

# Environmental Assessment Document

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## Initial Environmental Examination

Grant Number: 0093 NEP

April 2011

## Nepal: Rural Reconstruction and Rehabilitation Sector Development Program

### (Upgrading) Karkineta- Lunkhu Road Subproject, Parbat District

Prepared by the Government of Nepal

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

**Initial Environmental Examination (IEE) Report**  
of  
**(Upgrading) Karkineta- Lunkhu**  
Road Sub-project, Parbat

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

Proponent:  
**District Development Committee**  
**District Technical Office**  
KUSHMA, PARBAT

April, 2011

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

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## ABBREVIATIONS

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



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## NAME AND ADDRESS OF THE PROPONENT

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**Name of Proposal**

(Upgrading of) Karkineta - Lunkhu Road Subproject, Parbat District

**Name and Address of Proponent**

District Development Committee (DDC), District Technical Office (DTO), Parbat District  
Phone No: 067-421165

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## कार्किनेटा-लुंखु सडकको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन कार्यकारी सारांश

### पृष्ठभूमि

नेपाल सरकारले लामो दूरीले गर्दा क्षति भएका ग्रामीण पूर्वाधारहरूको पुनःनिर्माण र पुनःस्थापना को कार्य एशियाली विकास बैंक, स्विस् सरकार (SDC), ब्रिटिस सरकार (DFID) तथा ओपेक फण्ड (OFID)को आर्थिक सहयोगमा 'ग्रामीण पूर्वाधार पुनःनिर्माण र पुनःस्थापना आयोजना' नेपालको बिसवटा जिल्लाहरूमा संचालन गरिरहेको छ । पर्वत जिल्लामा अवस्थित प्रस्तावित कार्किनेटा-लुंखु ग्रामीण सडकको ग्रावेल स्तरको स्तरउन्नती सोही कार्यक्रम अन्तर्गत संचालन गर्न लागिएको एक उपआयोजना हो । १०.६६ कि.मी. लामो पर्वत जिल्लामा पर्ने उक्त कच्ची सडकमा हाल सबै मौसममा गाडीहरू चल्दछन् ।

### प्रस्तावक

प्रस्तावित सडक उप-आयोजनाको प्रारम्भिक वातावरणीय परीक्षणको प्रस्तावक जिल्ला विकास समिति र जिल्ला प्राविधिक कार्यालय, पर्वत हुन् । प्रस्तावकको प्रारम्भिक वातावरणीय परीक्षण स्विकृत गर्ने सम्बन्धित निकाय स्थानिय विकास मन्त्रालय हो ।

### उद्देश्य

प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन अध्ययनको मुख्य उद्देश्य प्रस्तावित उप आयोजना निर्माण तथा संचालन बाट उक्त क्षेत्रको भौतिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक वातावरणमा पर्ने प्रभावहरू पत्ता लगाई नकारात्मक प्रभावको न्यूनिकरण र सकारात्मक प्रभाव बढाउने उपायहरू बारे सुझाव दिनु, वातावरणीय अनुगमन योजना बनाई कार्यान्वयन गराउनु, तथा प्रस्तावित सडक आयोजनाको लागि प्रारम्भिक वातावरणीय परीक्षण गरे पुग्छ भन्ने कुराको यकिन गर्नु हो ।

### प्रस्तावको सान्दर्भिकता

प्रस्तावित सडकले पर्वत जिल्लाको दक्षिण पूर्वी भेगका वासिन्दाहरूलाई सदरमुकाम संगको पहुँच बढाउनेछ भने स्थानिय स्तरमा उत्पादन हुने तरकारी, दुध लाई बजार संग जोडी स्थानिय आय आर्जनमा अभिवृद्धि गर्नेछ । यस सडकले पर्वत जिल्लाको ग्रामीण बस्तीहरू लाई सिदार्थ राजमार्ग संग नौडाडामा जोड्छ । यस सडक पर्वत जिल्लालाई सिदार्थ राजमार्ग संग जोडने छोटो दूरीको बाटो हुनेछ ।

### अध्ययन प्रकृया

मे/जुन, २००९ मा फिल्ड सर्वेक्षणबाट लिइएको तथ्याङ्क तथा अन्य उपलब्ध तथ्याङ्कहरूको साथै प्राविधिक टोलीबाट पुनर्वास कार्यको सर्भेक्षणको सिलसिलामा संकलन गरेका तथ्याङ्कहरू केलिएर र सम्बन्धित गा.वि.स.को प्रभावीत घरधुरी सर्वेक्षण, लक्षित समुह सग छलफल गरि प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयार गरी निष्कर्ष तथा सुझावहरू दिइएको छ ।

यो प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन नेपाल सरकारको वातावरण संरक्षण ऐन २०५३, वातावरण संरक्षण नियामावली २०५४ अनुसार तथा स्थानिय विकास मन्त्रालयबाट मिति २०६६/०२/२५ मा स्विकृत गरिएको यसै प्रस्तावको कार्यसूची अनुसार तयार गरिएको छ । साथै, एशियाली विकास बैंकको Environmental Assessment Guideline, 2003 तथा Safeguard Policy Statement, 2009 को समेत अनुसरण गरीएको छ ।

### आयोजना को विवरण

प्रस्तावित सडकले पर्वत जिल्लाको दक्षिण पूर्वी भेगका बस्तीहरूलाई जिल्लाको सदरमुकाम साथै सिदार्थ राजमार्ग संग जोड्दछ । यसको कूल लम्बाइ १०.६६ कि.मि. छ । हाल उक्त ग्रामीण सडकको पुरै सडक खण्डमा गाडी चल्छ । यो सडक तीनवटा गाउँ विकास समितिहरू क्रमश कार्किनेटा, थापाथाना र भंगारा भएर जान्छ । सडकको कुल चौडाइ ५ मि. हुनेछ भने मोडहरूमा आवश्यकता अनुसारको चौडाइ हुनेछ । यो आयोजनाको कूल अनुमानित लागत नेरु. ८३,९४९,९९२.०० रहेको र प्रति कि.मी अनुमानित लागत नेरु. ७,८६७,९०३.०० लाग्ने देखिन्छ ।

### विद्यमान वातावरणीय स्थिति

यो उपआयोजना कार्किनेटा गा.वि.स को हिलेखोला नजिक, समुद्री सतहदेखिको १४०९ मी. को उचाईबाट शुरु भएर समुद्री सतहदेखिको १९०७ मी. उचाईमा पुगी भंगारा गा.वि.स को वयलनेटामा गई टुङ्गिन्छ । यस सडक खण्डमा विभिन्न प्रकारका चट्टानहरू जस्तै क्वार्टजाइट, सिष्ट आदि पाईन्छन् । प्रायः एलुभियल तथा बालुवा र पाँगो मिसिएको माटोहरू सडक खण्डमा पाईन्छन् । सडक खण्डमा पर्ने पानीका मुख्य श्रोतहरूमा हिलेखोला र काहुलेखोला पर्दछन् । प्रस्तावित सडक



क्षेत्रको वायु तथा पानीको स्तर सफा रहेको देखिन्छ, साथै ध्वनि प्रदूषणको समस्या छैन । यो सडक प्रायः खेती गरिएको जमीन, बाँझो जमीन, वन र वस्तीहरू भएर जान्छ ।

यस सडक खण्डमा पाइने मुख्य रुखहरूको प्रजातिहरूमा उत्तिस, चीलाउने, कटुस, सल्ला, लालीगुरास, मयल आदि पर्दछन् । यो सडक खण्ड कार्किनेटा सामुदायिक वन भएर जान्छ । चितुवा, दुम्सी, स्याल, बादर, वनबिरालो आदि वन्य जन्तुका साथै काग, कालिज, परेवा, भागेरा आदि पक्षीहरू यस सडक खण्ड भएर जाने वनमा पाइन्छन् । यो सडक खण्ड संरक्षित क्षेत्र वा मध्यवर्ती क्षेत्रमा पर्दैन यो सडक खण्डको प्रभावित क्षेत्र भित्र कार्किनेटा, थापाथाना र भंगारा गा.वि.स.का ४ वटा प्रमुख वस्तीहरू पर्दछन् । जम्मा घरधुरी संख्या ७६० र जनसंख्या ४०२३ रहेको छ । यहाँ वसोवास गर्ने विभिन्न जात जातिका मानिसहरूमा मुख्य गरी ब्राह्मण, तामाङ्ग, गुरुङ, तथा दलित(दमाई, कामी र सार्की) पर्दछन्।

यहाँका बासिन्दाहरूको मुख्य पेसा कृषि र पशुपालन हो । यातायातको राम्रो सुविधा नभएको तथा पहाडी क्षेत्र भएकोले कृषि उब्जनीले मात्र पर्याप्त नहुने हुदा यहाँका अधिकांश मानिसहरू श्रम रोजगारीका अन्य पेशामा काम गर्ने तथा केही मानिसहरू सरकारी तथा अन्य संस्थामा काम गर्ने, थोरै मानिसहरूले व्यापार व्यवसाय गर्ने गर्दछन् । साथै जनसंख्याको उल्लेखनीय प्रतिशत मानिसहरू जीविकोपार्जनको सिलसिलामा हिउँदमा पोखरा, बुटवल तथा भारत लगायतका विभिन्न ठाउँमा रोजगारीको लागि जाने गर्दछन् ।

### **प्रमुख वातावरणीय प्रभावहरू**

#### **सकारात्मक प्रभाव**

आयोजना बाट तत्कालै हुने लाभमा स्थानीय स्तरमा रोजगारीको सिर्जना हुनेछ । आयोजना संचालनको लागी करिव ६२९५६ मनव दिन वरावरको अदक्ष र १२५९१ मावन दिन वरावरको दक्ष श्रमशक्तीको आवश्यकता पर्नेछ । आयोजना संग सम्बन्धित कार्यमा (रोजगारीमा) गरीब, तथा पिछडिएका स्थानीय जनताले प्राथमिकता पाउनेछन् । यस चरणमा हुने अन्य लाभहरूमा वन्द व्यापारको बृद्धि हुने अवसर, आयोजनाले प्रदान गरेको शीपमुलक तथा जनचेतनामुलक तालिममा तथा आयोजना निर्माण कार्यमा सहभागी भई स्थानीय जनताको शीप बृद्धि हुने अवसर पर्दछन् ।

सडक सञ्चालनका चरणमा सडकले प्रभावित क्षेत्रका बासिन्दालाई वजार, सामाजिक सेवा प्रदायक स्थान तथा देशका अन्य भागहरूसम्म पुग्न छिटो, छरितो तथा सुविधाजनक पहुँचको अवसर प्रदान गर्नेछ । यस सडकले पर्वत जिल्लाको ग्रामीण वस्तीहरू लाई सिदार्थ राजमार्ग संग नैडाडामा जोड्छ । यस सडक पर्वत जिल्लालाई सिदार्थ राजमार्ग संग जोडने छोटो दूरीको बाटो हुनेछ । यसले स्थानीय जनताको आय तथा खाद्य सुरक्षामा अभिवृद्धि हुनेछ साथै स्थानीय श्रोत साधनको उपयोग गर्ने साना कृषि उद्योगहरूको प्रवर्द्धन हुनेछ । पहुँच तथा यातायातको अवसर संगै शिक्षा, स्वास्थ्य, संचार, वजार, वैकिङ्ग तथा अन्य आर्थिक तथा सामाजिक क्षेत्रहरूको विकास हुनेछ । यसले यस क्षेत्रका मानिसहरूको समग्र जीवनस्तर उकास्न मद्दत पुऱ्याउनेछ । सडकको सञ्चालनले स्थानीय जग्गा जमिनको मुल्य बृद्धि गर्न सहयोग पुऱ्याइ स्थानीय जग्गाधनीलाई लाभ पुऱ्याउनेछ ।

#### **आयोजना कार्यन्वयनबाट पर्न सक्ने नकारात्मक प्रभावहरू:**

सडक निर्माणको क्रममा भिरहरू काट्दा, खन्दा निस्किएको माटो तथा गेगर थुपार्दा, निर्माण सामग्री फिक्किलाई खानी सञ्चालन गर्दा त्यस क्षेत्रको भिरालो ढाँउहरूमा असर पर्न गई पहिरो तथा भू-क्षय हुन सक्ने सम्भावना रहन्छ । फोहर तथा खन्दा निस्किएका माटो, गेगर को उचित व्यवस्थापन हुन सकेन भने यसले भुक्षय बढाउन तथा जल प्रदूषण गराउन सक्छ । सडक निर्माणको दौरान बाटो चौडाई ५मी. कायम गर्नको लागी ०.५१ हेक्टर जंगल क्षेत्र प्रयोग हुनेछ, तथा विभिन्न जातका गरी करिव ९१ रुखहरू विरुवाहरू काटिनेछन्। सडक निर्माण क्रियाकलापबाट जीवजन्तुलाई असर पर्ने तथा सडक निर्माण कार्यमा खटिएका कामदारहरूले वनका जीवजन्तुलाई जिस्क्याउने तथा तिनको शिकार गर्नसक्ने सम्भावना रहेता पनि ति न्युन हुनेछ ।

सडक निर्माण कार्यको दौरान ०.५६ हेक्टर खेती गरिएको जमीन अधिग्रहण गर्नुपर्ने हुन्छ जसले गर्दा वार्षिक १.३ टन वालीको उत्पादनमा असर पुग्नेछ । सडक निर्माण कार्यको दौरान १० वटा घर (Ch 5+050-5+160) र १ वटा गा.वि.स. भवन(Ch 5+070) लाई क्षति पुग्ने देखिन्छ ।सडक निर्माण कार्यले खानेपानीको पाइप, कुलो, गोरेटो बाटो, पानीको मुहान आदिमा समेत असर पर्न सक्ने देखिन्छ । निर्माण कार्यको क्रममा श्रमिकहरू तथा स्थानीय जनतालाई स्वास्थ्य समस्या पर्न सक्छ तथा अप्रिय दुर्घटनाहरू घट्न सक्छन् ।

सडक सञ्चालनको चरणमा सवारी साधनको आवगमनबाट, वर्षायामको पानीबाट तथा स्थानीय भिरपहराहरूमा रुख विरुवा काट्दा भिरपहराहरूमा अस्थिरता बढ्न गई पहिरो जान सक्छ । सडक किनाराका नाला बाट वगेको अनियन्त्रित पानीले सडक मुनिका खेतवारीमा भुक्षय हुन सक्छ । सवारी साधनको बृद्धिले धुलो तथा ध्वनी प्रदूषण बढ्नेछ । त्यसैगरी सडकको सुधार संगै वन क्षेत्रसम्म भएको पहुँचको बृद्धिले वन सम्पदा तथा अन्य जन्तुमा चाप बढ्न गई वन सम्पदाको



क्षय र जीवजन्तुलाई असर पर्न सक्छ। सडकको सुधार संगै बस्ती र वजारको अव्यवस्थित विस्तार हुने सम्भावना र सडक क्षेत्र मिच्ने प्रवृत्ति देखिन सक्छ।

### प्रभाव न्युनिकरणका उपायहरू:

यस आयोजनाहरूलाई वातावरण मैत्री बनाउनका लागि सकारात्मक प्रभावलाई बढावा गर्ने तथा नकारात्मक प्रभावहरूलाई नियन्त्रण या न्युनिकरण गर्ने थुप्रै उपायहरू यस प्रतिवेदनमा प्रस्तावित गरिएको छ। जनताले राजी खुशीले वाटोको लागि दिएको वाहेक आयोजनाले गरिवीका रेखामुनि परेका परिवारहरूको अधिग्रहण गर्ने सबै जग्गाको प्रचलित मूल्य अनुसार क्षतिपूर्ति दिनेछ। सम्भव भए सम्म सडक मानव श्रम प्रविधिमा आधारित हुनेछ तथा LEP (श्रम मूलक वातावरण मैत्री सहभागीता मूलक) ढंगले निर्माण गरिने छ। आयोजनाले प्रभावित जनतालाई निर्माण कार्यमा रोजगारीमा तथा शिपमूलक तालिममा प्रथमिकता दिनेछ। आयोजना निर्माणको क्रममा जग्गा फँडानी गर्दा, जमिन काट्दा, खानी सञ्चालन गर्दा, खन्दा निस्किएका माटो, गेगर थुपार्दा तथा अन्य संवेदनशील कार्य गर्दा त्यस क्षेत्रको वातावरणलाई सुरक्षित राख्न विशेष ध्यान दिनेछ। निर्माण कार्यको क्रममा श्रमिकहरूको बिमा गरिने छ तथा सुरक्षाका सम्पूर्ण सामग्री श्रमिकहरूलाई प्रयोगमा ल्याउन दिइने छ। वन, जीवजन्तुको संरक्षण गर्न तथा सामाजिक अक्षुण्णतालाई कायम राख्न यस चरणमा जनचेतनामूलक कार्यक्रमहरू तथा तालिमहरू सञ्चालन गरिनेछ। निर्माण कार्यको क्रममा श्रमिकहरूको बिमा गरिने छ तथा सुरक्षाका सम्पूर्ण सामग्री श्रमिकहरूलाई प्रयोगमा ल्याउन दिइने छ। निर्माण स्थलहरूमा प्राथमिक उपचारको सामग्रीहरूको व्यवस्था गरिने छ। काटिएका रुख विरुवाहरूको क्षतिपूर्ति वापत १:२५+१०% अनुपातमा २५०३ रुखविरुवाहरू वृक्षारोपण गरिनेछ। सडक सञ्चालनका क्रममा सडकमा देखिएका अस्थिरताहरूलाई नियमित रूपमा मर्मत संभार गरिनेछ। सडकमा तथा सडकको कारण नजिकैको खेतवारीमा पानी जम्मा हुन नदिन उचित निकासको व्यवस्थापन गरिनेछ। सडक दुर्घटनाबाट बचाव गर्ने उपायहरू अवलम्बन गरिनेछ।

