

# Environmental Assessment Document

---

## Initial Environmental Examination

Grant Number: 0093 NEP

February 2010

## Nepal: Rural Reconstruction and Rehabilitation Sector Development Program

### Bhatkekopati-Jitpur-Mahamanjushree-Chareli- Kalamasi-Nagarkot Road Subproject, Bhaktapur District

Prepared by the Government of Nepal

The Environmental Assessment is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

Government of Nepal  
MoLD / DoLIDAR  
**Rural Reconstruction and Rehabilitation Sector Development Program**

**Initial Environmental Examination (IEE)**  
of  
**Bhatkekopati – Jitpur – Mahamanjushree – Chareli –  
Kalamasi - Nagarkot Road Sub-project**  
Bhaktapur District, Nepal



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

**Proponent:**  
Office of District Development Committee  
District Technical Office  
Bhaktapur District

**February 2010**

**Prepared by:**  
Cemeca Consultant (P.) Ltd.  
Anamnagar, Kathmandu, Nepal  
Telephone No.: 01-4218344  
Fax No.: 01-6226703

# TABLE OF CONTENTS

## ABBREVIATIONS

## EXECUTIVE SUMMARY

## SALIENT FEATURE

## NAME AND ADDRESS OF THE PROPONENT

<b>1. INTRODUCTION .....</b>	<b>2</b>
1.1 Background.....	2
1.2 Relevancy of the proposal.....	2
1.2.1 Objectives.....	2
1.2.2 Methodology adopted .....	3
1.3 Description of the proposal.....	4
1.4 Construction Approach.....	5
1.4.1 Proposed Schedule for Implementation of Sub-project.....	8
<b>2. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE.....</b>	<b>9</b>
2.1 Public Consultation.....	9
2.2 Information Disclosure.....	10
<b>3. REVIEW OF RELEVANT ACTS, REGULATIONS AND GUIDELINES</b>	<b>11</b>
<b>4. EXISTING ENVIRONMENTAL CONDITION</b>	<b>14</b>
4.1 Physical Environment	
4.1.1 Topography .....	14
4.1.2 Geology and soil type.....	14
4.1.3 Climate.....	14
4.1.4 Hydrology and Drainage System .....	14
4.1.5 Soil Erosion and Sedimentation.....	14
4.1.6 Existing Road Condition.....	15
4.1.7 Existing Traffic Situation.....	15
4.1.8 Land use.....	15
4.1.9 Air, Noise and Water Quality .....	15
4.2 Biological Environment	
4.2.1 Vegetation.....	16
4.2.2 Wildlife .....	16
4.2.3 Aquatic life.....	16
4.3 Socio-economic and Cultural Environment	
4.3.1 Population, Household and Ethnicity .....	17
4.3.2 Main occupation.....	17
4.3.3 Market Centre and Business Facilities.....	17
4.3.4 Local Economy.....	17
4.3.5 Agriculture pattern .....	18
4.3.6 Livestock.....	18
4.3.7 Trade and Commerce .....	18
4.3.8 Tourism related services.....	18
4.3.9 Health and Sanitation .....	18
4.3.10 Public Services and Infrastructures .....	18
4.3.11 Land holding pattern .....	19
4.3.12 Food Security .....	19
4.3.13 Migration pattern .....	19
4.3.14 Settlement Pattern .....	19
4.3.15 Potential Development area .....	19
4.3.16 Religious, Cultural and Historical Sites.....	19

---

<b>5. PROJECT ALTERNATIVES</b>	
5.1 Project Alternatives.....	21
5.2 Alternative Alignment Description .....	21
5.3 Alternative Design and Construction Methods .....	21
5.4 Alternative Construction Schedule.....	22
5.5 Alternative Resources .....	22
5.6 Do-Nothing Alternative.....	22
<b>6. IDENTIFICATION OF IMPACTS AND BENEFIT AUGUMENTATION / MITIGATION MEASURES</b>	
6.1 General.....	23
6.2 Project Corridor.....	23
6.3 Mitigation Measures During Pre-construction phase .....	23
6.3.1 Route Selection .....	23
6.3.2 Detailed Survey and Design .....	24
6.3.3 Land and Property Acquisition, Compensation and Resettlement	24
6.4 Beneficial Impacts and Benefit Augmentation Measures.....	24
6.4.1 Construction Stage .....	24
6.4.2 Operation Stage .....	25
6.5 Adverse Impacts and Mitigation Measures .....	27
6.5.1 Construction Stage .....	27
6.5.1.1 Physical Impacts .....	27
6.5.1.2 Biological Impacts .....	32
6.5.1.3 Socio-economic Impacts .....	33
6.5.2 Operation stage .....	35
6.5.2.1 Physical Environment .....	35
6.5.2.2 Biological Environment .....	35
6.5.2.3 Socio-economic and Cultural Impacts .....	36
<b>7. ENVIRONMENT MANAGEMENT PLAN</b>	
7.1 Institutions and Their Roles .....	37
7.2. Reporting and Documentation.....	38
7.3. Environmental Management Plan.....	39
7.4. Mitigation cost .....	51
7.5. Implementation of Mitigation Measures.....	51
7.6. Environmental Monitoring.....	52
7.6.1 Monitoring Responsibility .....	52
7.6.2 Types of Monitoring and Monitoring Parameters .....	53
<b>8. CONCLUSION AND RECOMMENDATIONS</b>	
8.1 Conclusion .....	59
8.2 Recommendation .....	59
<b>REFERENCES</b>	

## **ANNEXES**

Annex I	Terms of Reference for IEE study
Annex II	REA Checklist (ADB)
Annex III	RRRSDP Environmental Checklist
Annex IV	Photographs
Annex V	Abstract of cost
Annex VI	Public notice
Annex VII	Deed of enquiry (Muchulka)
Annex VIII	Name of the Organizations
Annex IX	List of persons contacted
Annex X	Summary of minutes of meeting with local people
Annex XIa	Distribution of household by major occupation
Annex XIb	Summary of public services & infrastructures
Annex XIc	Land holding pattern of settlements within Zol
Annex XId	Number of households belonging to different food security category
Annex XII	Recommendation letters
Annex XIII	Topography, geology and soil type along the road
Annex XIV	Summary of land use pattern along the road alignment
Annex XV	Settlements and population within the Zol of road alignment
Annex XVI	Development Potentialities in Various Sectors
Annex XVII	Religious Sites and their details along the Road alignment
Annex XVIII	Gabion Wall Structures for slope stabilization
Annex XIX	Proposed Cross Drainage Structures for Water management
Annex XX	Detailed of list of Trees cutting

## **LIST OF TABLE**

Table 1.1	Sub-project implementation schedule.....	8
Table 2.1	Table showing summary of meeting minutes.....	9
Table 3.1	Review of Environmental Acts, Regulations and Guidelines.....	11
Table 4.1	Summary of land use pattern along the road alignment with 5m formation width.....	15
Table 4.2	Community Forests along road alignment.....	16
Table 4.3	Ethnicity and Population Composition.....	17
Table 6.1	Recommended Spoil disposal sites .....	28
Table 6.2	Recommended Quarry sites.....	30
Table 7.1	Framework of Implementing Environmental Management Plan (EMP).....	40
Table 7.2	Cost Estimate for Environmental Enhancement and Mitigation Measures.....	52
Table 7.3	Environmental Monitoring Cost.....	54
Table 7.4	Compliance monitoring for Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project.....	56
Table 7.5	Impact/Effect for the Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project.....	58

## **LIST OF FIGURES**

Figure 1.1	Map of Bhaktapur Showing alignment of Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project.....	6
Figure 1.2	Topographical Map showing the alignment of Bhatkekopati – Jtipur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project (Scale 1:35000) .....	7
Figure 7.1	Environmental Management Organization Structure.....	39

---

## ABBREVIATIONS

---

ADB	Asian Development Bank	LEST	Livelihood Enhancement and Skill Training
Amsl	Above mean sea level	M	meter
AP	Affected Person	MoU	Memorandum of Understanding
BG	Building Group	MoE	Ministry of Environment
Ch	Chainage	MLD	Ministry of Local Development
CBO	Community Based Organization	NGO	Non-Governmental Organization
CDC	Compensation Determination Committee	NRs	Nepali Rupees
CDO	Chief District Officer	NTFPs	Non timber forest products
CEA	Country Environmental Analysis	OFID	OPEC Fund for International Development
CF	Community Forest	OP	Operational Plan
CFUG	Community Forest Users Group	OPEC	Organization of Petroleum Exporting Countries
CISC	Central Implementation Support Consultants	PAM	Project Administrative Memorandum
CITES	Convention on International Trade in Endangered Species of Flora and Fauna	PCC	Plain Cement Concrete
DADO	District Agriculture Development Office	PCU	Project Coordination Unit
DDC	District Development Committee	RBG	Road Building Group
DFID	Department for International Development	RCC	Reinforced Cement Concrete
DFO	District Forest Office/Officer	REA	Rapid Environmental Assessment
DG	Director General	RES	Rapid Environmental Screening
DIST	District Implementation Support Team	RIDP	Rural Infrastructure Development Project
DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads	RP	Resettlement Plan
DPO	District Project Office	RRRSDP	Rural Reconstruction and Rehabilitation Sector Development Program
DPCC	District Project Coordination Committee	RS	Resettlement Survey
DRSP	District Road Support Programme	SA	Social Appraisal
DSCO	District Soil Conservation Office	SDC	Swiss Agency for Development and Cooperation
DTO	District Technical Office	SM	Social Mobilizer
DTMP	District Transport Master Plan	TA	Technical Assistance
EARP	Environmental Assessment and Review Procedures	ToR	Terms of Reference
EIA	Environmental Impact Assessment	TWS	Technical Walkover Survey
EMP	Environmental Management Plan	VDC	Village Development Committee
EMS	Environmental Management Section	VICCC	Village Infrastructure Construction Coordination Committee
EPA	Environmental Protection Act	Zol	Zone of Influence
EPR	Environmental Protection Rules		
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		

---

# भत्केकोपाटी-जीतपुर-महामञ्जुश्री-चरेली-कलामसी-नगरकोट सडकको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यकारी सारांश

## पृष्ठभूमि

प्रस्तावित भत्केकोपाटी - जीतपुर - महामञ्जुश्री - चरेली - कलामसी - नगरकोट सडक उप-आयोजना मध्यमाञ्चल विकास क्षेत्र अन्तर्गत भक्तपुर जिल्लामा पर्दछ । यो सडक उप-आयोजना कमलविनायक चोक भन्दा १.३७५ कि.मी. पूर्व यातुमहादेव वाट शुरु भई नगरकोट गा.वि.स.को नगरकोट टावरसम्म पुगेर टुगिन्छ । यो सडक जिल्ला सडक सञ्जालसँग आवद्ध छ । यस उप-आयोजना लाई जिल्ला यातायात गुरु योजनाले दृष्टिगत गरी उच्च प्राथमिकता दिएर ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना (RRRSDP) अन्तर्गत पुनर्स्थापनाका लागि प्रस्तावित गरेको छ ।

प्रस्तावित भत्केकोपाटी-जीतपुर-महामञ्जुश्री-चरेली-कलामसी-नगरकोट सडक जिल्ला सडक हो जुन जिल्लाको पूर्वमा पर्ने वागेश्वरी, सुडाल र नगरकोट गा.वि.स. भएर जान्छ । यो सडक यातुमहादेववाट शुरुवात भई नगरकोट गा.वि.स.को नगरकोट सम्म गएर टुगिन्छ । यो सडकको चौडाई ५ मी. र जम्मा लम्बाई ११.४९ कि.मी. रहेको छ । प्रस्तावित सडकको जम्मा अनुमानित लागत करिब ने. रु. ८,६८,३५,०५६.३६ रहेको छ ।

अरनिको राजमार्ग भक्तपुर जिल्लाको मध्य भागवाट पूर्व पश्चिम दिशा भएर जान्छ जुन यस जिल्लाको मुख्य सडक सञ्जाल हो र साथै सदरमुकाम लगायत अन्य बजार केन्द्रहरु अन्य सडकहरुले जोडिएका छ । प्रस्तावित सडकको निर्माण कार्य सम्पन्न भएपछि सदरमुकाम र अन्य बजारहरु जस्तै कमलविनायक र राजधानी जान सहज हुनेछ ।

यो सडकको निर्माण भएपछि नगरकोट, वागेश्वरी र सुडाल गा.वि.स. का जनताको यात्रा अवधी छोटिने र आय आर्जन साथ साथै व्यापारिक अवसरहरु बढ्ने छन् तथा बजारसम्मको पहुँच सजिलो भई व्यवसायका अवसरहरु बढ्नेछन् । साथै सडक निर्माण हुँदा स्थानीय वासिन्दाले छोटो अवधिको लागि रोजगारीका अवसर पाउने छन् । यस्ता प्रत्यक्ष फाइदा दिने कार्यक्रमवाट त्यस क्षेत्रको आर्थिक गतिविधि बढ्नुको साथै अन्य रोजगारीका अवसरहरु श्रृजना हुने छन् ।

## प्रस्तावक

ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना (RRRSDP) अन्तर्गत जिल्लामा कार्यान्वयन निकायको जिम्मेवारी जिल्ला विकास समिति र जिल्ला प्राविधिक कार्यालय भक्तपुर भएकोले सडक उप-आयोजनाको प्रारम्भिक वातावरणीय परीक्षणको प्रस्तावक पनि जिल्ला विकास समिति र जिल्ला प्राविधिक कार्यालय, भक्तपुर नै हो ।

## उद्देश्य

प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन अध्ययनको मुख्य उद्देश्य उप-आयोजना क्षेत्रको भौतिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक वातावरणमा पर्ने प्रभावहरु पत्ता लगाउनु हो । अन्य उद्देश्यहरु निम्नानुसार छन् :

- उप-आयोजना क्षेत्रमा गरिने विभिन्न निर्माण कार्यहरुले गर्दा भौतिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक वातावरणमा पर्ने मुख्य असरहरु पत्ता लगाउनु ।
- वातावरणमा पर्ने नकारात्मक प्रभावको न्यूनिकरणका उपायहरु र सकारात्मक प्रभाव बढाउने उपायहरु बारे सुझाव दिनुका साथै वातावरणीय अनुगमन योजना बनाई कार्यान्वयन गराउनु ।
- प्रस्तावित सडक उप-आयोजनाको लागि प्रारम्भिक वातावरणीय परीक्षण गरे पुग्छ भन्ने कुराको यकिन गर्नु ।

## प्रस्तावको सान्दर्भिकता तथा अध्ययन प्रकृया

अप्रिल, २००९ मा फिल्ड सर्वेक्षणबाट लिइएका तथ्याङ्क तथा अन्य उपलब्ध तथ्याङ्कहरूको साथै सामाजिक तथा प्राविधिक टोलीबाट पुनर्वास कार्यको सर्भेक्षणको लागि संकलन गरेका तथ्याङ्कहरू केलाएर प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयार गरी निष्कर्ष तथा सुझावहरू दिइएका छन् ।

### विद्यमान वातावरणीय स्थिति

यो सडक समुद्री सतहदेखि १,३७० मी. को उचाईमा रहेको बागेश्वरी गाविसको यातुमहादेवबाट शुरु भई बागेश्वरी र सुडाल गा.वि.स. को विभिन्न वस्ती हुँदै २,१२० मी. उचाईमा रहेको नगरकोटमा गएर टुगिन्छ । यस सडक खण्डमा विभिन्न प्रकारका चट्टानहरू जस्तै क्वार्टजाइट, सिष्ट आदि पाईन्छ । प्रायः एलुभियल तथा रेजीड्यूल प्रकारका बालुवा र पाँगो मिसिएको माटोहरू सडक खण्डमा पाइन्छ । सडक खण्डमा पर्ने पानीका मुख्य श्रोतहरूमा मुलसाँगु खोला, भाप्रो खोला, बगिनी खोला, नयाँवस्ती खोल्साहरू पर्दछन् । प्रस्तावित सडक क्षेत्रको वायु तथा पानीको स्तर सफा नै रहेको देखिन्छ, साथै ध्वनि प्रदूषणको समस्या छैन । यो सडक प्रायः खेती गरिएको जमीन तथा वन र वस्तीहरू भएर जान्छ ।

यस सडक खण्डमा एउटा ठुलै पाखा बहाल सामुदायिक वन (चेनेज ८+६८० - ११+४९०) पर्दछ । यस सडक खण्डमा पाइने मुख्य रुखहरूको प्रजातीहरूमा उत्तिस, चिलाउने, कटुस, सल्ला तथा गैह्र काष्ठ वन पैदावारमा मजिठो, सिलटिमुर, लप्सी, कण्टकारी आदि पर्दछन् । यो सडक खण्ड ठुलै पाखा बहाल सामुदायिक वन भएर जान्छ । बदेल, दुम्सी, मृग, स्याल, बाँदर, वनविरालो आदि वन्य जन्तुका साथै काग, भँगेरा, सारौ, कालिज, परेवा आदि पंक्षीहरू यस सडक खण्ड भएर जाने वनमा पाईन्छ । यो सडक खण्ड संरक्षित क्षेत्र वा मध्यवर्ती क्षेत्रमा पर्दैन ।

यो सडक खण्डको प्रभावित क्षेत्र भित्र बागेश्वरी, सुडाल र नगरकोट गा.वि.स.का १२ वटा प्रमुख वस्तीहरू पर्दछन् । जम्मा घरधुरी संख्या ५९४ र जनसंख्या ३,५६४ रहेको छ र सरदर प्रति परिवार संख्या ५.८५ छ । यहाँ वसोवास गर्ने विभिन्न जात जातिका मानिसहरूमा मुख्य गरी नेवार, ब्राम्हण, तामाङ, गुरुङ तथा दलित (दमाई र कामी) पर्दछन् ।

यहाँका बासिन्दाहरूको मुख्य पेसा कृषि र पशुपालन हो । यातायातको राम्रो सुविधा नभएको तथा पहाडी क्षेत्र भएकोले कृषि उब्जनीले मात्र पर्याप्त नहुने हुँदा यहाँका अधिकांश मानिसहरू श्रम रोजगारीका अन्य पेशामा काम गर्ने तथा केही मानिसहरू सरकारी तथा अन्य गैरसरकारी संस्थामा काम गर्ने र केहि मानिसहरूले व्यापार व्यवसाय पनि गर्ने गर्दछन् । साथै जनसंख्याको उल्लेखनीय प्रतिशत मानिसहरू जीविकोपार्जनको सिलसिलामा काठमाडौँ लगायत वरिपरीका विभिन्न ठाउँमा रोजगारीको लागि जाने गर्दछन् ।

### सकारात्मक प्रभाव

विकास प्रयासका कार्यहरूमा विशेष गरी यातायात सञ्जालको विकासले स्थानीय बासिन्दाहरूको जीवनमा थुप्रै सकारात्मक प्रभाव पर्दछन् । सडक निर्माण गर्दा स्थानीय बासिन्दाहरूले श्रमिकको रूपमा रोजगारीका (१८८३९ दक्ष श्रमिक दिन र ९१८४२ अदक्ष श्रमिक दिन) अवसरहरू प्राप्त गर्ने र प्राविधिक सीप तथा ज्ञान समेत प्राप्त गर्ने छन् । यस सडक उप आयोजनालाई नगरकोट जाने वैकल्पिक मार्गको रूपमा प्रस्ताव गरिएकोले पर्यटन क्षेत्रमा सुधार आउने छ ।

सडकको निर्माण भई संचालनको अवस्थामा सडकसम्मको पहुँचमा हुने सुधारले त्यस क्षेत्रको खाद्य सुरक्षा तथा समग्र आर्थिक तथा सामाजिक स्थायित्वमा सुधार आउनेछ । साथै सडक यातायातले गर्दा ग्रामीण भेगबाट बजार क्षेत्र र बजार क्षेत्रबाट ग्रामीण भेगमा सेवा तथा सामानहरूको ओसार पसार छिटो, छरितो, सुलभ तथा सस्तो हुन जानेछ । कृषि उत्पादनमा विशेष गरी दुध र तरकारी बजारसम्म पहुँच वृद्धि हुने भएकोले कृषि उत्पादन बढाउन कृषकहरू उत्साही हुनेछन् । यसले गर्दा उत्पादकत्वमा वृद्धि हुने तथा शिक्षा, स्वास्थ्य जस्ता सामाजिक सेवासम्मको पहुँचले अन्ततः ग्रामीण भेगका बासिन्दाको समग्र आर्थिक तथा सामाजिक अवस्थामा सुधार हुनेछ ।



यो सडक उप-आयोजना संचालन भए पश्चात व्यापार व्यवसायमा वृद्धि हुन जानेछ । त्यसै गरि जितपुर, महामञ्जुश्री, चरेली र कलामसीमा बजार विकास भई यहाँका बासिन्दाहरुको जीवन स्तरमा सुधार हुन जानेछ । यसका साथै बजार क्षेत्रको विकासले गर्दा जग्गाको मूल्यमा समेत वृद्धि हुन जानेछ ।

#### **नकारात्मक प्रभाव:**

सडक निर्माण गर्दा भौतिक वातावरणमा पर्ने नकारात्मक प्रभावहरुमा भू-स्वामित्वको प्रयोगमा वदलाव, भिरालो जग्गामा पहिरो जाने, वायु तथा पानीमा प्रदूषण, खनेको माटो फालिँदा पर्ने प्रभावहरु मुख्य छन् । यसै प्रकार जैविक प्रभाव अन्तरगत १.१२ हेक्टर वनक्षेत्र स्थायी रूपमा बाटोमा परिणत हुनुको साथै वन्यजन्तुको बसोवासमा अप्ठ्यारो पर्ने र जम्मा १२५ वटा रुखहरु काटिनेछन् । आर्थिक तथा सामाजिक प्रभाव अन्तरगत सडक निर्माण गर्दा ३.७७ हेक्टर खेती गरिने जमीन र ०.८ हेक्टर बाँझो जमिनको नोक्सानी पर्नुका साथै श्रमिक तथा अन्य बासिन्दाहरुको स्वास्थ्यमा सडक निर्माण हुँदा केही मात्रामा प्रतिकूल असर पर्न जानेछ ।

सडक संचालनको दौरान भौतिक वातावरणमा पर्ने नकारात्मक असरहरुमा भिरालोपनको स्थायित्व र यसको व्यवस्थापन, वायु तथा ध्वनि प्रदूषण तथा सडक सुरक्षाका समस्याहरु पर्दछन् । यसै प्रकार जैविक प्रभावमा वन्य श्रोत घट्नु, वन्य जन्तुहरुलाई अप्ठेरो पर्नु हुन् भन्ने सामाजिक तथा आर्थिक प्रभावहरुमा नयाँ बस्ती र बजारको अव्यवस्थित विस्तार, सामाजिक व्यवहारमा परिवर्तन आदि पर्दछन् ।

यस सडक खण्डको चेनेज २+६८० मा जितपुर पहिरो पर्दछ । अन्य साना पहिराहरु चेनेज ५+५८० र ६+६८५ मा पर्दछ । चेनेज २+५०० देखि ४+६०० सम्म ८ ओटा धाराहरुलाई पुनर्स्थापना गर्नुपर्ने छ । चेनेज ५+३०० मा रहेको गुम्बाको पर्खाल भित्र सार्नु पर्नेछ ।

#### **प्रभाव न्यूनीकरणका उपाय**

यस सडकको निर्माणबाट सकारात्मक तथा नकारात्मक दुवै प्रकारका प्रभावहरु पर्ने देखिन्छन् । सकारात्मक प्रभाव बढाउने उपायहरु तथा नकारात्मक प्रभाव न्यूनीकरण गर्ने उपायहरुको प्रभावकारी कार्यान्वयनले गर्दा सकारात्मक प्रभाव बढ्न जानुका साथै नकारात्मक प्रभाव न्यून गर्न सकिने वा हटाउन सकिने छन् । प्रभावहरुको आँकलनको आधारमा सडक निर्माण तथा संचालन दुवै चरणमा सकारात्मक प्रभाव बढ्ने उपाय र नकारात्मक प्रभाव घटाउने उपायहरु उल्लेख गरिएका छन् ।

#### **वातावरणीय व्यवस्थापन योजना**

सकारात्मक असरहरुलाई बढाउने र नकारात्मक असरहरुलाई घटाउन वातावरणीय व्यवस्थापन योजना एउटा महत्वपूर्ण उपाय हो । यसले गर्दा आवश्यक सूचनाहरु प्राप्त भई प्रभाव न्यूनीकरणका उपायहरुको कार्यान्वयनमा सुधार गर्न सकिन्छ । यसको लागि जिल्ला विकास समिति र जिल्ला प्राविधिक कार्यालय, भक्तपुरले अनुगमन प्रणालीको विकास गरी वातावरणीय सुधारमा आफ्नो प्रतिबद्धता देखाउने छ । यस कामको लागि जि.वि.स. लाई जिल्लामा रहेको जिल्ला आयोजना कार्यालय र जिल्ला कार्यान्वयन सहयोग टिम र केन्द्रीय कार्यान्वयन सहयोग परामर्शदाताले सहयोग पुर्याउने छन् ।

### निष्कर्ष तथा सुझावहरू

भत्केकोपाटी-जीतपुर-महामञ्जुश्री-चरेली-कलामसी-नगरकोट सडक उप-आयोजना स्तरोन्नोती गर्ने उप-आयोजना हो । यसको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदनले सकारात्मक प्रभावहरू नकारात्मक प्रभावको तुलनामा बढी महत्वपूर्ण रहेको र लामो समयसम्म रहने तथा नकारात्मक प्रभावहरू न्यूनीकरण गर्न सकिने कुरा देखाउँछ, यस कारण यो सडक उपआयोजनाको स्वीकृतिको लागि प्रारम्भिक वातावरणीय परीक्षण पर्याप्त रहेको छ । प्रभावहरूको न्यूनीकरण र संलग्न वातावरणीय अनुगमन योजना कार्यान्वयन गरी प्रस्तावित उपआयोजना कार्यान्वयनको लागि सिफारिश गरिन्छ । सडक निर्माण गर्दा प्रभावित व्यक्तिहरूको सम्पत्तिको क्षतिपूर्ति गर्न पुनर्वास योजनाको आवश्यकता पर्नेछ ।

## Executive Summary

### Background

The proposed Bhatkekopati - Jitpur - Mahamanjushree - Chareli - Kalamasi - Nagarkot Road Sub-project lies in Bhaktapur district of Central Development region of Nepal. This road starts from Black topped road at Yatumahadev, which lies 1.375 km from kamal Binayak and ends at Nagarkot of Nagarkot VDC, which a major tourist destination. It becomes the part of district road network. Considering the importance of this road, DTMP 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 Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot is a district road passing through Bageshwari, Sudal and Nagarkot VDCs in the eastern part of Bhaktapur district. This road starts from Yatumahadev, and ends at Nagarkot of Nagarkot VDC. Formation width of road is 5.0 m in average and total length of this road is 11.49 km. The tentative estimated sub-project cost including bridge is approximately NRs. **86,835,056.36**.

Arniko Highway passes through central part of the Bhaktapur district in east west direction which is serving as a main transportation link in Bhaktapur district and other market centres are connected by other roads. After the completion of the proposed road, the road will provide alternate accessibility to Nagarkot from district headquarter as well as from various market centres and especially for north east part of the district. The road will also provide easy access to district headquarter, and other market centers such as Kamal Binayak for the people of this 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 Bageshwari, Sudal and Nagarkot, VDCs. Moreover, this road will also provide short term employment opportunity by engaging the rural poor people in construction of the road. 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), Bhaktapur 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 Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot 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 subproject 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 findings and conclusions of the report are based on the analysis of the information collected from the field during April, 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.

