policy Statement 2009 of ADB.	All the significant issues have been quantified and these are included into both English and Nepali summary. Refer Nepali and English Summary. Refer silent Feature no. 16. Change have made accordingly.
5.	Please summarize para 1 to 5 (Background) in half page, focusing on the proposal rather than datails of RRRSDP, Similarly, summarize Methodology Adopted (1.2.2) in one paragraph; please avoid detail steps of IEE as it is already included in TOR.	Refer para 1 and 7, And Changes have been made accordingly.
6.	Maps under figure 1.1 and 1.2 are black and white, and are not clear. Please also mark all the figures with the correct numbers.	Refer Map 1.1 and 2.1. Changes have been made accordingly.
7.	In para 32, Table 2.1: Please incorporate all the necessary issues and suggestions of focus group discussions in one list and table to be included in annex. Similarly in para 40, please summarize in one paragraph and table to be included in annex.	Refer para 12 and Table 2.1. Changes have been made accordingly.
8.	Please delete empty columns of table 4.2 and 4.3.	Refer table number 4.1 and table 4.3 is deleted as comments number 11 of ADB. Changes have been made accordingly.
9.	In para 37,it mentions ' the project area lies in mountain region'. However, para 40clams it to be in 'sub-tropical climatic region'. According to the characteristics of the climatic region and elevation of the alignment; the project area should lie in 'mid-hills'. Please reckon.	Refer para 17 and 19. Changes have been made accordingly.
10.	In para 41, the sentence could be replaced with the following : 'Various streams existing along the road alignment are given in	Refer para 20. Changes have been made accordingly.

	table 4.2.'	
11.	In para 42, the paragraph could be replaced with the following: 'The water supply pipeline exists along and across the road alignment. The pipe at chainage 3+900 and 10+600 (Aaidhugara settlement) of the road may be damaged during the construction.' Please also delete table 4.3.	Refer para 21. Changes have been made accordingly.
12.	In para 47, please move table 4.4 to annex.	Refer para 25 and 26. Refer Annex XIII-b of Summary of Land use Pattern along the road alignment table. Changes have been made accordingly.
13.	In para 109, 152 and 158, it mentions that 0.4 ha of forest land and 0.7 ha of cultivated land will be lost. However, the figure in Executive summary, Table 6.5 and 7.1 state 4.18 ha of forest and 0.12 ha of cultivated land. Please recheck it and ensure consistency through out the report.	Refer para 106, 129, 130 and 135. Refer Table 7.2 and Table 7.3. Changes have been made accordingly.
14.	After para 182, there is no information under 'Impact on livelihood and Economic Activities'.	Refer para 157. Changes have been made accordingly.
15.	Table 6.5 may have following format:	Table 6.5 and Table 7.2 and Table 7.3 contain same information so, Table 6.5 is deleted and instead of Table 6.5, Refer Table 7.2 and Table 7.3. Changes have been made accordingly
16.	Table 7.1 repeats most of the information given in table 6.5. Please replace following format for 'compliance monitoring' and 'impact monitoring'. Information from Table 7.4 shall be integrated in this table. In such case, Table 7.1 and Table 7.4 can be deleted.	Table 6.5 should be deleted because most of the information given in table 7.2 and Table 7.3. So, refer Table 7.2 and Table 7.3. Changes have been made accordingly.
17.	The REA Checklist in Annex II is not correctly filled up. There are explanations given in most of the remarks where 'NO' has been ticked, indicating significant issues in the project area. If there are issues, then the answers should be 'Yes' and that will put project into Category A, requiring EIA study as per ADB requirements. Please recheck it.	Refer Annex II for The REA checklist. Changes have been made accordingly.
18.	As an evidence of 15 days public notice (Mulculka), a list of signatures is included in Annex VI. However, the document doesn't indicate that these signatures are actually done for the same purpose.	Refer Annex VII (For mulculka (enquiry)). Changes have been made accordingly.
19.	In para 199, please include that environmental monitoring report to be submitted quarterly for the first year of the operation of the road by the Proponent to the EA. This is to ensure that post project monitoring is also carried out at least for one year.	Refer para 162. Changes have been made accordingly.
20.	The impacts of climate change are not addressed. This is not a compliance issue, however it is necessary to consider them. According to the sources, the timing and magnitude of rainfall in Nepal will change in near future. This definitely has implications on design and maintenance of roads and their drainage. Please refer to the report of DFID financed NGO to evaluate climate vulnerability of RRRSDP.	It is the high time to initiate climate change issues created due to the construction of rural infrastructures. However, legal framework, construction protocols and guidelines are necessary to address climate change issues related to rural infrastructure projects. Moreover, IEE report format should be modified to facilitate integration of climate change concerns.