### वातावरण व्यवस्थापन योजना

यस प्रतिवेदनमा वातावरण व्यवस्थापन योजना अन्तर्गत आयोजनाबाट पर्ने संभावित असरहरू, असरहरूको प्रभाव, न्युनिकरण विधि, अनुगमन विधि तथा कार्यतालिका प्रस्तावित गरिएको छ। यसका साथै न्युनिकरणका उपायहरूको तथा अनुगमन कार्यको कार्यन्वयन गर्ने जिम्मेवार निकायहरूको पनि पहिचान गरिएको छ। अनुगमनका लागि आवश्यक भौतिक, जैविक, सामाजिक-आर्थिक तथा सांस्कृतिक वातावरणका विभिन्न अनुगमन सूचाङ्कहरूको पनि पहिचान गरिएको छ। वातावरण व्यवस्थापन योजना कार्यन्वयन गर्न निम्नानुसार खर्च हुने अनुमान गरिएको छ।

क्र. सं.	विवरण	रकम (ने.रु.)	कैफियत
१.	वातावरण सम्बन्धी जनचेतनामूलक तालिम तथा अन्य तालिम	३००,०००.००/-	आयोजनाको बजेटमा समावेश गरिने।
२.	श्रमिकहरूको बिमा	४००,०००.००/-	BoQ मा समावेश गरिने।
३.	बायो-इन्जिनियरिङ्ग/सडक छेउछाउ वृक्षारोपण	६०९,१०५.००/-	BoQ मा समावेश गरिने।
४.	पुनर्वास तथा जग्गा अधिग्रहण	४,८१३,१६४.००/-	पुनर्वास योजनामा समावेश गरिने।
५.	पुनर्निर्माण तथा अन्य	५००,०००.००/-	BoQ मा समावेश गरिने।
६.	क्षतिपूर्ति वृक्षारोपण	१५०,१८०.००/-	आयोजनाको बजेटमा समावेश गरिने।
७.	सामाजिक कार्य लागत	४५३,०००.००/-	सामाजिक योजना तथा आयोजनाको बजेटमा समावेश गरिने।
८.	पेशागत स्वास्थ्य सुरक्षा तथा जानकारीमूलक सूचनापाटी	६५०,०००.००/-	BoQ मा समावेश गरिने।
९.	अनुगमन तथा मूल्यांकन	२००,०००.००/-	आयोजनाको बजेटमा समावेश गरिने।
	जम्मा :	८,०७५,४४९.००/-	

### निष्कर्ष

परिचान गरिएका प्रायः वातावरणीय प्रभावहरू थोरै क्षेत्रमा तथा मुख्य गरी निर्माणकार्यका वखतमा सिमित रहेको पाइएको छ। प्रस्तावित न्युनिकरण विधिको पालना गरिएमा पहिचान गरिएका वातावरणीय प्रभावहरूको न्युनिकरण अथवा नियन्त्रण गर्न सकिनेछ। सडक निर्माण गर्दा प्रभावित व्यक्तिहरूको सम्पत्तीको क्षतिपूर्ति गर्न पुनर्वास योजनाको आवश्यकता पर्नेछ। वातावरण व्यवस्थापन योजना अन्तर्गत उल्लेख गरिएको उपायहरूको कार्यान्वयन गरिएमा यस आयोजनाको कार्यान्वयनले आयोजना क्षेत्रको भौतिक, जैविक, सामाजिक - आर्थिक तथा सांस्कृतिक वातावरणमा उल्लेखनीय नकारात्मक प्रभाव नपर्ने देखिन्छ। यस प्रारम्भिक वातावरणीय अध्ययनको आधारमा यस प्रतिवेदनमा उल्लेख गरिएको वातावरणीय व्यवस्थापन योजनालाई पूर्ण रूपमा लागु गरी प्रस्तावित आयोजना कार्यान्वयन गर्न सिफारिश गरिन्छ। आयोजनाको वातावरणीय प्रभाव मूल्याङ्कन स्तरमा अध्ययन गर्न आवश्यक नरहेको सिफारिश समेत गरिन्छ।



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## EXECUTIVE SUMMARY IN ENGLISH

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### Background

Government of Nepal has received financial assistance from ADB, SDC, DFID and OFID for implementation of the Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP). The RRRSDP aims for reconstruction and rehabilitation of rural infrastructures damaged in the twenty conflict affected districts of the country. The Proposed Karkineta- Lunkhu Rural Road is one of the Sub Projects under RRRSDP, which is proposed by Parbat district for upgrading into gravel standard. At present, the road is earthen all weather and total length of the road is 10.66 km.

### Project Proponent

The proponent and executing agencies of the proposed road Subproject for Initial Environmental Examination (IEE) is District Development Committee (DDC)/District Technical Office (DTO) at the district level. Ministry of Local Development (MoLD) is the authorized body for approving the IEE of the proposed Subproject.

### Objectives of the IEE Study

The main objective of the IEE study is to identify the impacts from the construction and operation of the proposed Subproject on the physical, biological, socio-economic and cultural environment of the Subproject area. The objective of IEE study is to recommend site specific environmental mitigation measures for adverse impacts, benefit augmentation measures for beneficial impacts, prepare and implement environmental monitoring plan and make sure that IEE is sufficient for the proposed road sub-project.

### Relevancy of the Proposal

The proposed Subproject will provide access to district headquarter, living in rural area of Parbat district. As a result socio-economic condition of people living in that area will enhance as local products like vegetables, fruits will get access to market. This road helps to links rural areas of Parbat district with Siddhartha highway at Naudada. This is shorter route to reach Siddhartha Highway from Parbat district (only 20 KM from Karkineta).

### Study Methodology

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

The IEE report has been prepared following the Environmental Protection Act, 2053 BS (1997 AD) and Environmental Protection Rules, 2054 BS (1997 AD) (second amendment 2007) of the Government of Nepal (GoN); and Environmental Assessment Guidelines, 2003 and Safeguard Policy Statement, 2009 of ADB. The report follows the Terms of Reference for IEE Study approved by MoLD on 25/02/2066 BS.

### Project Description

The proposed road links with South-Eastern part of the remote community of Parbat district with the district headquarter and joins the Siddhartha Highway at Naudada. The total length of the road is 10.66 Km. The road alignment is already opened and motorable. The road passes three village development committees namely Karkineta, Thapathana and Bhangara. The average width of the road is 5 m and geometry will be improved as per design required. The total project cost is NRs 83,941,992.00 and per km cost is NRs. 7,867,103.00.

### Existing Environmental Condition

The road starts near Hilekhola of Karkineta VDC at 1409 m amsl and ends at Bayalneta of Bhangara VDC at 1907m amsl. Various kind of rock such as quartzite, schist etc. were observed along the road alignment. Various types of soil such as boulder mixed soil and alluvial soil are found along the road alignment. Main water bodies found across the road alignment are Hilekhola and Kahulekhola. Ambient air and water quality of the proposed project area is observed to be good and there is no noise pollution. The road mainly passes through cultivated land, forest, barren land and settlements.

The dominant forest species found in the road alignment are Uttis (*Alnus nepalensi*), Chilaune (*Schima wallichii*), Katus (*Castanopsis indica*), Salla (*Pinus roxburghii*), Laligurans (*Rhodendron arboretum*) and Mayal (*Pyrus pashia*). The road passes through Karkineta Community Forest. Syaal (*Canis aurieus*), Monkey



(Macaca mulatta), Jungle Cat (Felis chaus), Fox (Vulpes vulpes), Dumsi (Hystrix indica) and Chituwa (Panthera pardus) are the wild animals reported in the forests area. Similarly birds like Crow (Corvus splendens), Dove (Zenaida macroura), Sparrow (Passer domesticus), Kalij (Lophura lencomelana), and Pigeon (Columba livia) are found in the project area. The road does not fall under any protected.

There are 4 major settlements along the ZoI of the proposed road alignment in Karkineta, Thapathana and Bhangar VDCs with total population of 4023 persons (760 households). Diverse ethnic groups such as Brahmin, Tamang, Gurung and occupational caste (Damai, Kami, and Sarki) live along the ZoI of road alignment.

Subsistence agriculture and livestock farming are the main occupation. Due to limited transportation facilities and high altitude, agriculture farming is not enough for subsistence level due to small landholding size and lack of irrigation facilities. Therefore people are involved in government and non government services and few are involved in business. Moreover, significant percentage of the economically active male population also migrates to various places including Pokhara, Butwal and India seasonally during slack farming season for employment.

## Major Environmental Impacts

### Beneficial Impacts

The immediate benefit from this road Subproject is employment opportunities. The implementation of Subproject requires about 62956 person days of unskilled and 12591 person days of skilled manpower. The project will give priority to the poor, ethnic minorities and disadvantaged local people for employment opportunity. Other beneficial impacts include enhancement of local business, development in skills of local people from skill developing training, awareness raising training and involvement in the construction of the project.

During operation stage of road, the people from the ZoI will get easy and fast accessibility to markets, social services and other regions of the country. This road helps to link rural areas of Parbat district with Siddhartha highway at Naudada. This is shorter route to reach Siddhartha Highway from Parbat district (only 20 KM from Karkineta). This will ensure better economic condition and food security of the people living in the ZoI of the project area. Moreover this will promote the small agro based industries that use local resources. Easy access and opportunity of better transportation system will develop other sectors like education, health, communication, market, banking and other socio-economic sectors. This will increase the overall living condition of the people living in ZoI of project area. The better land network will result in increased land price which will be beneficial for land owners.

### Adverse Impacts

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

During road widening and construction required 0.51 Ha of forest area and different type of tree total 91 nos. will have to be cleared. Also during construction of road there might be possible impacts on wildlife as workers might harass/ hunt the wildlife in the nearby forests, however, such effects are very minimum.

During construction stage, there will be loss 0.56 Ha of agricultural land which results in annual reduction of more than 1.3 Metric Tons of agricultural production. **10 residential houses (Ch 5+050- Ch 5+160) and 1 VDC building (Ch 5+070) will be affected.** Also water supply lines, irrigation and water sources, foottrail will be affected during construction of road. Labours and local people are prone to health effects and accidents relating to construction activities.

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

### Mitigation measures

The various benefit augmentation measures and adverse impact mitigation measures have been proposed in the report to make this project environment friendly. Other than land donated by local people for the projects, adequate compensation will be provided to affected poor and marginalized household for all the lands that need



to acquire. The construction of road will be based on Labour-based, Environment friendly and Participatory (LEP) Approach to extend feasible. Affected families will be given high priority for employment and skill development trainings. Necessary measures will be taken to reduce the adverse effects that might arise from site clearance, cutting of slopes, disposal of spoils and quarrying activities. Necessary trainings and awareness programs will be conducted. Necessary measures will be adopted for protection of flora and fauna. At construction site, the workers will be provided insurance, first aid facilities and safety equipments. Loss of trees will be compensated by planting 2503 numbers of trees in the ratio of 1:25 and additional 10 percent for the numbers of trees that need to be cut down. Proper maintenance and proper drain system will be provided to prevent accumulation of water on the nearby agricultural lands during operation. Adequate road safety measures will be provided to minimize road accident.

#### **Environmental Management Plan**

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

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

SN.	Description	Amount (NRs.)	Remarks
1	Awareness raising training and other training	300,000.00	To be included in project cost
2	Insurance of workers	400,000.00	To be included in BoQ
3	Bio-engineering/ Roadside Plantation	609,105.00	To be included in BoQ
4	Resettlement Cost (Compensatory for properties)	4,813,164.00	To be included in Resettlement plan
5	Restoration or relocation of affected infrastructures, Spoil management, Reinstatement of quarry, stockpiling etc.	500,000.00	To be included in BoQ
6	Compensatory Plantation cost	150,180.00	To be included in project cost
7	Social Cost	453,000.00	To be included in Social plan, project cost
8	Occupational health and safety, Health awareness, Information signboard	650,000.00	To be included in BoQ
9	Monitoring	200,000.00	To be included in project cost
	<b>Total</b>	<b>8,075,449.00</b>	

#### **Conclusion and Recommendation**

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



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## 1.0 Introduction

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### 1.1 Background

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

2. Parbat District is one of the project districts under RRRSDP. This Proposal is for upgrading in gravel standard of the 10.66 km long Karkineta- Lunkhu district road in Parbat District

### 1.2 The Name and Address of Proposal

Name of Proposal:	(Upgrading of ) Karkineta- Lunkhu District Road, Parbat District, Nepal
Name of Proponent:	District Development Committee, District Technical Office, Parbat
Address of Proponent:	Kushma, Parbat
	Phone No: 067-420151

### 1.3 Need and Objectives of the IEE Study

3. **Need:** IEE study of the Proposal is a legal necessity according to Environment Protection Act, 2053 BS (1997 AD); and Environment Protection Rule, 2054 BS (1997 AD) of GON. Similarly, an IEE study is required according to provision of Environmental Assessment Guidelines, 2003; and Safeguard Policy Statement, 2009 of ADB.

4. **Objectives:** The main objective of the IEE study is to identify the impacts from the implementation and operation of the Proposal on the physical, biological, socio-economic and cultural environment of the sub-project area. The IEE study recommends practical and site specific environmental mitigation and enhancement measures, prepare and implement environmental monitoring plan and make sure that IEE is sufficient for the proposed road sub-project.

### 1.4 Methodology adopted

5. The IEE study has followed the provisions of the EPA, 2053 BS (1997 AD) and EPA, 2054 BS (1997 AD), and the provisions of ADB. It follows methodology suggested in the approved Terms of Reference for IEE Study (please refer Annex 1). For the collection of environmental features related to bio physical environment, maximum 100 meter distance observable from the centre of the road alignment was taken as an influence area and socio-economic and cultural environment was taken of ZoI (one and half hour walking distance from the centre line of the road) information of the Subproject area. Data collection on physical, biological, socio-economic and cultural environment of the Subproject area was done in May/June 2009. Field survey, sample household survey, organization of Focus Group Discussions in the related VDCs was carried out and necessary information was collected. The DDCs officials, VDC and Community Groups were also contacted to verify information to solicit their concerns. Based on the analysis of information the impacts have been predicted, mitigation measures prepared and monitoring plan has been developed.

### 1.5 Public Consultation

6. 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 **Shrawan 10, 2066** in the Naya Patrika, a national daily newspaper (see **Annex V**) seeking written opinion from concerned VDCs, DDC, schools, health posts and related local organizations. A copy of the public notice was also affixed in the above mentioned organizations and deed of enquiry (muchulka) was collected (see **Annex VI** for deed of inquiry and **Annex VII** 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 VIII** for the list of persons consulted). Moreover, Focus Group Discussions were conducted to collect and solicit information regarding the bio-physical and socio-economic and cultural aspects of the road. Summary of minutes of meeting with local people is given in **Annex IX** and following **Table 2.1**. The FGDs were held at three different VDCs in the ZoI of the road. Existing environmental conditions and socio-economic data are tabulated in **Annex XI a, b, c and d**.
- Draft IEE report will be sent to Karkineta, Thapathana and Bhangara VDCs for Public disclosure. Recommendation letters were also obtained from above mentioned VDCs as given in **Annex X**. A copy of draft IEE will also be kept in information center of DDC, Parbat 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 1.1: Summary of FGD Meeting**

Location	Date	No. of Participants		Issues and Suggestions	Decision
		Male	Female		
Bhangara	2066 /05/05	8	3	1. There will not be adverse impacts on the environment due to implementation of this project. 2. Water supply project was requested in ward no 1 & 2 of Bhangara VDC. 3. Construction of Mule track road in ward no.6, Suntole in Karkineta VDC.	1. Adequate benefit augmentation and mitigation measures will be taken to enhance the beneficial impacts and mitigate adverse impacts. 2. Water supply projects will be included in supplementary projects of RRRSDP. 3. Construction of Mule Track road is not within the scope of this subproject thus, it will not be included in this subproject.
Karkineta	2066 /05/27	8	3		
Thapathana	2066 /05/10	7	4		

## 1.6 Information Disclosure

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

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



## 2.0 Description of the Proposal

8. The proposed 10.66 km long earthen Karkineta- Lunkhu road Subproject lies in the South- Eastern part of Parbat district in Western Development Region of Nepal. This road helps to links rural areas of Parbat district with Siddhartha highway at Naudada. This is shorter route to reach Siddhartha Highway from Parbat district (only 20 KM from Karkineta). This road starts from Karkineta (Hilekhola) VDC and ends at Bhangara (Bayalneta) VDC. In between, the road passes through Karkineta, Thapathana and Bhangara VDCs. The road was opened in 2001 and vehicles ply during dry and rainy season. The alignment requires widening, geometrical correction in bends, and grade improvements. Activities included during the road construction are: Site clearance, Pavement work, Structures work (toe wall, retaining wall, breast wall, river training etc.), Earthwork, Bio-engineering, Cross drainage works and Side drain works and Bridge work. The location and alignment of the road is given in **Figure 1.1 and 1.2**. The total project cost is NRs. 83,941,992.00 and per km cost is NRs. 7,867,103.00 as shown in **Annex III**.