## Existing Environmental Condition

The road starts from Yatumadev of Bageshwori, VDC at 1,370 m from mean sea level, passes through various settlements of Bageshwari and Sudal VDC and ends at Nagarkot at 2120 m from mean sea level. Various kinds of rock such as quartzite, schist etc. were observed along the road alignment. Generally, alluvial, residual and clay mixed sandy soil are found along the road alignment. Main waterbodies found across the road alignment are Mulsangu River, Jhapra Khola, Bogini Khola, and Naya Basti Khola. Ambient air and water quality in the proposed subproject area is found to be good and there's also no noise pollution. The road mainly passes through cultivated land, forest and settlements.

There is one community forest named Dunge Pakha Bahal Community forest along the proposed road alignment at chainage 8+680-11+490m. 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* (Kantakari) etc.. *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* (Bhangera), *Lophura lencomelana* (Kalij Pheasant), *Columba livia* (Pegion) etc. The road does not fall under any protected or buffer zone area.

There are 12 major settlements along the Zol of the proposed road alignment in Bageshwori, Sudal and Nagarkot VDCs with total population of 3564 (594HH) persons and average family size of 5.85. Several caste and ethnic groups such as Newar Brahmin, Tamang, Gurung, and occupational caste (Damai, Kami, Sarki) live along the Zol of road alignment. Occupational caste households are distributed in almost all the settlements.

The main occupation of all people residing within the Zol of the proposed road alignment is agriculture and livestock. Due to limited transportation facilities, agriculture farming is not enough for subsistence level. Therefore, people are carrying out other economic activities like majority of the people work as labour and porters while some people work in government and non government organizations and a few are doing business. Moreover, significant section of the economically active male population also migrates to various places including Kathmandu and Lalitpur 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 (18839 skilled and 91842 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 and vegetables 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. Moreover as it is prescribed as alternative alignment, tourism activities will be further upgraded.

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 Chareli, Jitpur and Nalachhap. 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 1.12 ha of forest area and disturbance to wildlife and bird habitat. Total 125 numbers of trees will be cleared. Socio-economic impacts during road construction will be loss of 3.77 ha of agricultural land and 0.8 of barren land 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.

There is a major landslide named Jitpur at chainage 2+680. Other minor landslide observed at chainage 5+580 and at chainage 6+685 m. 8 no. of water taps from chainage 2+500 to 4+600 needed to be relocated. The boundary wall of Gumba at chainage 5+300 should be shifted.

### **Mitigation Measures**

Impacts from the proposed road subprojects 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 subproject and avoid/minimize the adverse impact from the subproject. 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/DTO Bhaktapur 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 DIST (DPO and DIST) team in the district and Environmental team from the CISC for the environmental monitoring.

## **Conclusion and Recommendation**

The IEE study of the proposed Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot road sub-project reveals that the benefits from the implementation of the proposed road subproject 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	: Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road
2. Location	
2.1 Geographical Locations	
2.1.1 Start Point	: Yatumahadev of Bageshwari VDC
2.1.2 End Point	: Nagarkot of Nagarkot VDC
2.2 Geographical Feature	
2.2.1 Terrain	: Mid-Hills
2.2.2 Alignment	: Ridge/Lower valley
2.2.3 Altitude	: 1370 m at Yatumahadev to 2120 m at Nagarkot
2.2.4 Climate	: Sub-Tropical
2.2.5 Soil	: Alluvial soil, colluvial soil
3. Classification of Road	: District Road (Rural Road) Class A
4. Status of road	: Proposed for rehabilitation
5. Length of Road	: 11.49 km
6. Standard of Pavement	: Premix Carpeting and Semi Grouting
7. Construction Period	: 360 days
8. Traffic Forecast	: 200 vehicles per day in both direction
9. Design speed	: 20 km/hr
10. Major Settlements:	
10.1 Major Settlements	: Gairapati, Ratopati, Kalihopi, Jitpur, Dwaretol, Manjushree, Chareli, Shantitol, Nayabasti, Kalamasi, Tukuche and Nagarkot
10.2 No. of Household	: 594 HHs
10.3 VDCs along the Road	: Bageshwari, Sudal and Nagarkot
11. Cross Section	
11.1 Right of way	: 5 m each side (center line)
11.2 Formation width	: 5 m
11.3 Carriageway width	: 3 m
11.4 Lane	: Single
12. Structures	
12.1 Retaining Structures	
12.1.1 Gabion Wall	: 770.00 Cum
13. Bio-Engineering	: NRs 1,311,893.14
14. Sub-project cost	
14.1 Total Cost (NRs)	: NRs. 86,835,056.36
14.2 Costs per km (NRs.)	: NRs. 7,557,446.16
15. Employment generation	
16.1 Total person days	
16.1.1 Skilled	: 18839
16.1.2 Unskilled	: 91842

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

The District Development Committee (DDC) / District Technical Office (DTO), Bhaktapur are the executing agencies at the district level under RRRSDP and the proponent of the Initial Environmental Examination (IEE) study for the rehabilitation of Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project.

### **Address:**

District Development Committee (DDC) / District Technical Office (DTO)  
Bhaktapur  
Telephone No.: 01-6614826  
Fax No.: 01-6613215

### **Consultant:**

Cemeca Consultant (P.) Ltd.  
District Implementation Support Team (DIST)  
Anamnagar, kathmandu, Nepal  
Telephone No.: 01-4218344  
Fax No.: 01-6226703

### **Prepared By**

Suman Dahal                                      Environmental Specialist

### **Data collection support**

Abhishek kumar Mahto	Team Leader
Sujit Kumar Yadav	Deputy Team Leader
Kabita Kafle	Social Development Specialist
Sagar Joshi	Sub- Engineer
Rameshwor Homegai	Asst. Sub-Engineer
Laxmi Aryal	Social Mobilizer
Binu Mahat	Social Mobilizer



# 1. INTRODUCTION

## 1.1 Background

1. The Rural Reconstruction and Rehabilitation Sector Development Programme (RRRSDP) is launched in Bhaktapur district to enhance economic and social services, and enhanced social and financial status of people of this area. Labor-based, environmentally friendly, and participatory (LEP) and contractor based approaches will ensure that the investment in reconstruction and rehabilitation of infrastructure results in sustainable, improved access in Bhaktapur district. Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) is the implementing agency for RRRSDP supported sub-projects. Project Coordination Unit (PCU) in Kathmandu headed by a Project Coordinator will guide and monitor District Development Committees (DDC)/District Technical Office(DTO) as implementer of project components. all the project activities. Cemeca Consultant is District Implementation Support Team (DIST) for RRRSDP and has the responsibility of providing technical assistance in Bhaktapur district.

## 1.2 Relevancy of the proposal

2. 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.

3. 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 Road sub-project falls under category "B" project where IEE is mandatory for all sub projects according to ADB Environmental Assessment Guidelines, 2003. According to Appendix 15, Schedule 4, Paragraph 32 of Environmental Covenants as given in Project Administration Memorandum (PAM), all sub-projects shall be identified, implemented and reported with an IEE. Nepali legal provisions in essence satisfy ADB's requirements.

4. This IEE report of Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road sub-project in Bhaktapur district is prepared based on the Terms of Reference (ToR) approved on 2066/01/17 by the Secretary level decision of the Ministry of Local Development (MoLD) which is given in Annex I. Rapid Environmental Assessment (REA) Checklist was also considered during IEE report preparation as given in Annex II.

5. The findings and conclusions of the report are based on the analysis of the information collected during April, 2009 from the field by undertaking a walk-through environmental survey along the proposed route (for which a checklist was used) and secondary information, supplemented by information collected by the social and technical teams working on the resettlement survey and detail survey.

### 1.2.1 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, and
- Provide information on the general environmental setting of the Yatumahadev to Nagarkot area as baseline data.

### 1.2.2 Methodology adopted

7. The IEE approach, methodology and procedure were generally followed according to the provisions of the EPA, 1997 and EPR, 1997. Data collection was done in April, 2009 by the staff of DIST team (Sub-Engineer, Enumerators and Environmental Specialist).

#### Desk review

8. The following steps were followed during the desk review:

- Collection and review of secondary information from various sources
- Initial interaction and consultation with the local community and district level stakeholders
- Delineation of geographical boundary of the influence area on the topographical map
- Preparation of subproject specific checklist

### 9. Collection and review of secondary sources of information from various sources

Secondary information was collected through published and unpublished reports and interpretation of maps and photographs. The sources of information were District Development Committee (DDC), District Forest Office (DFO) and other line agencies, related NGOs and other project offices in the district.

**10. Initial interaction and consultation with the local community and district level stakeholders:** During the IEE report preparation, DIST team met, Discussed and interacted with concerned staff of the Government of Nepal, DDC, VDCs in the district head quarter and teachers, community based organization member and knowledgeable key persons of surrounding areas within the Zone of Influence (Zol).

### 11. Delineation of geographical boundary of the influence area on the topo-map

The geographical boundary of Zol (one and half hours walk from the road or 5 km distance) was drawn on the topographical maps with the help of DIST Engineer and Social Mobilizer. For the collection of environmental features related to biophysical environment, maximum 100 meter distance observable from the center of the road alignment was taken as an influence area.

### 12. Preparation of Sub project specific checklist

A checklist was prepared to collect physical, biological, socio-economic and cultural environment related information in the field as given in **Annex III**. This check list was based on APPROACH manual produced by DoLIDAR. In addition, Zol household survey questionnaire was used to collect socio-economic information of the households. Similarly, household listing survey report was used for the listing of agricultural land, forest, trees, houses and other affected properties prepared during resettlement survey.

#### Field survey

13. Field survey comprised of walkthrough survey, consultation with community, site inspection and observation. The road alignment from the starting point at yatumahadev of Bageshwari VDC and end point at Nagarkot of Nagarkot VDC was visited and observed. The following tools were used for the collection of primary data:

- Focus group Discussion (FGD) - To conduct consultation with the local communities at different settlements, FGD was organized with key informants and other knowledgeable persons. It was done to collect biological, socio-economic and cultural environment related information using a checklist as given in **Annex III**.
- Zol household survey - Questionnaire was used to collect socio-economic information of all the households within the Zol.
- Household listing survey - Total enumeration was done for the listing of agricultural land, forest, trees, houses and other affected properties.

- Stripe map - It was used during walkthrough survey to document environmental features according to the Chainage.
- Topographical map - It was used to show environmental features on the map during walkthrough survey.
- Photographs - Necessary photographs were taken to show different environmental features as given in **Annex IV**.

### **Compilation of existing information, impact identification and prediction**

14. The information collected from different sources were processed and analyzed according to the physical, biological, socioeconomic and cultural environment within the zone of influence. The collected secondary data were the major sources for verification and crosschecking of primary data during the field survey. The generated information from primary source was analyzed, tabulated and prioritized.

15. Based on the identification of the impacts, their prediction was done to forecast the changes in local environment. The methods adopted in impact predictions were done by using various methods, such as trend analysis, cause and effect relationship, expert judgment etc. The assessment of environmental impact was derived exclusively in terms of magnitude, duration and extent. The significance of positive and negative impacts associated with construction and subsequent operation of the road were identified and predicted considering the ZoI.

### **Mitigation Measures and Management Plan**

16. Based on the identified impacts their nature, extent and magnitude, the mitigation and monitoring prescriptions were developed. A realistic approach was applied for the application of the mitigation measures in the local context. Environmental monitoring and management plan was developed to assess the effectiveness of the mitigation measures and implementation status.

### **The Final Report**

17. The IEE report was prepared by Environmental Specialist of DIST Team and submitted to DDC/DTO. After reviewing the final IEE report, it will be submitted to MLD and ADB for approval.

## **1.3 Description of the proposal**

18. The proposed of Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project lies in the north-eastern part of Bhaktapur district of Central Development region of Nepal. The starting point of the road, Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot is Yatumahadev of Bageshwari VDC and end point is Nagarkot, one of the renowned tourist place in the Kathmandu valley. It is a point 1.375 km away from Kamalbinayak chok and of 2.5 km far from district headquarters of Bhaktapur. Upto 1 km section, the road width is 5 m or more because of plain sections. For the remaining length of the road, width is 5 m in general, but some sections of road are having 3.5 to 6.5 m width also. Almost all alignment of the road passes from lower valley to upper valley.

19. The people in this project area are having many types of transportation problems due to the steep topography and worse condition of road. Local people have no good access to the market centres of the district to sell their milk product named as khuwa which is famous of these VDC and vegetative products such as Potato, Brinjal, Tomato, Onion, cauliflower etc. to sustain their daily livelihood. Having lots of transportation difficulties, local tourist, foreign tourist and people of the road corridor too do not have the fast and appropriate access road to reach the Nagarkot to view beautiful natural scene of Nagarkot such as sunshine, sunshade and Himalaya etc.. The location and alignment of the road is given in **Figure 1.1 and 1.2**. The total sub-project cost is NRs. **86,835,056.36** where as per km cost is NRs. **7,557,446.16** as shown in **Annex V**.

20. Vehicles are operated on queue basis from kamalbinayak (Bhaktapur district) to Nagarkot via Telkot. This section will make an alternative shortest route for the access to Nagarkot. However, this road links to remote part of Sudal VDC which will enhance the economic condition of the people of that area.

21. Main means of transportation for the large area of the district is motorable roads but the people have to overcome difficulty in rainy season. Consequently, transportation of goods and services from the market centers to the rural areas and vice-versa has been difficult, insufficient and costly. It is one of the shortest routes joining Kathmandu and Nagarkot district via KamalBinayak. The proposed road sub-project connects several VDCs of eastern part of district to the Kamal Binayak and hence facilitates the easy access to Kathmandu and district headquarters of Bhaktapur.

22. 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.

23. The rehabilitation of road will mainly enhance the transportation of Vegetable product, milk product produced in remote areas of Sudal and other VDCs and it will also extend physical and economical access to the people within the immediate zone of influence. It will also be the appropriate road transport to reach the Nagarkot to view the natural scenario of the Nagarkot. For the road construction, use of local labour will generate immediate employment to local people and minimise migration to Kathmandu and Lalitpur city in search of work. Consequently, local people will get long-term benefit which will enhance their economic status within the Zol of road corridor and adjoining area of Kabre district.

24. Direct beneficiaries of this road subproject will be the people of Bageshwori, Sudal and Nagarkot VDCs and indirect beneficiaries will be the people living in adjacent VDCs. During field study, local people told that this road can be access way to Kathmandu for people living in Nagarkot VDCs.

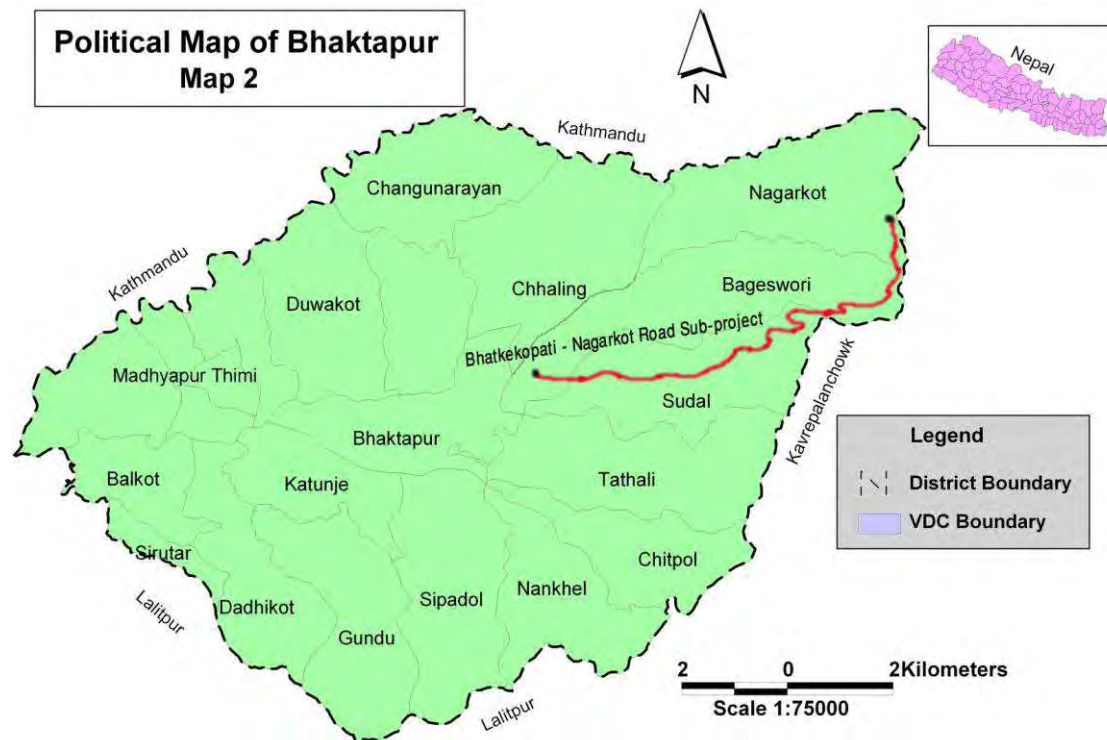
25. This road will save considerable travel time and improve income generation potentials, enhance commercial opportunities and improve market accessibility to local people especially from Bageshwori, Sudal and Nagarkot VDCs. Moreover, this road will also provide short term employment opportunity by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

#### **1.4 Construction Approach**

26. This road will be constructed using the labour-based, environment-friendly and participatory (LEP) and Contractor based 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.

Since the construction approach of the project is LEP approach. But as the settlements of Bhaktapur district is developing as a semi urban area, people want to work in official works rather than working as a labour. Thus, the work in which the local people be interested or can be performed such as earthwork excavation, back filling and cutting of trees will be performed by RBG. And the works such as bituminous surfacing and heavy structure work will be carried out through contractor because these heavy structures can not be constructed by the RBG. Although



**Figure 1.1 Map of Bhaktapur Showing alignment of Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project**





**Figure 1.2 Topographical Map showing the alignment of Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project (Scale 1:35000)**

in the case of contractor, they will be discouraged for blasting and are encouraged for use of appropriate environment friendly construction work.

#### 1.4.1 Proposed Schedule for Implementation of Sub-project

27. Table shows the proposed implementation schedule for Bhatkekopati – Jitipur – Mahamanjushree – Chareli – Kalamasi - Nagarkot 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. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

### 2.1 Public Consultation

28. 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 25th June of 2009 in the *Nayapatrika*, a national daily newspaper (see **Annex VI**) 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 deed of enquiry (Muchulka) was collected (see **Annex VII** for 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 (FGDs) were conducted to collect and solicit information regarding the bio-physical and socio-economic and cultural aspects of Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot Road Sub-Project
- . Summary of meeting minutes with local people is given in Table 2.1 and meeting minutes in Annex X. The FGDs were held at different 12 major settlements along the Zol of the road (refer **Table 4.8** for the names of settlements) and the results of FGD are mentioned under the chapter 4, Existing Environmental Conditions. Socio-economic data are tabulated in **Annex XI a, b, c and d**.
- Draft IEE report will be sent to Bageshwari, Sudal and Nagarkot VDCs VDC for public Disclosure. Recommendation letters were also obtained from above mentioned VDCs as given in **Annex XII**. Draft IEE will also be kept in information center of DDC Bhaktapur 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 Table showing summary of meeting minutes**

Date	Location of the public meeting	Address	Issues and Suggestions of the meeting
2066/03/23	Sudal VDC Office	Sudal VDC Bhaktapur	<ul style="list-style-type: none"> <li>• (kulo) should not be affected by spoil disposal</li> <li>• Affected drinking water supply pipelines should be restored.</li> <li>• Ganesh Temple should not be affected.</li> <li>• VDC office should be managed as it might be affected.</li> <li>• Soil erosion due to road construction should be minimized with proper means.</li> <li>• Taps adjacent to roadside should be protected, otherwise recolate in appropriate place</li> </ul>
2066/03/21	Bageshwari VDC office	Bageshwari VDC	Care should be taken in protection of infrastructure along the alignment Pati pauwa along the alignment should be protected.
2066/03/25	Nagarkot VDC office	Nagarkot VDC Bhaktapur	Minimize the adverse affect on the wildlife, birds and forest itself.



## **2.2 Information Disclosure**

29. Draft IEE will be kept in information center of DDC Bhaktapur 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 posting 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 information center of DDC Bhaktapur and websites of ADB, DoLIDAR and RRRSDP. Following offices will get the IEE report:

1. District Development Committee, Bhaktapur
2. District Technical Office, Bhaktapur
3. District Project Office, Bhaktapur
4. District Implementation Support Team, Bhaktapur
5. Bageshwari, Sudal and Nagarkot VDCs
6. Ministry of Local Development
7. Department of Local Infrastructure Development and Agricultural Roads
8. Project Coordination Unit, RRRSDP
9. Asian Development Bank, Nepal Resident Mission

### 3. REVIEW OF RELEVANT ACTS, REGULATIONS AND GUIDELINES

30. 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	Environment 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.
2	Environment 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	The Forest Act, 1993 (amendment, 1998) contains several provisions to ensure the development, conservation, management, and sustainable use of forest resources, based on an approved work plan. It also recognizes the importance of forests in maintaining a healthy environment. Sections 68 of the Forest Act, 1993 empowers the government in case of no alternatives, to provide parts of any types of forests for the implementation of a national priority plan with assurance that it does not adversely affect the environment significantly. Section 49 of the Act prohibits reclaiming lands, setting fires, grazing, removing or damaging forest products, felling trees or plants, wildlife hunting and extracting boulders, sand and soil from the national forest without prior approval from DFO and DDC.
4	Forest Rules, 1995	The Forest Rules, 1995 further elaborate legal measures for the conservation of forests and wildlife. Rule 65 of the Forest Regulation stipulates that in case the execution of any project having national priority in any forest area causes any loss or harm to any local individual or community, the proponent of the project itself shall bear the amount of compensation to be paid. Similarly the entire expenses required for the cutting and transporting the forest products in a forest area to be used by the approved project shall be borne by the proponent of the project.
5	National Park and Wildlife Conservation Act, 1973	The National Parks and Wildlife Conservation Act, 1973 addresses for conservation of ecologically valuable areas and indigenous wildlife. The Act prohibits any movement of a person without written permission within the parks and the reserves. The Act further prohibits wildlife hunting, construction of houses and huts, damage to plants and animals etc. within the park and reserve, without the written permission of the authorized person. The Act has also listed 26 species of mammals, 9 species of birds and 3 species of reptiles as protected wildlife.
6	Local Self Governance Act (1999) and Rules (1999)	The Local Self Governance Act has been enacted to provide greater political, administrative and financial autonomy to local bodies and facilitate community participation at the local level. The Local Self Governance Act, 1999 empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities. Sections 28 and 43 of the Act provide the Village Development Committee (VDC) a legal mandate to formulate and implement programs related to the protection of the environment during the formulation and implementation of the district level plan.

SN	Environmental Acts, Regulations and Guidelines	Description of Requirements
7	Land Acquisition Act, 1977 and Land Acquisition Rules, 1969	The Land Acquisition Act, 1977 and the Land Acquisition Rules, 1969 are the two main legal instruments that specify procedural matters of land acquisition and compensation. Government can acquire land at any place in any quantity by giving compensation pursuant to the Act for any public purposes or for operation of any development project initiated by government institutions. The powers given under these two sections are very broad as government is empowered to acquire any land in the name of public works. However, the Constitution of the Kingdom of Nepal, 1990 has provision for compensation to be paid to the individual if the state takes land for development purposes.
8	National Environmental Impact Assessment Guidelines, 1993	In order to integrate the environmental aspects in development projects and programs, the government has developed the National EIA Guidelines (1993). The guidelines provide 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.
9	APPROACH for the Development of Agricultural and Rural Roads, 1999	With respect to agriculture sector, roads and irrigation sub-sectors play an important role since these are directly related to agriculture. The rural roads that are termed as "Agricultural Road" link farms to market centers or to nearby strategic road. The existing rural road network, at present has a limited economic impact because of its low density. Therefore, among all the rural infrastructure development activities, rural road sub-sector is considered vital. The approach given in this manual is, therefore prepared in line with the poverty alleviation objectives and the decentralized participatory development concepts of the government. In addition of poverty alleviation objectives, this manual emphasizes labor based technology and environmental friendly, local resource oriented construction methods to be incorporated actively in rural infrastructure process.
10	Reference Manual for Environmental and Social Aspects of Integrated Road Development, 2003	This Manual is designed to help integrate social and environmental considerations, including public involvement strategies, with technical road construction practices. It suggests stepwise process of addressing environmental and social issues alongside the technical, financial and others. The main objective of the Manual is to assist in the effective implementation of environmental and social plans and actions, to advice and suggest appropriate methodologies to achieve sustainable development. The Manual recommends various environmental and social approaches, actions and strategies to assist developers in following mandatory requirements of the law and improving public involvement.
11	Green Roads in Nepal, Best Practices Report: An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions, 1999	The green road concept is a new conservation oriented rural mountain road construction approach mainly focusing on participatory, labor based and environment friendly technology that has been gradually developing in Nepal since the mid 1970's. Proper alignment selection, mass balancing, proper water management, and bioengineering are the major features of the Green Road technology, yet some of them are sometimes difficult to apply. Green Roads are fair weather, low volume earth roads that are built in different phases using labor-based methods. Many of the environmental advantages of the technology are obviously not immediate. The Green Road Concept comprises a "phased construction" approach

SN	Environmental Acts, Regulations and Guidelines	Description of Requirements
		meaning construction of road in different phases.
12	Batabaraniya Nirdesika (Nepali), 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. More emphasis is given to prevention rather than cure. So, the recommendations for the mitigation measures are provided only when it is necessary.
13	IEE Rural Access Programme (RAP) Guidelines, 2003	The Rural Access Programme guidelines for IEE, 2003 clearly indicates the objectives and process of IEE in terms of project screening, preparation of terms of reference, desk review, field work, data analysis and interpretation (identification, prediction and analysis of impacts), mitigation measures, monitoring plan and reporting.
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. EXISTING ENVIRONMENTAL CONDITION

31. 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

32. This section describes the physical condition of the area that comes under the Zol 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

33. The proposed road lies in hilly and mountainous region. The lowest elevation of the proposed road at starting point at Yatumahadev is 1370 m and highest elevation at Nagarkot is 2120 m. Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot road alignment passes through the valley area to north hilly region. The road passes to valley plain area in the initial section and passes through the hilly section as it goes on.

34. The slope varies from 0° to 5° in the initial section but in the Nagarkot area slope exceeds 20°. Major portion of the road passes along the south and west facing slope.

#### 4.1.2 Geology and soil type

35. The road section comprises of different types of rocks. The road corridor falls in the Lesser Himalayan Sediments zone that comprises rocks such as quartzite and schists. Generally, alluvium soil is found along the road alignment.

36. In general, soil type along the alignment can be classified as alluvial, colluvial and residual. The detail topography, geology and soil type along the road alignment is presented in the **Annex XIII**.

#### 4.1.3 Climate

37. Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot road lies in the sub-tropical climatic region. Generally, rainy season starts from June and ends in September. The meteorological record shows unevenly distributed monsoon rain in the project area with the total average annual rainfall is 1362.2 mm. The general climatic condition is cold in winter and hot in summer with average minimum temperature of -2° C and average maximum temperature of 32°C.

(Source: DTMP of Bhaktapur, 2008)

#### 4.1.4 Hydrology and Drainage System

38. There are various seasonal and permanent streams along the road alignment namely Mulsangukhola khola, Jhapra Khola and Nayabasti Khola.

39. In addition, there are many dry streams along the road alignment at Chainage 6+220(Chareli Kholsa), 6+540(Panighat Kholsa), 6+825 (Banchoro Kholsa), 7+110(Thulo Kholsa), 7+305(Rajendra ko ghar Kholsa), 7+621(Talasa Kholsa), 7+800(Sisne Kholsa). No wetlands are found within the vicinity of the road.