**Annex XVI**  
**Comments from MoLD and Modification made by proponent.**  
Rural Reconstruction and Rehabilitation Sector Development Project (RRRSDP)  
Initial Environmental Examination (IEE) of Bagbazaar-Bagerkot Rural Road  
Dadeldhura District

**B. Specific Comments**

S.N	Comments from ADB	Modification made by Proponent
<b>B.</b>	<b>Specific</b>	
1.	List of person consulted <b>df</b> District stakeholders office/person <b>klg ;dfj]z ug]{</b> .	Refer Annex IX and changes have been made accordingly
2.	Page 9 (Vi, page 9, 10) vegetation, wildlife <b>sf]</b> scientific name <b>df lbg]</b> .	Refer existing environmental condition in executive summary, para 29 and para 34. Changes have been made accordingly
3.	Page no. table 4.1 <b>df</b> length <b>sf]</b> ; <b>6f</b> stream width <b>pNn]v ug HP sf]</b> full form abbreviation <b>df pNn]v ug]{</b> .	Refer table 4.1 and changes have been made accordingly.
4.	Page 9, 17+940 / 17+750 <b>df ePsf</b> landslide <b>sf]</b> mitigation measures <b>klg lbg]</b> .	Given structures are enough as given in para 22 .
5	Road Construction <b>sf]</b> ; <b>dodf</b> existing traffic <b>nfO{ s;/L</b> manage <b>ug]{ ;f]</b> s'/f <b>pNn]v ug]{ h:t}</b> M Page 16 <b>sf]</b> alternative schedule <b>df p;</b> <b>af/] pNn]v ug{ ;lsG5</b> .	Refer para 76 and changes have been made accordingly.
6	Page 9, existing road condition <b>df</b> table 4.2 <b>cg;/correction ug]{</b> (barren land <b>sf]</b> Area)	Refer para 23 and changes have been made accordingly.
7	Table 4.3 <b>df</b> mayal <b>n]lvPsf]n]</b> 4.2.1 Vegetation <b>df klg pNn]v ug]{</b>	Refer para 29 and changes have been made accordingly.
8	Page 12, 4.3.2 <b>df</b> agriculture and livestock <b>sf]</b> percentage confirm <b>ug]{</b>	Refer para 38 and changes have been made accordingly.
9	Page 13, Chainage 16+220 <b>df</b> water tap damage <b>pNn]v ul/Psf]df</b> table 7.4 <b>sf]</b> 2.5 <b>cGt/utsf]</b> mitigation cost <b>df ;dfj]z eP gePsf]</b> confirm <b>ug]{</b> .	In table 7.4 at 2.5, mitigation cost is under taken.
10	Mitigation Measures <b>x? ;se/</b> site specific <b>agfpg]</b>	Mitigation Measures are site specific.
11	<b>lkksnf] ?v ;+Vof s]lx elgPsf]df</b> (in impact on flora and fauna, page no. 25) exact no. <b>pNn]v ug]{</b> .	Refer para 129 and Annex XI. Changes have been made accordingly
12	Monitoring indicator <b>af6</b> Seismicity <b>nfO{ x6fpg]</b> .	Refer Table 7.6 and changes have been made accordingly.
13	Page 48, Reference <b>df</b> District Profile Sindupalchowk <b>ePsf]df</b> Dadeldhura <b>pNn]v ug]{</b> .	Refer page 48 and changes have been made accordingly.