### 9. Salient features of the Road Subproject

1. Name of the Project	:	Karkineta- Lunkhu Road
Project Components	:	Road
Project Activities	:	Construction Stage Site clearance, Pavement work, Structures work (toe wall, retaining wall, breast wall,), Earthwork, Bio-engineering, Cross drainage works and Side drain works.
		Operation Stage Maintenance Works
2. Location		
2.1 Geographical Locations		
2.1.1 Start Point	:	Hilekhola of Karkineta VDC
2.1.2 End Point	:	Bayalneta of Bhangara VDC
2.2 Geographical Feature		
2.2.1 Terrain	:	Mid Hill
2.2.2 Alignment	:	Ridge/Upper valley
2.2.3 Altitude	:	1409 m amsl at Hilekhola and 1907 m amsl at Bayalneta
2.2.4 Climate	:	Sub-Tropical, Temperate
2.2.5 Soil	:	Boulder mixed, alluvial soil and clay mixed soil.
2.2.6 Landuse Pattern	:	Cultivated Land, Barren Land, Forest and Built up Area.
		The Road alignment does not pass through any national Park, conservation area hunting reserve, wetland and their Buffer zone or through any archeological/historical important place.
3. Classification of Road	:	District Road (Rural Road Class A)
4. Length of Road	:	10.66 km
5. Standard of Pavement	:	Gravelled
6. Design speed	:	20 km/hr
7. Major Settlements:		
7.1 Major Settlements	:	Aahal Gairo, Rata Mata, Karkineta Bazaar and Bayalneta
7.2 No. of Household	:	659HHs
7.3 VDCs along the Road	:	Karkineta, Thapathana and Bhangara.
8. Right of way	:	5m each side (center line)
9. Formation width	:	5 m
10. Carriageway width	:	3m
11. Lane	:	Single
12. Existing Traffic	:	4 bus, 12 mini truck/pick up ply daily during dry season
13. Structures		
13.1 Dry Stone Masonry	:	1276 Cum
13.2 Cement concrete work	:	27.58 Cum
13.3 Dry Stone wall	:	1,276.6 Cum
13.4 Gabion Wall	:	2,113.50 Cum



13.5 Stone Pitching	:	3,084.75 Cum
14. Bio-Engineering	:	1% to total cost (NRs. 609,105.00)
15. Earth Work		
15.1 Cutting	:	38,908.38 Cum
15.2 Filling	:	10,499.500 Cum
16. Project cost		
16.1 Total Cost (NRs)	:	NRs. 83,941,992.00
16.2 Costs per km (NRs.)	:	NRs 7,867,103.00
17. Employment generation:		
17.1 Total employment	:	75547
17.1.1 Skilled	:	12591
17.1.2 Unskilled	:	62956
18. Gradient	:	Max. 12%
19. Radius	:	Min. 10

## 2.1 Relevancy of the proposal

10. Despite the project area being within Parbat District, it lies in South-eastern part of the district. The area has high potential in production of vegetable and fruits. This road helps to links rural areas of Parbat district with Siddhartha highway at Naudada. This is shorter route to reach Siddhartha Highway from Parbat district (only 20 KM from Karkineta). This road helps to reduce travel time and cost of local people to access other part of the country. The proposed road will enhance access to market and social services to the people of the area, and will significantly contribute in their socio-economic development. Better access will also open door to new development opportunities.

## 2.2 Construction Approach and Activities

11. The construction approach will be labour-based, environment-friendly and participatory (LEP) ensuring minimum damage to local environment and Contractor approach where manual works are not possible.

12. Activities included during the road construction are: Site clearance, Pavement work, Structures work (toe wall, retaining wall, breast wall, river training etc.), Earthwork, Bio-engineering, Cross drainage works and Side drain works and Bridge work.

## 2.3 Proposed Schedule for Implementation of Sub-project

13. Following table shows the proposed implementation schedule for Karkineta-Lunkhu road sub-project:

**Table 2.1: Sub-project implementation schedule**

SN	Activity	2008 IV	2009				2010				2011			
			I	II	III	IV	I	II	III	IV	I	II	III	IV
1	Detailed survey, design and estimate													
2	Preparation of resettlement plan													
2.1	Life skill and income generation training													
3	Environment Assessment and implementation													
3.1	IEE report preparation and approval from MoLD													
3.2	Implementation of EMP													
3.3	Environmental monitoring													
4	Work implementation													
4.1	Civil construction work by contractors													
4.2	Civil construction work by RBGs													

### Note:

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



Figure 2.1 Map of Nepal showing Parbat District

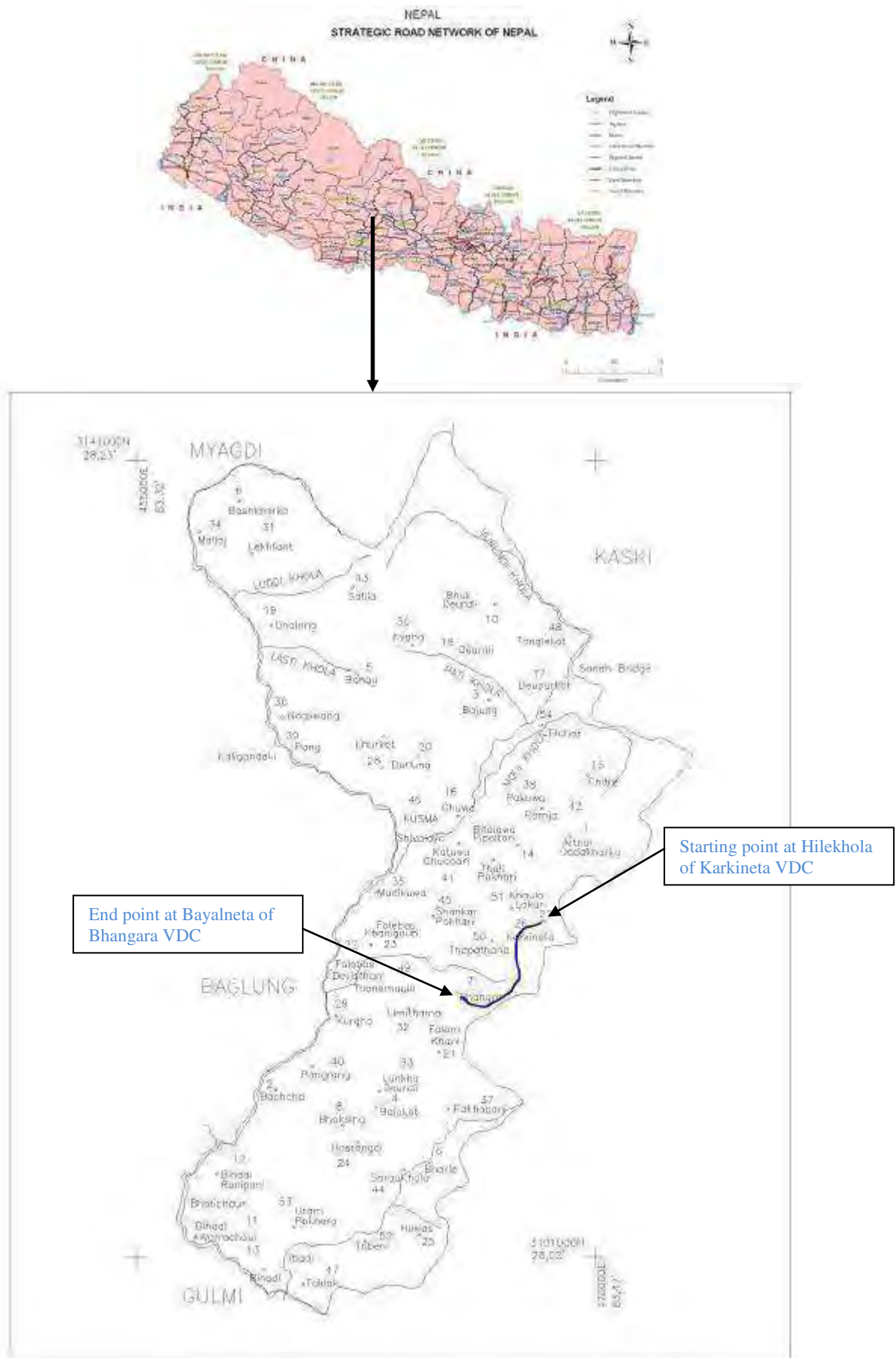
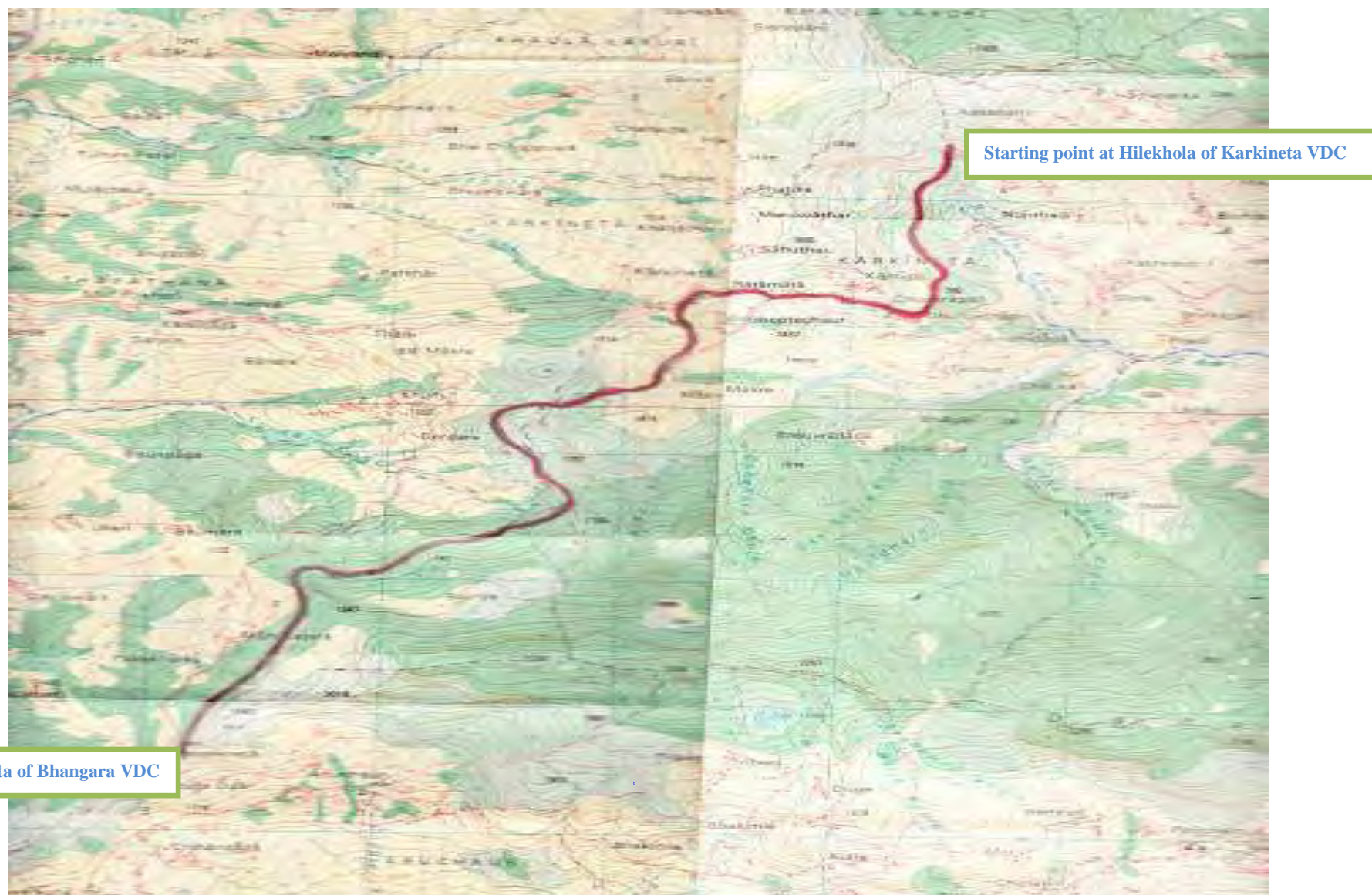




Figure 2.2. Topo Map, showing the alignment of Karkineta-Lunkhu road





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

14. The IEE study has followed the provisions of following acts, regulations and guidelines of Government of Nepal and ADB to ensure development and conservation of environment.

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

SN	Environmental Acts, Regulations and Guidelines	Description of Requirements
1	Three Years Interim Plan, 2007/08-2009/10, GoN	Requires all projects will be formulated and constructed based on methods that optimally utilize the local skill and resources and generate employment opportunities.
2	Environmental Protection Act, 2053 BS (1997 AD), GoN	Any development project, before implementation, shall pass through environmental assessment, which will be either IEE or an EIA depending upon the location, type and size of the projects.
3	Environmental Protection Rule 2054 BS (1997 AD) (amendment, 2007), GoN	The EPR and its schedules clearly provide various step-wise requirements to be followed while conducting the IEE study. It also obliges the Proponent to timely consult and inform the public on the contents of the proposal and IEE study.
4	Forest Act, 2049 BS (1993 AD) (amendment, 2007), GoN	Requires decision makers to take account of all forest values, including environmental services and biodiversity, not just the production of timber and other commodities. It includes several provisions to ensure development, conservation, management, and sustainable use of forest resources based on approved work plan.
5	Forest Rules, 2051 BS (1995 AD), GoN	Elaborates legal measures for the conservation of forests and wildlife. Expenses incurred for cutting trees and transportation shall be borne by proponent.
6	Batabaraniya Nirdesika (Nepal; MLD), 2057, GoN	The directive is focused in the practical implementation of small rural infrastructures through the minimization of environmental impacts. This directive includes the simple methods of environmental management in the different phases of the project cycle.
7	National Park and Wildlife Conservation Act, 2029 BS (1973 AD), GoN	Addresses for conservation of ecologically valuable areas and indigenous wildlife. The Act prohibits trespassing in park areas, prohibits wildlife hunting, construction works in park area, damage to plant and animal, construction of huts and house in park area without permission of authorized person. It lists 26 species of mammals, 9 species of birds, and 3 species of reptile as protected wildlife.
8	Local Self Governance Act 2055 BS (1999 AD) (1999) and Regulation 2055 BS (1999 AD), GoN	Empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities
9	Land Acquisition Act, 2034 BS (1977 AD) and Land Acquisition Rules, 2026 BS (1969 AD), GoN	Specifies procedural matters on land acquisition and compensation
10	National Environmental Impact Assessment Guidelines, 1993 (2050 BS), GoN	Provides guidance to project proponent on integrating environmental mitigation measures, particularly on the management of quarries, borrow pits, stockpiling of materials and spoil disposal, operation of the work camps, earthworks and slope stabilization, location of stone crushing plants etc.
11	APPROACH for the Development of Agricultural and Rural Roads, 1999 (2055 BS), GoN	Emphasizes labor based technology and environmental friendly, local resource oriented construction methods to be incorporated actively in rural infrastructure process.
12	RRRSDP Environmental Assessment & Review Procedures (EARP), 2007, GoN	For preparation of environmental assessments of future subprojects under Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP), this EARP includes: i) The process to be adopted while preparing environmental reports, ii) the potential environmental impacts that could result from undertaking the Project based on the Initial Environmental Examinations (IEEs) of sample core subprojects; iii) the



		proposed mitigation measures to avoid the identified impacts; iv) institutional capacity assessment and strengthening arrangements; v) legal framework for environmental assessment, domestic and the Asian Development Bank (ADB) environmental assessment and review procedures; and finally vi) the approaches to be adopted during implementation of the Project in order to ensure that environmental aspects are dealt with in a comprehensive manner.
13	Reference Manual for Environmental and Social Aspects of Integrated Road Development, 2003 (2060 BS), GoN	Suggests stepwise process of addressing environmental and social issues alongside the technical, financial and others
14	Green Roads in Nepal, Best Practices Report: An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions, 1999 (2055 BS), GoN	Focuses on participatory, labor based and environment friendly technology with proper alignment selection, mass balancing, proper water management, bioengineering and phased construction
15	Environmental Assessment Guidelines, 2003, ADB	Requires that environmental considerations be incorporated into ADB operations where environmental assessment is the primary administrative tool to integrate environmental considerations into decision-making of all types of development initiatives
16	Safeguard Policy Statement, 2009, ADB.	ADB's Safeguard Policy Framework consists of three operational policies on the Environment, Indigenous people and Involuntary resettlement. It requires that (i) impacts are identified and assessed early in the project cycle, (ii) plans to avoid, minimize, mitigate or compensate for the potential adverse impacts are developed and implemented and (iii) affected people are informed and consulted during project preparation and implementation.
17	The Interim Constitution of Nepal, 2063 (2007).	Has provision of right regarding environment - Every person shall have the right to live in clean environment.
18	The Labor Act, 2048 BS (1992 AD)	Regulates the working environment and deals with occupational health and safety.
19	Child Labor (Prohibition and Regulation) Act, 2056 (2000)	No child having not attained the age of 14 years shall be engaged in works as a laborer.



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## 4.0 Existing Environmental Condition

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15. Baseline information on the existing physical, biological as well as socio-economic and cultural environment of the proposed Subproject is described in this chapter.

### 4.1 Physical Environment

16. This section describes the physical condition of the area that comes under the ZoI of the road section.

#### 4.1.1 Topography

17. The proposed road lies in mountain region. The elevation of the proposed road at Hile khola is 1409 m amsl and at Karkineta is 1907 m amsl. Karkineta-Lunkhu road alignment passes through ridge. The road ascends up to end point of the road. The slope varies from 10° to 50°. Major portion of the road passes along the south and east facing slope.

#### 4.1.2 Geology and Soil Type

18. The road section comprises of sedimented highly weathered types of rocks. The road corridor falls in the Lesser Himalayan Sediments zone that comprises rocks such as quartzite and schists. Generally, boulder mixed, alluvial soil and clay mixed soil are found along the road alignment.

#### 4.1.3 Climate

19. The road lies in the Sub Tropical and temperate region. Generally, rainy season starts from June and ends in September. The meteorological record shows unevenly distributed monsoon rain in the project area with the total average annual rainfall of 1532 mm. Average minimum temperature of 5° C and average maximum temperature of 25°C is observed in the area. (Source: District Profile of Parbat,2058)

#### 4.1.4 Hydrology and Drainage System

20. There are many natural drainage along the alignment. Many dry streams are across the road alignment. Main water bodies found across the road alignment are Hile Kholsi and Kahule kholsi. No wetlands and river are found within the vicinity of the road. The summary of the cross drainage works along the road alignment is given in **Annex XIV**.