#### 4.1.5 Soil Erosion and Sedimentation

40. The road alignment passes through mountainous region. The stability of slopes along the road corridor depends upon slope angle, the material constituting the slope, rock discontinuities and hydrological conditions. There is approximately 30\*10m landslide in Jitpur at Chainage 2+680. However, this slide is passive since the area has been protected by check dams. Main cause of this landslide is improper management of drain water and slope. However, few small scale slides (slumps) are observed along the road alignment which may have caused to due traffic load and improper management surplus water from fields and surface runoff.

#### 4.1.6 Existing Road Condition

41. The alignment starts from Yatumahadev which is the religious site Bhaktapur district. At this section, the width of road is 5m and has got alluvial at both sides. Altitude of this point is 1370m from sea level. Grade of this alignment is around 2%-5% upto Chainage 0+900, after that section grade increases up to 14%. Existing road width upto this section is around 4.5m however there is adequate land to widen the road to meet the required standard.

42. The alignment passes through a plain cultivated land upto Chainage 0+960, where lies a river named Mulsangu Khola. This river is boundary of Sudal and Bageshwari VDC. After passing the river the grade of road exceeds 5%. The road is gravelled in lower section and earthen in upper section. At Chainage 1+300 lies a Ganesh temple.

43. The road alignment passes through one of the important settlement i.e. Jitpur at Chainage 2+500. It is one of the important places for the production for milk products. Some small shops of daily goods are observed. Major landslide is observed in the area named Jitpur landslide. Now it is in stable condition but had badly affected the road alignment. The average width of road in this section is 4.5m in average. Smaller landslide in stable condition lies in this area. At Jitpur, there lies Om Shanti Mandir at Chainage 3+140 and Ganesh Mandir at Chainage 3+680.

44. The grade of the road increases for more than 7% in upper section. No major erosion passes through this section. Mostly the land is used for cultivation and settlements. Rill formation and corrugation on road surface is observed. Settlements like Chareli, Kalamasi lies in this section.

45. As the alignment reaches community forest from Chainage 8+680 the grade is uniform and not exceeding 5%. No erosions and streams are observed in this section. An army camp lies adjacent to the alignment near Nagarkot.

#### 4.1.7 Existing Traffic Situation

46. Regular buses are operated regularly upto Jitpur in all season. The buses are not operated in the settlements beyond Jitpur but few vehicles like small Pick up and Bikes are found moving all time. Regular motorcycles around 250, trucks/ Mini trucks around 45 are observed in dry season but can reduce to one third in rainy season.

#### 4.1.8 Land use

47. Land use pattern of the area through which the road passes have been classified into three types: cultivated land, forest and barren as shown in **Annex XIV**. The road alignment mainly passes through cultivated land. Details about land use pattern along the road alignment have been given as below.

Details of land use pattern mentioned in **Annex XIV** have been summarized in **Table 4.1** below  
**Table 4.1: Summary of land use pattern along the road alignment with 5m formation width**

Land use	Total Length (m)	Area (ha)
Agriculture	7940	3.77
Barren Land	740	0.8
Community and Private Forest	2810	1.12
<b>Total</b>	<b>11490</b>	<b>5.69</b>

Source: Field Survey, 2009

#### 4.1.9 Air, Noise and Water Quality

48. The air quality observed was good and expected to be good in future. Dust emission during vehicle operation has become common phenomena in the existing road. 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. However, during the monsoon season the quality of water may be polluted due the accumulation of silt, landslide and gully erosion. The proposed area does not have any sources of noise nuisance.

## 4.2 Biological Environment

49. This alignment does not pass through any protected area. The road mainly passes through cultivated area, forest, barren land and settlement areas.

### 4.2.1 Vegetation

50. The dominant forest and fodder species reported in the road alignment are *Alnus nepalensis* (Uttis), *Schima wallichii* (Chilaune), *Pinus roxburghii* (Khote Salla), and *Castanopsis indica* (Katus). Other plant species found within Zol of the sub-project are *Buddleja asiatica* (Bhimsen pati), *Litsea monopelata* (Kutmiro), *Ficus semicordata* (Kanyu), *Lindera neesiana* (Siltimur), *Fraxinus floribunda* (Lankuri), *Prunus cerasoides* (Painyu), *Ficus religiosa* (Pipal), *Choerospondias axillaris* (Lapsi), *Bahunia purpurea* (Tanki), *Bahunia variegata* (Koiralo), *Albizia labbeck* (Sirish), *Bassia latifolia* (Mauwa), *Pisidium guyava* (Amba), *Sauravia nepauensis* (Gogan), *Drepanostachyum intermedium* (Nigalo), *Dendrocalamus strictus* (Bans), *Maesa chisia* (Bilaune), *Urtica dioca* (Sisnoo), *Vitex negundo* (Simali), *Lyonia ovaliforiya* (Angeri), *Woodfodia fruticosa* (Dhangeri). Detailed of trees cutting from community forest and private forest during road construction are given in **Annex XX**.

### NTFPs

51. Non timber forest products (NTFPs) are defined as any kind of products derived from forest species other than timber and fuel wood. The main NTFP species found along the road alignments are: *Lindera neesiana* (Siltimur), *Asparagus racemosus* (Kurilo), *Azadirachta indica* (Neem), *Gaultheria fragrantissima* ( Dhasingare), *Solanum surattense* (Kantakari), and *Rubia manjith* (Majitho).

### Community Forest

52. There is one CFs along the proposed road alignment as given in the **Table 4.2**.

**Table 4.2: Community Forests along road alignment**

SN	Name of Community Forest	Chainage	Length	Main Species
1	Dhunge Pakha Bahal Community Forest	8+680-11+490	2810m	Natural and Planted forest (Salla, Uttis, Chilaune)
	<b>Total</b>		<b>2810m</b>	

Source: Field survey, 2009

### Private forest

53. Local people have planted trees in their field for slope stability. Major Species are Bakaina, Sisau, Dubo, Khari etc.

### Religious forest

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

### 4.2.2 Wildlife

55. *Muntiacus muntjak* (Barking deer), *Hystix indica* (Porcupine), *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), *Herpestes Edwardsi* (Nyauri Musa), *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), *Gallus gallus* (Jungle fowl), and *Psittacula kramen* (Suga). However, none of these wild lives are endangered species. The road does not fall under any protected or buffer zone area.

### 4.2.3 Aquatic life

56. Fish species found in water bodies i.e. streams and kholas across the road alignment are Asala (*Schizothorax plagiostomus*), Hile. These fish species are mainly found in Mulsangukhola. Similarly, Earthworm and Snakes of different species are found in the area.

### 4.3 Socio-economic and Cultural Environment

#### 4.3.1 Population, Household and Ethnicity

57. The alignment covers three VDCs namely: Bageshwori, Sudal and Nagarkot. Major settlements within Zol of the project are Gairapati of Bageshwori VDC, Ratopati, Kalihopi, Jitpur, Dwaretol, Manjushree, Chareli, Shantitol, Nayabasti and Kalamasi of Sudal VDC. There are no major settlements in Nagarkot VDC. Major caste in this area are Brahmin, Kshetri where as Ethnic groups in this area are Newars and Tamang and Occupational caste in this area are Damai and Kami as given in **Table 4.3**.

**Table 4.3: Ethnicity and Population Composition**

VDC	Major settlements	Caste and ethnicity composition	Major Occupation
Bageshwori	Gairapati	Kshetri, Newars, Bahun, and Dalits	Agriculture
Sudal	Ratopati, Kalihopi, Jitpur, Dwaretol, Manjushree, Chareli, Shantitol, Nayabasti, Kalamasi	Bahun, Kshetri, Newars, Tamang, Damai, Kami	Agriculture
Nagarkot			Business

Source: Field Survey, 2009

58. There are 12 main settlements along the Zol of the proposed road alignment in Bageshwori, Sudal and Nagarkot VDCs with total population of 3564 in 594 households and average family size of 5.85 as illustrated by **Annex XV**. Different castes and ethnic groups such as Newar, Brahmin, Chhetri, Tamang and occupational castes (Damai and Kami,) live along the Zol of road alignment.

#### 4.3.2 Main occupation

59. The main occupation of all people residing within the Zol of the proposed road alignment is agriculture and livestock. Almost all households (HHs) are involved in agriculture and livestock along with other occupation. Along with this, few people of this area are engaged in business as well as few are job holders. People are carrying out other economic activities like agriculture and livestock (60%), labour and porters (30%), working in government and non government organizations (5%) and business (5%). Details of occupations of the people according to the settlements are shown in **Annex XI a**.

#### 4.3.3 Market Centre and Business Facilities

60. Small shops for daily goods and tea stalls available in the almost all settlements. In Nagarkot, quite reasonable no. of hotels and lodges are observed. Other smaller market centres with shops of daily commodities are Jitpur, Ratopati, Kamal Binayak. Similarly, there are some places along the road alignment which may be developed as market centres after the upgrading of the road, which are at Chareli and Kalamasi.

#### 4.3.4 Local Economy

61. The economy of the area is predominantly agriculture based with practicing of a mixture of milk products such Kurauni. Local people are gradually attracted towards cultivation of cash crops such as cauliflower, cabbage etc. Dairy production and selling it to the market has been also another source of income for local farmers. About 60 percent populations base upon agricultural activities for their livelihood. With growing closeness of the project area with market centre due to transportaion facility, cultivation of fruits, vegetables in a commercial manner seems to gain momentum. Diversity in employment pattern has been also observed in recent years. Local people have increasingly engaged in business activities.



#### 4.3.5 Agriculture pattern

62. Major crops that are cultivated in the project area are rice, wheat, maize, millet, potato, beans etc. Local peoples are also found to be encouraged in cash crops such as cauliflower, Carrot etc in recent days. Some fruit trees as guava, oranges etc. are also grown in the area.

#### 4.3.6 Livestock

63. Cow and buffalo farming are observed in this area. Most people make Kurauni, one of the milk products. Some people are also engaged in selling milk to market centres. After the accessibility of road more people will be engaged in dairy production as more markets will be open which will ultimately enhance the economic condition of the people of that area.

#### 4.3.7 Trade and Commerce

64. 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, vegetables etc. whereas cereal crops such as rice, maize are export and import items both.

#### 4.3.8 Tourism related services

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

#### 4.3.9 Health and Sanitation

66. Major health problems associated with local people are gastric, water borne diseases, Gynae related diseases, respiratory diseases, skin related diseases, 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

67. There are various social sector facilities and infrastructure in different settlements as given below. There is a wooden bridge over Mulsangu Khola. This bridge is proposed to replace by new RCC Bridge which is incorporated in DPR. There are several water taps in major settlements. Besides this; drinking water supply pipelines across or pass along the road alignment. These pipelines are mainly located in nearby areas of settlements. Water taps from chainage 2+500 to 4+600 in Jitpur settlement may be affected due to road construction which is proposed to relocation where necessary and mitigation cost has been included.

#### Education

68. The proposed project area consists of more than 49 educational institutions ranging from primary level to college level educational institutions. Schools are found in majority of the settlements. According to the local people, they have realized the importance of education in their life and most of them send their children to school, however, female enrollment in schools is still lower than that of male students. Literacy rate in the project area has been estimated around 63 percent. Higher secondary education and further education is achieved by the people of this area from institutions at Kamal Binayak and Kathmandu.

#### Health Facility

69. In health sector, there are altogether 3 health posts/sub healthposts in 3 VDCs. For serious health problem, people go to District Hospital of Bhaktapur and Kathmandu.

#### Transportation facilities

70. The main means of transportation in the area local buses and other vehicles. Private motor cycles are also employed for the transportation of daily goods from the nearest market centres, Kamal Binayak and Kathmandu. Opening of existing road has provided better accessibility to local people for the supply of daily commodities and selling of agricultural products. This road sub-

project has been also linked with Banepa through an earthen road. There are several rural roads under construction within the Zol of the project and in the periphery area.

#### Water Supply

71. Generally, Drinking water supply facility is available to all settlements. The water supply schemes generally use spring sources located at higher altitudes. The water is conveyed by pipes from the sources to the public taps through gravity flow. These taps are located in common places so that each serves the surrounding households. There are also private taps distributed in the project area in the settlements like Jitpur, Dwaretol, Kalihopi etc.

#### Irrigation

72. Irrigation facility is not available to most of the settlements. Irrigation is possible only during rainy season in the project area.

#### Industries

73. Cottage and other industries are not well developed within the Zol. There are some rice and flour mill in few settlements. Few peoples are engaged in Poultry farming where as few are engaged in dairy products.

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

74. Land holding pattern within the Zol of the road project demonstrates that most of the population (54%) have 1-5 ropani (approximately 1 ha = 20 ropani) land while 17% households fall under 5-10 ropani land holding category. Very few HH (1.0%) are landless and HHs (22%) have less than one ropani land. While 6% percent of the households have more than 10 ropani land. Details about land holding pattern are given in **Annex XI c**.

#### **4.3.12 Food Security**

75. As a result, about 6 percent of the households have food sufficiency for more than 12 months. 17 percent households grow foods sufficient for 12 months, 54 percent HHs for 3 to 9 months, 19 percent for 3 months, and 4 percent grows only for less than 3 months. This shows the poverty situation within the Zol of the project area. Food sufficiency condition of local people for varied time period is given in **Annex XI d**.

#### **4.3.13 Migration pattern**

76. Permanent migration takes place in limited scale towards Kathmandu and markets place of Bhaktapur district. Similarly, seasonal migration also takes place from all the settlements in the search of temporary job. This shows economic dependency of the local people in the proposed road corridor. This could be reduced by providing employment opportunities at the local level and providing better transportation facility in the project area.

#### **4.3.14 Settlement Pattern**

77. Most of the settlements within Zol of the project are scattered type. Housing pattern of these settlements are mostly one or two storied, CGI sheet roofed buildings. Some of them are also thatch roofed houses. RCC buildings have been started to appear in Jitpur.

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

78. Many of the places, areas and settlements within Zol of the project have the potentialities in various sectors. These sectors and their potentialities have been mentioned in **Annex XVI**.

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

79. The following historical and religious sites are within Zol of the proposed project area (within RoW and outside the road alignment) as given in **Annex XVII**. There is Chautaras, and temples within the RoW of the road in some places. There are temples named Ganesh Temple, Om Shanti Mandir, Radha Krishna Mandir, Gumba, Bindabashi Temple at Chainages 1+300, 3+140, 5+300, 6+420, and 6+440 respectively.

80. Religious sites mentioned above are visited and used for worship, by the local residents. However, these temples and religious sites don't fall in the proposed road alignment and their displacement is not needed. Several fairs are held on an occasion of religious festivals in various places within Zol of the project.

81. Religious faith of most of the people within Zol of the project is Hinduism followed by Buddhism. Main festivals observed by local people are Dashain, Tihar, Magh / Shrawan Sakranti, Lhosar etc.

## 5. PROJECT ALTERNATIVES

82. Alternative analysis has been considered as an integral part of IEE study, which involves an examination of alternative or options of a proposed project. The objective of alternative analysis is to arrive at a development option, which maximizing the benefits while minimizing the unwanted impacts. The aim of proposed road project is to improve the transportation network for the enhancement of safe and faster connectivity of rural areas into market centers and eventually improve the living condition of people living in the zone of influence. The various alternatives to achieve the above project objectives with minimum environmental degradation are discussed in following sub-sections.

### 5.1 Project Alternatives

83. This is referred as the other modes of transportation network to be built, which include trails, rope-ways and other forms of transportation mode. The people living within the zone of influence require the efficient and safe mode of transport to have access to the market centre. At the same time, there is also urgent need to conserve the environment in terms of physical, biological and social and cultural aspects. In this context, the alternative projects to achieve above said objectives can be improvement of trails and construction of rope-ways.

84. The zone of influence has numbers of trails, which are being used by the local people for transporting goods and services for many years. The zone of influence has potential of producing agricultural products and these needs to be transported up to market centre. The development of new trails or improvement of existing trail cannot provide services for vehicular movement. Consequently, the local people will not be benefited to the desired extent. This alternative can conserve the environment better than road construction, but it will fail to serve the transportation need of people living within the zone of influence

85. Similarly, rope-way can be another mode of transportation to enhance the transportation facilities within the zone of influence. The rope-way primarily serves to transport goods and it normally does not provide facilities for human mobility except if it is built as with cable car facilities. At present context, this alternative will not serve transportation need and may not also conserve the environment.

86. Considering the project alternatives, the proposed road Project, can be the best option to serve the purpose of transportation requirement. The proposed road is in rehabilitation and reconstruction stage of construction by LEP approach and contractor based approach with maximum conservation of the environment.

### 5.2 Alternative Alignment Description

87. An alternative alignment survey has not been conducted in the proposed road project. There is no alternative alignment feasible because this road serves more households than any others. Technically it is feasible because it doesn't pass through steep slope and terrain and no vulnerable condition either. More over, it is an open track which has been used for more than two years. This road is proposed as an alternative route to Nagarkot via Jitpur.

### 5.3 Alternative Design and Construction Methods

88. There can be two types of road design and construction methods. They are conventional and green roads. In conventional methods, heavy machinery and equipment, blasting materials, heavy concrete structures with the application of bituminous surfacing, side drains, bridges and culverts, etc. are extensively involved.

89. On the other hand, green road, which is normally referred as an environment friendly, low cost, participatory, technically appropriate, labour-based rural road construction and maintenance

methodology, focuses to conserve the delicate mountain ecology through the protection of vegetation cover as means of soil conservation. Under this concept, majority of the work will be performed manually. The use of blasting materials is discarded. The extent of the machinery will be limited to the drilling machine, hydraulic lever arms and the compression machines only. Simple dry stonewalls and stone causeways will be used at maximum possible extent. Instead of up-hillside side-drains, the cross slope of road itself is maintained with 5% outward slope. The design of the green roads is based on assumptions that only the locally available materials and local technology will be utilized during the construction. Hence, the design and the road standards are developed on such a way that the inevitability of foreign materials will be as low as possible. The proposed road has been designed considering the low cost design concept.

90. Considering the local situation, construction cost and maintenance requirement, this concept appears most suitable for the proposed project in terms of low cost for construction as well as maintenance. Furthermore, the maintenance responsibility for the proposed road project will remain with the beneficiary groups. Hence the construction approaches of this road will be based on LEP and contractor based approach.

#### **5.4 Alternative Construction Schedule**

91. During rainy season, the construction work may stop for 4 months from July to October. Work is carried out during the remaining months.

92. The construction period as scheduled on October to June is most suitable for the project to provide food grains against the work done by the local inhabitants.

#### **5.5 Alternative Resources**

93. The physical resources consumed for the construction of proposed road project will include simple equipment for earthwork excavation, boulders for gabion and dry walls and gabion and dry walls and gabion wires. The alternative resources for construction roads will include, as in conventional road construction, covering heavy equipment for earthwork, concrete, reinforce steel etc. Hence this road will use both alternatives. The proposed construction will use local labour forces to some extent and remaining will be carried out by contractor.

#### **5.6 Do-Nothing Alternative**

94. This alternative avoids the implementation of the project. This alternative has both beneficial and adverse impacts on the environment including the limitation of achieving the objective of project. The objectives of this project are to provide connectivity of rural area to market centre, increase productivity in rural areas, enhance the flow of goods and services from rural area to market centers and vice versa and eventually increase the living condition of people living in the zone of influence. If the project is not implemented the present conditions of remoteness and isolation exists, and this will limit the access of local people to the markets and vice versa resulting into low level of productivity and prevalence of poverty. The do-nothing situation will conserve some of the environmental adverse impacts at the cost of severe poverty.

## 6. IDENTIFICATION OF IMPACTS AND BENEFIT AUGUMENTATION / MITIGATION MEASURES

### 6.1 General

95. This section identifies the overall impacts of construction/ rehabilitation works on the physical, biological and socio-economic environment of the Sub-project Area. This assessment also includes the impact of traffic volume due to improved road conditions. In addition, it also narrates the measures that will mitigate the Subproject's adverse environmental effects. Following is a description of the perceived environmental impacts (positive/negative) of the Subproject with their proposed mitigation measures.

### 6.2 Project Corridor

96. The Project corridor is delineated according to two criteria: Right of way (RoW); and Zone of Influence (Zol), i.e. the width of the corridor that will be impacted, directly or indirectly, by the Subproject during the construction and operational phases.

Project Right of Way (RoW): The proposed Project corridor will have a well defined RoW that will be 5m either side. Major construction works will generally remain confined within the RoW. All the infrastructure and commercial activities within the existing or proposed RoW need to be relocated and have direct impact of the Sub-project.

Zone of Influence (Zol): Delineated as the extent, which has direct or indirect impact of Subproject. Direct impacts of the Sub-project, caused by relocation and vegetation clearing, are visionable within the RoW and indirect impacts, caused by noise, dust emissions, camp sites and borrow sites could be beyond the RoW. Zol is defined as 100 m on both sides of the Road section from its centre for environmental feature and one and half hour walking distance on both sides of the road alignment (from its centre) for socio-economic study.

97. An effective implementation of benefit maximization measures and adverse impacts mitigation measures would optimize the benefits expected from the sub-project and avoid/minimize the adverse impact from the sub-project and appropriate benefit enhancement and mitigation measures are suggested as following. Based on the impact assessment and identification, beneficial augmentation and adverse impact mitigation measures for pre-construction phase are presented below:

### 6.3 Mitigation Measures During Pre-construction phase

98. The mitigation measures adopted during design or pre-construction phases are of preventive in nature with two basic objectives:

- (i) Avoiding costly mitigation measures, and
- (ii) Increasing awareness among the stakeholders for environmental management of road construction, rehabilitation and operation.

#### 6.3.1 Route Selection

99. Since, this is an existing road and proposed for rehabilitation, there is no new route selection rather designing geometrical improvements (as required) and widening of the road formation to the specified width i.e. 5.0m. Local conditions (structures, switchback, lay-byes, mass balancing and safe disposal site for the excess excavated material, community utilities, slopes, sensitive spots etc.) will be taken into due consideration as to which side widening will take place in order to minimize land acquisition from forest, cultivable lands, settlement and cultural properties.

### 6.3.2 Detailed Survey and Design

100. 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 and manpower. To improve the transport services for the people living along the alignment and link local area and the main market, 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 design1.

### 6.3.3 Land and Property Acquisition, Compensation and Resettlement

101. 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 depreciation or 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:

- The donation is unforced and not the result of community pressure
- Donated land <20% agricultural holdings
- Food security above 9 months
- Full income restoration measures are in place

102. 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 will be produced for the loss of land under the 10% of total holding. The compensation for trees will be 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.

## 6.4 Beneficial Impacts and Benefit Augmentation Measures

103. 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:

### 6.4.1 Construction Stage

#### Employment Generation and Increase in Income

104. 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 18839 skilled and 91842 unskilled person days's work. Employment generation for the local people will minimize seasonal migration to other parts of the country as well as in foreign

countries. 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 positive impacts in other economic activities in a chain manner creating other income generating activities. This is one of the direct and significant impacts of the projects but it is of short-term and local in nature.

105. 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. To utilize their money earned from the project works, RRRSDP will implement life skill training for income generation activities to improve their livelihood. These programs will generate multiplier effect in the local economy and support significantly to uplift the socioeconomic condition of the local people particularly poor, Dalit (occupational caste), ethnic minority and women.

#### Skill Enhancement

106. 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. Furthermore, the project will also organize training on road construction and maintenance to the Road Building Groups (RBG), Social mobilizers and supervisors. This will enhance the technical skills of local people. The skill and knowledge acquired from the project during construction will enhance future employment opportunities such as trained manpower can earn livelihoods from similar project in futures. This impact is indirect, medium, local and long-term in nature.

107. Road Building group members will be given on the job training during road construction which will enhance their skills and capability in works like masonry, gabion wires, construction of dry and foundation walls, slope cutting and stabilization as well as bioengineering works. These skills will not only benefit the local workers by providing long-term employment opportunity but also contribute to local human resource development. This will help them to find job as skilled worker in other future projects as an alternative occupation in addition to agriculture.

#### Enterprises Development and Business Promotion

108. 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, local and short terms in nature.

109. The benefit augmentation measures will include providing support to local entrepreneurs, promotion of cooperatives and linkage with bank and other financial institutions.

#### Community Empowerment and Ownership

110. 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.

### **6.4.2 Operation Stage**

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

111. Once the road project is completed, the people living within the road corridor will have easy access to market places of Bhaktapur like kamal Binayak, Chyamasingh etc. This will enhance the transaction of goods and services. Furthermore, the local people will have safe and fast mobility within the area as well as to the market centre. People from three VDCs of the district also get benefited due to easy access to market centers after construction of this road. It takes two and half hour to reach Kamal Binayak, the nearest market centre of Bhaktapur from farthest point of the



road alignment, Nagarkot by walking, whereas it takes half an hour by bus through the existing road.

112. Furthermore, with the up-gradation of road, there will be increase in movement of vehicles and transportation time to reach the destination will be also less. The transportation costs change to become additional numbers of trips in specific time. This will save the transportation cost and greatly enhance the socio-economic condition of people within the project area. This is the direct, most significant, regional impacts and will have long-term benefits.

113. Agricultural support services will be improved for the increased income from the farm products and maintenance of existing foot trails will be done.

#### Access to Inputs and Services

114. Access to inputs and services is expensive and not regular at present due to earthen road. Once the road is in operation, people would have cheaper and improved access to many inputs such as seeds, chemical fertilizer and technology leading to increased agricultural production and diversification. The transportation cost is expected to come down heavily for many of the inputs that are used by farmers in the farm and other goods. This will have direct, significant, local and long-term impact within Zol of the proposed project

115. Agricultural support services will be improved for the increased income from the farm products.

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

116. There is a possibility of increased economic opportunities and significant growth and extension of the minor local markets along the road like in Jitpur and others. No. of shops, their business volume and diversity in business type will be also accelerated with improved access facilities. 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, who are till now mainly dependent on subsistence farming that will lessen pressure on local natural resources. There will be many non-farm employment opportunities for the growing rural populace especially for occupational caste groups due to extension of market centres and development of small towns. The impact will be indirect, low, local and long term in nature.

117. Sewerage and other basic facilities will be supported in the market centers.

#### Appreciation of Land Value

118. The construction of road leads to appreciation of land values particularly near the market and settlement areas. Existing land value in Bageshwari VDC is around 3-4 lakhs per anna<sup>1</sup> and in Jitpur is around 2-3 lakhs per anna and it goes on decreasing upto Nagarkot. The land price would increase due to the availability of reliable transportation facilities. There will be rapid increase in the commercial production of agricultural crops due to road accessibility which is also a major factor to raise the land value. This activity would likely uplift the economic condition of the local people. The impact is indirect, medium, local and long term in nature.

119. Benefit enhancement measures will be promotion of land development activities and control of encroachment within RoW. The local people will be made aware of the fact that high value lands are easily acceptable to the banks and microfinance institutions to provide loans. Local people can start their own business.

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

120. 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 Yatupati and Ratopati settlements, which are potential areas for the production of vegetables, fruits and cash crops such as cauliflower, carrot 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 to integrate with broader world economy. This is the indirect, significant, local and long term impacts from the proposed road.

121. Promotion of market linkages and networking for better market price will increase sale of farm and livestock products in the settlements along the road corridor. Farmers will be more interested to increase agricultural production due to market accessibility.

#### Enhancement of Community Development Services

122. Due to increase in employment opportunities, trade, business and agricultural 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.

123. The project will help to enhance this beneficial impact by generating awareness to the people about the ways of enhancing community development activities. Likewise, project will support to promote linkage of social infrastructure services.

#### Promotion of Tourism Activity

124. The road sub-project ends at Nagarkot, a tourist destination. The road will provide an alternative route to Nagarkot. Similarly, there are many such places which can be explored and developed as tourist destination such as Kalamasi. More tourists will visit this area due to easy accessibility. Flow of tourists due to road construction will contribute in the enhancement of economic activities of the area which will increase the living condition of the local people. The impact will be direct, medium, regional and long term in nature. More hotels and lodges will be operated in this area. People will get more employment opportunities in hospitality sector.