#### 4.1.5 Soil Erosion and Sedimentation

21. Proposed alignment does not pass through major landslides or erosion prone area. Small slide has been observed at Ch 1+700, 6+800 and 9+860.

#### 4.1.6 Existing Road Condition

22. The maximum and the minimum gradient along the road alignment is 12% and 6% respectively. The whole length of the road alignment is motorable with earthen surface. The width of the road alignment in average is about 4.5 m. The road is operable in all season.



**Existing Road**



#### 4.1.7 Existing Traffic Situation

23. Four regular passenger buses and 12 mini truck/pick up ply on the road. In rainy season, vehicles operation reduces by half.



Passenger bus daily plys on the road

#### 4.1.8 Land Use

24. Land use pattern of the area through which the road passes have been classified into four types: cultivated land, forest, built up area and barren as shown in **Table 4.1**.

**Table 4.1: Summary of land use pattern along the road alignment**

Land use	Chainage		Length (m)	Existing width (m)	Additional Width (m)	Additional Area (ha)
	From	To				
Cultivated land	0+150	1+100	950	3.5	1.5	0.1425
	1+100	1+450	350	4	1	0.035
	1+450	5+050	3600	4	1	0.36
	5+250	5+500	250	4	1	0.025
Total cultivated land						<b>0.5625</b>
Barren land	0+000	0+150	150	3.5	1.5	0.0225
Total Barren land						<b>0.0225</b>
Forest	5+500	10+600	5100	4	1	0.51
Total Forest land						<b>0.51</b>
Built up area	5+050	5+250	200	3.5	1.5	0.03
	5+300	5+400	100	3.8	1.2	0.012
	10+600	10+660	75	5	0	0
Total Built up area						<b>0.042</b>

Source: Field Survey, May/June, 2009

#### 4.1.9 Air, Noise and Water Quality

25. The air, noise and water quality are not tested, but are observed to be within acceptable limit. Dust emission during vehicle operation has become common phenomena in the existing road and it is more significant during dry and winter season.

### 4.2 Biological Environment

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

#### 4.2.1 Vegetation

27. The dominant forest and fodder species reported in the road alignment are Uttis (*Alnus nepalensis*), Chilaune (*Schima wallichii*), Salla (*Pinus roxburghii*), Laligurans (*Rhodendron arboretum*), Mayal (*Pyrus pashia*) and Katus (*Castanopsis indica*). Other plant species found within ZoI of the sub-project are Bhimsen pati (*Buddleja asiatica*), Kutmiro (*Litsea monopelata*), Khanyu (*Ficus semicordata*), Siltimur (*Lindera neesiana*), Lankuri (*Fraxinus floribunda*), Painyu (*Prunus cerasoides*), Pipal (*Ficus religiosa*), Lapsi (*Choerospondias axillaris*), Tanki (*Bahunia purpurea*), Koiralo (*Bahunia variegata*), Sirish (*Albizia labbeck*), Bhorla (*Bauhinia vahillii*), Mauwa (*Bassia latifolia*), Amba (*Pisidium guyava*), (Gogan) Sauravia *nepauensis*, Nigalo (*Drepanostachyum intermedium*), Bans (*Dendrocalamus strictus*), Bilaune (*Maesa chisia*), Sisnoo (*Urtica dioica*), Simali (*Vitex negundo*), Angeri (*Lyonia ovalifolia*), Dhangeri (*Woodfordia fruticosa*), Mauwa (*Bassia latifolia*) and Nilkada, Khirro (*Sapium insigne*).

28. Siltimur (*Lindera neesiana*) is major NTFPs found along the road alignment.



29. The road alignment passes through a Karkinta Community Forest (Ch 5+500- 10+600).

#### 4.2.2 Wildlife

30. Jackal (*Canis aurieus*), Monkey (*Macaca mulatta*), Jungle Cat (*Felis chaus*), Fox (*Vulpes vulpes*), Dumsi (*Hystrix indica*) and are the wild animals found in the forests. Similarly birds like Crow (*Corvus splendens*), Dove (*Zenaida macroura*), Sparrow (*Passer domesticus*), Kalij (*Lophura lencomelana*), Pigeon (*Columba livia*) are found in the surrounding forest along the road alignment.

#### 4.2.3 Endangered and protected species

31. **Faunal species:** Among the fauna present in the forest area along the road alignment Chituwa (*Panthera pardus*) is listed in CITES Appendix I. Monkey (*Macaca mulatta*) is listed in CITES Appendix-II. Jackal (*Canis aurieus*) is listed in CITES Appendix III.

32. **Floral Species:** Lapsi (*Choerospondias axillaris*) is listed IUCN categories as rare.

#### 4.2.3 Aquatic Life

33. There is no major river crossing and no major aquatic life is found.

### 4.3 Socio-economic and Cultural Environment

#### 4.3.1 Population, Household and Ethnicity

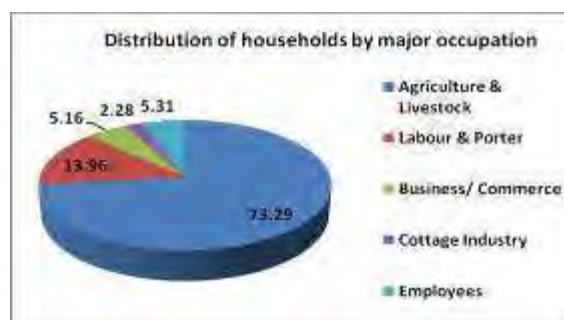
34. The demographic profile of the concerned VDCs is presented in following Table 4.2. Major castes in the area are Chhetri, Brahman, Tamang, Gurung, Damai, Kami and Sarki.

**Table 4.2: Demographic Profile of VDCs**

SN	Influenced VDCs/MC	Total HHs	Population distribution by sex		
			Male	Female	Total
1	Karkineta	362	876	1093	1969
2	Thapathana	177	456	465	921
3	Bhangara	221	598	535	1133
<b>Total</b>		<b>760</b>	<b>1930</b>	<b>2093</b>	<b>4023</b>

#### 4.3.2 Main Occupation

35. The main occupation of all people residing within the ZoI of the proposed road alignment is agriculture and livestock (73.29 percent). However, agriculture farming is not enough for subsistence level due to small landholding size and lack of irrigation facilities. People are carrying out other economic activities like labour and porters (13.96%), working in government and non government organizations (5.31%), cottage industry (2.28 %) and business (5.16%). Details of occupations of the people according to the settlements are shown in Annex XI a.



Source: Field Survey 2009

#### 4.3.3 Market Centres and Business Facilities

36. Major settlements along the road alignment are Aahal Gairo, Rata Mata, Karkineta Bazaar and Bayalneta. There are grocery shops and tea stalls available in the almost all settlements. Karkineta and Bayalneta have also some hotels and restaurants. Other smaller market centres with shops of daily commodities are also found along the road alignment.

#### 4.3.4 Local Economy

37. The economy of the area is predominantly agriculture based. Local people are gradually attracted towards cultivation of cash crops such as orange, potato, ginger. With growing closeness of the project area with Siddhartha highway due to transportation facility, cultivation of fruits, vegetables in a commercial scale seems to gain momentum. Diversity in employment pattern has been also observed in recent years. Local people have increasingly engaged in business activities of different areas.



#### **4.3.5 Agriculture Pattern**

38. Major crops that are cultivated in the project area are rice, wheat, maize, millet, potato and beans. Local peoples are also found to be encouraged in cash crops in recent days. Major cash crops that are grown in the project area are mustard, vegetables, potato and fruits.

#### **4.3.6 Livestock**

39. Due to availability of good number of fodder trees, the project area has also immense potentiality of cow and buffalo farming for dairy and goat farming for meat.

#### **4.3.7 Industry**

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



Furniture industries at Ch 1+950

#### **4.3.8 Trade and Commerce**

41. 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 vegetables, fruits and timber.

#### **4.3.9 Tourism Related Services**

42. Some hotel, lodges are in operation in Karkineta Bazar and Bayalneta. Since the ZoI of the project and its surrounding area has potentiality of various types of tourism promotion, more lodge, restaurant and resorts are expected to be established in the area. From end point of the road Sirubari is only 20 KM far which is famous tourist place.



Way to Sirubari which is tourism place

#### **4.3.10 Health and Sanitation**

43. People use piped water with source at high altitude springs. Sanitation awareness among local people is increasing and many of them have toilets in their home, but there is no public sewerage system. There are toilets in few (more than 50%) Karkineta and Bayalneta settlements. Major health problems observed in the area are gastric, water borne diseases, gout, respiratory diseases, and skin disease. There are 6 health posts/sub health post in the project areas.



#### 4.3.11 Public Services and Infrastructures

**Table 4.3: Infrastructure Facilities in the Project Area**

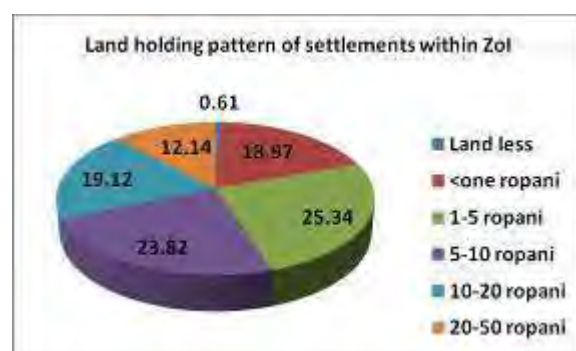
Infrastructure Facilities	Details
Education	9 educational institutions ranging from primary level to college level exists in the area. Most of the families send their children to school. Female enrollment in schools is lower than that of male students. Literacy rate in the project area has been estimated around 70 percent.
Health	3 health posts/sub- health posts.
Communication	All of the settlements have telephone facilities mostly with Cell phone and wireless phone.
Electricity	Almost all settlements in ZoI are connected with national grid transmission line.
Water Supply	Generally, piped Drinking water supply facility is available to all settlements from the sources to the public taps through gravity flow. These taps are located in common places so that each serves a few households
Other Infrastructures	There are some rice and flour mills in various settlements. Agricultural Service Sub-Centre, and Veterinary Service Sub Centres are also available in the project area.
Financial Institutions	There are six saving and credit cooperatives in ZoI.
Community Center	2 nos. in all settlements.

**Table 4.4: Public Services and Infrastructures along the Road Alignment**

Type of Public Service and Infrastructure	Chainage/ Location	Distance from the Road
Irrigation Crossing	4+075, 3+900, 2+412, 1+980 and 0+800	Across the road
Water Supply Pipe	4+050, 2+500, 1+100 and 5+500	Across the road
Foot Trail	3+650, 2+650, 2+370, 1+900, 1+980, 1+200 and 5+212	
School	2+650 and 5+212	ROW
Wood Mill	1+950	ROW
Water Source	1+700 and 1+650 (tap)	Below the road
Access road	1+000, 5+212	

#### 4.3.11 Land Holding Pattern

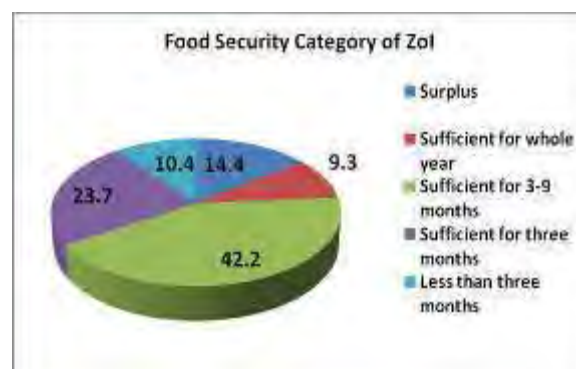
44. Land holding pattern within the ZoI of the road project demonstrates that 25.34% households have 1-5 ropani (approximately 1 ha = 20 ropani) land while 23.82% households fall under 5-10 ropani land holding category. Very few households (0.61%) are landless and 18.97% households have less than one ropani land. While 19.12 % of the households have more than 10 ropani land and 12.14% households have land holding between 20 to 50 ropani. Detail about land holding pattern is given in **Annex XI c**.



Source: Field Survey 2009

#### 4.3.12 Food Security

45. About half of the households (42.2%) have enough food for only for three to nine months. 23.7% households have enough food for three months; where as 10.4 % HHs have enough food for less than three months, 9.3 percent of the households of the project area have food sufficiency for whole year and 14.4 percent households are reported as food surplus ones who are in the well off category of selling their surplus farm products. This shows the poverty situation within the ZoI of the project area. The detail is given in **Annex XI d**.



Source: Field Survey 2009



#### 4.3.13 Migration Pattern

46. Permanent migration takes place in limited scale towards Syanja and Pokhara. Similarly, seasonal migration also takes place from all the settlements. Majority of them migrate during slack farming season from Mangsir to Poush mainly in Pokhara, Butwal and various parts of India to work as a labourer. This could be reduced by providing employment opportunities at the local level.

#### 4.3.14 Settlement Pattern

Most of the settlements within ZoI 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 buildings. RCC buildings have been started to appear in market centres such as Karkineta and Bayalneta.

#### 4.3.15 Potential for Development

47. Many of the places, areas and settlements within ZoI of the project have the potentialities in various sectors. These sectors and their potentialities have been mentioned in **Table 4.5** below.

**Table 4.5: Development Potentialities in Various Sectors**

SN	Sector	Development potentiality
1	Agriculture	Wheat, potato, beans farming, within the whole ZoI
2	Tourism Promotion	This road helps to enhance tourism promotion for Sirubari which is 20 KM far from end point of the road.
3	Small and Cottage Industry	bamboo products, furniture, mills
4	Trade and business	Development several rural market centres at various places along the road alignment and main market centres at Karkineta bazar and Bayalneta bazaar.

Source: Field Survey, May/June, 2009

#### 4.3. 16 Religious, Cultural and Historical Sites

48. There are no Religious, Cultural and Historical Sites along the road alignment.



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## 5.0 Project Alternatives

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

### 5.1 No Action Option

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

### 5.2 Proposal Alternatives

51. Construction of other supporting roads could be the options for achieving the transportation and access. Considering other project alternatives, the proposed road project can be the best option to serve the home to home services. Upgrading of Karkineta-Lunkhu road links Parbat district with Siddhartha highway at Naudada. This is shorter route to reach Siddhartha Highway from Parbat district (only 20 KM from Karkineta). The proposed road project is the best alternative for cheap and efficient transportation.

### 5.3 Alternative Alignment

52. Alignment of the Karkineta-Lunkhu road is an existing earthen road and proposed for the upgrading as a graveled standard, in which requirement to acquire land and cutting trees will be minimum than in new alignment opening. Hence, new alternative alignment is not studied and the proposed road can be the best option.

### 5.4 Alternative Design and Construction Approach

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

### 5.5 Alternative Schedule and Process

54. During the rainy season, the construction work is stopped to allow the natural compaction of the road. Construction work will be carried out during the remaining months. The construction period is more appropriate from October to June as the local people are generally free from farming activities.

### 5.6 Alternative Resources

55. The physical resources consumed for the construction of the proposed road will mainly include boulders for gabions and stone for dry masonry wall. Stones are easily available in nearby areas of various sections of the road whereas fine aggregates and sand has to be transported from Andhi Khola 22 KM far from the road. The proposed construction will optimally use the local labour force and local materials.



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## 6.0 Identification and Evaluation of Impacts, Benefit Augmentation of Mitigation Measures

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56. The identification, evaluation and assessment of impacts has been carried out by considering the proposed proposal activities examined in terms of its current condition and impacts during construction and subsequent operation phases. Several such impacts have been identified based on site observation, field survey, and information obtained from the stakeholders and few were identified on value judgment. Impacts from the proposed road sub-project can be both beneficial as well as adverse. Most of the identified impacts have been quantified to the extent possible. The impacts have been predicted in terms of their magnitude, extent and duration. The possible impacts (positive and negative) in construction and operation phase are presented in the following sub-sections.

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

### 6.1 Beneficial Impacts and Benefit Augmentation Measures

#### 6.1.1 Construction Stage

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

58. Impacts: One of the major direct beneficial impacts of the road during construction stage is the creation of employment opportunity to the local community. Total employment during construction of this road alignment is 75547 person days in which 12591 person days as skilled and 62956 person days as unskilled. Employment generation for the local people will minimize seasonal migration through for a short period. The amount of money that is earned by the wages will directly enhance various economic activities and enterprise development with multiplier effect. This is one of the direct and significant impacts of the project but it is of short-term and local in nature.

59. Measures: Benefit augmentation measures will be implementing the work as much as possible through the local Road Building Groups (RBGs) the local people particularly poor; dalit (occupational caste), ethnic minority and women will be given priority for employment. Proponent will conduct Livelihood Enhancement Skills Training (LEST) program (which include Horticulture (Orange Plantation), Organic/pesticides making training, Lapsi Pickle Production, Bamboo goods, Woolen goods) and awareness programs. The costs of these training are included in cost of Social Action Plan.

##### **Skill Enhancement**

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

61. Measures: Road Building group members will be given on the job training on masonry, gabion wires, construction of dry and foundation walls, slope cutting and stabilization, bio-engineering works.

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

62. Impacts: During construction period, different types of commercial activities will come into operation in order to meet the demand of workers. Since the workers will have good purchasing power due to money earned from wages, they will regularly demand for different types of food, beverage and other daily necessary items. More local shops and restaurants will be opened to meet these demands around the vicinity of the construction sites at Aahal Gairo, Rata Mata, Karkineta Bazaar. This impact is also direct, low significance, local and short terms in nature.

63. Measures: Proponent will conduct Livelihood Enhancement Skills Training (LEST) program (which include Horticulture (Orange Plantation), Organic/pesticides making training, Lapsi Pickle Production, Bamboo goods, Woolen goods) and awareness programs. The costs of these training are included in cost of Social Action Plan.