#### Women and Indigenous People Empowerment

125. All the people will be benefited from the road construction. However, women and indigenous people in particular may be benefited more from improved access to the market centers and various service providing agencies like health centers, banks, training institutions, women development office etc. Frequency of visit to such agencies will increase awareness level and empower the women and indigenous people. Thus, the project will have indirect, significant, local and long-term impact in Zol.

126. During the road construction and rehabilitation, more emphasis is given to women workers as at least 50% workers should be women.

### **6.5 Adverse Impacts and Mitigation Measures**

#### **6.5.1 Construction Stage**

127. The proposed road will be constructed according to LEP 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.

##### **6.5.1.1 Physical Impacts**

##### Change in Land Use

128. 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. Agricultural land (3.77ha), forest area (1.12 ha) and Barren land (0.80 ha) 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 camps etc. The impact from changes in land use will be high, direct, local and long term in nature.

129. Following mitigation measures will be adopted:

- Plantation of trees in the community forests
- Improving agricultural extension services
- Applying additional protective measures that the remaining land will not be lost due to erosion.
- Temporary lost vegetation on work site and material storage yards shall be revegetated after the completion of road construction. During re-vegetation, local species identified during the survey shall be used. The spoil sites shall be stabilized with bio-engineering technologies.

#### Spoil Disposal

130. Fresh cuts whenever is required, invites landslides and erosion during the monsoon. The common likely problems from the inappropriate disposal of spoils are: gullying 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.

131. Spoils should be safely disposed and managed with minimum environmental damage using LEP approach which includes balanced cut and fill volume, re-use of excavated materials and minimum quantity of earth works. Recommended spoil disposal sites are given in **Table 6.1**.

The following mitigation measures will be adopted:

- Wherever possible, surplus spoil will be used to fill eroded gullies, quarries and depressed areas etc.
- 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.
- Spoils should not be disposed on fragile slopes, farmland, marshy land, forest areas, natural drainage path, canals and other infrastructures.
- After the disposal, the site will be provided with proper drainage, vegetation and adequate protection against erosion.
- Necessary toe walls and retaining walls will be provided to protect the disposal of soil.

**Table 6.1: Recommended Spoil disposal sites**

SN	Chainage	Recommended Spoil disposal sites
1	0+650	Right side of the road
2	3+750	Left side of the road near Radha Krishna Mandir
3	8+500	Left side of the road near Dhunge Pakha community forest
4	10+500	Right side of the road near Army Camp

Source: Field Survey, 2009

#### Slope Instability

132. Removal of vegetation and open cuts with exposed soil to rain will cause soil erosion as well as landslide. This can become a major source of silt that the monsoon runoff carries away. The stability of slopes along the road corridor depends upon slope angle, the material constituting the slope, rock Discontinuities and hydrological conditions. The degree of sliding increases during the road excavation and it may cause regular sliding during operational phase. These slides will undoubtedly cause more problems during monsoon period. However, the proposed road adopts the green road in which, heavy machineries are not used so that the chance of slope instability and erosion decreases. The likely impact of slope instability and soil erosion is indirect, medium, site specific and mid-term nature.

133. The construction activities will be carried out as per LEP and contractor based approach. There will be used equipment and machinery only in the case of contractor for the construction of heavy structures. Cut and fill mass management methods will be applied. Environmental awareness raising activities will be implemented. Local people will need to be made aware about how to protect unstable slope. Protective measures such as construction of gabion walls, catch drains and plantation shall be adopted in those areas where serious problems of landslides exist; however, the project has avoided the significant areas with problems of landslides. All small drainage will be joined with the natural drainage system in order to avoid possible gully formation at different locations, particularly on hill slopes.

134. Recommended engineering structures necessary at various Chainages for slope stabilization have been given in **Annex XVIII**. The following mitigation measures will be adopted during the construction and rehabilitation of the proposed road and cost for these mitigation measures shall be included in detail design and cost estimates of the road sub-project:

- Ensuring minimum cut slope
- Selecting cut and fill slope at correct angle depending upon the soil type
- Re-vegetation of cut and fill slope or exposed areas as soon as possible by using native plant species
- Adoption of bio-engineering techniques
- Ensuring minimum damage of vegetation during construction
- No construction work during rainy season

#### Water Management

135. The concentrated water from the road outlet causes erosion and landslides eventually affecting the stability of the road itself. The impact will be indirect, medium, site specific and medium term.

136. 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 locations, particularly on hill slopes.

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

- Provide adequate and appropriate numbers of drainage structures in order to have minimum interference with and impact on natural drainage pattern of the area,
- Avoid surface water discharge into farmland or risky locations,
- Do not divert water away from natural water course unless it is absolutely necessary
- Avoid blockage or diversion of natural channels due to construction of road and disposal of spoils.
- Adopt outward road slope as per green road standard to minimize water accumulation.

138. Details about necessary structures required to mitigate the water induced adverse impacts are as given in **Annex XIX**.

#### Air Dust, Noise and Water Pollution

139. Although the air quality data of the project area is not available at present, the air does not appear to be polluted. This is primarily due to the non-existence of vehicles and industries as sources of pollution. During the construction of the road, there is a strong possibility of dust emission. The emission will be intense along the construction site. This may affect the local people and workers as well as agricultural crops. In addition, the construction work will be carried out

during the dry season when the emission is likely to be significant. This may affect the health of the RBG members and people living in the nearby areas and production of the crops. As the proposed construction is under labour-based and construction based approach, the involvement of heavy equipment and vehicles will be utilized during construction only in the case of contractor based approach. This will significantly decrease the emission of dusts from earthwork and quarrying. As a result, 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.

140. The water quality data within the project area is not available. Nevertheless the quality of water in the water bodies, within the project area appears to be fairly good, as is proven by the fact that they are widely utilized for irrigation, household use and drinking for cattle and wildlife without any ill effect. During construction these water bodies are likely to be affected due to the disposal of excavated materials and disposal wastes by the workers if adequate care is not taken. However, since the construction will follow the green road concept appropriate consideration will be given to the disposal of excavated material. Similarly, there is not necessity of labour camps due to the use of local labour. As a result, there will be very insignificant impact on water quality. The impact will be direct, low, local, short term and reversible in nature.

141. The following mitigation measures will be adopted:

- Use of face mask by the workers to minimize air pollution due to dust generation
- Plantation of local species along the roadside
- Use of ear muffs to lessen noise pollution during rock breaking and quarrying
- Avoiding the disposal of excavated materials in the water bodies

#### Quarrying

142. 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 rocky area near the road alignment and rocky portions near the road alignment mainly at Chainage 8+380. Fine aggregates i.e.sand has to taken taken from other places. 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 6.2**.

143. Following mitigation measures will be adopted:

- Appropriate planning for quarrying and borrowing of materials will be made during construction.
- Unstable sites, erosion prone area, dense forest area, settlements, fertile farm land will be avoided for quarrying operation.
- After the extraction is completed, the quarry site will be rehabilitated to suit the local landscape.

**Table 6.2: Recommended Quarry sites**

SN	Chainage	Places of recommended quarry sites
1	7+100	Left side of the road
2	8+380	Left side of the road

Source: Field Survey, 2009

144. Though the amount of materials needed, will not be sufficient from the above quarry side it is recommended to buy from market places at market price.

#### Decline in Aesthetic Value

145. 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 impact will be direct, low in magnitude, local nature and short term in duration

146. The following mitigation measures will be adopted:

- Indiscriminate dumping of spoil material will be discouraged.
- After the extraction is completed, the quarry site will be rehabilitated to suit the local landscape.
- Plantation of local species along the roadside

### ***Issue added doing IEE Study***

#### Setting out and Clearing Row

147. Setting out of RoW includes felling of tree and removal of vegetative cover. The negative impacts are decrease in the greenery of road side, loss of religious value and loss of public property lying within the Row.

148. The following mitigation measures are adopted:

- Compensatory plantations within proposed vegetation strip of Row to be undertaken by concerned VDCs on behalf of DDC Bhaktapur.
- Re-plantation at 1:25 is to be commenced just after disturbance due to construction is stopped and not after completion of project.
- Small temples, shrines are to be transplanted to adjacent areas outside the RoW in close consultation with local community leaders. If required, the Department of Archeology, Government of Nepal may be consulted to transplant such services could be utilized if found warranted.

#### Diversion of traffic:

149. The diversion is needed in order incorporate the smooth flow of traffic. Construction works will also carry in slow speed in diversion of traffic is not allocated. On other hands adverse effects due to diversion of traffic is also dominant such as Increase in accident, Inadequate drainage causes loss of crops at adjacent fields, Inconvenience to road users particularly in nighttime.

150. The following mitigation measures are adopted:

- Appropriate traffic diversion schemes shall be implemented so as to avoid inconvenience due to project operation to present road users, particularly during night time.
- Proper diversion schemes will ensure smooth traffic flow minimizes accidents and disturbances.
- The diversion signs should be bold and clearly visible particularly at night.

#### Borrow areas:

151. The borrow area might be located near or far, but should be economically appropriate The negative impacts related to this is Decline in aesthetic value and accumulation of water. The potential adverse impacts are Increase in risk of accidents to children and livestock, Conversion of borrow areas into ponds due to accumulation of water in rainy season, removal of top soil decreases fertility of soil.

The following mitigation measures are adopted

- Within these locations, the actual extent of area/zones to be excavated areas to be separated with signboards.
- The borrow areas may be converted into surface/ponds wherever possible, as a derivative of development. Some of these ponds could serve as source of water for agriculture.

Location of campsites, storage depots:

152. It normally brings change in ecology. The adverse impacts are: Use of fodder and forest products as fuel and settlements, Change of cultivatable land into temporary settlements, Encroachment of forest and poaching of wild animal, Increase in erosion and gully formation in rainy season., Increase in risk of catching fire.

153. The following mitigation measures are adopted:

- The location of campsites, storage depots shall preferably on unproductive/ barren lands. Away from forest areas as far as possible.
- Use of agricultural lands shall not be allowed unless extreme circumstances.
- All fuel loading, unloading, storage areas shall be spill proof, leakage proof and carried out on paved areas.
- The sites should have suitable system to drain storm water, sanitary facilities and shall not contaminate any near by water courses/drains.
- The site shall also have a system for handling any emergency situation like fire, explosion etc.

Construction Equipment Vehicles

154. As the construction is carried out in contractor based also, hence there will use of heavy machineries and tools. The related negative impacts are Increase air pollution due to emission of smoke, Increase in vibration due to vehicular movement.

155. The following mitigation measures are adopted

- All equipment/vehicles deployed for construction activities shall be regularly maintained.
- Vehicles/equipment shall be regularly subjected for emission tests and shall have pollution under control certificates.
- All the vehicles deployed for material movement shall be spill proof to the extent possible.
- In any case all material movement routes shall be inspected daily twice to clear off any accidental spills.

Use of Bitumen:

156. Bitumen is required for black topping which needs some operation before using. Increase in air pollution due to use of fodder for heating bitumen, Water may get polluted due to disposal of waste products and if spill out to water bodies are the adverse impacts.

157. The following mitigation measures are adopted

- Use of less amount of fodder for heating.
- Appropriate storage of material.
- No entry for unnecessary personals in site office.
- Use of appropriate safety devices to ensure safe health of workers such as masks

**6.5.1.2 Biological Impacts**Loss or degradation of forests and vegetation

158. Total of 1.12 ha of forest will be permanently lost due to road construction work. The proposed road passes through one CFs. From this CFs and private cultivated land, total 125 numbers of tree, fodder and fruit trees of various species will be removed during road construction. The adverse impacts on vegetation/forest resources due to the clearance for construction of the road have been considered to be high in magnitude, site specific in extent and long term in duration, whereas loss of other forest resources will be moderate, local and long term in magnitude, extent and duration respectively.

159. The loss of trees can not be minimized; however, it can be compensated by the plantation (1:25 ratio). 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. The forest products from the CFs will be utilized by the community forest users groups (CFUGs) according to community forest operational plan.

Impact on wildlife including birds due to loss or degradation of habitat, increased hunting and other form of human pressure

160. 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.

161. 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.
- The construction activities near forest area will be appropriately managed so that there will be least disturbance to the wildlife and birds.
- Workers shall be actively discouraged from collecting fuel wood from forest or hunting of birds or animals.
- Proponent shall provide counseling services for the promotion of agro-forestry, Nontimber forest products, and horticulture in private land providing seeds, seedlings, slips, training and other incentives to the farmers residing in adjoining the road corridor in coordination with District Forest Office (DFO).
- 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 (as listed in CITES and IUCN Red data book)

162. There will be no impact on flora and fauna (listed in CITES and IUCN category) .

163. As there are no such species, mitigation measures are not warranted.

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

Loss or degradation of farm land and productivity

164. There will be permanent loss of 3.77 ha agricultural land and 0.8 ha barren land due to road construction. This will lead to loss of food grain production among the families losing lands to the project. Loss of agricultural land in the form of small pieces along the road while widening and so no significant negative effect will appear on agriculture production. But, 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.

165. 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 or degradation of private properties such as houses, farm sheds, and other structures, crops and fodder/ fruit trees

166. The proposed road alignment passes through nearby the settlements of Gairapati, Ratopati, Jitpur, and Chareli. 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 (Cadastral surveying is undergoing; It will take some time for information gathering. Hence, it is not included in this report.)

167. Mitigation measures for this impact will be dealt as per decision made by Compensation Determination Committee (CDC) as mentioned in 6.3.3 of this report.



Impact on community infrastructure such as irrigation, water supply, schools, health post

168. Drinking water supply pipe lines at various Chainage sections and Chautari (resting place) at 1+300 will be affected during road construction. The impact will be direct, site specific, short term and medium in magnitude.

169. In order to avoid such impacts, the following mitigation measures are suggested:

- Restore all disturbed infrastructures to the condition before disturbance or improve where appropriate in coordination with local irrigation canal users' committee/water users' committee
- Avoid contamination of water resources systems during construction
- Adopt outward slope as per Green Road Standard to minimize water accumulation.
- Schedule the construction activities during crop off-season not to disrupt water bodies being used for irrigation purposes by the road.

170. Mitigation measures for affected community infrastructures along the road alignments are recommended as given in **Annex XIX**. Costs for mitigation measures have been included in project cost and relocation cost for community structures will be included in resettlement plan.

Impacts on cultural, religious and archeological sites

171. There are Ganesh Mandir with Chautara, Omshanti Mandir, Radha Krishna Mandir, Gumba and Bindabasini Temple at Chainages 1+300, 3+140, 3+680, 5+300, and 6+420 respectively. Therefore, they might be affected due to the construction of the road. This impact is expected to be of low in magnitude, local in extent and of short term in duration. There will be likely no impact on local culture and tradition during construction stage. The boundary of Gumba at chainage 5+300 should be shifted and no relocation is required for other above other sites.

172. Mitigation measures for this impact are:

- Shifting of centre line of road alignment wherever possible
- Relocation of temple if it can not be avoided for dismantling
- Consultation with local people for appropriate solution

Impacts on health and safety matters

173. 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 proper sanitation system should be developed to reduce the air and water pollution otherwise the surrounding environment may be polluted. It affects the health of local people. The lack of proper sanitary measures and increase in waste and water pollution can lead to an outbreak of epidemics, diseases as jaundice, typhoid etc. The most vulnerable will be women and children.

174. Furthermore, the road construction will encourage roadside settlement, which will increase the dumping of solid waste around the bridge may cause stomach problems due to poor quality drinking water. This impact is considered to be of the direct, high in magnitude, for the short term and localized.

175. The following measures will be adopted:

- The workers will be provided with helmets, masks, muffs depending on the nature of the construction work.
- 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.
- Workers will be provided with first aid and health facilities.
- Group accidental insurance will be done for the workers.
- First aid training will be provided to field staffs like sub-engineer, social mobilizers and supervisors.

## 6.5.2 Operation stage

### 6.5.2.1 Physical Environment

#### Road slope stability and management

176. 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. Similarly, there's also possibility of slope destabilization of road alignment due to opening of branch roads that will connect the road with other village settlements. Most of these roads are/will be opened by local efforts/VDCs/DDC and necessary considerations on technical/environmental aspects have not been made during its route selection, survey, design and construction. This may cause damage to road section, disruption to transportation and other social impacts in the nearby areas. The inadequate maintenance of the road due to the blockage of drains damages the road surface that can lead to slides and slope failure. Sensitive areas for possible road slope stability problems are:

- Area near streams/kholsi/springs
- Water seepage areas at Chainage 6+825, 7+620, 3+520
- Landslide prone area at Chainage 2+540 to 5+565
- Junction of road alignment with other branch roads at Chainage 8+350 ( links to Banepa)
- Jitpur Landslide at Chainage 2+680.

The impact will be direct, medium local and long term nature.

177. The following mitigation measures will be adopted:

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

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

178. During operation period, a number of vehicles will move along the road and will emit gaseous pollutants. This will increase the pollution level of ambient air along the road corridor. As the road is of district road category and the vehicular movement is not expected to be quite high. The overall impact of air pollution will, thus, be direct, low, local and long term.

179. 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. During operation period, the disposal of gases and liquid pollutants from vehicles into water bodies may cause water pollution. The disposal of spoil and other construction materials and wastes into water bodies may also degrade the water quality. The impact of this kind will be direct, low, local and long term.

180. Following mitigation measures will be adopted:

- Community and road user awareness program shall be organized to enhance public understanding
- Plantation shall be done near the settlements
- Use of horns should be restricted near dense forest, health posts, schools and settlements
- For control of dust nuisance, sprinkling of water, speed limit of vehicle and vegetative barrier of earthen bounds should be designed.

### 6.5.2.2 Biological Environment

#### Depletion of Forest Resources

181. The forest resources depletion may occur 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. However, provision of forest products distribution in community forest operational plan will minimize the depletion of forest resources.

182. The pressure on forest resources during road operation is likely to occur. The mitigation measures recommended are:

- CFUGs will be supported to conserve and manage their CFs according to operational plans
- Encourage and support local community for controlling illegal harvesting of forest resources.
- Awareness programmes shall be organized to educate local people on the conservation of forest.

#### Disturbance to the Wildlife and Illegal Hunting

183. Although the wildlife population is reported low, however, they may be disturbed due to the frequent movement of the vehicles. Vehicular flow, horn blowing in the forest area will have impact on the wildlife and bird species. There may occur illegal hunting during operation period by the people from market areas due to easy accessibility. The impact will be indirect, low, local and long term in nature.

184. Wildlife and birds will be disturbed due to the vehicle movement. The mitigation measure for this is to erect appropriate sign boards informing drivers about:

- Prohibition of blowing horns in the dense forest areas
- Potential areas for wildlife crossing

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

#### New Settlement and Market Center Development

185. The existing trend is to settle along the road side for the economic activities. This is primarily attributed to increased opportunities for trade and commerce through the establishment of shops, restaurants, stalls and hotels. So, there is expansion of settlement area in Ratopati, Gairapati and market place is likely being developed in Jitpur settlement. 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 medium term in nature.

186. The following mitigation measures will be adopted:

- Awareness raising programme through local organizations to plan proper settlements.
- Regulate settlement growth with proper planning/zoning along RoW.
- Plantation of trees along the road.

#### Change in Social behavior

187. People may leave their family in their villages to dwell near the new spots for economic incentives. This will ultimately affect the traditional bonds, norms and functions of the family. This will 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

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

#### Road safety Measures

189. 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.

190. The mitigation measures adopted will be:

- Applying appropriate road safety measures with the help of 3-Es i.e. Engineering, Enforcement and Education.
- Appropriate spoil disposal sites should be identified and utilized
- Required safety signs will be used along the road

## 7. ENVIRONMENT MANAGEMENT PLAN

191. The EMP is prepared to guide implementation of mitigation measures and monitoring requirements. It includes institution and their roles, environmental management activities, environmental management organizational structure and budget for mitigation measures.

### 7.1 Institutions and Their Roles

192. The Ministry of Environment, (MoE) is the main institution mandated to formulate and implement environmental policies, plans and programmes at the national level. It is also charged with the responsibility for preparing and issuing environmental regulations and guidelines; development and enforcement of environmental standards; pollution control, commissioning environmental research and studies; and monitoring of programmes implemented by other agencies.

193. The main responsibility for IEE and Environmental Management Plan (EMP) implementation is with DDC/DTO, Bhaktapur. During the implementation in the district, DIST team will assist DDC/DTO. The DDC/DTO will also receive necessary assistance from the CISC team for the implementation and monitoring of the EMP.

194. The Ministry of Local Development (MLD), District Development Committee/District Technical Office (DDCs)/DTO, and the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) are the institutions directly involved in the IEEs of RRRSDP funded sub-projects. The environmental management organizational structure is illustrated by **Figure 7.1**. The roles of these institutions are as following:

#### **Ministry of Local Development (MLD)**

195. As the concerned line ministry, it is responsible for review and final approval of ToRs and study reports of IEEs, and for managing environmental monitoring. MLD has established an Environmental Management Section (EMS) which is mandated with the overall environmental responsibility of the Ministry.

#### **Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR)**

196. It is the executing department of the RRRSDP under MLD and responsible for various project implementation activities including environmental management. It is responsible for providing back-up support to DDC in carrying out its tasks and advising MLD as necessary through Environmental Focal Point.

#### **Rural Reconstruction and Rehabilitation Sector Development Project–Project Coordination Unit (RRRSDP-PCU)**

197. It is the technical unit which is responsible to assist in project implementation in the districts.

#### **Central Implementation Support Consultant (CISC)**

198. It is responsible for assisting RRRSDP implementation in the central and districts.

#### **District Development Committee (DDC)/District Technical Office (DTO), Bhaktapur**

199. As project implementer at district level, DDC/DTO Bhaktapur are responsible for screening and ToR preparation, commissioning IEE studies and carrying out mitigating works along with monitoring of EMP.

#### **District Project Office (DPO)**

200. It is the part of project team in the district which assists DDC/DTO for the implementation of the program.

**District Implementation Support Team (DIST)**

201. With technical, environmental, resettlement and social staff, it supports in the implementation of the project activities in the district.

**District Project Coordination Committee (DPCC)**

202. It is a sub-committee of the DDC for the implementation of the road construction and operation activities within the district.

**Village Infrastructure Construction Coordination Committee (VICCC)**

203. It coordinates infrastructures issues among beneficiaries and institutions at VDC level.

**Road Building Groups/Contractors**

204. Responsible for reconstruction and rehabilitation activities of road sub-project.

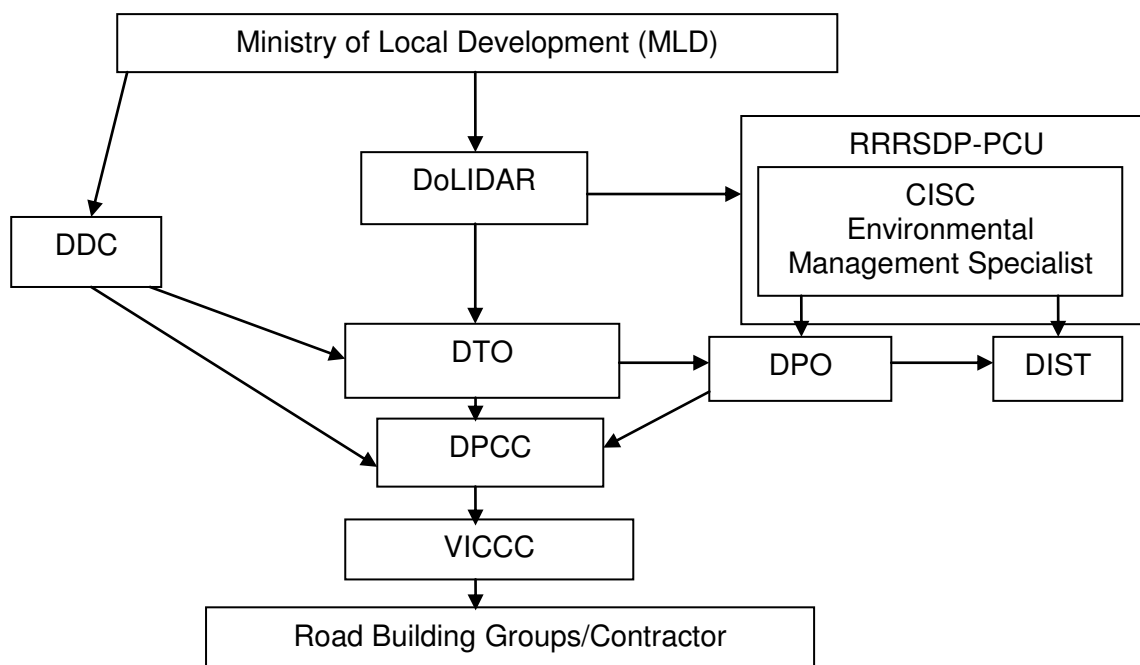
**7.2 Reporting and Documentation**

205. As part of EMP, reports should be produced at regular time intervals depending upon type and size of project by the EMP team or unit. Since the construction period is less than 2 years, three monthly reports will be prepared and submitted to the DDC and DDC will send to the PCU and DoLIDAR. The trimester environment monitoring report will be submitted for the first year of operation of the road by the DDC/DTO Bhaktapur to PCU/DOLIDAR, who will submit the report to ADB.

206. The Contract will need to state that the DDC/DTO must approve the road building groups/contractor's arrangements for environmental protection, health and safety, waste management and other environmentally related actions identified during the detailed design phase and these must be written into the Contract Document.

207. The DIST 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 RBG/Contractor.

208. 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, etc.



**Figure 7.1: Environmental Management Organization Structure**

### 7.3. Environmental Management Plan

209. The DDC/DTO with project support will be responsible for the implementation of mitigation measures and of the monitoring plan. Overall implementation of the EMP will become proponent's responsibility. Framework for implementing environmental management plan is shown by **Table 7.1**.