### **Community Empowerment and Ownership**

64. Impacts: During construction period, various road construction coordination committees and road building groups will be constituted in order to proceed and implement the road construction activities. In this process, they will be oriented and trained to build and safeguard community infrastructures which will result in community empowerment and feeling of ownership among them. This impact is also indirect, low, local and short terms in nature.

65. Measures: The coordination committees will be constituted and training will be given to them. Training such as Advocacy Training, Leadership Training under Empowerment related Training of LEST program will be given by proponent. The costs of these training are included in cost of Social Action Plan.

### **6.1.2 Operation Stage**

#### **Improvement in Accessibility and Saving of Time and Transportation Cost**

66. Impacts: After upgrading to gravel standard, it helps to reduce travel time by 1 hour now it takes 2 hour to reach Bayalneta and travel cost also reduce by half. Once the road project is completed, the people living within the road corridor will have easy access to cities and markets. This road helps to links rural areas of Parbat district with Siddhartha highway at Naudada. This is shorter route to reach Siddhartha Highway from Parbat district (only 20 KM from Karkineta). This will enhance the transaction of goods and access to social services. Access to input and services will increase, which will be cheaper due to transportation facility. This impact is direct, high, regional and for long term.

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

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

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

68. Measures: DDC/VDCs shall manage planned growth with required infrastructure facilities in the market areas. . Agriculture extension services, market linkages and networking for better market price.

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

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

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

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

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

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

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

73. Impacts: Due to increase in employment opportunities, trade, business and income, it is expected that there will be improvement in social service such as education, health, government offices, saving and credits. The improvement can also be expected with more frequent visit of extension workers, longer stay of professionals such



as teacher, doctors to their rural duty areas. Similarly, enhanced income level will encourage local people to spend more on health and sanitation, development of education facilities by employing qualified and professional teachers and upgrading the existing health posts. Production of educated manpower will also help to increase the number of employees in government/non government services. This is direct, significant, local and long-term impact of the proposed project.

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

#### **Women and Indigenous People Enhancement**

75. Impacts: Women and disadvantaged 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 ZoI.

Measures: During the road construction and rehabilitation, more emphasis will be given to women, dalit and vulnerable workers. Various training programs will be conducted under Gender Action Plan (GAP) of the project. Trainings programs include Legal and women human right literacy classes, Reproductive cum maternity health care orientation classes, Gender sensitization and social inclusion training and Trimester GAP implementation review workshops will be conducted as per GAP of social plan. Total budget for GAP is NRs. 76500.

## **6.2 Adverse Impacts and Mitigation Measures**

### **6.2.1 Construction Stage**

76. The proposed road will be constructed according to LEP where manual works are possible; and contractor approach where the work cannot be done manually. The impacts on physical, biological, socio-economic and cultural resources of the proposed road area and respective mitigation measures are presented hereunder.

#### **Physical Impacts**

##### **Change in Land Use**

77. Impacts: Construction of road will convert 0.563 ha. of cultivated land, 0.022 ha. of barren land, 0.51 ha. of forest and 0.042 ha. of settlement areas into built-up area. This may reduce product of 1.3 MT of wheat, maize and millet annually. The impact from changes in land use will be high, direct, local and long term in nature.

78. Measures: The mitigation measures will be compensatory. Proponent will assist the farmers in coordination with district agriculture office for better agriculture extension services. Plantation of trees at the ratio of 1:25 + 10% for each cleared plant.

##### **Spoil Disposal**

79. Impacts: The common likely problems from the inappropriate disposal of spoils are: gully 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.

80. Measures: Spoil will be safely disposed and managed at designated site with minimum environmental damage. Engineer will give approval for disposal site of spoil. Proposed Safe spoil disposal sites are Ch 0+150, 0+350, 2+700, 4+250, 6+250 and 8+600. Balanced cut and fill and re-use of excavated materials will be given emphasis. Spoil will be used to reclaim land or eroded areas. Disposal site will be provided with proper toe wall, drainage, vegetation and adequate protection against erosion.

##### **Slope Instability**

81. Impacts: Small slide has been observed at Ch 1+700, 6+800 and 9+860. Removal of vegetation and open cuts with exposed soil to rain may cause soil erosion as well as landslide. As the road is an existing corridor, hill slopes will not be disturbed by new cuttings of slope. Majority of work will be done manually under LEP approach by RBGs, which is an environment friendly method. The impact of slope instability and soil erosion is indirect, medium, site specific and mid-term nature.

82. The mitigation measures will be balance cut and fill; ensuring minimum cut slope depending upon the soil type; Re-vegetation of exposed areas; adoption of bio-engineering techniques at Ch. 1+700 and 6+700 (Grass



plantation, Brush layering, Palisades, Shrub/Tree plantation), at Ch. 9+860 bioengineering measures together with gabion breast wall is proposed; no construction work during rainy season; and use of soft engineering structures (dry wall, check dams) before disposing spoil. Soil conservation will be done by providing cross drainage structures with protection works at outlet for safe discharge of drain water on eroded roadside slopes. Recommended engineering structures necessary at various chainages for slope stabilization have been given in **Annex XVI**.

#### **Drainage Management**

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

84. Measures: The mitigation measures will be to provide adequate numbers of drainage structures in order to have minimum interference with natural drainage pattern of the area; channelize surface water discharge from side drains with outlet management. Details about necessary structures required to mitigate the water induced adverse impacts are as given in **Annex XIV**.

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

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

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

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

#### **Quarry Operation**

88. Impacts: 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 and vector proliferation. The impact from the operation of quarry sites will be direct, low in magnitude, local nature and short term in duration.

89. Measures: Quarry and borrow operation sites will be identified and approved by Engineer; unstable sites, erosion prone area, forest area, settlements, fertile farm land will be avoided for quarry / borrow operation; quarry sites will be rehabilitated by providing appropriate civil engineering structures and bioengineering measures after the extraction is complete. Recommended quarry sites in the area are given in Table 6.2.

**Table 6.1: Recommended Quarry sites**

SN	Chainages	Places of recommended quarry sites
1	Andhi Khola	Sand and Aggregates 22 KM from the proposed road
2	5+800	

Source: Field Survey May/June, 2009



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

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

91. Measures: The mitigation measures will be use of local labors as far as possible; siting camp away from productive lands; pay compensation for using private farm or lands for storage or camp; electricity and first aid facilities will be provided in camp sites; provision of soak pit and pit latrine will be made. For waste water and solid waste management, soak pit will be made and proper management will be done. Appropriate camp site should be at 5+600, 6+750, 8+600 and 9+200.

### **Decline in Aesthetic Value**

92. Impact: Landscape degradation relates particularly to poorly designed or monitored activities resulting from quarrying operations and from indiscriminate dumping of spoil material. Road may create scars on the landscape. The impact will be direct, low in magnitude, local nature and short term in duration

93. 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 to cover the scar by greenery.

### **Construction Equipment Vehicles**

94. Impacts: The contractor based construction will use machineries and tools. During construction vehicles such as roller, spreader, tipper, loader will be in use which increase in air pollution due to emission of smoke and dust, and increase in vibration due to vehicular movement. Impact will be direct, high significance, site specific and short-term.

95. Measures: All equipment/vehicles deployed for construction activities shall be regularly maintained. All the vehicles deployed for material movement shall be spill proof to the extent possible. In any case all material movement routes shall be inspected daily twice to clear off any accidental spills.

### **Chemical Issues**

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

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

### **Biological Impacts**

#### **Loss or Degradation of Forests and Vegetation**

98. Impacts: Total of 0.51 ha of forest will be permanently lost due to road construction work. 91 numbers of trees of various species will be removed from forest and private land during road construction (See **Annex XII**). The impacts on vegetation/forest resources have been considered to be high in magnitude, local in extent and long term in duration.

99. Measures: Proponent will manage a nursery to grow tree sapling and plant them in 1:25 + additional 10 % ratio. Total compensatory plantation will be 2503 numbers of trees. Roadside tree plantation will be done along the RoW.

#### **Impact on Wildlife Due To Loss of Habitat and Hunting**

100. Impacts: The road passes through one community forest from Ch 5+500- 10+600. The construction of road might disturb wildlife and bird species present in surrounding forests along the road corridor. The impact will be indirect, low, local and long term in nature.



101. Measures: 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/harassing of birds or animals; Coordination with DFO to control the activities like illegal poaching by enforcing acts and regulations strictly.

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

102. Impacts: Protected wildlife species such as Chituwa (*Panthera pardus*), Monkey (*Macaca mulatta*) and Jackal (*Canis aurieus*) are found in the surrounding forests within ZoI. However, activities involved in construction will not affect these species as road alignment doesn't passes through major forest areas and habitat of these wildlife. Similarly, protected floral species of Lapsi (*Choerospondias axaillaries*) is found but will not be affected by construction activities.

103. Measures: As there are no major impacts. However, the measures as no vegetation shall be cut unless absolutely necessary and minimum site clearance, discouraging workers for collecting fuel wood from forest or hunting/harassing faunas; shall be followed.

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

##### **Loss or Degradation of Farm Land and Productivity**

104. Impacts: There will be permanent loss of 0.56 ha of agricultural land due to road rehabilitation. This will lead to annual loss of 1.3 Metric Tons of food grain production among the families losing lands to the project. Moreover, spoils on farm land will also affect the production of agricultural crops. This impact is expected to be of high in magnitude, local in extent and of long term in duration

105. Measures: Compensation for the loss of property will be provided to the affected people. A separate Resettlement Plan will address land acquisition and compensation issues. Camp sites and spoil sites shall away from productive agricultural land.

##### **Loss of Private Properties**

106. Impacts: 10 numbers of residential houses will be affected during construction of road. Affected household will suffer from their property losses and hardship during road construction. The impact will be direct, significant, long term and local. Details about property loss and damage will be described in Resettlement Plan Report (See **Annex XV**).

107. Measures: Compensation and resettlement measures will be dealt as per decision made by Compensation Determination Committee (CDC). The total resettlement and rehabilitation cost is NRs. 4813164.00.

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

108. Impacts: The community infrastructure that requires reconstruction / rehabilitation during construction works, and the mitigation measures are as presented in following Table 6.2. The impact due to loss of community infrastructure will be direct, site specific, short term and medium in magnitude

**Table 6.2: Affected Community Infrastructures and Mitigation Measures**

Type of Public Service and Infrastructure	Chainage/ Location	Potential Impact	Mitigation measures
Irrigation Crossing	4+075, 3+900, 2+412, 1+980 and 0+800	Damaged during road construction	Will be reinstated and 30 dia. HP will be provided for water crossing.
Water Supply Pipe	4+050, 2+500, 1+100 and 5+500	Damaged during road construction	Will be reinstated
Foot Trail	3+650, 2+650, 2+370, 1+900, 1+980, 1+200 and 5+212	Damaged	Will be reinstated by providing drain cover and damage foot steps
School	2+650 and 5+212	Noise pollution	Information signboard will be placed
Water Source	1+700 and 1+650 (tap)	Construction materials will damage	Strickly prohibited spoil disposal below the road.



Access road	1+000, 5+212	Damaged	Will be reinstated
Building of V.D.C. office	5+070	Damaged	Will be compensated

#### **Impacts on Cultural, Religious and Archeological Sites**

109. Impacts: There are no any cultural, religious and archeological sites along the road alignment.

#### **Impacts on Health and Safety Matters**

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

111. Measures: The workers shall be provided and made mandatory the use of helmets, safety belts, masks, gloves and boot depending on nature of work; provide clean drinking water at sites and camp; pit toilets at sites and camp; first aid facilities at sites and camp with training to use them; provide group accidental insurance for workers. Awareness generation to local people and workers on HIV/AIDS and other communicable diseases.

### **6. 3.2 Operation Stage**

#### **Physical Environment**

##### **Road Slope Instability and Management**

112. Impacts: The destabilization of slope may also be expedited due to human activities in the road neighborhood such as quarrying stones or soil, irrigated cultivation, opening of branch roads that will connect the road with other village settlements. This may cause damage to road section, disruption to transportation and other social impacts in the nearby areas. The inadequate maintenance of the road, blockage of drains, damages the road surface can lead to slides and slope failure. Major area of concern is at Ch. 9+860. The impact will be direct, medium local and long term nature.

113. Measures: The mitigation measures to be adopted include immediate clearance of slides and restoration of slopes; regular maintenance of bio-engineering and civil structures for slope protection; restoration of rill and gully formation; and conservation of soil.

##### **Impact Due to Air, Noise and Water Pollution**

114. Impacts: During operation period, vehicles will ply along the road and will emit gaseous pollutants. This will increase the pollution level of ambient air along the road corridor due to emission of gaseous pollutants. However, air pollution due to dust will be minimized to greater extent after upgrading of earthen road to the gravel standard. As the road is of district road category and the vehicular movement is not expected to be very high, the overall impact of air pollution will, thus, be direct, low, local and medium term. Noise level during the operation period will increase due to the movement of vehicles and other activities. However, due to low traffic volume, the impact due to noise pollution will be direct, low, local and short term. The disposal of spoil and other construction materials and wastes, washing of vehicles in water bodies may degrade the water quality. The impact of this kind will be direct, low, local and long term.

115. Measures: Plantation of trees on both sides of the road as far as possible; Use of horns should be restricted near forest area, health posts, schools and settlements; for control of dust nuisance, speed limit of vehicle and vegetative barrier by planting trees along roadsides will be designed.

#### **Biological Environment**

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

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

117. Measures: 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**

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

119. Measures: Erect appropriate sign boards informing drivers about prohibition of blowing horns in the dense forest areas; potential areas for wildlife crossing.

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

#### **Unplanned Settlement and Market Center Development**

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

121. Measures: Awareness raising program through local organizations for planned settlements; include regulation of settlement with proper planning; plantations of trees in the RoW so that it is not encroached; provide sewerage in market areas. Authorities and VDCs will control encroachment of road.

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

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

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

#### **Road Safety Measures**

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

125. Measures: The mitigation measures to be adopted will be applying appropriate road safety measures with the help of 3-Es i.e. Engineering, Enforcement and Education; and required safety signs will be used along the road. Information sign boards will be used such as Traffic Signs at (Ch: 3+150, 3+200, 3+620, 3+680, 5+000, 5+100, 6+050, 6+100, 8+900, 8+950, 9+850 and 9+950), sign boards for school area (Ch: 5+220, 5+260, 2+800, 2+880) and for market areas (at Ch: 5+050,5+200).



## 7.0 Environmental Management Plan

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

### 7.1 Institutions and Their Roles

**Table 7.1: Institution and their roles**

<b>Institution</b>	<b>Role</b>	<b>Responsibility in the Project</b>	<b>Remark</b>
Ministry of Environment	Mandated to formulate and implement environmental policies, plans and programs at national level	Facilitate when needed on environmental safeguards	No direct responsibility in the project
Ministry of Local Development (MLD)	It is concerned line ministry, executive agency and concerned agency as per EPA/EPR. Environment Management Section is responsible to look into safeguard matters for the ministry.	<ul style="list-style-type: none"> <li>▪ To review IEE ToR and Report, and give approval.</li> <li>▪ Coordinate with project on safeguard issues</li> <li>▪ Conduct environmental monitoring from central level.</li> </ul>	
Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR)	Department under MLD responsible to execute infrastructure projects under MLD. Provides back-up support to DDCs in technical matters through DTO.	RRRSDP is being executed under overall coordination and supervision of the Department for the Ministry. It is also supporting DDCs through DTOs to implement the project.	
RRRSDP- Project Coordination Unit	Project specific unit.	Technical Unit to support and coordinate all activities for implementation of RRRSDP. Review, comment, and forward IEE ToR and Report for review to ADB and for approval to MLD	First Class Officer / DDG of DoLIDAR have been heading the PCU.
District Development Committee / District Technical Office	DDC/DTO is Project Implementing Agency.	<ul style="list-style-type: none"> <li>▪ Prepare IEE ToR and submit for approval to PCU/MLD</li> <li>▪ Conduct IEE Study, Public Consultation, and prepare IEE Report</li> <li>▪ Receive comments from PCU/ADB/MLD and modify accordingly. Get final approval from MLD.</li> <li>▪ Conduct environmental safeguard monitoring</li> <li>▪ Reporting</li> </ul>	District Technical Officer is the Project Manager
District Project Office	Project implementation office working directly under DDC/DTO.	Responsible for overall activities related to implementation of the works at field level.	
Central Implementation Support Consultant (CISC)	Support consultants at central level	Technical and management support to PCU	
District Implementation Support Team (DIST)	Support consultants at district level	Technical and management support to DPO	

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



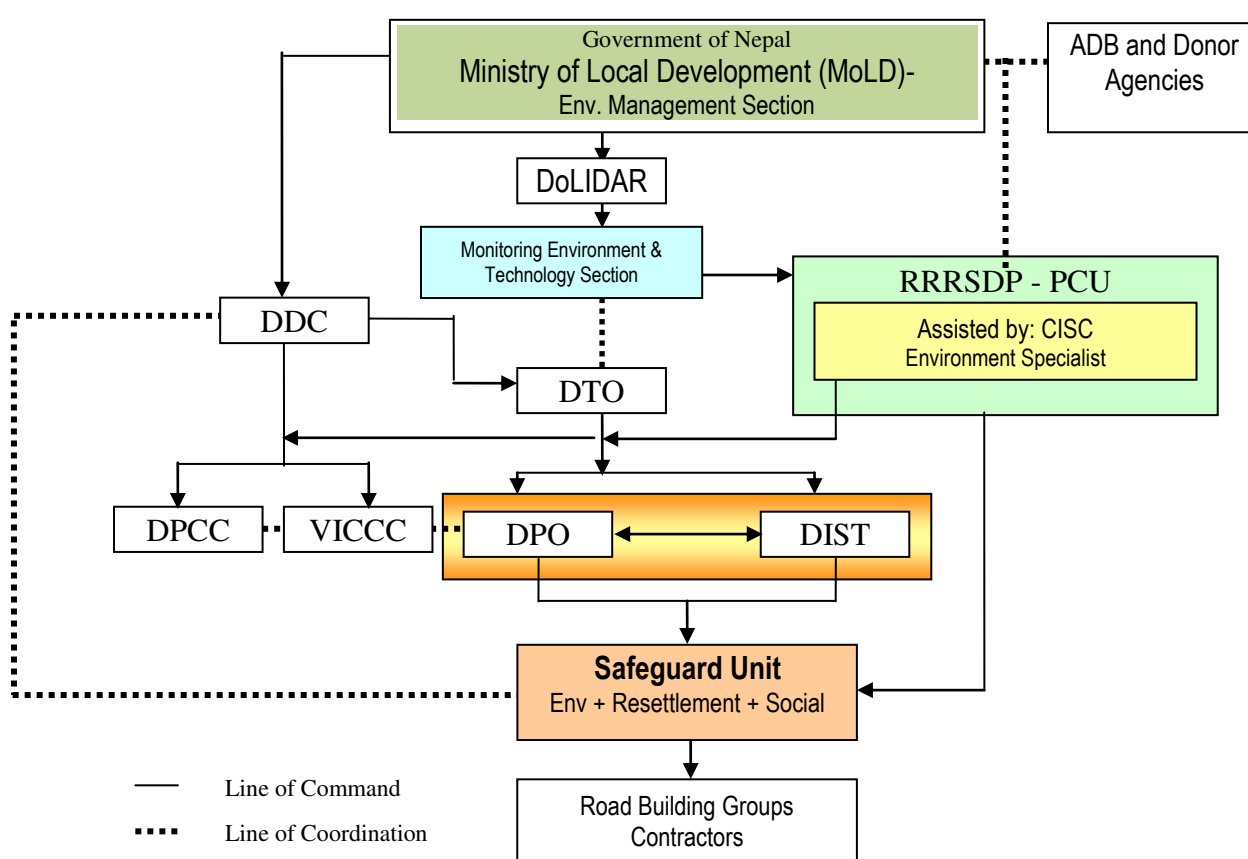
## 7.2. Reporting

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

129. The monthly reports will be based on recurrent site inspections and will report on the effectiveness of the mitigation measures; the contractor's compliance with the environmental specifications; measures recommended in the events of non-compliance, and recommendations for any other corrective plan.