Table 7.1: Framework of Implementing Environmental Management Plan (EMP)

Activity	Potential Impacts	Related Impacts	Type of impact					Mitigation Measures	Responsibility for Mitigation Measure		
			Na	M	E	D	R		Responsible Executing Agency	Relevant Supporting Agency	
Beneficial Impacts and Benefit Augmentation Measures											
Construction stage											
Construction of road	Employment Generation and Increase in Income	<ul style="list-style-type: none"><li>Increase in employment</li></ul>	D	H	Lc	St		<ul style="list-style-type: none"><li>Members from target minorities and the disadvantaged groups will have proportional representation in RBGs.</li><li>At least 40% women participation as workers and women as RBG leaders will be ensured</li></ul>	DDC/DPO	DIST	
	Skill Enhancement	<ul style="list-style-type: none"><li>Training on job</li></ul>	In	M	Lc	Lt		<ul style="list-style-type: none"><li>Training in road construction, soft engineering structures and bioengineering works for members of RBGs.</li></ul>	DDC/DPO/ DIST	DIST	
	Enterprise Development and Business Promotion	<ul style="list-style-type: none"><li>Increase in enterprises</li></ul>	In	L	Lc	St		<ul style="list-style-type: none"><li>Providing support to local entrepreneurs, promotion of cooperatives and linkage with bank and other financial institutions.</li></ul>	DPO/DIST/ Department of Cottage and Small Industries	DIST	
	Community Empowerment and Ownership	<ul style="list-style-type: none"><li>Development of institutions</li></ul>	In	L	Lc	St		<ul style="list-style-type: none"><li>to strengthen capacity of communities, beneficiary participation, and social cohesion through, among others</li><li>awareness raising about the Project and opportunities there under</li><li>training of BGs</li><li>assisting communities in identifying supplementary infrastructure and preparing proposals</li><li>facilitating beneficiary participation, including through public hearings and social audits;</li></ul>	DDC/DPO/ DIST	DIST	

								• building community capacity in maintenance of supplementary infrastructure		
Operation Stage										
	Improvement in accessibility, saving of time and transportation cost	• safe of time and money	Direct	H	R	Lt		• Improve agricultural support services for the farmers • Improvement of foot trails	DDC/DADO /NGO/	local farmers
	Access to Inputs and Services		Direct	H	Lc	Lt		• Agricultural support services will be improved for the increased income from the farm products		
	Increase in Trade, Commerce and Development of Market centers	• Development of markets centers	Indirect	L	Lc	Lt		• promote cooperative and provide linkage with bank and other financial institutions for setting up business enterprises • Sewerage and other basic facilities will be supported in the market centers	DDC/DPO/	DIST
	Appreciation of Land Value		Indirect	M	Lc	Lt		• Promotion of land development activities and check encroachment within RoW	DDC/VDC	
	Increased Crop Productivity and Sale of Farm Products	• Extension of agriculture	Indirect	H	Lc	Lt		• Improve agricultural support services for the farmers	DDC/VDC/	local people
	Enhancement of Community Development Services	• Development of community services	Direct	M	Lc	Lt		• Support promotion of community development activities and development and linkage of social infrastructure services	DDC/VDC/	local people
	Promotion of Tourism Activity	• Employment generation	Direct	M	R	Lt		• Development of lodges, restaurants and hotels for the tourists will be supported	DPO / Nepal Tourism Board	DIST
	Women Empowerment	• Increase in social status	Indirect	L	Lc	Lt		• The Project will target minorities and the disadvantaged for proportional representation in BGs, and promote female membership of at least 50% and women as RBG leaders.	DDC/DPO/	DIST



Adverse Impacts and Mitigation Measures										
Construction stage										
Physical Environment										
Construction of road	Change in Land use	<ul style="list-style-type: none"><li>Permanent conversion of 3.77 ha of agricultural land, 0.8ha of barren area and 1.12 ha of community to road built up area.</li></ul>	D	H	Lc	Lt	IR	<ul style="list-style-type: none"><li>Plantation of trees in the community forests (1:25).</li><li>Improving agricultural extension services.</li><li>Applying additional protective measures that the remaining land will not be lost due to erosion.</li><li>Temporary lost vegetation on work site and material storage yards shall be re-vegetated after the completion of road construction. During re-vegetation, local species identified during the survey shall be used. The spoil sites shall be stabilized with bio-engineering technologies.</li></ul>	DDC/DADO	NGO/local farmers
Spoil Disposal	Gully, erosion and slope failure	<ul style="list-style-type: none"><li>Disruption of natural drainage pattern, causing scouring, erosion and landslide</li><li>Damage to irrigation systems and crops through direct deposition or indirectly as result of mass flow</li><li>Water pollution and degradation of water quality</li></ul>	D	M	St	St	Rev	<ul style="list-style-type: none"><li>Wherever possible, surplus spoil will be used to fill eroded gullies, quarries and depressed areas etc.</li><li>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.</li><li>Spoils should not be disposed on fragile slopes, farmland, marshy land, forest areas, natural drainage path, canals and other infrastructures.</li><li>After the disposal, the site will be provided with proper drainage, vegetation and adequate protection against erosion.</li><li>Necessary toe walls and retaining walls will be provided</li></ul>	DDC/DSCO	DIST/RBG/Contractors

								to protect the disposal of soil		
Slope instability	Cutting of slope	<ul style="list-style-type: none"> <li>Failure of slope and blockage of traffic flow</li> <li>Accumulation of debris on adjacent fields damaging the crops</li> <li>Collection of debris on drainage system.</li> </ul>	In	M	Ss	Mt	Rev	<ul style="list-style-type: none"> <li>Ensuring minimum cut slope.</li> <li>Selecting cut and fill slope at correct angle depending upon the soil type.</li> <li>Re-vegetation of cut and fill slope or exposed areas as soon as possible by using native plant species.</li> <li>Adoption of bio-engineering techniques</li> <li>Ensuring minimum damage of vegetation during construction.</li> <li>No construction work during rainy season.</li> </ul>	DDC/DSCO	DIST/RBG/Contractors
Water Management; Spring, Streams, Rain Water (Drainage and cross drainage works etc.)	Concentration of water	<ul style="list-style-type: none"> <li>Concentrated water from the road outlet causes erosion and landslide eventually affecting the stability of the road itself.</li> </ul>	In	M	Ss	Mt	Rev	<ul style="list-style-type: none"> <li>Provide adequate and appropriate numbers of drainage structures in order to have minimum interference with and impact on natural drainage pattern of the area.</li> <li>Avoid surface water Discharge into farmland or risky locations.</li> <li>Do not divert water away from natural water course unless it is absolutely necessary.</li> <li>Avoid blockage or diversion of natural channels due to construction of road and disposal of spoils.</li> <li>Adopt outward road slope as per green road standard to minimize water accumulation.</li> <li>Adequate precaution is to be taken to prevent oil/lubricant/hydrocarbon contamination of channel beds.</li> </ul>	DDC/DPO	DIST/RBG
Construction of road	Air dust, noise and water pollution	<ul style="list-style-type: none"> <li>Decline in the quality of air to due to dust emission.</li> <li>Deterioration in water quality due to disposal of excavated</li> </ul>	D	L	Lc	St	Rev	<ul style="list-style-type: none"> <li>Heavy equipments used during construction are to be regularly monitored so leads to minimizing dust emissions.</li> <li>Buffer zones shall be developed in nearby settlements by</li> </ul>	DDC/DPO	DIST

		materials and waste by workers. <ul style="list-style-type: none"> <li>• Increase in noise pollution due to vehicular and pedestrian movement.</li> </ul>						planting trees on right of way. <ul style="list-style-type: none"> <li>• Uses of ear muffs and face masks should be maintained.</li> <li>• Avoid the disposal of excavated materials in the water bodies</li> </ul>		
Quarrying	Damage of local environment	<ul style="list-style-type: none"> <li>• Quarrying can accelerated erosion, landslides, create disturbance in natural drainage patterns, water logging and water pollution</li> </ul>	D	L	Lc	St	IR	<ul style="list-style-type: none"> <li>• Appropriate planning for quarrying and borrowing of materials will be made during construction.</li> <li>• Unstable sites, erosion prone area, dense forest area, settlements, fertile farm land will be avoided for quarrying operation.</li> <li>• After the extraction is completed, the quarry site will be rehabilitated to suit the local landscape.</li> </ul>	DDC/DPO	DIST
Construction of road	Decline of aesthetic value	<ul style="list-style-type: none"> <li>• Adverse affect in tourism industry.</li> <li>• Decrease in the movement of people.</li> </ul>	D	M	Lc	Lt	IR	<ul style="list-style-type: none"> <li>• Indiscriminate dumping of spoil material will be discouraged.</li> <li>• After the extraction is completed, the quarry site will be rehabilitated to suit the local landscape.</li> <li>• Plantation of local plant species along the roadside</li> </ul>	DDC/DPO/DFO	CFUG
<b>Issues Added Doing IEE Study</b>										
Setting out and clearing Row	Felling of tree and removal of vegetative cover	<ul style="list-style-type: none"> <li>• Decrease in the greenery of road side.</li> <li>• Loss of religious value,</li> <li>• Loss of public property lying within the Row.</li> </ul>	D	M	Lc	St	IR	<ul style="list-style-type: none"> <li>• Trees falling within Row and other vegetative cover are to be removed.</li> <li>• Compensatory plantations within proposed vegetation strip of Row to be undertaken by concerned VDCs on behalf of DDC Bhaktapur.</li> <li>• Re-plantation at 1:25 is to be commenced just after disturbance due to construction is stopped and not after completion of project.</li> <li>• Small temples, shrines are to be transplanted to adjacent areas outside RoW in close</li> </ul>	CFUG/Local people/Contractor/RBG	DDC/DPO/DF O

								consultation with local community leaders. If required, the Department of Archeology, Government of Nepal may be consulted to transplant such services could be utilized if found warranted.		
Diversion of traffic	Disturbance to traffic and pedestrians	<ul style="list-style-type: none"> <li>• Increase in accident.</li> <li>• Inadequate drainage causes loss of crops at adjacent fields.</li> <li>• Inconvenience to road users particularly in nighttime.</li> </ul>	D	M	Lc	St	IR	<ul style="list-style-type: none"> <li>• Appropriate traffic diversion schemes shall be implemented so as to avoid inconvenience due to project operation to present road users, particularly during night time.</li> <li>• Proper diversion schemes will ensure smooth traffic flow minimizes accidents and disturbances.</li> <li>• The diversion signs should be bold and clearly visible particularly at night.</li> </ul>	DDC/DPO	Local people/Contractor/RBG/Traffic police
Construction Camp sites	Affects to Local environment	<ul style="list-style-type: none"> <li>• Increase in water and noise pollution.</li> <li>• Disturbance to local people.</li> <li>• Disturbance to the wildlife and other inhabitants.</li> </ul>	D	M	Lc	St	IR	<ul style="list-style-type: none"> <li>• The construction campsites shall be far away from any local human settlements and preferably located on lands presently. The camps shall have adequate water supply, sanitation and all requisite facilities. This would minimize dependence of construction personnel on outside resources.</li> <li>• The camp shall be located at a minimum 500m from forest land to deter the construction labour in trespassing.</li> <li>• The camps shall have septic tank/soak pit of adequate capacity so that it can function properly for the entire duration.</li> </ul>	DDC/DPO	Contractor/DIST
Borrow areas	Decline in aesthetic value and accumulation of water	<ul style="list-style-type: none"> <li>• Increase in risk of accidents to children and livestock.</li> <li>• Conversion of borrow areas into ponds due to accumulation of water in rainy season.</li> </ul>	D	M	Lc	St	IR	<ul style="list-style-type: none"> <li>• Within these locations, the actual extent of area/zones to be excavated areas to be separated with signboards.</li> <li>• Through this project, the borrow areas may be converted into</li> </ul>	DDC/DPO/DSCO	Contractor/RBG/DIST

		<ul style="list-style-type: none"> <li>Removal of top soil decreases fertility of soil.</li> </ul>						surface/ponds wherever possible, as a derivative of development. Some of these ponds could serve as source of water for agriculture.		
Location of campsites, storage depots	Change in ecology	<ul style="list-style-type: none"> <li>Use of fodder and forest products as fuel and settlements.</li> <li>Change of cultivatable land into temporary settlements.</li> <li>Encroachment of forest and poaching of wild animal.</li> <li>Increase in erosion and gully formation in rainy season.</li> <li>Increase in risk of catching fire.</li> </ul>	D	M	Lc	St	IR	<ul style="list-style-type: none"> <li>The location of campsites, storage depots shall preferably on unproductive/ barren lands. Away from forest areas as far as possible.</li> <li>Use of agricultural lands shall not be allowed unless extreme circumstances.</li> <li>All fuel loading, unloading, storage areas shall be spill proof, leakage proof and carried out on paved areas.</li> <li>The sites should have suitable system to drain storm water, sanitary facilities and shall not contaminate any near by water courses/drains.</li> <li>The site shall also have a system for handling any emergency situation like fire, explosion etc.</li> </ul>	DDC/DPO/DSCO	Contractor/DI ST
Storage of hazardous materials	Risk of contamination and accidents.	<ul style="list-style-type: none"> <li>Increases the pollution in the water bodies if spill out.</li> <li>Decreases the quality of air in case of explosion</li> </ul>	D	M	Lc	St	IR	<ul style="list-style-type: none"> <li>All areas intended for storage of hazardous materials shall be away from the untrained personnel and provided with adequate facilities to combat emergency situations.</li> <li>The personnel in charge of such areas shall be properly trained, licensed and with sufficient experience.</li> <li>The areas shall be access controlled and entry shall be allowed only under authorization.</li> </ul>	DDC/DPO	Contracto/DIS T
Construction Equipment Vehicles	Air pollution, noise pollution	<ul style="list-style-type: none"> <li>Increase air pollution due to emission of smoke.</li> <li>Increase in vibration due to</li> </ul>	D	M	Lc	St	IR	<ul style="list-style-type: none"> <li>All equipment/vehicles deployed for construction activities shall be regularly maintained.</li> </ul>	DDC/DPO	Contractor/DI ST

		vehicular movement.						<ul style="list-style-type: none"> <li>Vehicles/equipment shall be regularly subjected for emission tests and shall have <u>pollution under control</u> certificates.</li> <li>All the vehicles deployed for material movement shall be spill proof to the extent possible.</li> <li>In any case all material movement routes shall be inspected daily twice to clear off any accidental spills.</li> </ul>		
Use of Bitumen	Air and water pollution	<ul style="list-style-type: none"> <li>Increase in air pollution due to use of fodder for heating bitumen.</li> <li>Water may get polluted due to disposal of waste products and if spill out to water bodies.</li> </ul>	D	M	Lc	St	IR	<ul style="list-style-type: none"> <li>Use of less amount of fodder for heating.</li> <li>Appropriate storage of material.</li> <li>No entry for unnecessary personals in site.</li> <li>Use of appropriate safety devices to ensure safe health of workers such as masks.</li> </ul>	DDC/DPO	Contractor/DI ST
<b>Biological Environment</b>										
Construction of road	Change in land use	<ul style="list-style-type: none"> <li>Loss or degradation of forests and vegetation: Total of 1.12 ha of forest will be permanently lost due to road construction work. The proposed road passes through one CF. From this CFs and private cultivated land, total 125 numbers of forest trees, fodder and fruit trees of various species will be removed during road construction</li> </ul>	D	M	Lc	Lt	IR	<ul style="list-style-type: none"> <li>Concerned CFs will carry out plantation in their community forests with project support.</li> <li>The forest products from the CFs will be utilized by the community forest users groups (CFUGs) according to community forest operational plan</li> </ul>	DDC/DPO/DFO	CFUG
Construction of road	Impact on wildlife and birds	<ul style="list-style-type: none"> <li>loss or degradation of habitat, increased hunting and other form of human pressure</li> </ul>	In	L	Ss	St	IR	<ul style="list-style-type: none"> <li>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.</li> <li>The construction activities near forest area will be appropriately managed so that there will be least disturbance to the wildlife and birds.</li> </ul>	DDC/DPO/DFO	CFUG

								<ul style="list-style-type: none"> <li>Workers shall be actively discouraged from collecting fuel wood from forest or hunting of birds or animals.</li> <li>Proponent shall provide counseling services for the promotion of agro-forestry, Non timber forest products, and horticulture in private land providing seeds, seedlings, slips, training and other incentives to the farmers residing in adjoining the road corridor in coordination with District Forest Office (DFO).</li> <li>Coordination with DFO and CFUGs to control the activities like illegal hunting and poaching by enforcing acts and regulations strictly.</li> </ul>		
Construction of road	Impact on flora and fauna.	<ul style="list-style-type: none"> <li>loss or degradation of habitat, increased hunting and other form of human pressure</li> </ul>	In	L	Ss	St	IR	<ul style="list-style-type: none"> <li>Coordination with DFO and CFUGs to control the activities like illegal hunting and poaching by enforcing acts and regulations strictly</li> </ul>	DDC/DPO/DFO	CFUG
<b>Socio-economic and cultural environment</b>										
Construction of road	Loss of land	<ul style="list-style-type: none"> <li>Loss or degradation of farm land and productivity.</li> </ul>	D	H	Lc	Lt	IR	<ul style="list-style-type: none"> <li>Improvement of agricultural extension services</li> </ul>	DDC/DPO	DIST
Construction of road	Loss of private properties.	<ul style="list-style-type: none"> <li>Loss or degradation of private properties such as houses, farm sheds, and other structures, crops and fodder/ fruit trees</li> </ul>	D	M	Ss	St	IR	<ul style="list-style-type: none"> <li>A separate Resettlement Plan will be prepared to address land and property acquisition as well as compensation issues</li> </ul>	DDC/DPO/CDO	DIST
Construction of road	Impacts on community infrastructure	<ul style="list-style-type: none"> <li>Impact on community infrastructure such as irrigation, water supply, schools, health post, trail and trail bridges</li> </ul>	D	M	Ss	St	IR	<ul style="list-style-type: none"> <li>Restore all disturbed infrastructures to the condition before disturbance or improve where appropriate in coordination with local irrigation canal users' committee/water users' committee</li> <li>Avoid contamination of water resources systems during construction</li> <li>Adopt outward slope as per</li> </ul>	DDC/DPO	DIST

								Green Road Standard to minimize water accumulation. • Schedule the construction activities during crop off-season not to disrupt water bodies being used for irrigation purposes by the road		
Construction of road	Impacts on cultural, religious and archeological sites.	• Impacts on cultural, religious and archeological sites	D	L	Lc	St	IR	• Shifting of centre line of road alignment wherever possible • Relocation of temple if it can not be avoided for dismantling • Consultation with local people for appropriate solution	DDC/DPO	DIST
Construction of road	Impacts on health and safety measures	• The potential impacts to health are respiratory and eye diseases due to the exposure on dust, risk of accident during works. • The lack of proper sanitary measures and increase in waste and water pollution can lead to an outbreak of epidemics, diseases as jaundice, typhoid etc.	D	H	Lc	St	IR	• The workers will be provided with helmets, masks, muffles depending on the nature of the construction work. • 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. • Workers will be provided with first aid and health facilities. • First aid training will be provided to field staffs like sub-engineer, social mobilizers and supervisors. • Insurance for workers for accidents	DDC/DPO	DIST
<b>Operation Stages</b>										
<b>Physical Environment</b>										
Operation phase (plying of vehicles)	Slope Instability	• the slope along the road alignment and nearby areas may be destabilized due to human activities in the road neighborhood such as quarrying for stones or soil, animal grazing and irrigated cultivation. This will cause the damage to road section, disruption of transportation and other social	D	M	Lc	Lt	Rev	• Correction of maintenance of the slope protection measures and drainage works • Minor landslides and mass wasting will be immediately cleared and slope restored with appropriate technology (bio-engineering) • Soil conservation will be promoted in the right of way	DDC/DPO/DSCO	DIST



		impact in nearby area						and vulnerable areas beyond the road alignment		
Operation phase (plying of vehicles)	Air, water and noise pollution.	<ul style="list-style-type: none"> <li>Due to the movements of vehicles and other activities.</li> <li>Disposal of gases and liquid pollutants from vehicles into water bodies may cause water pollution</li> </ul>	D	L	Lc	Lt	Rev	<ul style="list-style-type: none"> <li>Community and road user awareness program will be organized to enhance public awareness near the settlements.</li> <li>Speed limit of vehicles will be maintained near the settlements</li> <li>Use of horns should be restricted near health posts, schools and settlements</li> <li>Plantation will be done along the Right of Way (RoW) near the settlement</li> </ul>	DDC/DPO	DIST
<b>Biological Environment</b>										
Operation phase (plying of vehicles)	Depletion of forest resource	<ul style="list-style-type: none"> <li>In operational phase of the road, the rate of forest resource depletion will be increased because of the inaccessible sites mainly in Community forest area where forest resources are in good condition will become more accessible.</li> </ul>	In	M	Lc	Lt	Rev	<ul style="list-style-type: none"> <li>Encourage and support local CFUG and authorities in controlling illegal harvesting of forest resources.</li> </ul> <p>Awareness programmes shall be organized to educate local people on the conservation of forest.</p>	DDC/DFO	CFUG
Operation phase (plying of vehicle)	Increase in poaching and illegal trafficking	<ul style="list-style-type: none"> <li>Operation of road makes inaccessible sites, where wild faunas are available, will become more accessible and the rate of poaching can also increase if controls are not introduced. It may also increase smuggling of wild-fauna and their parts due to easy access and easy transportation facilities.</li> <li>Operation of road may increase in sudden accidents between wildlife and vehicles, ultimately results casualties and death</li> </ul>	In	M	Lc	Lt	Rev	<ul style="list-style-type: none"> <li>Workers shall be briefed regularly about the importance and rules and regulation of DFO and in order to make them comply with.</li> <li>Appropriate sign boards will be erected informing drivers about potential areas for wildlife crossing</li> <li>Workers shall be briefed regularly about the importance and rules and regulation of DFO and in order to make them comply with.</li> <li>Awareness programmes shall be organized to educate local people on the conservation of forest.</li> </ul>	DDC/DFO	CFUG
<b>Socio-economic and cultural Environment</b>										

Operation phase (plying of vehicle)	New settlement, market centre development and population pressure	<ul style="list-style-type: none"> <li>The existing trend is to settle along the road side for the economic activities.</li> </ul>	D	M	Lc	Mt	Rev	<ul style="list-style-type: none"> <li>Regulate settlement growth with proper planning/zoning along RoW and discourage ribbon settlement</li> <li>Awareness raising programme through local organizations to plan proper settlements</li> <li>Regulate settlement growth with proper land use planning/zoning along RoW</li> <li>Plantation of trees along the road.</li> </ul>	DDC/DPO	DIST
Operation phase (plying of vehicle)	Change in social behavior	<ul style="list-style-type: none"> <li>Flow of tourists and other visitors may influence the changes in the social behavior. This may increase economic opportunities along the road corridor. People may leave their family in their villages to dwell near the new spots for economic incentives. This will ultimately affect the traditional bonds, norms and functions of the family.</li> </ul>	In	M	Lc	Lt	Rev	<ul style="list-style-type: none"> <li>facilitate awareness raising programmes to the communities about negative social behavior like gambling, excess use of alcohol</li> </ul>	DDC/DPO	DIST
Operation phase (plying of vehicle)	Road Safety Measures	<ul style="list-style-type: none"> <li>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</li> </ul>	In	M	Lc	Lt	Rev	<ul style="list-style-type: none"> <li>Applying appropriate road safety measures</li> <li>Required safety signs will be used along the road</li> <li>Applying appropriate road safety measures with the help of 3-Es i.e. Engineering, Enforcement and Education.</li> </ul>	DDC/DPO	DIST

**Note:**

- **Magnitude:** This can be low-**L** (minor), medium-**M** (moderate), and high-**H** (major), depending on the scale or severity of change.
- **Geographical extent:** If the action is confined to the project area, it is referred as sitespecific (**Ss**), if it occurs outside area but close to project area, the extent of impact is local (**Lc**), if it occurs far away from the project, it is referred as regional (**R**).
- **Duration:** It can be short term (**St** - i.e. less than 3 years), medium term (**Mt** - i.e. 3-20 years), and long term (**Lt** - i.e. more than 20 year)
- **Rev** : Reversible **IR** : Irreversible

## 7.4. Mitigation cost

210. 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) programme of the RRRSDP. Costs for income generation and awareness programme activities for Affected Persons (APs) are included in Resettlement 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, supporting CFUGs shall be incorporated in the design and cost estimates. Therefore, most of the mitigation measures suggested would be a part of road design and construction without additional 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 7.2**.

**Table 7.2: Cost Estimate for Environmental Enhancement and Mitigation Measures**

SN	Measures	Estimated cost (NRs.)	Remarks
<b>1</b>	<b>Benefit Augmentation Measures</b>		Will be included in resettlement plan, Community Empowerment and Livelihood Enhancement Skills Training component of RRRSDP.
1.1	Community Awareness and Livelihood Training	200,000.000	Lump Sum (LS),
1.2	Environmental awareness program for DDC/DTO Staffs for EMP implementation/Monitoring	50,000.00	LS
1.3	Restoration/ Enhancement / implementation of other environmental safeguard measures.	500,000.00	LS
<b>2.</b>	<b>Adverse Impact Mitigation Measures</b>		
2.1	Occupational health and safety	250,000.00	Included in subproject cost
2.2	Insurance	400,000.00	Included in subproject cost
2.3	Compensatory plantation (plantation of 3125 plants in community forest area) and protection cost for five years	139062.5	Cost estimated as per rate analysis norms of MoFSC
2.4	Drainage and cross-drainage structure	25,000,000.00	Included in subproject cost
2.5	Bio-engineering works	1,300,885.93	Included in subproject cost
<b>3.</b>	<b>Resettlement and Rehabilitation cost</b>		Will be included in resettlement plan as Cadastral surveying is undergoing.

## 7.5. Implementation of Mitigation Measures

211. The mitigation measures should be integrated into subproject design and tender documents. Using this approach, the mitigation measures will automatically become part of the subproject 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.

Subproject Design

212. The mitigation measures should be integrated in the design of the sub- project itself. Such a step shall enhance the mitigation measures in terms of specific mitigation design, cost estimation of the mitigation measure, and specific implementation criteria. The mitigation measure integration in the design phase shall also help in strengthening the benefits and sustainability of the subproject.

Subproject Contract

213. The subproject contractor should 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.

Bill of Quantities

214. The tender instruction to bidders should 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.

Supervision and Monitoring

215. The purpose of supervision is to make sure that specific mitigation parameters identified in the environmental assessment and as bound by the contract is satisfactorily implemented. Likewise, monitoring is necessary such that the mitigation measures are actually put into practice.

**7.6. Environmental Monitoring**

216. 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 for minimizing adverse impacts and maximizing the beneficial impacts. Environmental monitoring generates useful information and improves the quality of implementation of mitigation measures.

**7.6.1 Monitoring Responsibility**

217. Monitoring is an integral part of the subproject proponent so as to know the unlikely impacts and implement corrective measures. The proponent, DDC/DTO Bhaktapur will develop in-built monitoring mechanism to show its additional commitment for environmental improvement and mitigate undesirable environmental changes, if any during construction and operational stage. DDC/DTO will be supported by District Implementation Team (DPO and DIST) team in the district and Environmental Management Specialist from the CISC for environmental monitoring. There is a need to support these organizations to carry out environmental monitoring effectively. Therefore, environmental monitoring training will be conducted together with technical, social, resettlement and subproject performance monitoring and evaluation training.

218. 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

219. DDC/DTO with RRRSDP/PCU support should make arrangements for sub-project level monitoring. It should constitute a monitoring team, which must be independent from the implementation team and should consist of relevant persons in the context of a sub-project being monitored, for example persons from the forest, agriculture, social and NGO sectors. The monitoring team will be constituted separately for each monitoring event. 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 7.4** shall be followed. At least one monitoring in each construction season is necessary.

220. 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 as well as central level monitoring cost) is estimated NRs. 480,000 as given in **Table 7.3**.

**Table 7.3: Environmental Monitoring Cost**

SN	Description	Duration (month)	Rate (NRs)	Amount (NRs)
<b>District Level Monitoring</b>				
1	Team Leader / Environmental Specialist	2	48,000	150,000
2	Engineer	1	46,000	60,000
3	Forester	1	30,000	60,000
4	Socio-economist	1	30,000	60,000
5	Support staff	2	20,000	40,000
6	Transportation cost	LS	20,000	20,000
7	Report preparation and sampling / lab test	LS	40,000	40,000
<b>Central Level Monitoring</b>				
1	Monitoring cost	LS	50,000	50,000
<b>Total</b>				<b>480,000</b>

## 7.6.2 Types of Monitoring and Monitoring Parameters

221. 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:

- 1. Compliance Monitoring** - It verifies whether contract environmental clauses and the mitigation measures are properly implemented in the field.
- 2. Impact Monitoring** - It confirms whether the environmental mitigation measures specified in the subproject design and contract are correctly formulated.

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

### Pre-construction Stage

223. Monitoring at this stage of subproject 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

224. 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

225. 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

226. The following Table 7.4 identify the specific compliance monitoring activities. Phase-wise/chronological details are provided for the methods, schedules, responsible implementing agency and the responsible monitoring agency. The compliance monitoring refers primarily to the pre-construction and construction stage of the Project.