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

**Fig. 7.1: Environmental Management Organization Structure**



## 7.3. Benefit augmentation measures and mitigation measures implementation strategy

131. The DDC/DTO with support of DPO/DIST at local level and PCU/CISC at central level will be responsible for conducting careful and routine monitoring of environmental safeguard and ensure the implementation of mitigation measures and according to EMAP. Overall implementation of the EMP will become proponent's responsibility. Framework for implementing environmental management plan is shown by Table 7.2.



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

Table 7.2: Beneficial Impacts and Proposed Enhancement Measures									
Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies	
			Nat	Ma g	Ext	Dur		Executing Agency	Supporting Agency
Construction Stage									
Construction of road	Employment Generation and Increase in Income	Increase in income level Employment generation of Skilled 12591 person days and unskilled 62956 person days.	D	H	L	ST	Maximize manual work through local, poor, vulnerable and women. Proponent will conduct Livelihood Enhancement Skills Training (LEST) program	DDC/DTO/ DIST	DPCC / VICCC / CISC/PCU
Construction of road	Skill Enhancement	Increase in income generating activities, employment opportunities	D	M	L	LT	Priority to Affected Peoples (APs) and vulnerable groups, job training on various constructions works.	DPO/DIST	DDC/DTO / CISC/PCU
Construction of road	Enterprise development and commercialization	Enhancement in local economy	D	M	L	ST	Proponent will conduct Livelihood Enhancement Skills Training (LEST) program	DPO/DIST	DDC/DTO / CISC/PCU
Construction coordination committee and RBG program	Community Empowerment and Ownership	Increase in income and ownership.	IN	L	L	ST	Coordination committees will be constituted and training will be given to them. Training such as Advocacy Training, Leadership Training under Empowerment related Training of LEST program will be given by proponent.	DPO/DIST	DDC/DTO / CISC/PCU
Operation Stage									
Operation of Road	Improvement in Accessibility and Saving of Time and Transportation Cost	Saving in travel time and travel cost. This road helps to links rural areas of Parbat district with Siddhartha highway at Naudada. This is shorter route to reach Siddhartha Highway from Parbat district (only 20 KM from Karkineta). This road helps to reduce travel time and cost of local people to access other part of the country	D	H	R	LT	Proper maintenance (regular, emergency) , continuation of bioengineering	DTO/DDC	DoLIDAR
Operation of Road	Increase in Trade, Commerce and Development of Market centers	Shifts towards improved and commercial agriculture. Growth and extension of the minor local markets along the road like in Karkineta Bazaar and Bayalneta.	IN	L	L	LT	Manage planned growth with required infrastructure facilities in the market areas. Agriculture extension services, market linkages and networking for better market price.	DPO	DDC/VDC
Operation of Road	Appreciation of Land Value	Improvement in local economic condition	IN	M	L	LT	Promotion of land development activities and control of encroachment within RoW. Awareness program shall be organized on use of high value land to get bank loans for setting up enterprise ventures.	DDC/DPO	DDC/VDC
Operation of Road	Increased Crop	Socioeconomic development and	IN	H	L	LT	Promotion of market linkages and networking for better market	DDC, VDC	DDC, VDC



Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies	
			Nat	Mag	Ext	Dur		Executing Agency	Supporting Agency
	Productivity and Sale of Farm Products	raise in quality service. Sale of farm and livestock products will increase in Aahal Gairo, Rata Mata, Karkineta Bazaar and Bayalneta settlements which are potential areas for the production of vegetables, fruits and cash crops such as ginger, Orange, Vegetables etc.					price.		
Operation of Road	Enhancement of Community Development Services	Ease of access to social service and raise in quality service	D	H	L	LT	Keep road maintained to ensure access facility that will attract development of other social services facilities	Local people, DDC, VDC	DDC, VDC
Operation of Road	Women and Indigenous People Enhancement	Poor, disadvantaged groups and women will have easy and frequent access to social services (education, health, community development, bank, training, CBOs and networking)	IN	H	L	LT	Trainings under GAP will be provided which include programs like Legal and women human right literacy classes, Reproductive cum maternity health care orientation classes, Gender sensitization and social inclusion training and Trimester GAP implementation review workshops will be conducted as per GAP of social plan. Total budget for GAP is NRs. 76500.	VDC / DDC	VDC / DDC

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

Table No. 1: Adverse Impacts and Proposed Mitigation Measures										
Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
Construction Stage										
Physical Environment										
Construction of Road, site clearance	Change in land use - Loss of 0.563 ha. of cultivated land, 0.022 ha.of barren land, 0.51 ha.of forest and 0.042 ha.of settlement areas .	Reduce product of 1.3 MT of wheat, maize and millet annually.	D	H	L	LT	IR	Compensation will be given for loss of private properties. Proponent will assist the farmers in coordination with district agriculture office for better agriculture extension services.	DDC/DTO	DIST
Construction of Road, earth excavation	Spoil Disposal and imposed weight of spoil on fragile slopes	Gully erosion, landslide, disruption of road, damage to farmland, water pollution etc.	D	M	SS	ST	Re	Proper site selection and management of spoil at designated areas approved by Engineer; provision of proper drainages, toe walls; Proposed Safe spoil	DDC/DTO	DIST/VICCC/ VDC



Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
								disposal sites are Ch 0+150, 0+350, 2+700, 4+250, 6+250 and 8+600		
Site clearance, excavation	Slope Instability	Erosion, landslide, loss of property. Areas of concern are at Ch 1+700, 6+800 and 9+860	IN	M	SS	MT	Re	Re-vegetation of exposed areas; adoption of bio-engineering techniques at Ch. 1+700 and 6+700 (Grass plantation, Brush layering, Palisades, Shrub/Tree plantation), at Ch. 9+860 bioengineering measures together with gabion breast wall is proposed; no construction work during rainy season; and use of soft engineering structures. Soil conservation will be done by providing cross drainage structures with protection works at outlet for safe discharge of drain water on eroded roadside slopes.	DDC/DTO	DIST
Construction of Road	Drainage Management, generation of large volume of surface runoff	Erosion, landslide, damage to farmland	IN	M	SS	MT	IR	Proper drainage structures and proper spoil disposal, Avoid blockage or diversion of natural channels due to construction of road and disposal of spoils, channelize surface water discharge from side drains with outlet management	DDC/DTO	DIST
Operation of quarry	River bank cutting and erosion, change in river regime, instability, land slide,	Damage to farmland, water pollution etc.	D	L	L	ST	Re	Proper selection and management of quarry sites, rehabilitation of quarry sites after completion of work. Recommended quarry sites are at Ch. 5+800 and Andhi Khola, for Sand and Aggregates 22 KM from the proposed road.	DDC/DTO/ Contractor/ RBGs	PCU/CISC/ DIST/VICCC
Construction works, operation of construction vehicles, material hauling and unloading etc	Dust from exposed surface, from construction equipments and vehicles	Air pollution, public health risks	D	L	L	ST	Re	Use of face mask while working on dust prone areas, covering of dust sources	DDC/DTO / RBGs	DIST
	Increase in level of noise around school, forest areas	Noise pollution, disturbance and annoyance.	D	L	L	ST	Re	Restrict horn near school and forest etc.	DDC/DTO / Contractor	DIST
Slope cutting, spoil and waste disposal during road construction	Increase in sediment level, spills and leakage of oils and chemicals to water bodies	Water pollution and impact on users	D	L	L	ST	Re	Proper spoil management, avoid disposal of excavated materials in the water bodies areas.	DDC/DTO/ Contractor/RBG s	DIST/VICCC



Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
Construction of road	Location of Camp Sites, Storage Depots	Encroachment of forest, agriculture land, solid waste, and waste water may cause pollution	D	M	L	ST	Re	Use of local labours; Siting camp away from productive lands; pay compensation for using private farm or lands for storage or camp; electricity and first aid facilities will be provided in camp sites; provision of soak pit and pit latrine will be made. Appropriate camp site should be at 5+600, 6+750, 8+600 and 9+200.	DPO assisted by DIST/ Contractor	DIST/VICCC
Operation of construction equipments	Construction equipment vehicles (Rollers, tippers, spreader, water tanker etc.)	Air pollution due to emission of smoke, increase in vibration and noise pollution	D	H	SS	ST	Re	Equipment/vehicles deployed for construction activities shall be regularly maintained. All the vehicles deployed for material movement shall be spill proof to the extent possible	DPO assisted by DIST/ Contractor	DIST/CISC/PCU
Construction of Road	Decrease in aesthetic value	Disturbances in working areas and scar on topography	D	L	L	ST	Re	Cover the road alignment by planting tree on both sides; manage working areas.	DPO in assistance by DIST / Contractors	PCU / CISC / Users Committee / VDC
Operation of construction vehicles fuel, Kerosene and spoil productivity.	Storage of Petrol, diesel and grease for vehicles. Kerosene for workers to used for light.	Water sources and soil are polluted. Affects health of the workers.	IN	L	SS	ST	IR	Store fuels and chemicals on paved surface with surrounding catch drain to protect soil from leakage. Proper storage of hazardous chemicals and providing information signboards. Use of safety gears to workers during handling of chemicals and fuels. Close monitoring during operation of machineries.	DIST/Contractor	DIST/CISC/PCU
<b>Biological Environment</b>										
Clearance of vegetation necessary for road formation	Loss or Degradation of Forests (0.51 Ha) and Vegetation/trees (91 numbers)	Loss of green cover; loss of environmental benefits from vegetation, disturbance in ecological function (dust and noise absorbance, aesthetic value etc	D	H	L	LT	Re	Cutting of tree only in formation width, compensatory plantation of local species of tree at 1:25 ratio + 10 percent in forest land . Total compensatory plantation will be 2503 numbers of trees.	DDC/DTO/DFO	DFO/CFUGs/ DIST/VDC
Construction activity	Impact on Wildlife Due To Loss of Habitat and Hunting	Killing and harrasing of wildlife; Loss of biodiversity and valuable species of wildlife	IN	L	L	ST	Re	Work only in day time, do not disturb wildlife, aware workers	DDC/DTO/DFO	DFO/CFUGs/ DIST
Construction activity	Impacts on Flora and Fauna	Loss of biodiversity	IN	L	L	MT	IR	Minimum site clearance, discouraging workers for collecting fuel wood from forest or	DDC/DTO/DFO	DF/CFUGs/DI



Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
								hunting/harassing faunas		ST
<b>Social-economic Environment</b>										
Acquisition of land for maintaining road width	Loss or Degradation of Farm Land and Productivity (0.56 Ha), annual loss of 1.3 Metric Tons of food grain production	Reduced production, hardship, food shortage	D	H	L	LT	IR	Compensation for affected people. A separate Resettlement Plan will be prepared to address land acquisition and compensation issues. Camp sites and spoil sites shall away from productive agricultural land.	DDC/DTO	CFC <sup>1</sup> DIST/VICCC
Acquisition of land and property for maintaining road width	Loss of Private Properties	Displacement of people, hardship	D	H	L	LT	IR	Compensation and resettlement measures will be dealt as per decision made by Compensation Determination Committee (CDC). The total resettlement and rehabilitation cost is NRs. 4813164.00.	DTO / DIST	CFC
Demolition of structures along road alignment	Impact on Community Infrastructure	Loss of services (see table 6.2)	D	H	L	MT	Re	Restoration or relocation of affected infrastructures: Irrigation Crossing (4+075, 3+900, 2+412, 1+980 and 0+800), Water Supply Pipe (4+050, 2+500, 1+100 and 5+500), Foot Trail (3+650, 2+650, 2+370, 1+900, 1+980, 1+200 and 5+212), Access road (1+000, 5+212). prohibited spoil disposal near Water Source (1+700 and 1+650 (tap)). Information signboard will be placed in School area (2+650 and 5+212)	DDC/DTO	PCU DIST/CISC/VI CCC/VDC
Occupational health and safety aspects	Health and safety matters	Injury, fatal accidents, outbreak of epidemics and diseases, decline in capacity to work	D	H	L	ST	IR	Occupational health and safety regulations, first aid facility at sites with health treatment arrangements, contingency planning; Proper drinking water and toilet facility for construction crew	DDC/DTO / Contractors	DIST/CISC
<b>Operation Stage</b>										
<b>Physical Environment</b>										
Quarrying, operation of road	Road Slope Stability and Management	Slides and slope failure, Disturbance to traffic flow, pollution of water bodies, impacts on agriculture land, loss of	D	M	L	LT	Re	Major area of concern is at Ch. 9+860. include Immediate clearance of slides and restoration of slopes; regular maintenance of bio-engineering and civil structures for slope protection; restoration of	DDC/DTO/VDC	DoLIDAR , DFO, District Watershed and Soil

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



Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
		vegetation.						fill and gully formation; and conservation of soil.		Conservation Office (DWSSC)
Operation of vehicles, Inadequate drainage	Air, Noise and Water Pollution	Disturbance to students, patients, wildlife, effect to nearby agriculture land and crops	D	L	L	LT	Re	Speed limit for vehicles, no horn signs, use vegetation barrier; Regular maintenance of drainage.	DDC/DTO	DoLIDAR/ Local administration
<b>Biological Environment</b>										
Road operation	Depletion of Forest Resources	Loss of timber, forest resources.	IN	M	L	LT	IR	Enforcement of law, vigilance and monitoring, participation of community.	DFO/ CFUGs/VDCs	DDC/CDO
Road operation	Disturbance to the Wildlife and Illegal Hunting	Affect wildlife and bird species from vehicular movement, blowing of horn near the forest area. Illegal poaching.	IN	L	L	LT	IR	Prohibition of blowing horns near the forest areas.	DTO/ CFUGs	DDC/CDO / DFO
<b>Social-economic Environment</b>										
Easy Access by road operation	Unplanned New Settlement and Market Center Development	Encroachment of RoW, increased accidents, delay in traffic movement, depletion of local resources, water pollution	D	M	L	LT	IR	Awareness program, enforcement of law, planning of land development, plantation of trees.	DDC/DTO	CDO / VICCC
Operation of Road	Change in Social behavior	Social and cultural conflicts	IN	M	L	ST	Re	Awareness, Enforcement of law and order, Provision of training for skill	DTO	DDC/ DoLIDAR
Operation of Road	Road Safety Measures	Increase in accidents	D	M	L	LT	IR	Appropriate road safety measures, Safety signs along the road.	DTO	DDC/ DoLIDAR

\* Legend Value in parenthesis is level of significance:

Nature- IN= Indirect; D= Direct

Magnitude- L= Low; M= Medium; H= High

Extent- SS= Site Specific; L= Local; R= Regional; N= National; CB=Cross-boundary

Duration- ST= Short Term; MT= Medium Term; LT= Long term

Re=Reversible; IR= Irreversible



## 7.4. Mitigation cost

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

**Table 7.4: Cost Estimate for Environmental Enhancement and Mitigation Measures**

SN.	Environmental Protection Measures	Estimated Budget (NRs.)	Remarks
<b>1. Benefits Augmentation Measures</b>			
1.1	Training to DDC/DTO/DPO/DIST to conduct environmental monitoring and reporting	50,000.00	To be included in project cost
1.2	Training to Naik of RBGs	50,000.00	To be included in project cost
1.3	Enhancement in Technical Skills	200,000.00	To be included in project cost
	<b>Sub-Total (1)</b>	<b>300,000.00</b>	
<b>2. Adverse Impacts Mitigation Measures</b>			
2.1	Bio-engineering work/Road side plantation	609,105.00	To be included in BoQ
2.2	RBG Insurance	400,000.00	To be included in project cost
2.3	Information Signboard	100,000.00	To be included in BoQ
2.4	Resettlement Cost (Compensation for properties)	4,813,164.00	To be included in Resettlement plan
2.5	Restoration or relocation of affected infrastructures, spoils disposal site management and rehabilitation, reinstate of quarry etc.	500,000.00	To be included in BoQ
2.6	Compensatory plantation Re-plantation / Re-forestation	150,180.00	To be included in project cost
2.7	Social Cost	453,000.00	To be included in Social plan, project cost
2.8	Occupational health and safety; First aid boxes, campsite sanitation (Pit latrine); solid waste management, Safety measures for workers (Helmets, gloves, masks, boots, etc.)	550,000.00	To be included in BoQ
	<b>Sub-Total (2)</b>	<b>7,575,449.00</b>	
	<b>Total</b>	<b>7,875,449.00</b>	

## 7.5. Implementation of Mitigation Measures

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

134. The tender instruction to bidders will explicitly mention the site-specific mitigation measures to be performed, the materials to be used, labor camp arrangements, and waste disposal areas, as well as other site specific



environmental requirements. Action to be taken against failure to comply with EMAP requirements will also be clearly agreed in the contract agreement document.

## 7.6. Environmental Monitoring

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

### 7.6.1 Monitoring Responsibility

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

137. 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.

138. DDC/DTO with support from PCU/CISC will make arrangements for sub-project level monitoring. It will constitute a monitoring team. Project's district management team should be responsible for forming the monitoring team, financing the monitoring works, providing logistics and other necessary support. Thus, it is recommended that an external team hired by DDC/DTO take responsibility for periodic monitoring of the environmental performance, in addition to the regular supervision and guidance provided by the DIST at the site. The sub-project specific monitoring plan as given in **Table 7.4 and 7.5** shall be followed. At least one monitoring in each construction season is necessary.

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

**Table 7.5: Environmental Monitoring Cost**

S. No.	Detail	Unit	Quantity	Rate	Total (NRs.)
1	Environmental Management Specialist	Man-month			Included in the Cost of DIST
2	Sociologist / Public Relation Expert	Man-month			Included in the Cost of DIST
3	Report Preparation		LS		100,000.00
4	Transportation		LS		50,000.00
5	Cost for Monitoring by MoLD/DoLIDAR		LS		50,000.00
	<b>TOTAL</b>				<b>200,000.00</b>

Thus, total environmental monitoring and management cost is NRs. 8,075,449.00

### 7.6.2 Types of Monitoring and Monitoring Parameters

140. Monitoring is an on going component of the environmental assessment process and subsequent environmental management and mitigation activities. There are basically three types of monitoring: baseline monitoring, Compliance Monitoring and Impact Monitoring.

141. Environmental Monitoring for this sub project are:

- Compliance Monitoring** - It verifies whether contract environmental clauses and the mitigation measures are properly implemented in the field. The frame work for compliance monitoring is given in the **Table 7.6**.
- Impact Monitoring** - It confirms whether the environmental mitigation measures specified in the project design and contract are correctly formulated. The frame work for impact monitoring is given in the **Table 7.7**.



**Table 7.6: Compliance Monitoring for Karkineta-Lunkhu Road Construction Works**

<b>Parameters &amp; Indicators</b>	<b>Responsible Implementing Agency</b>	<b>Verifiable Indicators</b>	<b>Verification Methods</b>	<b>Schedule</b>	<b>Responsible Monitoring Agency</b>
Final alignment selection as per IEE /EMP recommendation	DIST	Incorporation of IEE / EMP recommendations into alignment selection process and design document	Walkthrough along final road alignment, verifying sensitive areas	Initial stage preconstruction phase	Proponent through CISC; DoLIDAR
Land and property acquisition and compensation	Proponent with assistance of DIST	Cadastral records, Land and properties acquisition procedures; Procedures followed during voluntary donation of Land; Preparation of inventory of infrastructures likely to be affected	Public consultation, photos; geo-referencing; Check inventory against cadastral records and discuss with people	Initial stage pre-construction phase - well ahead of construction	CFC / PCU (CISC) / DOLIDAR / MoLD
Resettlement, assistance and compensation	Proponent / DIST	Legal provisions by GoN; Compensations paid	Check compliance to legal procedures	Well ahead of construction	CFC / PCU (CISC) / DOLIDAR / MoLD
Site selection and preparation of construction logistics	Proponent / VICCC	Project's arrangement for materials storage, and construction activities	Site observation, geo-referencing and photographic documentation	Beginning of construction period	DIST/ DPO
Use of local labour, particularly vulnerable groups and women	DPCC / VICCC / DIST	Specifications which obligate the contractors/BG to observe certain quotas for employing local labour, specially vulnerable groups and women, prohibition of child labour	Records of the that facilitates and coordinates the process for local people's employment, interviews	During the entire period where labour work is contracted, trimester	Proponent / DPO
Awareness and orientation training on road construction to technicians, and locally employed labourers	Proponent in assistance of DIST	Training programmes for skill development, occupational safety and environmental protection associated with road construction works	Specifications; Training records, check training programme reports, assess feedback from participants	Beginning of construction and during construction	DIST / Proponent (DTO)
Compliance to Occupational health and safety matters	DIST / Contractor (if involved)	Health and safety regulations, first aid and medical arrangements, contingency plan, number and type of safety equipments such as mask, helmet, glove, safety belt, First Aid, Emergency Rescue	Spot checks at work sites, photos, accident records, interviews	throughout construction activities, trimester	Proponent / DPO
Compliance to Environmental Protection Measures, including pollution prevention, water and		Arrangement specified in the Code of Practice and in Manuals relating to environmental protection; EMP detail in IEE Document; records and observations on	Site inspection, DISTussion with Project management, consultants, and local people. Quantifying site-specific impacts,	Before and during construction period	DPO/Proponent



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



Parameters & Indicators	Responsible Implementing Agency	Verifiable Indicators	Verification Methods	Schedule	Responsible Monitoring Agency
Clean up and reinstatement of the construction sites (camps, quarries, borrow pits)	Contractor / RBG / DIST	Decommissioned sites indicate no adverse/residual environmental impacts, and are rehabilitated to the satisfaction of the supervisor and land owners	Site observation; Comparing photos; Consultation with land owners and CBOs	At end of construction period	Proponent / DPO

**Table 7.7: Impact / Effect Monitoring for Karkineta-Lunkhu Road Construction Works**

Parameters & Indicators	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 DISTussion with people and technicians	Near steep slopes and at landslide areas and sites where bio-engineering failed	Continuously during construction and operation	DIST during construction; Proponent / DPO / Soil Conservation Office during operation
Bio-engineering of disturbed slopes	Re-vegetation through bio-engineering application on disturbed slope; Establishment of nursery	Site observation; Inspection of nursery and its production rate, photos, measurements	Cut slope area, where vegetation is cleared; Nursery	During and at end of Project construction	DIST/ Proponent
Disposal of Spoils and construction wastes	Affected aesthetic value, affected forest and agriculture, initiated land erosion by local blocked drainage, hazard to downhill slope residents and agricultural lands	Site observation and interviews, photos, geo-referencing sites	At specific locations where such sites occur	During construction	DIST/ Proponent
Quarrying of construction materials	Initiated erosion, changes in river regime, erosion by river systems, landslide due to quarrying, degradation of vegetation, water logging, waterborne diseases	Site observation, photos, records from local health centres	Quarry site areas	During construction	DIST/ Proponent
Disruption of drainage system	Status of rehabilitation Service status of irrigation and water supply system; Operation and maintenance requirement	Observation and interviews, photos, fisheries data, wildlife records	Disrupted aquatic system, irrigation schemes	During construction	DIST / Proponent
Loss or degradation of farmland , houses and properties	Status of road side land; Production / yield; Status of road side houses; Status of standing crop along alignment	Observation, data collection and analysis and interview with stakeholders	Road side land and houses	During construction	Proponent / DIST/ VICCC
Water quality	observation of open defecation and waste disposal around water sources near construction sites ; Parameters like pH, hardness, DO etc.	Visual observation, measurement of water sample using standard field kit	local streams	During construction; Upon demand for testing	DIST / Proponent



Parameters & Indicators	Verifiable Indicators	Verification Methods	Location	Schedule	Responsible Implementation and Monitoring Agency
				with field kit	
Air quality	Dust level in ambient air	Visual inspection and comparison with baseline condition	At construction sites and at sensitive spots (schools, health spots, major settlements)	During construction and operation	DIST / Proponent
Forest and vegetation	Numbers of trees, presence of ground vegetation, signs of illicit logging and extraction of NTFPs	Observations, DFO records, photos; interview with CFUGs members	In and around the construction sites, markets,	During construction and operation	DIST/ CFUGs/DFO during construction; CFUGs / DFO during operation
Wildlife	Wildlife hunting trapping and poaching by work force, trade of wildlife, biological survey on selected biota, 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 during operation
Change in economy	Numbers of people employed by the Project during construction Numbers of women in work forces	Records kept by the Project management, DISTussion with stakeholders	Project Area	Trimester during construction phase	DIST /Proponent
Trade and commerce	Numbers of shops increased or decreased, rental of houses and land spaces	Records, interviews, observations, photos	Project Area	Throughout Project, once in a year	Proponent / VDC
Cottage industries	Establishment of industries in the vicinity of Project Area	Records and interviews, photos	Project Area/ zone of influence	Throughout Project	Proponent / VDC
Occupational safety and hazard	Type and number of accident occurred during construction; Adequacy of occupational safety measured provided; Compensation provided in case of fatal accidents or invalidity	Observations, photos, spot checks, contractors' and health centre records interview with labourers	Project Area	During construction	DIST/Proponent
Change in socio-economic structure	No and extent of new settlements / types and ethnic groups; Nos and extent of new businesses; Nos and extent of new services and utilities, social conflicts	Observations, interview with local people, DDC Police and VDC records	Project Area	During operation	Proponent / VDC
Ribbon settlement	Congestions to road users Nos. of accidents, RoW encroachment	Records, observations	Project Area	During operation	DDC/CDO



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## 8.0 Conclusion and Recommendations

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### 8.1 Conclusion

142. The IEE study of the proposed Karkineta-Lunkhu road sub-project does not pass through any environmentally sensitive area and have minimal detrimental effects associated with loss of forest and agricultural land. This road helps to link rural areas of Parbat district with Siddhartha highway at Naudada. This is shorter route to reach Siddhartha Highway from Parbat district (only 20 KM from Karkineta). Most of the adverse impacts predicted are of low significance and short term as well as of reversible nature. The beneficial impacts with the facility of access to market centers and location of social services will enhance productivity in rural area and improve the quality of life of the people. In addition, local people will get direct employment as workers which will contribute significantly in improving their livelihood. These benefits from the implementation of the proposed road project are more significant and long term in nature against the adverse impacts most of which could be mitigated or avoided.

143. 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

144. 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.

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



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## 9.0 Miscellaneous

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## **ANNEXES**



[illegible]

मिति: २०६६/१/२५

लिपि: - प्राचिन: ब्राह्मणलिपि: (1100) का उपयोग (1100) स्वीकृत भाषा: -

प्रामाण्य पुनर्विधेय तथा कुलसंघर्षका कार्यक्रमका (TUBUDAN) अन्तर्गत विभिन्न शिक्षा निकाय प्रतिष्ठितको सम्मेलनबाट विभिन्नसमागका सदस्यहरुको प्रारम्भिक ज्ञातपरिचय परीक्षणको कार्यसूची (ताहा) कार्यसूची (TUBU) तथा गरी तल्लो विषय मार्फत ज्ञातपरिचय संज्ञान विषयसंबन्धी २०१४ अनुसार स्वीकृतिको तालीम यस सम्बन्धमा पेश भएकोमा नेपाल सरकारको मिति २०१६/२/२४ को निर्णय (प्रतिबन्धक) अनुसार स्वीकृत भएको प्रतिवेदन मातः २/२ गरी सरकारबाट गठन भएको कार्यसूची अनुसार भर्नायु ।

1. चिन्तामणी-हवाम बाग, चौक, डोमिनन्ता-फलोकास, तुल्साव-सोलाजा, काळीनिठ-तुडपु सडक बांधवापर्यंत चिन्ता। ✓
2. तनुषा-राठीवेडवा, कात्कीडोल-तुकम माईकोट, धिंधोल-रपारु सडक बांध (राजुस सिल्ता)। ✓
3. धनेलवरी-गिरीरड, सौकु-अर्दिह, पौवा-फटकेकर, सोडिपौवा-भोटेपूर, ज्यापिडोल-बाणवज्जलाड (जाहमाणरी सिल्ता)। ✓
4. ताम्बु-मावू-पुल (दोलसा सिल्ता)। ✓
5. तेलकोट-झुलंड-चंगु, ज्यामासिव-बमराडोल-साजा (प्रतपूर सिल्ता)। ✓
6. पिपरा-भगवत-हैताड (सिन्धुली सिल्ता)। ✓
7. काले तुडोली-सिम्बा, चोरफेसरी-आहवा-दोडा-परी भज्यवाड-जोगमा, किदिम-राली मांड-बालोफ, काले तुडोली-दुर्विम्बा (पौवध सिल्ता)। ✓
8. फागम-वहचौर-हर्जव-सिउरी (सिल्ता)। ✓

विजयराज भुवेंदी  
शास्त्र अभिज्ञ





२०६६/०३/२२

२०६६/०३/२२

**Terms of Reference (ToR)**  
For  
Initial Environmental Examination (IEE)  
Of  
**Karkineta-Lunkhu  
Road Sub-Project**

Submitted to:

**Ministry of Local Development,  
Government of Nepal**

२०६६/०३/१७

Proponent:

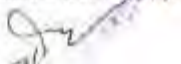
**District Development Committee (DDC)  
District Technical Office (DTO)  
Parbat  
Telephone No. -067-421165**

Date: March 2009



## 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 Coordination Committee
DTO	District Technical Office
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management Section
EPA	Environmental Protection Act
EPR	Environmental Protection Rules
FGD	Focus Group Discussion
GoN	Government of Nepal
IEE	Initial Environmental Examination
IUCN	The World Conservation Union
Km	Kilometer
LEP	Labour based, environment friendly and participatory
MLD	Ministry of Local Development
NGO	Non-Governmental Organization
PAM	Project Administrative Memorandum
PCU	Project Coordination Unit
REA	Rapid Environmental Checklist
RRRSDP	Rural Reconstruction and Rehabilitation Sector Development Project
SF	Social Funding
SDC	Swiss Agency for Development and Cooperation
SDS	Social Development Specialist
SM	Social Mobilizer
TA	Technical Assistance
ToR	Terms of Reference
VDC	Village Development Committee
ZoI	Zone of Influence







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ToR for IEE of Karkineta-Lunkhu road sub-project in Parbat District

*[Handwritten signature]*  
*[Blue ink stamp]*







## 1.0 NAME AND ADDRESS OF THE PROPONENT

The District Development Committee (DDC)/District Technical Office (DTO), Parbat is the executing agency at the district level and the proponent of the Initial Environmental Examination (IEE) study for the rehabilitation of **Karkineta-Lunkhu** 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)

Kushma, Parbat

## 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.

This Terms of Reference (ToR) is prepared to conduct an IEE study of **Karkineta-Lunkhu** road sub-project in Parbat District.

### 2.2 BACKGROUND OF THE SUB-PROJECT

The proposed of **Karkineta-Lunkhu** road sub-project starts from Karkineta VDC and lies in the middle part of Parbat district of Western Development region of Nepal. This sub-project starts from **Karkineta** VDC ends at **Lunkhu** VDC. Total length of the road alignment is 10 km.

The people in this project area are having many types of transportation problems due to the steep topography. Local people have no access to the market centres of the district to fulfil their daily needs. Other development facilities are also far from the reach of people



because it is very difficult to create a system like water supply, electricity, bio-gas plant and telephone without a road corridor. Having lots of transportation difficulties, people of the road corridors initiated to construct a road by using excavating machine through DDC from FY 062/063.

For the road construction, use of local labour will generate immediate employment to local people and minimise migration to Kathmandu and Pokhara 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 Parbat district.