**Table 7.4: Compliance Monitoring for Bhatkekopati- Jitpur-Mahamanjushree-Chareli-Kalamasi-Nagarkot Road Sub-project**

Parameters/Issues	Responsible Implementing Agency	Verifiable Indicators	Verification Methods	Schedule	Responsible Monitoring Agency
Final alignment selection as per IEE recommendation	DIST	Incorporation of IEE recommendations into alignment selection process and design document	Walkthrough along final road alignment, verifying sensitive areas	Initial stage preconstruction phase	DDC/DTO through PCU-CISC, DoLIDAR
Land and property acquisition and compensation	DDC 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 discuss with people	Initial stage pre-construction phase - well ahead of construction	CDC/PCU - CISC/ DOLIDAR
Resettlement, assistance and compensation	DDC / DIST	Legal provisions by GoN; Compensations paid	Check compliance to legal procedures	Well ahead of construction	CDC/PCU - CISC/ DOLIDAR
Site selection and preparation of construction logistics	DDC / VICCC	Project's arrangement for materials storage, and construction activities	Site observation, geo-referencing and photographic documentation	Beginning of construction period	DIST/DTO
Use of local labour, particularly vulnerable groups and women	DICC/ VICCC / DIST	Specifications which obligate the contractors/BG to observe certain quotas for employing local labour, specially vulnerable groups and women, use of child labour	Records of the NGO that facilitates and coordinates the process for local people's employment, interviews	During the entire period where labour work is contracted, trimester	DDC/DTO
Awareness and orientation training on road construction to technicians, and locally employed labourers	DIST/VICC	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	DDC/DTO/DIST
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	Spot checks at work sites, photos, accident records, interviews	throughout construction activities, trimester	DDC/DTO
Compliance to environmental protection measures, including pollution prevention, water	Contractor/RBG/ DIST	Records and observations on pollution, waste management, spoil deposit. Training programmes for labourers to prevent impacts on	Site inspection, discussion with Project management, consultants, and local people. Quantifying site-specific impacts, photos, laboratory	Before and during construction period	DPO

Parameters/Issues	Responsible Implementing Agency	Verifiable Indicators	Verification Methods	Schedule	Responsible Monitoring Agency
and soil management, slope stabilisation, cut and fill, waste management, spoils, sensitive habitats and critical sites, protection of fauna and flora		wildlife sensitive habitats, forests and fuel wood use.	tests where required. Existing patrol, control and enforcement mechanisms, enforcement records		
Vegetation clearance	Contractor / RBG / DIST	Actual number of trees felled during construction works	Record, inspection and interview with local people and CFUGs	After detail design and before construction work	CFUGs/DTO/DC/DFO
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	DDC/DTO/CFUGs
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 and discussion with residents and workers	Once in a month during construction	DDC/DTO
Measures to protect water bodies from pollution	Contractor / RBG/DIST	Visual observation, observation of open defecation and waste disposal around water sources near construction sites	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	DDC/DTO
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/DDC records; public consultation meetings; photos	Once in 15 days during construction	DDC/DTO
Adequate technical and environmental supervision	DIST	Adequate number of technicians regularly at site with 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	DDC/DTO
Clean up and reinstatement of the construction sites (camps, quarries)	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 community based organizations	At the end of construction period	DDC/ DTO



Table 7.5 details the impact and effect monitoring activities envisaged for this Project. As in the previous table, details are provided for the applied methods, schedules, location, responsible implementing agency and the responsible monitoring agency.

**Table 7.5: Impact/Effect Monitoring for the Bhatkekopati- Jitpur-Mahamanjushree-Chareli-Kalamasi-Nagarkot Road Subproject.**

Parameters /Issues	Verifiable Indicators	Verification Methods	Location	Schedule	Responsible Implementation and Monitoring Agency
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	Continuously during construction and operation	DIST during construction; DDC/DTO/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 sites	During and at end of project construction	DIST/DDC/DTO
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/DDC/DTO
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/DDC/DTO
Disruption of drainage system	Status of rehabilitation, service status of irrigation and water supply system; operation and maintenance requirement	Observation and interviews, photos, records	Irrigation schemes and water supply system	During construction	DIST/DDC/DTO
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	DDC/DTO/DIST/VICCC
Water quality	Observation of open defecation and waste disposal around water sources near construction sites	Visual observation, measurement of water sample using field kit	Local streams	During construction; upon demand for testing with field kit	DDC/DTO/DIST/VICC
Air quality	Dust level in ambient air	Visual inspection	At construction sites and at sensitive spots (schools, health spots, major settlements)	During construction	DDC/DTO/DIST

<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>
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/DDC during operation
Wildlife	Wildlife hunting trapping and poaching by work force, trade of wildlife, road accidents inflicting wildlife	Interview with local people/ DFO/CFUGs members, photos, observations	Forest areas at roadside	Twice a year during construction and routine during operation	DIST during construction; CFUGs/DFO/DDC 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, discussion with stakeholders	Project area	Trimester during construction phase	DDC/DTO/DIST
Trade and commerce	Numbers of shops increased or decreased, rental of houses and land spaces	Records, interviews, observations, photos	Throughout project area	Once in a year	DDC/DTO/DIST/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 workers	Throughout project area	During construction	DIST/DPO
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	Throughout project area	During operation	DDC/DTO/VDC
Ribbon settlement	Congestions to road users nos. of accidents, RoW encroachment	Records, observations	Throughout project area	During operation	DDC/DTO/Local administration

## 8. CONCLUSION AND RECOMMENDATIONS

### 8.1 Conclusion

227. The IEE study of the proposed Bhatkekopati – Jitpur – Mahamanjushree – Chareli – Kalamasi - Nagarkot 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 subproject are more significant and long term in nature against the adverse impacts most of which could be mitigated or avoided.

228. 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

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

230. 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.

## **REFERENCES**

- ADB, 2003 Environmental Assessment Guidelines. Asian Development Bank, Manila, The Philippines
- ADB, 2007, Summary Initial Environmental Examination, RRRSDP Project, ADB TA 4919 NEP, Final Draft Report
- DDC Profile of Bhaktapur District, 2063/64
- Department of Roads, 1998 "Nepal Road Statistics"
- Department of Roads, 2002, Reference Manual for Roadside Bioengineering
- Department of Roads, 2002, Site Handbook for Roadside Bioengineering
- Department of Roads, 2003, Reference Manual for Environmental and Social Aspects of Integrated Road Development
- Department of Roads, 2003, Reference Manual for Environmental and Social Aspects of Integrated Road Development
- Department of Roads, GEU. 1996 "Bio-Engineering Information"
- Department of Roads, GEU. 1997 "Environmental Impact Assessment Guidelines for the Road Sectors"
- DoLIDAR 1999 APPROACH for the Development of Agricultural and Rural Roads. Department of Local Infrastructure Development and Agricultural Roads, 1999
- DoLIDAR Green Road Approach Manual
- DRILP 2006 Environmental Guidelines (Draft), Decentralized rural Infrastructure and Livelihood Project, GoN, DoLIDAR.
- GoN 2006 Environmental and Social Management Framework. Road maintenance and Development Project, Department of Roads, Ministry of Physical Planning and Works, November 2006
- GoN/DoLIDAR, 2007 Environmental Assessment and Review Procedures for RRRSDP (Draft)
- GTZ, SDC, 1999 Green Roads in Nepal, Best Practices Report – An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions.
- GTZ/SDC, 2000 Green Road: Best Practices
- HMG/N 1973 National Park and Wildlife Conservation Act, 1973
- HMG/N 1993 Forest Act, 1993
- HMG/N 1995 Forest Rules, 1995
- HMG/N 1997 Environment Protection Act, 1997, Ministry of Law and Justice, GoN, Kathmandu
- HMG/N 1997 Environment Protection Rules, 1997, Ministry of Law and Justice, GoN, Kathmandu
- HMG/N 1998 Environment Guide for Small Rural Infrastructure Projects.
- HMG/N 1999 Local Self Governance Act, 1999 and Land Acquisition Act, 1977
- HMG/N 2000 Local Self Governance Rules, 2000
- HMG/N 2003 REFERENCE MANUAL for Environmental and Social Aspects of Integrated Road Development, Ministry of Physical Planning and Works
- ICIMOD, 1998 Access Improvement and Sustainable Development, Rural Road Development in Nepal, Durga P. Poudel
- IUCN, 1996 "EIA Training Manual for Professional and Managers"
- PROJECT GRANT AGREEMENT (GRANT NUMBER 0093-NEP (SF)) (Special Operations) for (Rural Reconstruction and Rehabilitation Sector Development Program) between NEPAL and ASIAN DEVELOPMENT BANK, January 2008
- RAP 2001 Initial Environmental Examination Guidelines (Draft). Department for International Development (UK) Rural Access Programme Nepal
- RAP, 2000 "Brief Paper on Environmental Guidelines For Road Corridor Alignment, WSP, GEOCE and CDG"
- RAP, 2001 "Initial Environmental Examination Guidelines , WSP, GEOCE, and ODG"
- Upreti B K 2003 Safeguarding the Resources Environmental Impact Assessment Process and Practice

## Annex I : Terms of Reference



नेपाल सरकार  
स्थानीय विकास-मन्त्रालय  
स्थानीय पूर्वाधार विकास तथा कृषि सडक विभाग (डोलिडार)  
**ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना**  
**आयोजना समन्वय इकाई**  
काठमाडौं, तत्तितपुर

प.स. ०६५ ६६

च.नं: १०६७

मिति: २०६३/११/२८

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

श्री जिल्ला प्राविधिक कार्यालय  
ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना  
जिल्ला आयोजना कार्यालय,  
भक्तपुर ।

उपर्युक्त सम्बन्धमा त्यस जिल्लामा निर्माण हुने भत्केको पाटी-जितपुर-महामञ्जुश्री-चर्रेली-  
नगरकोट उप आयोजनाको प्रारम्भिक वातावरणीय परीक्षण (IEE) को कार्य सूचि (ToR) नेपाल सरकार  
(साँचव स्तर) को मिति २०६३/११/१७ को निर्णय अनुसार स्वीकृत भएकोले स्वीकृत ToR यसै साथ सलग्न  
गरी सो अनुसार आवश्यक कारवाहीको लागि अनुरोध छ ।

बोधार्थः  
श्री जिल्ला विकास समितिको कार्यालय,  
भक्तपुर ।

नारायण प्रसाद बराल  
प्रोजेक्ट इन्जिनियर

स्वीकृत दिनांक: २०३३/१/१६

## Terms of Reference (ToR)

Initial Environmental Examination (IEE)

Bhatkekopati-Jitpur- Mahamanjushree-chareli -  
Nagarkot  
Road Sub-Project

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

Proponent:  
**District Development Committee (DDC)**  
**District Technical Office (DTO)**  
**Bhaktapur**

Telephone No. – 01-6614854  
Fax No. – 977-1-6613215

२०३३/१/१६

April 2009

## Annex I : Terms of Reference

### TABLE OF CONTENT

1.0	NAME AND ADDRESS OF THE CONSULTANT.....	1
2.0	INTRODUCTION.....	1
2.1	GENERAL INTRODUCTION.....	1
2.2	BACKGROUND OF THE SUB-PROJECT.....	2
2.3	OBJECTIVES.....	4
2.4	RELEVANCY OF THE SUB-PROJECT.....	5
3.0	REVIEW OF RELEVANT LAWS, RULES AND GUIDELINES.....	5
4.0	PROCEDURE TO BE ADOPTED WHILE PREPARING THE REPORT.....	6
4.1	DESK REVIEW.....	6
4.2	PUBLIC CONSULTATION AND INFORMATION DISCLOSURE.....	6
4.3	FIELD WORK.....	7
5.0	ALTERNATIVES FOR THE IMPLEMENTATION OF THE PROPOSAL.....	7
6.0	REQUIREMENT OF THE IEE STUDY.....	8
6.1	TIME SCHEDULE.....	8
6.2	ESTIMATED BUDGET AND STUDY TEAM.....	8
7.0	ENVIRONMENTAL BASELINE.....	9
8.0	ANALYSIS AND INTERPRETATION.....	9
9.0	IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT.....	9
9.1	BENEFICIAL IMPACTS.....	9
9.2	ADVERSE IMPACTS.....	10
10.0	BENEFIT AUGUMENTATION/MITIGATION MEASURES.....	12
11.0	ENVIRONMENTAL MANAGEMENT PLAN.....	12
12.0	IEE REPORT FORMAT.....	12
TABLE		
Table 1. Proposed Work Schedule for Conducting IEE Study.....		8
FIGURE		
Figure 1. Map of Nepal Showing Location of Bhatkekopati-Jitpur-Mahamanjushree-charerli-Nagarkot Road Sub-Project in Bhaktapur District.....		3
Figure 2. Map of Bhaktapur District Showing Bhatkekopati-Jitpur-Mahamanjushree-charerli-Kalamasi-Nagarkot Road Sub-Project.....		4

*ToR for IEE Bhatkekopati-Jitpur-Mahamanjushree-charerli-Nagarkot road sub-project in Bhaktapur District.*



## Annex I : Terms of Reference

### 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



## Annex I : Terms of Reference

### 1.0 NAME AND ADDRESS OF THE PROPONENT

The District Development Committee (DDC)/District Technical Office (DTO), Bhaktapur is the executing agency at the district level and the proponent of the Initial Environmental Examination (IEE) study for the rehabilitation of Yatu mahadev-Ratopati-Jitpur-Chareli-Kalamasi-Nagarkot section of Bhatkekopati-Jitpur-Mahamanjushree-Chareli-Nagarkot Rural Road sub-project. The Ministry of Local Development (MLD) is the concerned authority for the approval of IEE study report.

#### Address of the Proponent:

District Development Committee (DDC)  
District Technical Office (DTO)  
Bhaktapur  
Telephone No. :- 01-6614854  
Fax No. :- 977-1-6613215

### 2.0 INTRODUCTION

#### 2.1 GENERAL INTRODUCTION

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

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

CEMECA is the District Implementation Support Team (DIST) for RRRSDP and have the responsibility of providing technical, environmental and social assistance in Bhaktapur district.

This Terms of Reference (ToR) is prepared to conduct an IEE study of Bhatkekopati-Jitpur-Mahamanjushree-chareli- Nagarkot road sub-project in Bhaktapur District.

### 2.2 BACKGROUND OF THE SUB-PROJECT

The proposed of Bhatkekopati-Jitpur-Mahamanjushree-chareli-Kalamasi-Nagarkot road sub-project lies in the north-eastern part of Chitwan district of Central Development region of Nagarkot, one of the renowned tourist place in the Kathmandu valley of Nepal. Major settlements along the road alignment are Yatupati, Ratopati, Jitpur, Solithumko, Lamichhane tole, Faudar Gau, Duware tole, Nayabasti, Chareli, Thakalmath, Jhapra, Kalamasi, Nagarkot. Total length of the road alignment is 11 km.

The starting point of the road, Bhatkekopati-Jitpur-Mahamanjushree-chareli-Nagarkot is Bhaktapur-4, Yatumahadev. It is a point 1.375 km away from Kamalbinayakechowk and of 2.5 km far from district headquarters of Bhaktapur. Upto 1 km section, the road width is 8 m or more because of plain sections. For the remaining length of the road, width is 5 m in general, but some sections of road are having 3.5 to 6.5 m width also. Almost all alignment of the road passes from lower valley to upper valley.

The people in this project area are having many types of transportation problems due to the steep topography and worse condition of road. Local people have no good access to the market centres of the district to sell their milk product named as khuwa which is famous of these VDC and vegetatives products such as potato, Brinjal, tomato, onion, cauliflower etc, to sustain their daily livelihood. Hence, the locally produced materials such as Milk product and Vegetatives-products are getting low prices than it may fetch. Other development facilities such as water supply, bio-gas plant and telephone are also poor along the road corridor of some Sudal VDC. Having lots of transportation difficulties, local tourist, foreign tourist and people of the road corridor too donnot have the fast and appropriate access road to reach the Nagarkot to view beautiful natural scene of Nagarkot such as sunshine, sunshade and Himalaya etc.

The rehabilitation of road will mainly enhance the transportation of Vegetable product, milk product produced in remote areas of Sudal and other VDCs and it will also extend physical and economical access to the people within the immediate zone of influence. It will also be the appropriate road transport to reach the Nagarkot to view the natural scenario of the Nagarkot. For the road construction, use of local labour will generate immediate employment to local people and minimise migration to Kathmandu and Lalitpur city in search of work. Consequently, local people will get long-term benefit which will enhance their economic status within the ZOI of road corridor and adjoining area of Kabre district.

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

The location and alignment of the road is given in **Figure 1 and 2**.



## Annex I : Terms of Reference

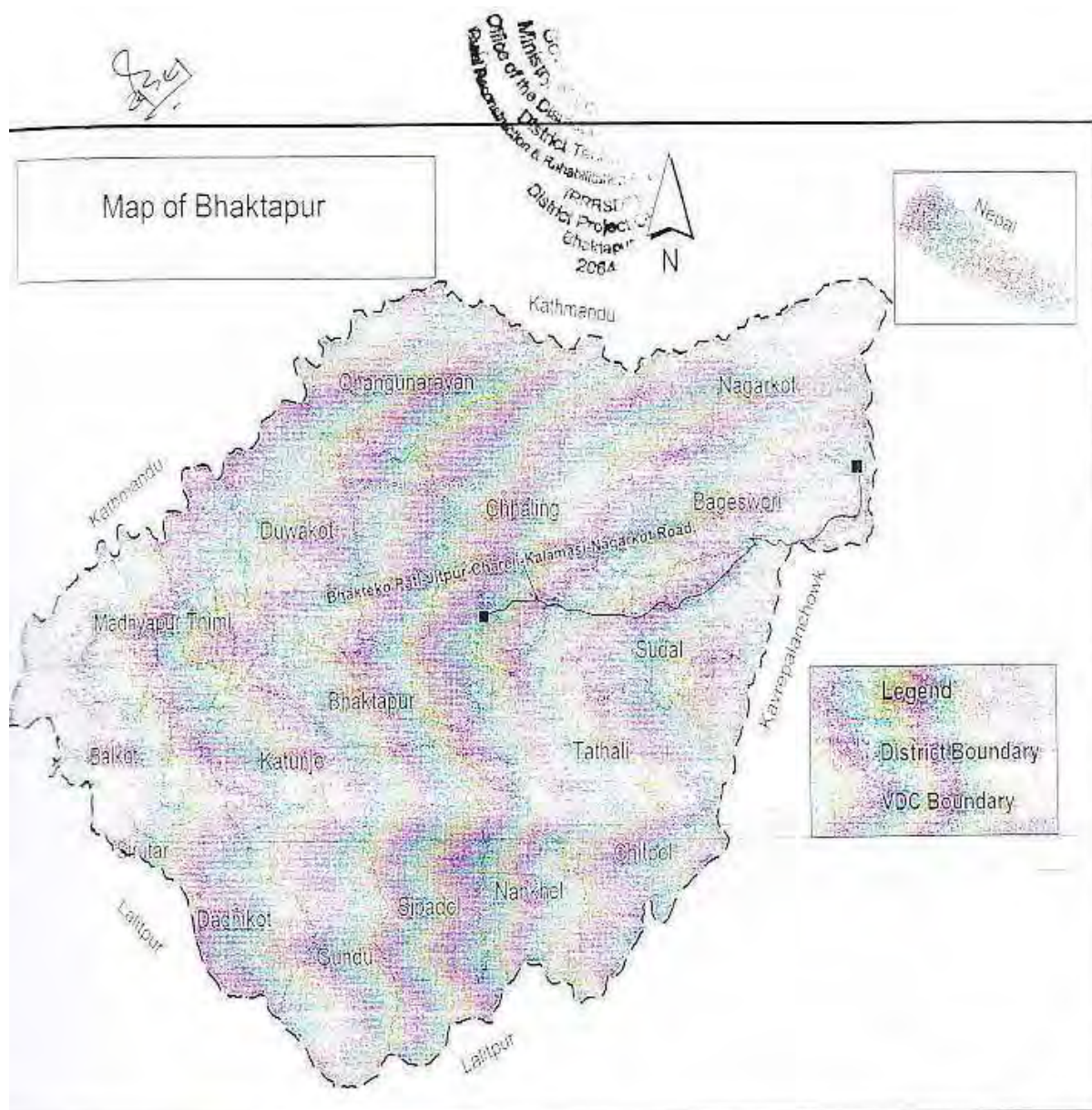


Figure 1. Map of Nepal showing location of BhatkekoPati-Jitpur-Mahamanjushree-Chareli-Nagarkot sub project in Bhaktapur district.



## Annex I : Terms of Reference

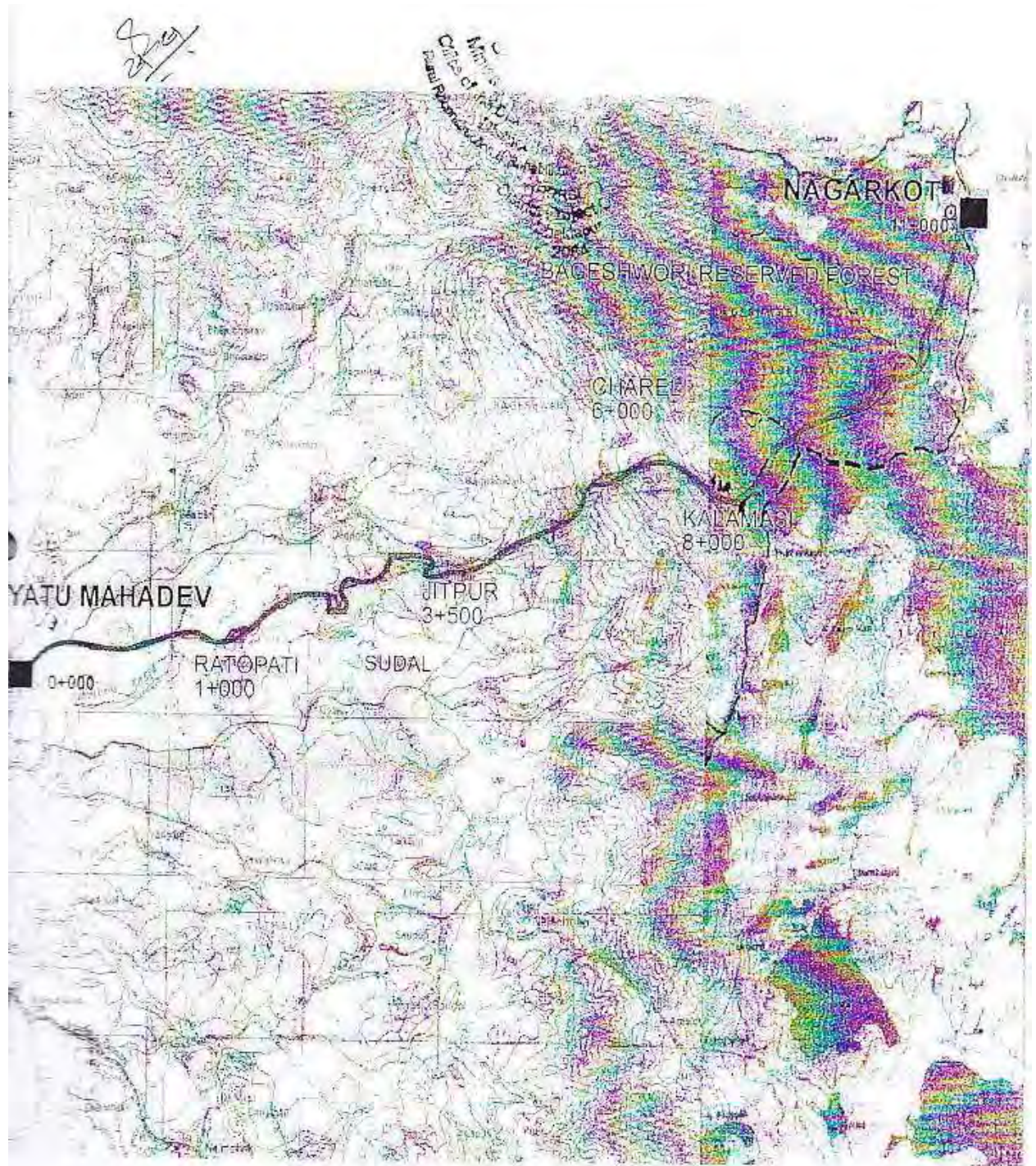


Figure 2. Topographical Map of Bhaktapur district showing BhatkekoPati-Jitpur-Mahamanjushree-Chareli-Nagarkot road sub project.



### 2.3 OBJECTIVES

The objectives of the proposed IEE study includes to:

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

### 2.4 RELEVANCY OF THE SUB-PROJECT

The proposed road will connect Nagarkot, Sudal, and Bageswari VDCs with trails to the Bhaktapur Municipality, Bhaktapur. This road starts from Yatamahadev of Bhaktapur Municipality, which is 1.375 km away from Kamalbinayak chowk and is a small settlement likely to be changed to a bazaar area due to economical growth. Then the road runs towards North-east direction to uphill side in between the Mahabharat range with hills and low mountains. The end point of this rehabilitation section of road is Nagarkot-8, Mahadev pokhari which is near from pocket area of Nagarkot Tower. 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 Nirdeśika* (Nepal: MLD), 2057
- National Park and Wildlife Conservation Act, 1973
- Local Self Governance Act, 1999 and Local Self Governance Rules, 2000
- Land Acquisition Act, 1977 and Land Acquisition Rules, 1969
- National Environmental Impact Assessment Guidelines, 1993

## Annex I : Terms of Reference

- 
- APPROACH for the Development of Agricultural and Rural Roads, 1999 (DoLIDAR)
  - RRRSDP Environmental Assessment and Review Procedures (EARP) Guidelines, 2007
  - REFERENCE MANUAL for Environmental and Social Aspects of Integrated Road Development, 2003, Department of Road.
  - Green Roads in Nepal, Best Practices Report – An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions. GTZ, SDC, 1999.
  - ADB Environmental Assessment Guidelines, 2003
  - Three Years Interim Plan, 2007/08-2009/10

### 4.0 PROCEDURE TO BE ADOPTED WHILE PREPARING THE REPORT

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

#### 4.1 DESK REVIEW

The following steps will be followed during the desk review:

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

#### 4.2 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

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

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

## Annex I : Terms of Reference

- The approved IEE report will be made accessible to interested parties and general public through information center of DDC and websites of ADB, DoI, IDAR and RRRSDP.

### 4.3 FIELD WORK

The IEE team will walk through along the proposed 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

**■ ■ ■ ■ ■**

## Annex I : Terms of Reference

### 6.0 REQUIREMENT OF THE IEE STUDY

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

### 6.1 TIME SCHEDULE

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

Table 1. Proposed work schedule for conducting IEE study

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

### 6.2 ESTIMATED BUDGET AND STUDY TEAM

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

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

The IEE will be carried out and prepared by DIST Environmental Specialist, with support from DIST team Bhaktapur. 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.



## Annex I : Terms of Reference

### 7.0 ENVIRONMENTAL BASELINE

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

### 8.0 ANALYSIS AND INTERPRETATION

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

### 9.0 IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT

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

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

#### 9.1 BENEFICIAL IMPACTS

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

## Annex I : Terms of Reference

### *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 stages:

#### *Physical environment*


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

#### *Biological environment*

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

#### *Socio-economic and cultural environment*

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



### 10.0 BENEFIT AUGUMENTATION/MITIGATION MEASURES

The IEE study will propose site-specific benefit augmentatin and mitigation measures to optimize the benefits expected from the sub-project and minimize/mitgate 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

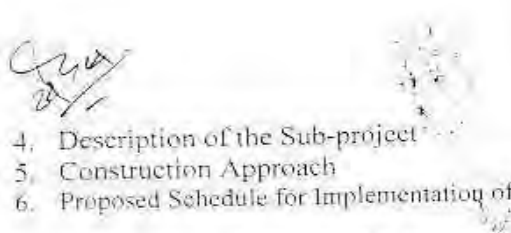
The study will ensure the implementation and monitoring of mitigation measures for minimizing adverse impacts and maximizing the beneficial impacts. This plan will also identify the key environmental monitoring indicators with respect to activities, methods and responsibilities in order to monitor the 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)**
- iv. **Executive Summary that includes:**
  - Background
  - Project Proponent
  - Objective
  - Relevancy of the Proposal
  - Project Description
  - Existing Condition
  - Identification of Impacts and Benefit Augmentation/Mitigation Measures
  - Environmental Management Plan
  - Conclusions and recommendations
- v. **Salient Features of the Project**
- vi. **Introduction:** This section should describe the project in simple terms and concisely, without missing relevant points but avoiding unnecessary details. The project description should provide following information:
  1. Background
  2. Relevancy of the proposal
    - Objectives
    - Methodology adopted
  3. Name and Address of the Proponent

## Annex I : Terms of Reference

- 
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.

## Annex I : Terms of Reference

### 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. Annexes

- 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 Zol
  - d. Number of households belonging to different food security category
- List of trees
- Maximization of slope cutting and preservation of vegetation cover
- Photographs

## Annex-II: Rapid Environmental Assessment (REA) Checklist

### Instructions:

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

**Country/Project Title:** Bhatekopati – Jitpur –Mahamanjushree – Chareli – Kalamasi - Nagarkot

**Sector Division:** RRRSDP

SCREENING QUESTIONS	Yes	No	REMARKS
<b>A. PROJECT SITING</b>			
IS THE PROJECT AREA ADJACENT TO OR WITHIN ANY OF THE FOLLOWING ENVIRONMENTALLY SENSITIVE AREAS?			
▪ CULTURAL HERITAGE SITE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
▪ PROTECTED AREA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
▪ WETLAND	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
▪ MANGROVE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
▪ ESTUARINE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
▪ BUFFER ZONE OF PROTECTED AREA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
▪ SPECIAL AREA FOR PROTECTING BIODIVERSITY	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>B. POTENTIAL ENVIRONMENTAL IMPACTS</b>			
WILL THE PROJECT CAUSE...			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
▪ encroachment on precious ecology (e.g. sensitive or protected areas)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

SCREENING QUESTIONS	Yes	No	REMARKS
<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>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<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>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<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>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<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>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<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>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<ul style="list-style-type: none"> <li>hazardous driving conditions where construction interferes with pre-existing roads?</li> </ul>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<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>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<ul style="list-style-type: none"> <li>creation of temporary breeding habitats for mosquito vectors of disease?</li> </ul>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<ul style="list-style-type: none"> <li>dislocation and compulsory resettlement of people living in right-of-way?</li> </ul>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<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>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<ul style="list-style-type: none"> <li>increased noise and air pollution resulting from traffic volume?</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>Being Black top dust will be reduced.</b>
<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>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

## Annex III

## RRRSDP Environmental Checklist

## A. GENERAL SOCIO-ECONOMIC SITUATION OF THE INFLUENCE AREA

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

**a. 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						

### 3. Existing services and infrastructures

[illegible]



[illegible]



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.

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

## 8. Name of settlement:

Address:

### A. 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			

### B. Dominant off-farm occupation in the settlement in descending order

- 1.....
- 2.....
- 3.....

### C. DEVELOPMENT POTENTIAL OF THE INFLUENCE AREA

C.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.No.	Name of Area	Description of Development Potential
1		
2		
3		
4		

C.2. Scope of the proposed linkage in view of promoting socio-economic development

S. No.	Sectors to get direct benefit	Describe how it will benefit
1		
2		
3		
4		

**D. Historic and Cultural Resources**

Type of Resource	Name/specification	Affecting activities	Location from project
Temples			
monuments			
Religious place			
others			

**E. Name of Existing Community Organisation**

**F. Trading pattern** -Imported items and Exported Items

G.a. Travel time from starting point - By Walking, By Vehicle

G.b. Transportation cost - Porter , Mule , Vehicle



#### Annex : IV Photograph





## Annex V: Abstract of Cost

SN	Description of works	Unit	Quantity	Rate	Amount
<b>1</b>	<b>General</b>			<b>NRs.</b>	<b>NRs.</b>
1.1	Occupational health and safety	LS	1	250,000	250,000.00
1.2	Insurance	LS	1	400,000	400,000.00
1.3	Compensatory plantation (plantation of 1350 plants in community forest area)	LS	1	139,063	139,062.50
1.4	Environmental Monitoring Cost	LS	1	480,000	480,000.00
1.5	Community Awareness and Livelihood Training	LS	1	200,000	200,000.00
1.6	Environmental awareness program for DDC/DTO Staffs for EMP implementation/Monitoring	LS	1	50,000	200,000.00
	<b>Sub-Total of 1</b>				<b>1,669,062.50</b>
<b>2</b>	<b>Road way</b>				
2.1	E/W excavation (Hard Soil)	m <sup>3</sup>	<b>3060</b>	<b>189.52</b>	<b>579,931.20</b>
2.2	Sub grade Preparation (Upto 10 cm)	m <sup>2</sup>	50820.00	35.54	1,806,142.80
2.3	Sub base (15 cm thickness with compaction)	m <sup>3</sup>	7623.00	1392.98	10,618,686.54
2.4	Base (10 cm thickness)	m <sup>3</sup>	3659.04	2502.90	9,158,211.22
2.5	Prime Coat (MC 30/ MC 70) with brushing	m <sup>2</sup>	36590.40	98.73	3,612,570.19
2.6	Premixed Carpeting	m <sup>3</sup>	1097.71	9980.89	10,956,142.72
	<b>Sub-Total of 2</b>				<b>36,731,684.67</b>
<b>3</b>	<b>Side Drain</b>				
3.1	E/W excavation (Hard Soil)	m <sup>3</sup>		189.52	0.00
3.2	Stone Mosonary (1:4)	m <sup>3</sup>	3081.72	5487.78	16,911,827.72
3.3	PCC (1:2:4)	m <sup>3</sup>	919.84	6948.60	6,391,614.12
	<b>Sub-Total of 3</b>				<b>23,303,441.84</b>
<b>4</b>	<b>Retaining structure</b>				
4.1	Gabion wall	m <sup>3</sup>	770.00	3415.68	2630069.75
	<b>Sub-Total of 4</b>				<b>2,630,069.75</b>
<b>5</b>	<b>Cross Drainage Structure</b>				
5.1	Hume pipe required	Rm	97.50	3651.00	355972.50
5.2	E/W excavation (Hard Soil)	m <sup>3</sup>	390.00	189.52	73,912.80
5.3	Concreting for footing (PCC 1:3:6)	m <sup>3</sup>	5.46	5933.51	32,396.96
5.4	Stone Mosonary (1:4) for wall	m <sup>3</sup>	45.15	5487.78	247,755.65
	<b>Sub-Total of 5</b>				<b>710,037.92</b>
	<b>Total Excluding Bio-Engineering</b>				<b>65,044,296.68</b>
<b>6</b>	<b>Bio-Engineering Works (2% of Total)</b>				<b>1,300,885.93</b>
	<b>Sub-Total of 6</b>				<b>1,300,885.93</b>
<b>7</b>	<b>Bridge (15*5 m)</b>	<b>Rm</b>	<b>15</b>	<b>700000</b>	<b>10,500,000.00</b>
	<b>Sub-Total of 7</b>				<b>10,500,000.00</b>
	<b>Total (1+2+3+4+5+6+7)</b>				<b>76,845,182.62</b>
	<b>VAT 13%</b>				<b>9,989,873.74</b>
	<b>Grand Total Including Bridge</b>				<b>86,835,056.36</b>
	<b>Cost per Km Including Bridge</b>				<b>7,557,446.16</b>

पृष्ठ १ बिहीबार, ११ असार, २०६६ Thursday, 25<sup>th</sup> June, 2009

ग्याँ पत्रिका



नेपाल सरकार  
स्थानीय विकास मन्त्रालय  
जिल्ला विकास समितिको कार्यालय  
ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना  
जिल्ला प्राविधिक कार्यालय  
भक्तपुर

## प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुभाषका लागि सार्वजनिक सूचना

(सूचना प्रकाशित मिति: २०६६/०३/११)

यस जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना, जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्न प्रस्ताव गरिएका निम्न सडकहरूको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ ।

प्रस्तावको नाम: जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नाम :	आयोजनाले प्रभावित पार्ने गा.वि.स.हरू	कैफियत
१	भत्केको पाटी-जीतपुर-महामंजुश्री- चरेली- कलामसी-नगरकोट सडक	वागेश्वरी- सुडाल- नगरकोट	
२	च्याम्हासिंह- अमलडोल-नाला सडक	भ.न.पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ्ग- चाँगु गा.वि.स भवन- नेपाल ईन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ्ग- चाँगु	

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

### राय सुभाष पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर  
फोन नं ६६१४८२६ फ्याक्स ६६१३२१५

जिल्ला प्राविधिक कार्यालय, भक्तपुर  
फोन नं ६६१४८५४, ६६१९२८०  
ईमेल:- dtobhaktapur@rrt.gov.np

## Annex: VII Deed of Enquiry

RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खटी आउनु भएका/भएकी सामाजिक परिचालक श्री विष्णु शर्मा ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावको सार्वजनिक सूचना मेरो रोहवरमा, प्रस्तावकको नाम को सूचना पाटीमा सूचना टाँस गरेको व्यहोरा प्रमाणित गर्दछु।

नाम:- श्री. पद्म शर्मा

ठेगाना:- श्री. पद्म शर्मा, गा.वि.स. सुङ्गल-२ नगरकोट

दस्तखत:- प्रस्तावकको नाम

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

(सूचना प्रकाशित मिति: २०६६/०३/११)

यस जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना, जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्ने प्रस्ताव गरिएका निम्न सडकहरुको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने मिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नाम:	आयोजनाले प्रभावित गर्ने गा.वि.स.हरु	कैफियत
१	भत्केको पाटी-जीतपुर-महामंजुश्री- चरेली- कलामसी- नगरकोट सडक	बागेश्वरी- सुङ्गल- नगरकोट	
२	च्याम्हासिंह- अमलडोल-नाला सडक	भ न पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ्ग- चाँगु गा.वि.स भवन- नेपाल ईन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ्ग- चाँगु	

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

राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६९४८२६ फ्याक्स ६६९३२९५	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६९४८५४, ६६९९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--



Annex: VII Deed of Enquiry



नेपाल सरकार  
स्वास्थ्य तथा जनसंख्या मन्त्रालय  
स्वास्थ्य सेवा विभाग

६६९०५४९  
६६९६०९०

मध्यमाञ्चल क्षेत्रीय स्वास्थ्य निर्देशनालय

## जिल्ला जनस्वास्थ्य कार्यालय

पत्र संख्या:- ०६६/०६६

चलानी नं:- ८

सुडाला उपस्वास्थ्य चौकी भक्तपुर

मिति:- २०६६.०४.१४ गते

**विषय:-** सार्वजनिक सूचना रोस गरिएको सम्बन्धमा ।

श्री जिल्ला प्राविधिक कार्यालय (प्रा.पु. तथा पु.आ.)  
भक्तपुर

उपरोक्त सम्बन्धमा श्राप्रीण पुर्ननिर्माण तथा पुर्नस्थापना  
आयोजना जिल्ला प्राविधिक कार्यालय भक्तपुरको प्रारम्भिक वातावर-  
णीय परिक्षण राख सुझावका लागि सार्वजनिक सूचना यस  
जा.वि.स. अर्न्तगतको उप-स्वास्थ्य चौकी मिर्खौलामा रोस  
गरिएको व्यहोरा जानकारीको लागि अनुरोध गरिन्छ ।

प्रस्तावको नाम - जिल्ला विकास समितिको कार्यालय, भक्तपुर

प्रस्तावको नाम - भत्केकोपाटी - भीतपुर -

महागज्जुझी - चोेली -

कलामसी - नाराकोट

सडक उप-आयोजना

०६६/०६६  
०६६/०६६  
वाकुराम सुवेदी



गाउँ विकास समितिको कार्यालय  
नगरकोट, भक्तपुर

०६६००४४

पत्र संख्या :- ०६६/०६७

मिति ०६.६.१४.१९४.....

चलानी नं :- ४६

विषय:- सुचना टोस गरीको बारे ।

श्री जिल्ला आयोजना कार्यालय  
भक्तपुर

उपरोक्त सम्बन्धमा तपाईं कार्यालयको पत्र सं. ०६६/०६३  
चलानी नं ७४ मिति ०६.६.३.१९ को पत्र पत्रानुसार प्राप्त भएको प्र  
वासवरणीय परिक्षण (IEE) सम्बन्धी राय सुझावको लागि मिति  
०६.६.१९ भन्दा १९ गते नयाँ पत्रिकाको प्रकाशित सुचना म  
गा. वि. सं. को सुचना परीक्षा, विद्यालय, स्वास्थ्य चौकी  
पत्र उपभोक्ता समिति तथा अन्य सार्वजनिक स्थानमा रहे  
भएको व्यक्तिलाई जानकारी को लागि अनुरोध गर्दछु ।

२०७४  
०६.६.१४

मणेश प्रसाद तिमिलसिन्  
गा. वि. सं. भक्तपुर



## Annex: VII Deed of Enquiry



RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खटी आउनु भएका/भएकी सामाजिक परिचालक श्री प्रो. रानी राणा ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावको सार्वजनिक सूचना मेरो रोहवरमा वडा नं. १, चण्डिकापुर, ललितपुर को सूचना पाटीमा सूचना टाँस गरेको व्यहोरा प्रमाणित गर्दछु।

नाम:- राम प्रसाद लामा

ठेगाना:- वागेश्वरी

दस्तखत:- राम प्रसाद लामा

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

(सूचना प्रकाशित मिति: २०६६/०३/११)

यस जिल्ला विकास समितिको कार्यालय जिल्ला प्राविधिक कार्यालय, ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना, जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्ने प्रस्ताव गरिएका निम्न सडकहरुको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नाम:	आयोजनाले प्रभावित पार्ने गा.वि.स.हरु	कैफियत
१	भत्केको पाटी-जीतपुर-महामंजुश्री- चरेली- कलामसी- नगरकोट सडक	वागेश्वरी- सुडाल- नगरकोट	
२	न्याम्हासिंह- अमलडोल-नाला सडक	भ.न.पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ्ग- चांगु गा.वि.स. भवन- नेपाल इन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ्ग- चांगु	

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

### राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६१४८२६ फ्याक्स ६६१३२१५	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६१४८२४, ६६१९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--

## Annex: VII Deed of Enquiry



RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खटी आउनु भएका/भएकी सामाजिक परिचालक श्री अस्ती खत्री ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावको सार्वजनिक सूचना मेरो रोहवरमा बागेश्वरी नगरपालिका को सूचना पाटीमा सूचना टाँस गरेको व्यहोरा प्रमाणित गर्दछु।

नाम:- बागेश्वरी नगरपालिका  
ठेगाना:- बागेश्वरी नगरपालिका, बागेश्वरी - ४  
दस्तखत:- [Signature]

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

(सूचना प्रकाशित मिति: २०६६/०३/११)

यस जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, ग्रामीण पुर्ननिर्माण तथा पुनर्स्थापना आयोजना, जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्ने प्रस्ताव गरिएका निम्न सडकहरुको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नाम:	आयोजनाले प्रभावित गर्ने गा.वि.स.हरु	कैफियत
१	भल्केको पाटी-जीतपुर-महामंजुश्री- चरेली- कलामसी- नगरकोट सडक	बागेश्वरी- सुडाल- नगरकोट	
२	च्याम्हासिंह- अमलडोल-नाला सडक	भ.न.पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ्ग- चांगु गा.वि.स भवन- नेपाल ईन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ्ग- चांगु	

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

### राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६१४८२६ फ्याक्स ६६१३२१५	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६१४८५४, ६६१९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--



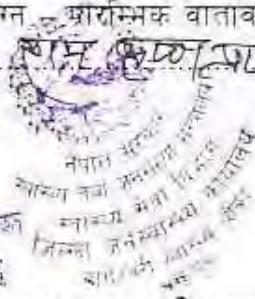
## Annex: VII Deed of Enquiry

RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खटी आउनु भएका/भएकी सामाजिक परिचालक श्री आरती खना ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावको सार्वजनिक सूचना मेरो रोहवरमा राय सुझाव पठाई सहयोग गरी दिनु हुन अनुरोध गरिन्छ को सूचना पाटोमा सूचना टाँस गरेको व्यहोरा प्रमाणित गर्दछु।

नाम:- राय सुझाव पठाई सहयोग गरी दिनु हुन अनुरोध गरिन्छ

ठेगाना:- काठमाडौं

दस्तखत:- राय सुझाव पठाई सहयोग गरी दिनु हुन अनुरोध गरिन्छ



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

(सूचना प्रकाशित मिति: २०६६/०३/११)

यस जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना, जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्न प्रस्ताव गरिएको निम्न सडकहरुको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ।

प्रस्तावको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नाम:	आयोजनाले प्रभावित गर्ने गा.वि.स.हरु	कैफियत
१	भक्तेको पाटी-जीतपुर-महामंजुधी- चरेली- कलामसी- नगरकोट सडक	वागेश्वरी- सुडाल- नगरकोट	
२	च्याम्हासिंह- अमलडोल-नाला सडक	भ.न.पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ्ग- चाँगु गा.वि.स भवन- नेपाल ईन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ्ग- चाँगु	

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

राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६१४८२६ फ्याक्स ६६१३२१५	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६१४८५४, ६६१९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--

## Annex: VII Deed of Enquiry



RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खटी आउनु भएका/भएकी सामाजिक परिचालक श्री अमरजी राय ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावको सार्वजनिक सुचना मेरो रोहवरमा नगरपालिका-१ को सुचना पाटीमा सुचना टाँस गरेको व्यहोरा प्रमाणित गर्दछु।

नाम:- श्री. अ. राय  
ठेगाना:- नगरपालिका-१  
दस्तखत:- श्री. अ. राय

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

(सूचना प्रकाशित मिति: २०६६/०३/११)

यस जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्ने प्रस्ताव गरिएका निम्न सडकहरूको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.न	आयोजनाको नाम:	आयोजनाले प्रभावित गर्ने गा.वि.स.हरू	कैफियत
१	भत्केको पाटी-जीतपुर-महामजुथ्री- चरेली- कलामसी- नगरकोट सडक	वागेश्वरी- सुडाल- नगरकोट	
२	चाम्हासिंह- अमलडोल-नाला सडक	भ.न.पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ- चांगु गा.वि.स भवन- नेपाल इन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ- चांगु	

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

### राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६९४८२६ फ्याक्स ६६९३२९५	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६९४८५४, ६६९९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--



## Annex: VII Deed of Enquiry



RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खटी आउनु भएका/भएकी सामाजिक परिचालक श्री आरती राहा ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावको सार्वजनिक सूचना मेरो रोहवरमा वि.सि.स. हरि को सूचना पाटीमा सूचना टाँस गरेको व्यहोरा प्रमाणित गर्दछु।

नाम:- वि.सि.स. हरि

ठेगाना:- चौमाली, भक्तपुर

दस्तखत:- वि.सि.स. हरि

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

(सूचना प्रकाशित मिति: २०६६/०३/११)

यस जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना, जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्न प्रस्ताव गरिएका निम्न सडकहरुको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नाम	आयोजनाले प्रभावित गर्ने गा.वि.स.हरु	कैफियत
१	भक्तेको पाटी-जीतपुर-महामंजुश्री-चरेली-कलामसी-नगरकोट सडक	वागेश्वरी-सुडाल-नगरकोट	
२	चाम्प्रासिंह-अमलडोल-नाला सडक	भ.न.पा-ताथली-चित्तपोल	
३	तेलकोट-छालिङ-चाँगु गा.वि.स.भवन-नेपाल ईन्जिनियरीङ्ग कलेज सडक	नगरकोट-छालिङ-चाँगु	

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

### राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६१४८२६ फ्याक्स ६६१३२१५	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६१४८५४, ६६१९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--

Annex: VII Deed of Enquiry



श्री बागेहिनी निम्न माध्यमिक विद्यालय  
Shree Bagehini Lower Secondary School

धुंगेनी, वार्ड नं. ४, बागेश्वरी, भक्तपुर  
(Dhungeni Ward No. 4, Bageswori Bhaktapur)

स्थापित २०२२  
(Estd 2022)

फोन ६-६१६५८१

(Phone) 6-616581

प.स. डी.प. २०६६

च.नं. २८

(Ref)


मिति:- २०६६/०८/१४

(Date)

विषय:- सूचना टाँस गर्दा मुचुब्का पठाएको बारे।  
(Subject)

बो (To) निम्ना विकास समितिबाट  
कार्यालय, भक्तपुर

उपरोक्त सम्बन्धमा जि.वि.स. भक्तपुरबाट मिति २०६६/०३/११ को सार्वजनिक सूचना यस विद्यालयमा प्राप्त भई उक्त सूचना यस विद्यालयबाट सूचना पाटीमा टाँस गरिएको थियो। यसै पत्र माफत जानकारीको लागि अनुरोध गरिन्छ।

  
(कुल्ला फेलाटि लागेको)



Annex: VII Deed of Enquiry



# श्री बहाल सामुदायिक वन उपभोक्ता समूह

वागेश्वरी, ४४५, भक्तपुर



पत्र संख्या:- ४६६/०६८  
चलानी नं.:-

मिति: ०६६/४/१४

विषय:- भुक्तिका, रोल गली भुक्तिका, पहाडको रोल

अ जिल्ला विकास समितिको  
कार्यालय भक्तपुर

उपरोक्त सूचनानुसार जिल्ला विकास समिति भक्तपुरको मिति २०६६/११/०५ को निर्णयानुसार लाना यान सामुदायिक वन उपभोक्ता समूहको प्रारम्भिक भुक्तिका लाना यान समूहको रोल गलीको व्यवहार यान प्रयोगको जानकारीका लागि कागजात गरिन्छ।

आदेश

अ राफाउडा वागेश्वरी  
गपुडा

Annex: VII Deed of Enquiry

फोन: ६६९४३९९

**गाउँ विकास समितिको कार्यालय**

बागेश्वरी, भक्तपुर

उप संख्या: ०६६/०६६/८६  
चलानी नं: ८६

मिति: २०६६/१४/१४

विषय: सूचना यस गाउँ मुकुलका पहाडको बारे ।

श्री जिल्ला विकास समितिको कार्यालय, जिल्ला आयोजना कार्यालय  
भक्तपुर,

दिएर एक सम्बन्धमा तहसिल व.  
भक्तपुरको मिति ०६६/०३/१५ सार्वजनिक सूचना यस गाउँको हरे  
मा प्राप्त भई, उक्त सूचना, गाउँको हरेको कार्यालय कोषरी  
विद्यालय, र अन्य सार्वजनिक स्थल र पसल पसलमा यस  
गाउँ मुकुलका पहाड दुवैतिन यसै पत्र साथ पठाईएको छैन  
जानकारीको लागि भन्नुत छ गाउँको ।

२०६६/१४/१४  
गणेश प्रसाद तिमिल्सिना  
गा. वि. स. (साथी)



## Annex: VII Deed of Enquiry



RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खटी आउनु भएका/भएकी सामाजिक परिचालक श्री ...लक्ष्मी...सुदाल...ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावको सार्वजनिक सूचना मेरो रोहवरमा श्री...सम्बन्धिता प्र. वि.....को सूचना पाटीमा सूचना टाँस गरेको व्यहोरा प्रमाणित गर्दछु।

नाम:- श्री लक्ष्मी सुदाल

ठेगाना:- सुदाल-५, जितपुर

दस्तखत:- श्री लक्ष्मी सुदाल

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

(सूचना प्रकाशित मिति: २०६६/०३/११)

यस जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना, जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्ने प्रस्ताव गरिएका निम्न सडकहरुको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नाम	आयोजनाले प्रभावित पार्ने गा.वि.स.हरु	कैफियत
१	भक्तपुरको पाटी-जितपुर-महामंजुश्री- चरेली- कलामसी- नगरकोट सडक	वागेश्वरी- सुदाल- नगरकोट	
२	च्याम्हासिह- अमलडोल-नाला सडक	भ.न.पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ्ग- चाँगु गा.वि.स भवन- नेपाल इन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ्ग- चाँगु	

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

राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६१४८२६ फ्याक्स ६६१३२१५	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६१४८५४, ६६१९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--

## Annex: VII Deed of Enquiry



RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खट्टी आउनु भएका भएकी सामाजिक परिचालक श्री ...ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IE) सम्बन्धी राय सुझावको सार्वजनिक सुचना मेरो रोहवरमा ...को सुचना पाटीमा सुचना टाँस गरेको ब्यहोरा प्रमाणित गर्दछु ।

नाम:- लातूराम सुर्वे  
 ठेगाना:- सुंडल - ६ मिर्झापूर  
 दस्तखत:- लातूराम सुर्वे

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

(सूचना प्रकाशित मिति: २०६६ ०३ ११)

यस जिल्ला विकास समितिको कार्यालय जिल्ला प्राविधिक कार्यालय, शमीण पुनर्निर्माण तथा पुनस्थापना आयोजना, जिल्ला आयोजना कार्यालय भक्तपुरद्वारा निर्माण गर्ने परस्ताव गरिएका निम्न सडकहरुको प्रारम्भिक वातावरणीय परीक्षण ।।EE प्रातिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ ।

प्रस्तावकको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नामः	आयोजनाले प्रभावित गर्ने गा.वि.स.हरू	कैफियत
१	भत्केको पाटी-जीतपुर-महामंजुश्री- चरेली- कलामसी-नगरकोट सडक	बागेश्वरी- सुडाल- नगरकोट	
२	च्याम्हासिंह- श्रमलडोल-नाला सडक	भ.न.पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ्ग- चाँगु गा.वि.स.भवन- नेपाल ईन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ्ग- चाँगु	

उक्त प्रस्तावको कार्यान्वयनबाट बातावरणमा पर्ने सक्ने प्रभावका बारेमा सम्बन्धित गा.वि.स. विद्यालय, स्वास्थ्य चौकी, वन उपभोक्ता समिति तथा अन्य सरोकारवाला व्यक्ति वा संस्थाले यो सुचना प्रकाशित भएको मितिले १५/पन्ध्र दिन भित्र तिनै ठेगानामा आफ्नो राय सभाब पठाई सहयोग गरी दिन हुन अनुरोध गरिन्छ ।

રાય સુભાગવ પઠાણને ઠેગાના

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६९४८२६ फ्याक्स ६६९३२९२	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६९४८५४, ६६९९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--



## Annex: VII Deed of Enquiry

RRRSDP आयोजना अन्तर्गत DIST भक्तपुरबाट खटी आउनु भएका/भएकी सामाजिक परिचालक श्री आरती खत्री ले वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसारको यसैसाथ संलग्न प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावको सार्वजनिक सूचना मेरो रोहवरमा राय सुझाव पठाई को सूचना पाटीमा सूचना टाँस गरेको व्यहोरा प्रमाणित गर्दछु।

नाम:- राय सुझाव पठाई

ठेगाना:- वागेश्वरी-सुडाल-नगरकोट

दस्तखत:- राय सुझाव पठाई

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

(सूचना प्रकाशित मिति: २०६६/०३/११)

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

प्रस्तावकको नाम: जिल्ला विकास समितिको कार्यालय/ जिल्ला प्राविधिक कार्यालय, भक्तपुर

सि.नं.	आयोजनाको नाम:	आयोजनाले प्रभावित गर्ने गा.वि.स.हरु	कैफियत
१	भक्तपुरको पाटी-जीतपुर-महामजुश्री- चरेली- कलामसी- नगरकोट सडक	वागेश्वरी- सुडाल- नगरकोट	
२	ब्याम्हासिह- अमलडोल-नाला सडक	भ.न.पा- ताथली- चित्तपोल	
३	तेलकोट- छालिङ्ग- चाँगु गा.वि.स. भवन- नेपाल ईन्जिनियरीङ्ग कलेज सडक	नगरकोट- छालिङ्ग- चाँगु	

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

### राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, भक्तपुर फोन नं ६६१४८२६ फ्याक्स ६६१३२१५	जिल्ला प्राविधिक कार्यालय, भक्तपुर फोन नं ६६१४८५४, ६६१९२८० ईमेल:- <a href="mailto:dtobhaktapur@rrr.gov.np">dtobhaktapur@rrr.gov.np</a>
--	--

### **Annex-VIII: Name of Organizations**

<b>SN</b>	<b>Name of organization</b>	<b>Address</b>	<b>Remarks</b>
1	Office of VDC	Bageswari, Bhaktapur	
2	Office of VDC	Sudal, Bhaktapur	
3	Office of VDC	Nagarkot, Bhaktapur	
4	Nagarkot Health Post	Nagarkot	
5	Post Office	Bageshwari	
6	Bageshwari Health Post	Bageshwari	
7	Shree Bagehini Lower Secondary School	Bageshwari-4	
8	Shree Bahal community forest	Bageshwari-3	
9	Sub Health Post	Bageshwari-3	
10	Shree Panchakanya Secondary School	Sudal-9	
11	Shree Krishna primary School	Jitpur -4, Sudal	
12	Sudal health Post	Sudal	
13	Shree kalika Secondary School	Nagarkot – 6	
14	Shree Saya Bangal Primary School	Sudal- 5	
15	Shree Gadgada Secondary School	Nagarkot-4	

*Source: RRRSDP Field Survey, 2009*

**Annex IX: List of Persons Consulted**

<b>Name</b>	<b>Designation</b>	<b>Address</b>
Sures K.C.	DTO	District Technical Office, Bhaktapur
Alka Shrestha	Engineer	DTO, Bhaktapur
Abhsihek Kumar Mahato	Team Leader	DIST, Bhaktapur
Kabita Kafle	SDC	Nagarkot VDC
Jaya Bahadur Lama	Farmer	Nagarkot VDC
Rajendra Timalisina	Farmer	Nagarkot VDC
Govinda Nepal	Farmer	Nagarkot VDC
Ram Kumar Nepal	Farmer	Nagarkot VDC
Suman Dahal	Farmer	Nagarkot VDC
Prem Nepal	Farmer	Nagarkot VDC
Sagar Ghimire	Farmer	Nagarkot VDC
Tanka Pd. Giri	Farmer	Nagarkot VDC
Shree Pd. Upadhya	Farmer	Nagarkot VDC
Upendra Dahal	Farmer	Nagarkot VDC
Tanka Bahadur Karki	Farmer	Bageswari VDC
Gyanu Bhandari	Farmer	Bageswari VDC
Renu Bhandari	Farmer	Bageswari VDC
Ramkrishna Baniya	Farmer	Bageswari VDC
Ambika Khadka	Farmer	Bageswari VDC
Madan Giri	Farmer	Bageswari VDC
Sajana Khadka	Farmer	Bageswari VDC
Gita Baniya	Farmer	Bageswari VDC
Madan Giri	Farmer	Bageswari VDC
Kamala Karki	Farmer	Bageswari VDC
Gyanu Karki	Farmer	Bageswari VDC
Sanu Maiya Baniya	Farmer	Bageswari VDC
Sarita Bhandari	Farmer	Bageswari VDC
Madhav Timalisina	Farmer	Sudal VDC
Krishna Pd. Timalisina	Farmer	Sudal VDC
Saraswati Dhakal	Farmer	Sudal VDC
Bimal Pariyar	Farmer	Sudal VDC
Kali Pariyar	Farmer	Sudal VDC
Koushalya Timalisina	Farmer	Sudal VDC
Sabitra Pariyar	Farmer	Sudal VDC
Parvati Timalisina	Farmer	Sudal VDC
Radhika Pariyar	Farmer	Sudal VDC
Maiya Pariyar	Farmer	Sudal VDC
Navaraj Pariyar	Farmer	Sudal VDC

*Source: RRRSDP Field Survey, 2009*

## Annex x: Summary of Meeting Minutes

मिति - २०६६-०३-२२

यस ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोगना (RRRSDP) को कार्यक्रम अर्हतगत यस भक्तपुर जिल्लाको अर्ल्कोपदी देखि जितपुर, चैरली हुँदै तगरकोट सम्मको सडक उप-आयोजनाको प्रारम्भिक वातावरणीय परीक्षण अध्ययनको बिलशिलामा सुडाल गा.वि.स.मा उपस्थित स्थानिय (अध्यक्ष <sup>महाप्रज्व</sup> बलराम) हरको उपस्थितमा वातावरणीय परिक्षण सम्वन्धि छलफल गरी राय सुझावहरु लिने कार्य बिन्नानुसार सम्पन्न गरियो।

### तपसिल

१. राम प्रसाद विमिलिसना - Bimal
२. माधव कार्की - महाप्रज्व
३. सरस्वती बस्नाल - सरस्वती बस्नाल
४. विमल परियार - Bimal
५. कृष्ण बहादुर कार्की - कृष्ण
६. रामकुमार कार्की - Ram Kumar
७. श्री राम कार्की - Shankar
८. प्रेम बहादुर शंख - Shankar
९. वलराम परियार - Balram
१०. कमला शंख - कमला शंख
११. रामकृष्ण बानियाँ - Ram Krishna
१२. सिर्जना खड्का - Sirjana
१३. सितादेवी बानियाँ - Sita Devi
१४. ज्ञानु कार्की - ज्ञानु
१५. राममाया विमिलिसना - Ram Maya
१६. सिताराम विमिलिसना - Sita Ram
१७. तारा गिरी - तारा गिरी



## Annex x: Summary of Meeting Minutes

### राय, सुझावहरू

१. यस सडक आयोजनाको विस्तार गर्दा बाटोमा पर्ने जाने पाये-पाँवा, मठ भन्डिरहरूको उचित संरक्षण गर्नुपर्ने।
२. सुझाव - ५ रातोपाटीमा पर्ने भन्डिर बाटोमा परी भत्काउनुपर्ने देखिएकोले त्यसलाई नभत्काई त्यहि ठाउँमै राख्नुपर्ने/कित आयोजनाले भर्को भन्डिर बनाउन सहयोग गर्नुपर्ने।
३. सडक खण्डमा पर्ने पानीका धाराहरूलाई हटाउनुपर्ने भएमा भर्को बनाउनुपर्ने।

## Annex x: Summary of Meeting Minutes

मिति - २०७८-०३-२२

ग्रामीण पुनर्निर्माण तथा पुर्नस्थापना आयोजनाको कार्यक्रम अन्तर्गत यस भक्तपुर जिल्लाको भत्केको पाये देखि शुरु गर्दै तगाकोट सम्म पुगेर यस उप-आयोजनाको विस्तारका लागि प्रारम्भिक वातावरणीय परिक्षण अध्ययनको शिलशिलामा सुदल तगाकोट गा.वि.स.को ~~कलामसिया~~ उपस्थित स्थानिय व्यक्तिहरूको उपस्थितिमा राय सुझावहरू लिने कार्य निम्नानुसार सम्पन्न भयो ।

### तपसिल

१. रामधरी नेपाल - सुदल
२. सिताराम नेपाल - Sitaran Nepel
३. गायत्री नेपाल - गायत्री
४. विमली सुनुवार - विमली
५. विहद वहादुर कामी सुनुवार - विहद
६. काङ्दी सुनुवार - काङ्दी सुनुवार
७. रामकृष्ण लामा - Ramkrishna
८. सर्मिला लामा - सर्मिला लामा
९. राम वहादुर लामा - राम वहादुर
१०. अच्युत नेपाल - अच्युत
११. अर्जुन नेपाल - अर्जुन
१२. देविकादत्त नेपाल - देविकादत्त
१३. निर्मला सुनुवार - Nirmala
१४. माया लामा - Maya Lamma
१५. सन्दिप लामा - Sandip
१६. खाडीकाङ्दी सुनुवार - खाडीकाङ्दी सुनुवार
१७. डुली सुनुवार - डुली

## Annex x: Summary of Meeting Minutes

### राय, सुभाषहन

१. यस आयोजनाबाट रैचान हुन लागेको भर्तेको पाटी - नगाकोट सडक यस नगाकोट गा.वि.स.को सामुदायिक वनको विचवाट जाने भएको ले यस जंगलमा भएका विभिन्न जातजातिका जडिवुटी तथा चराचुरुङ्गीहरूलाई नकारात्मक असर पर्न नदिन उचित व्यवस्था गर्ने ।
२. यस सामुदायिक वनमा रैका खुलविराइन ~~को~~ हटाउनु पर्ने हुने भएकाले त्यसलाई नकारात्मक असर पर्न नदिई वातावरण संरक्षणमा मद्दत गर्ने ।

## Annex x: Summary of Meeting Minutes

मिति - 2024-03-29

यस ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना कार्यक्रम अन्तर्गत  
भक्तपुर जिल्लाको भत्केको पाथी ढेरि पितपुर, चरेली, महाप्रजुशी  
हुँदै नगरकोट सम्म पुग्ने सडकको कार्य पुनर्निर्माण गर्न लागिफेले  
यस सडक आयोजनाले वातावरणमा पार्ने प्रभाव तथा खातावर्गीय  
परीक्षण अध्ययनको शिलशिलामा यस वागेश्वरी गा.वि.स.को स्थानिय  
महिला तथा भन्दा महातुभावहरूको उपस्थितिमा तपसिल बमोजिमका  
राय सुझावहरू लिने कार्य सम्पन्न गरियो ।

### तपसिला

१. गोपाल प्रसाद तिमिल्सिना - Chairman
२. नैज प्रसाद ढकाल - Secretary
३. खिताएम ढकाल - Member
४. राम नारायण वनियाँ - Ramunayan
५. यिता वनियाँ - सिता, बन्दा
६. नवराज घडीया - नवराज
७. जीमा सुवेदी - गोमा, सुवेदी
८. मन्ना सुवेदी - मन्ना
९. मन्ना सुवेदी - मन्ना
१०. कृष्ण प्रसाद अधिकारी - Krishna
११. सिता अधिकारी - सिता, अधिकारी
१२. अरस्वती ढकाल - अरस्वती ढकाल
१३. जीमा तिमिल्सिना - जीमा
१४. राजाराम तिमिल्सिना - राजाराम

## Annex x: Summary of Meeting Minutes

राय, सुभाष

१. राय अर्केकोपाटी - नगाकोट सडक विस्तार को क्रममा बढेमा पर्ने धार्मिक संस्थाहरू मध्ये पाँचौँ, चौताराहरूको उचित संरक्षण गर्नुपर्ने ।
२. राय अर्केकोपाटी - नगाकोट सडक विस्तार को क्रममा बढेमा पर्ने धार्मिक संस्थाहरू मध्ये पाँचौँ, चौताराहरूको उचित संरक्षण गर्नुपर्ने ।

## Annex XI a. Distribution of households by major occupation

SN	Settlement Name	Number of HH in Percentage			
		Agriculture and livestock	Labour and Porter	Business and commerce	Employees
1	Gairapati	60	30	5	5
2	Ratopati	55	25	10	10
3	kalihopi	70	20	3	7
4	Dwaretol	60	25	5	10
5	Manjushree	60	35	2	3
6	Kalamasi	50	40	7	3
7	Jitpur	50	40	3	7
8	Chareli	55	40	3	2
9	Shantitol	60	35	1	4
10	Nayabasti	70	20	7	3
11	Tukucha	100	0	0	0
12	Nagarkot	0	0	0	0

Source: RRRSDP Field Survey, 2009

## Annex XI b. Summary of public services and infrastructures

SN	Settlement Name	School	Post office	Shops and Lodge	Water Supply	Irrigation
1	Gairapati	2	-	5	7	-
2	Ratopati	5	-	12	9	-
3	kalihopi	4	1	13	9	-
4	Dwaretol	2	-	12	9	-
5	Manjushree	7	1	11	15	-
6	Kalamasi	9	1	20	19	-
7	Jitpur	11	-	21	23	-
8	Chareli	6	-	8	8	-
9	Shantitol	2	-	7	12	-
10	Nayabasti	1	-	5	4	-
11	Tukucha	-	-	2	3	-
12	Nagarkot	-	-	-	-	-
	<b>Total</b>	49	3	116	118	0

Source: RRRSDP Field Survey, 2009



### Annex XI c. Land holding pattern of settlement within Zol

Settlement Name	Number of HH					Total
	Land Less	< 1 ropani	1-5 ropani	5-10 ropani	10-20 ropani	
Gairapati	0	14	7	2	1	24
Ratopati	2	12	15	6	2	37
kalihopi	0	5	13	3	0	21
Dwaretol	0	5	7	3	2	17
Manjushree	1	20	75	20	7	123
Kalamasi	0	18	80	7	2	107
Jitpur	0	20	70	38	15	143
Chareli	0	27	25	15	7	74
Shantitol	0	5	12	3	0	20
Nayabasti	0	6	16	3	0	25
Tukucho	0	0	2	1	0	3
Nagarkot	0	0	0	0	0	0
<b>Total</b>	<b>3</b>	<b>132</b>	<b>322</b>	<b>101</b>	<b>36</b>	<b>594</b>

Source: RRRSDP Field Survey, 2009

### Annex XI d. Number of households belonging to different food security category

Settlement Name	Surplus	Sufficient for year	Sufficient for 3-9 month	Sufficient for 3 month	Sufficient for less than 3 month	Total
Gairapati	1	2	7	12	2	24
Ratopati	2	6	15	10	4	37
kalihopi	0	3	13	3	2	21
Dwaretol	2	3	7	4	1	17
Manjushree	7	20	75	16	4	122
Kalamasi	2	7	80	14	4	107
Jitpur	15	38	70	16	5	144
Chareli	7	15	25	25	2	74
Shantitol	0	3	12	5	0	20
Nayabasti	0	3	16	6	0	25
Tukucho	0	1	2	0	0	3
Nagarkot	0	0	0	0	0	0
<b>Total</b>	<b>36</b>	<b>101</b>	<b>322</b>	<b>111</b>	<b>24</b>	<b>594</b>

Source: RRRSDP Field Survey, 2009

बागेश्वरी भक्तपुर

फोन: ६६९४३९९

मिति: ०५/४/२०२०

36 विषय:- सिमाना रेखा /

श्री श्री गणेशाय नमः ।  
कामलिनी देवि

उपरोक्त संख्यामा बलाबला संख्यामा निमावली  
 २०२४ को पहिलो संवेदन २०२४ को नयाँ निमावली ६६३  
 वषाविले सयना हाँस गारेको छपहारो जानकारी  
 गराउनु सार्ने बलाबला मा कुनै प्रकारको आलोकन  
 प्रहृ नभने छपहारो जानकारी गराउनु / डिल बला  
 निमावली कोपमा परे मा-१९६ बला हल सय ५९३/६६३  
 ग बला छपहारो अनुभव गारेको

बदि कोईराला  
(सिपु)



पत्र संख्या - ०६३/६६  
चलानी न -

## गाउँ विकास समितिको कार्यालय



☎:-९६९२५८२

मिति २०६३/११/१८

विषय:- सिफारिस गरिएको बारे ।

श्री ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना  
भित्रका आयोजना कार्यालय भन्दा

उपयुक्त सम्बन्धमा बताएका संरक्षण नियमावली २०६४ को पहिलो  
संशोधन २०६६ समेत को नियम ६ (२) बमोजिमको शर्तमात्रै  
यस कार्यलयको सूचना पाटिमा लै गर्दै गरिएको छ। भन्दा  
गराइन्छ। साथै उक्त सडक निर्माणको लागि बताएको सम्पत्ति  
को प्रकारको पुतिबुल अवर तपाईं व्यक्त। समेत यस पत्रमा  
भन्दा गरिएको उक्त सडक निर्माण तथा विस्तारको लागि गा.वि.  
२.को तर्फबाट भएको सम्पत्ति जति पर्ने हो सो सम्पत्ति  
को सम्पत्ति आयोजनालाई निर्धारण उपमा रहने समेत पुतिबुल  
राखिने अझोष गरिन्छ।

सहायक  
२०६३

गा.वि. नं. सविन  
सुदामा गा.वि.





गाउँ विकास समितिको कार्यालय  
नगरकोट, भक्तपुर

६६८००४४

पत्र संख्या :- ०३३/०३५

चलानी नं :- ३०

मिति ०३३/०३/१९८०.....

विषय:- लिप्यारोप गरिएको वारे ।

श्री श्रीमान् पुनर्निर्माण तथा पुनर्स्थापना आयोगका  
जिल्ला आयोगका कार्यालय  
भक्तपुर,

उपरोक्त सम्बन्धमा वातावरण संरक्षण नियमावली २०५४ को (पां  
संशोधन २०५५ संस्करण) को नियम ६(२) पम्बोजीको सुचना पाटी  
शौल गरिएको व्यहोरा जानकारी गराउँदछु। साथै उक्त वारे निर्माण  
गै वातावरण मा पुर्न पुर्काको प्रतिकुल असर नपर्ने व्यहोरा समेत  
झपी गराउँदै उक्त वारे निर्माण कार्यमा यत्न गान। कि.सि.वाह छ  
सम्भव को बलयोग रहने व्यहोरा समेत अनुरोध गर्दछु।

०३३/०३/१९८०

गणेश प्रसाद तिमिल्सिना  
स. वि. स. कार्यालय

### Annex XIII: Topography, Geology, Soil Type along the Road

SN	Chainage		Location	Length	Elevation	Aspect	Geology	Soil Type
	From	To						
1	0	500	Gairapati	500	1330	North East	Quartzite / Schist	Ordinary Soil
2	500	1150	Gairapati	650	1325	North East	Quartzite / Phyllite	Ordinary Soil
3	1150	1800	Ratopati	650	1341	North East	Quartzite	Ordinary Soil
4	1800	3100	Jitpur	1300	1400	North East	Quartzite / Phyllite	Ordinary Soil
5	3100	4900	Jitpur	1800	1410	North East	Quartzite / Schist	Hard Soil
6	4900	5600	Chareli	700	1510	North East	Quartzite / Schist	Hard Soil
7	5600	7650	Shantitole	2050	1620	North East	Phyllite	Hard Soil
8	7650	8200	Kalamasi	550	1790	North East	Quartzite	Hard Soil
9	8200	9500	Sudal (Community Forest)	1300	1940	North East	Quartzite / Phyllite	Hard Soil
10	9500	11490	Nagarkot (Community Forest)	1990	2120	North East	Quartzite / Phyllite	Ordinary Soil

Source: RRRSDP Field Survey, 2009

#### Annex XIV: Summary of Land use pattern along the Road

Chainage		Existing Area (Ropani)	Village/ Settlement	Ward No.	Private Land (area in Ropani)				Public land
From	To				Khet	Bari	Barren	Jungle	
00+00	01+013	12.27	Bageshwori VDC/Gairapati	2	4.82	2.20	0.63	0.00	
01+013	2+939	19.76	Sudal VDC/Ratopati	5	8.86	7.37	1.87	0.00	
2+939	3+616	7.00	Sudal VDC/Jitpur	4	2.42	0.85	0.69	0.00	2.36
3+616	4+306	6.58	Sudal VDC/Faudal Tole	4	3.17	3.81	0.00	0.00	
4+306	5+146	8.41	Sudal VDC/Kafletimisina tole	7	0.00	8.10	0.00	0.00	
5+146	5+656	4.45	Sudal VDC/Dawarechautara	7	0.00	5.57	0.00	0.00	
5+656	6+427	7.80	Sudal VDC/Chareli	7	0.00	7.35	0.00	0.00	
6+427	6+847	4.58	Sudal VDC/Jhapra	7	1.59	2.08	0.00	0.00	
6+847	7+444	6.37	Sudal VDC/Nayabasti	6	2.36	3.01	0.00	0.00	
7+444	7+914	4.82	Sudal/Shantitole	8	0.00	4.42	0.00	0.00	
7+914	8+154	1.87	Sudal VDC/Kalamasi	5	0.00	1.00	2.00	3.00	
8+154	11+490	20.52	Sudal VDC/Nagarkot		0.00	0.00	0.00	0.00	35.42
		104.42			23	46	5	3	38

Source: RRRSDP Field Survey, 2009



## Annex XV: Settlements and Population within Zol of Road Alignment

SN	Major Settlements	VDCs	Total Population
1	Gairapati	Bageshwari	144
2	Ratopati	Sudal	222
3	kalihopi	Sudal	126
4	Dwaretol	Sudal	102
5	Manjushree	Sudal	738
6	Kalamasi	Sudal	642
7	Jitpur	Sudal	858
8	Chareli	Sudal	444
9	Shantitol	Sudal	120
10	Nayabasti	Sudal	150
11	Tukucho	Sudal	18
12	Nagarkot	Nagarkot	0
		<b>Total</b>	<b>3564</b>

Source: RRRSDP Field Survey, 2009

## **Annex XVI: Development Potentialities in Various Sectors**

SN	Sector	Development Potentiality
1	Agriculture	Potato, Vegetables, Dairy production
2	Tourism Promotion	Nagarkot as a tourist destination and Bindabasini Temple as a religious destination
3	Small and Cottage Industry	Bamboo products, Furniture and Dairy Industry
4	Trade and Business	Development of several rural market centres at various places along the road alignment and main market centres at Jitpur and Kalamasi

*Source: RRRSDP Field Survey, 2009*

## **Annex XVII: Religious Sites and their details along the Road alignment**

SN	Description	Chainage	Distance from center of Road alignment	Impact Type and Level
1	Ganesh Mandir	1+300	4 m	Doesnot require relocation or shifting of centre line
2	Om Shanti Mandir	3+140	7 m	No Impact
3	Radha Krishna Mandir	3+680	6 m	No Impact
4	Gumba	5+300	100 m	No Impact
5	Bindabasini Mandir	6+420	25 m	No Impact

*Source: RRRSDP Field Survey, 2009*

### Annex XVIII: Gabion Wall Structures for slope stabilization

Start Chainage	End Chainage	Length	Base Width	Height	X-Sectional Area	Quantity
		m	m	m	m <sup>2</sup>	m <sup>3</sup>
2+630	2+640	10.0	2.500	4.0	7.000	70.000
6+427	6+447	20.0	1.500	2.0	3.500	70.000
6+697	6+717	20.0	1.500	2.0	3.500	70.000
6+727	6+747	20.0	1.500	2.0	3.500	70.000
6+757	6+777	20.0	1.500	2.0	3.500	70.000
6+847	6+867	20.0	2.000	3.0	4.500	90.000
6+967	6+982	15.0	1.500	2.0	3.500	52.500
7+027	7+047	20.0	1.500	2.0	3.500	70.000
7+057	7+072	15.0	2.000	3.0	4.500	67.500
7+147	7+167	20.0	1.500	2.0	3.500	70.000
7+177	7+197	20.0	1.500	2.0	3.500	70.000
					<b>Total</b>	<b>770.000</b>

Source: RRRSDP Field Survey, 2009

### Annex XIX: Proposed Cross Drainage Structures for Water management

SN	Chainage	Dia. of Hume Pipe	Length of Hume Pipe	Earthwork	PCC (1:3:6)	Stone Masonary (1:4)	Remarks
		mm	Rm	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	
1	0+642	600	7.5	30.0	0.42	3.47	For Irrigation
2	0+849	600	7.5	30.0	0.42	3.47	"
3	1+402	600	7.5	30.0	0.42	3.47	"
4	1+882	600	7.5	30.0	0.42	3.47	"
5	2+262	600	7.5	30.0	0.42	3.47	"
6	2+582	600	7.5	30.0	0.42	3.47	"
7	3+088	600	7.5	30.0	0.42	3.47	"
8	3+535	600	7.5	30.0	0.42	3.47	"
9	3+947	600	7.5	30.0	0.42	3.47	"
10	4+382	600	7.5	30.0	0.42	3.47	"
11	6+847	600	7.5	30.0	0.42	3.47	"
12	6+967	600	7.5	30.0	0.42	3.47	"
13	7+297	600	7.5	30.0	0.42	3.47	"
		<b>Total</b>	<b>97.5</b>	<b>390.0</b>	<b>5.46</b>	<b>45.15</b>	

Source: RRRSDP Field Survey, 2009

### Annex XX: Detailed of list of Trees cutting

SN	Name of Owner	Address	Details of trees to be removed	
			Species	No.
1	Prem K Shrestha	Sudal	Uttis	1
2	Mutali pandit	Sudal	Paiyu	1
3	Mutali pandit	Sudal	Kavro	1
4	Guitamaya Karki	Sudal	Paiyu	1
5	Laxman Karki	Sudal	Bakayno	4
6	Padam Bd. Karki	Sudal	Bakayno	1
7	Chhote Karki	Sudal	Bakayno	1
8	Sanovai Dhulikhele	Sudal	Uttis	1
9	Purshotom Timalsina	Sudal	Uttis	3
10	Purshotom Timalsina	Sudal	Bakayno	1
11	Purshotom Timalsina	Sudal	Uttis	1
12	Purshotom Timalsina	Sudal	Bakayno	1
13	Purshotom Timalsina	Sudal	Uttis	1
14	Jakal Raj Timalsina	Sudal	Uttis	6
15	Jakal Raj Timalsina	Sudal	Uttis	1
16	Jakal Raj Timalsina	Sudal	Paiyu	1
17	Rudra Hari Timalsina	Sudal	Uttis	1
18	Parbati Phuyal	Sudal	Chiliune	1
19	Parbati Phuyal	Sudal	Uttis	2
20	Balkumari Kafle	Sudal	Arue	2
21	Shanti kafle	Sudal	Chiliune	1
22	Shanti kafle	Sudal	Chiliune	2
23	Govinda Timalsina	Sudal	Uttis	1
24	Ragunath Timalsina	Sudal	Uttis	12
25	Kul Pd. Timalsina	Sudal	Uttis	2
26	Kul Pd. Timalsina	Sudal	Paiyu	1
27	Murali Pd. Timalsina	Sudal	Paiyu	1
28	Kul Pd. Timalsina	Sudal	Bayar	2
29	Naniram Pariyar	Sudal	Kutomaro	1
30	Shyam Pd. Timalsina	Sudal	Paiyu	1
31	Shyam Pd. Timalsina	Sudal	Paiyu	9
32	Shyam Pd. Timalsina	Sudal	Paiyu	4
33	Shree pd. Timalsina	Sudal	Paiyu	3
34	Dilnath Timalsina	Sudal	Paiyu	1
35	Badra Timalsina	Sudal	Paiyu	2
36	Bharat Timalsina	Sudal	Hadebayer	1
37	Dhurba Pd. Timalsina	Sudal	Paiyu	2
38	Dhurba Pd. Timalsina	Sudal	Chiliune	1



39	Gynu Pariyar	Sudal	Uttis	5
40	Krishna Pd. Subedi	Sudal	Kaiyo	2
41	Krishna Pd. Subedi	Sudal	Naspati	1
42	Krishna Pd. Subedi	Sudal	Laharapipal	3
43	Krishna Pd. Subedi	Sudal	Uttis	6
44	Padam Nepal	Sudal	Paiyu	6
45	Padam Nepal	Sudal	Uttis	1
46	Padam Nepal	Sudal	Hadebayer	1
47	Ramhari Subedi	Sudal	Uttis	1
48	Karuna Nepal	Sudal	Uttis	3
49	Sushil Nepal	Sudal	Paiyu	2
50	Sushil Nepal	Sudal	Okhar	3
51	Community Forest	Sudal	Paiyu	1
52	Community Forest	Sudal	Uttis	1
53	Community Forest	Nagarkot	Uttis	2
54	Community Forest	Nagarkot	Paiyu	2
55	Community Forest	Nagarkot	Okhar	1
56	Community Forest	Nagarkot	Paiyu	3
57	Community Forest	Nagarkot	Uttis	2
Total				125

Source: RRRSDP Field Survey, 2009