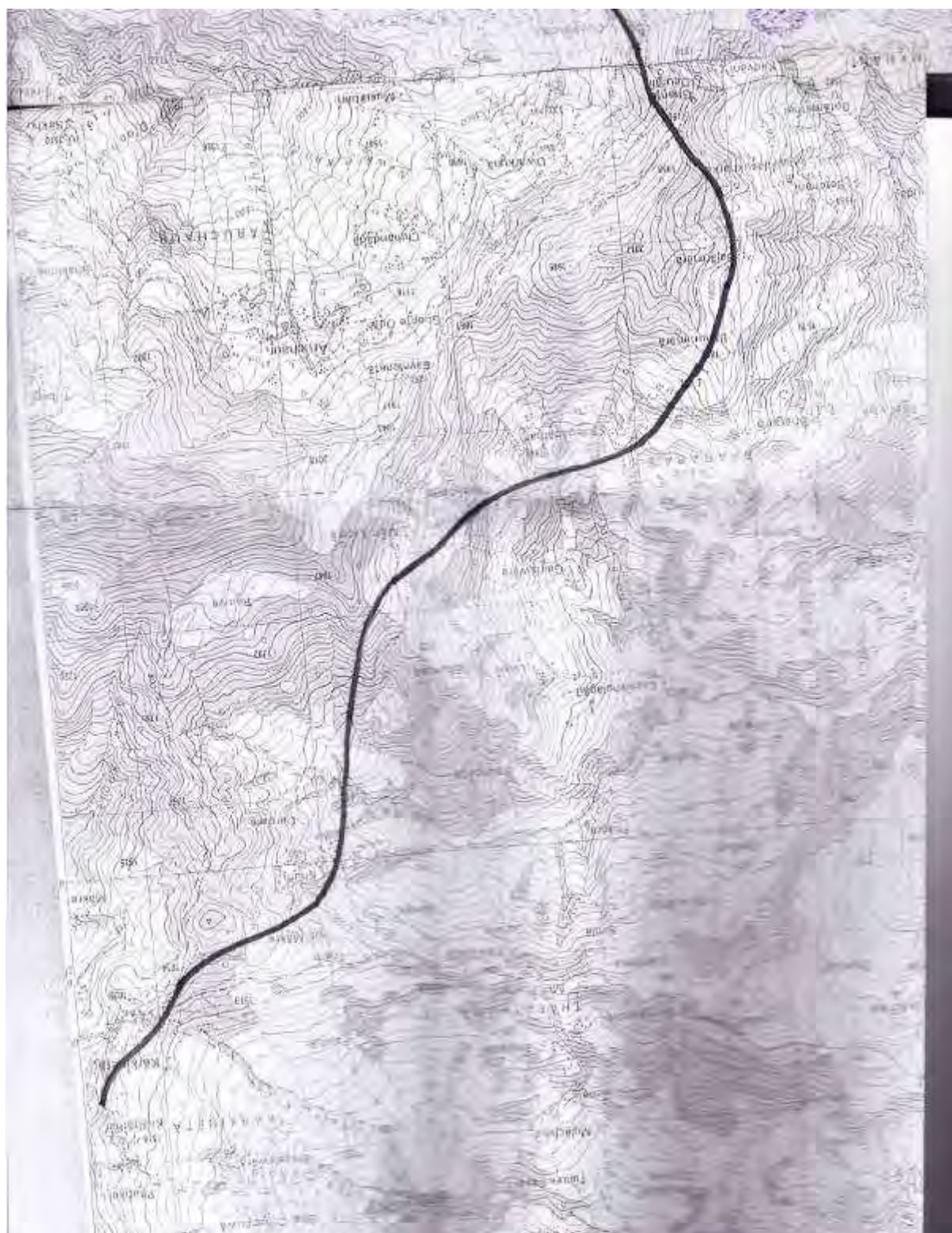
This road is identified as a priority road in the District Transport Master Plan (DTMP). Rehabilitation of this road with gravelling will provide physical and economical access to the people of South-Western part of the district with district headquarter and other part of Nepal.

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

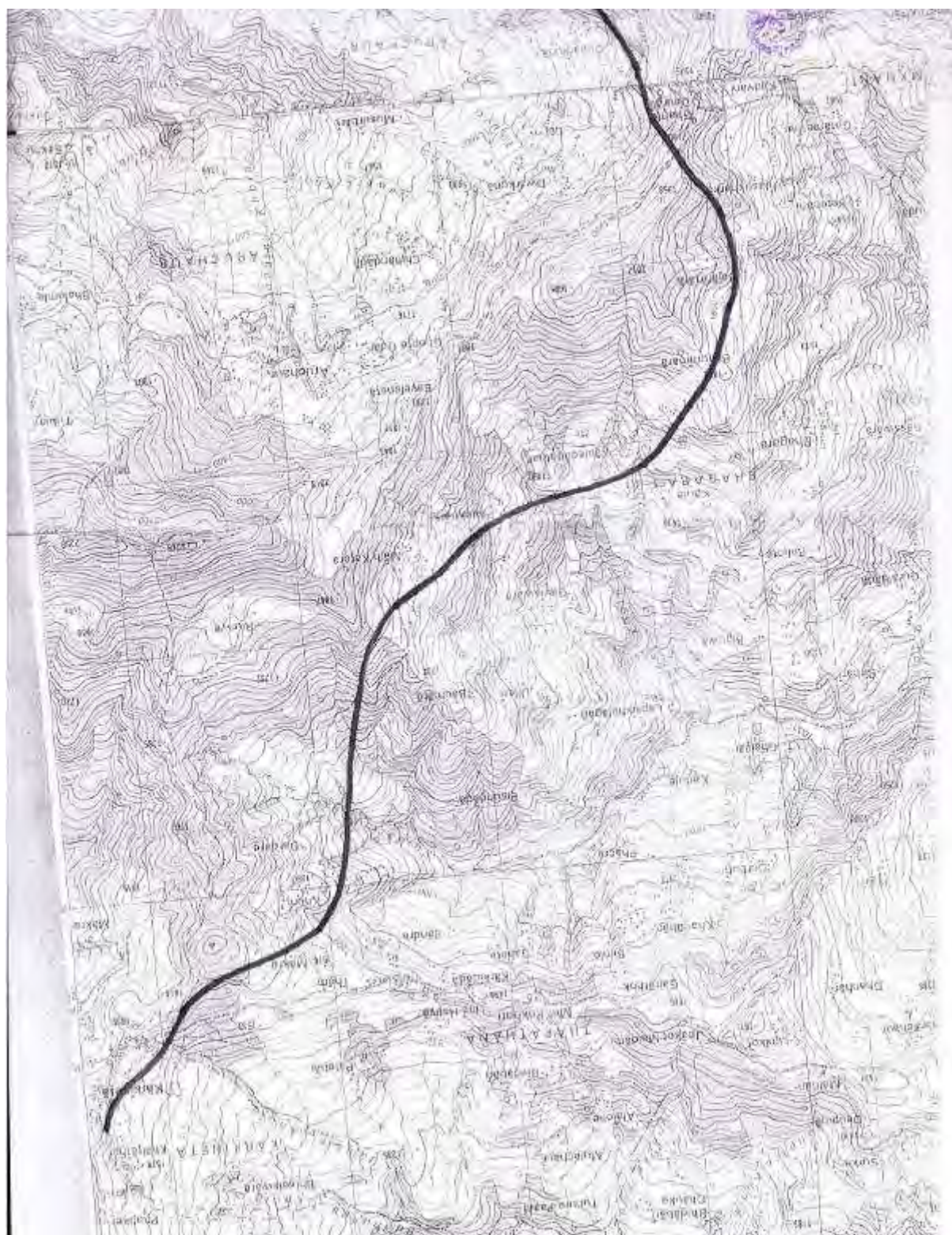














### 2.3 OBJECTIVES

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 **Karkineta, Thapathana, Bhangara, and Aruchaur**, VDCs with connect to the south-east part of parbat district and neighbouring VDCs of Syanja district. This road starts from **Karkineta** VDC lies at about 18 km south east of **kushma**. The end point of this rehabilitation section of road is Deurali of Aruchaur VDC. The end point of the road deserves the possibility of being market centre for several VDCs. About 23537 people of **karkineta, Thapathana, Bhangara, Aruchaur, Pakhapani, Lunghu, Kunga, Balakot and Bhoksing** VDCs of Parbat and Syanja districts will be facilitated.

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
- *Batabaranyia 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
- APPROACH for the Development of Agricultural and Rural Roads, 1999 (DoLIDAR)



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

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

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

##### **4.1 DESK REVIEW**

The following steps will be followed during the desk review:

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

##### **4.2 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE**

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

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

##### **4.3 FIELD WORK**

The IEE team will walk through along the road alignment visiting the significant environmental features in the probable influence corridor, and make necessary



measurements, inspect/observe and discuss it with the local stakeholders. The information collection will be made covering physical, biological, socio-economic and cultural aspects of the environment.

## 5.0 ALTERNATIVES FOR THE IMPLEMENTATION OF THE PROPOSAL

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

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

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

## 6.0 REQUIREMENT OF THE IEE STUDY

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

### 6.1 TIME SCHEDULE

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

**Table 1. Proposed work schedule for conducting IEE study**

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





## **6.2 ESTIMATED BUDGET AND STUDY TEAM**

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

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

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

## **7.0 ENVIRONMENTAL BASELINE**

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

## **8.0 ANALYSIS AND INTERPRETATION**

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

## **9.0 IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT**

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

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





The likely impacts of the proposed road construction as well as operation are described in the following sections.

### **9.1 BENEFICIAL IMPACTS**

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

#### **9.1.1 Construction Stage**

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

#### **9.1.2 Operation Stage**

- Access to Inputs and Services
- Development of Market centers
- Appreciation of Land Value
- Increased Crop Productivity and Sale of Farm Products
- Enhancement of Community Development Services
- Promotion of Tourism Activity
- Women and Indigenous People Empowerment

### **9.2 ADVERSE IMPACTS**

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

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

#### ***Physical environment***

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

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



- Decline in Aesthetic Value

#### ***Biological environment***

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

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

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

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

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

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

#### ***Physical environment***

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

#### ***Biological environment***

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

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

- New settlement along the road alignment
- Road safety measures

### **10.0 BENEFIT AUGUMENTATION/MITIGATION MEASURES**

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

### **11.0 ENVIRONMENTAL MANAGEMENT PLAN**

The study will ensure the implementation and monitoring of mitigation measures for minimizing adverse impacts and maximizing the beneficial impacts. This plan will also identify the key



environmental monitoring indicators with respect to activities, methods and responsibilities in order to monitor the environmental condition and adoption of suitable mitigation measures.

## **12.0 IEE report format**

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

- i. **Cover page with name of the proposal and proponent and address**
- ii. **Table of content**
- iii. **List of Abbreviation (acronyms)**
- 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
  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 Acts, Regulations and Guidelines:** During the study relevant policies, legislations and guidelines should be reviewed and their salient features should be mentioned in this section. Similarly related institutions should be consulted.
- ix. **Existing Environmental condition:** Baseline information on the existing physical, biological as well as socio-economic and cultural resources of the proposed sub-projects is described here. Environmental features such as sensitive areas, population and settlements, forests should be shown in a map



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

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

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

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

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

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

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

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


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

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

**xv. Annex**

- ToR of IEE
- Rapid Environmental Assessment (REA) Checklist
- Abstract of cost
- RRRSDP environmental checklist
- Public notice
- Deed of enquiry (*muchulka*)



- 
- Name of the organizations
  - List of person contacted
  - Meeting minutes of community consultation
  - Recommendation letters from municipality and VDC's
  - Existing condition
    - a. Distribution of household by major occupation
    - b. Summary of public services and infrastructures according to settlement
    - c. Land holding pattern of settlements within 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

### Rapid Environmental Assessment (REA) Checklist

#### Instructions:

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

Country/Project Title:

Nepal / RRRSDP

Name of the sub Project:

Karkineta-Lunkhu

SCREENING QUESTIONS	Yes	No	REMARKS
<b>A. Project Sitting</b>			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		✓	
▪ Protected Area		✓	
▪ Wetland		✓	
▪ Mangrove		✓	
▪ Estuarine		✓	
▪ Buffer zone of protected area		✓	
▪ Special area for protecting biodiversity		✓	
<b>B. Potential Environmental Impacts</b>			
Will the Project cause...			
▪ Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		✓	
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?		✓	



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>		✓	
<ul style="list-style-type: none"> <li>Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?</li> </ul>	✓		During road construction there will be increase in human and different construction activities that may cause the air pollution.
<ul style="list-style-type: none"> <li>Noise and vibration due to blasting and other civil works?</li> <li>dislocation or involuntary resettlement of people</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Hazardous driving conditions where construction interferes with pre-existing roads?</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Creation of temporary breeding habitats for mosquito vectors of disease?</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Dislocation and compulsory resettlement of people living in right-of-way?</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Increased noise and air pollution resulting from traffic volume?</li> </ul>		✓	
<ul style="list-style-type: none"> <li>Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?</li> </ul>		✓	

Source: field survey, May/June, 2009



### Annex III: Abstract of Cost

SN	Description of works	Unit	Estimated	Rate(NRs)	Amount
			Quantity	In Figure	(NRs)
<b>A</b>	<b>General</b>				
<b>1</b>	Insurance of works, Plants and materials, construction equipments and against accident to workmen including third party insurance.	Lump Sum		300,000.00	300,000.00
<b>2</b>	Carry out additional tests for material and works as required and instructed by the Engineer.	Lump Sum		150,000.00	150,000.00
<b>3</b>	Providing Site Office for Supervision team	Lump Sum		36,000.00	36,000.00
<b>4</b>	Providing motorbike for supervision team	Lump Sum		150,000.00	150,000.00
<b>5</b>	Relocation of public utilities structures ( Irrigation canal, Water supply pipelines etc)	Lump Sum		100,000.00	100,000.00
<b>Sub-Total (A)</b>					<b>736,000.00</b>
<b>B.</b>	<b>Roadway Works</b>				
<b>1</b>	Site clearance work	Sq.m	5,337.50	12.00	64,050.00
<b>Sub-Total (B)</b>					<b>64,050.00</b>
<b>2</b>	Excavation in roadway, drain and foundation for gabion, dry and cement masonry retaining wall structures including removal and satisfactory disposal and stacking or hauling (to sites of embankment construction) of suitable cut materials as required (Respective clause of specifications 2-1.2.2,2-1.8 and 2-1.9)				
<b>2.1</b>	a) ordinary soil	Cum.	12,959.060	150.00	1,943,859.00
<b>2.2</b>	b) hard soil	Cum.	23,136.460	180.00	4,164,562.80
<b>2.3</b>	c) Ordinary Rock	Cum.	1,191.440	600.00	714,864.00
<b>2.4</b>	d) Medium rock	Cum.	1,011.410	1,200.00	1,213,692.00
<b>2.5</b>	e) hard Rock	Cum.	610.010	5,100.00	3,111,051.00
<b>Sub-Total (C )</b>					<b>11,148,028.80</b>
<b>3</b>	Construction of roadway in embankment and miscellaneous backfilling areas with approved material obtained from roadway excavation including average transportation distance up to 50 m along the lead route, spreading in layers, watering and compaction; (Respective clause of specifications 2-5)				
<b>3.1</b>	a) ordinary soil	Cum.	10,499.500	75.00	787,462.50
<b>Sub Total (D)</b>					<b>787,462.50</b>
<b>C.</b>	<b>Structure Works</b>				
<b>1</b>	Stone Masonry work in (1:4) in Drain work along the road(Respective clause of specifications 8 A d)	Cum.	4,567.085	4,714.91	21,533,393.79
<b>2</b>	<b>Cement Concrete works:</b> It				



	includes all labour and material required for mixing, placing in position, vibrating, compacting, finishing, curing and all other incidentals required to produce concrete of specific strength as per the specification. The rate includes the work of making, fixing and removing of all centres and forms required for the work.(Respective clause of specifications 11 A a)				
2.1	Cement concrete work (1:3:6)	Cum.	3.580	8,253.39	29,547.14
2.2	Cement Concrete work(1:2:4)	Cum.	24.000	9,858.30	236,599.20
3	Dry Stone wall	Cum	1,276.660	1,496.35	1,910,330.19
<b>Sub-Total (E)</b>					<b>23,709,870.32</b>
5	Supply and laying RCC Hume pipe (NP3). It includes all operations required to complete the work upto a trench depth below the ground level and jointing of pipes with 1:2 cement sand mortar.For ever subsequent pipe having a length of minimum 1 m. (Respective clause of specifications 15-5 and 15-6 )				
5.1	30cm Dia	Rm.	187.500	2,741.28	513,990.00
<b>Sub-Total (F)</b>					<b>513,990.00</b>
6	Assembling,Stone Packing and Febrication of gabion baskets (including rolling, cutting, weaving and supply to the site, Hexagonal Mesh Size: 100mm*120mm, selvedge wire-7swg, mesh wire-10 swg & binding wire-12 swg, all heavy coated,placing them in position including stretching, binding them together and tying down lids,quarrying and transportation)(Respective clause of specifications 17-1.4,17-5 and 17-6)				
6.1	Gabion Boxes of sizes (2mx1mx1 m)	Cum.	1,374.000	2,587.69	3,555,479.19
6.2	Gabion Boxes of sizes (1.5mx1mx1 m)	Cum.	739.500	2,544.63	1,881,751.42
<b>Sub-Total (G)</b>					<b>5,437,230.61</b>
7	20 cm thick stone pitching on the prepared bedding including supply of stone and river spalls for sealing of voids	Cum.	2,452.800	1,383.02	3,392,271.46
8	5cm thick beddig for stone pitching with screened Granular material	Cum.	631.950	1,738.05	1,098,360.70
<b>Sub total (H)</b>					<b>4,490,632.16</b>
D.	<b>Pavement work</b>				
1	Subgrade preparation work(Loosing and recompacting at subgrade level including breaking of clods, spreading in layers,watering and compaction) Respective clause of specifications2-1.6,2-1.7,2-1.8,2-	Sq.m	42,700.000	38.50	1,643,950.00



	1.9 a				
2	15 cm thick gravelling work (63mm down) Lead average 21km	Cum.	4,569.000	2,707.68	12,371,389.92
	<b>Sub total ( I )</b>				<b>14,015,339.92</b>
E	Cutting of trees having girth of above 30 cm when measured at 1m above the ground including the removal of trunk, branches and stumps up to a lead of 100m along the lead route for trees of size:(Respective clause of specifications 1-1.5(a), 1-1.5(b) and 1-1.6)	Nos.	91.000	87.00	7,917.00
	<b>Sum Total ( J )</b>				<b>7,917.00</b>
	<b>( K) Total of Sub-Total A,B,C,D,E,F,G,H,I and J</b>				<b>60,910,521.31</b>
	<b>Bio-Engineering 1% of Total cost</b>				<b>609,105.21</b>
	<b>(A) Total</b>				<b>61,519,626.52</b>
	<b>15% OVERHEAD</b>				<b>9,227,943.98</b>
	<b>(B) Total</b>				<b>70,747,570.50</b>
	<b>13% VAT</b>				<b>9,197,184.17</b>
	<b>(C)Total</b>				<b>79,944,754.67</b>
	<u>Contingency@5% of total</u>				<b>3,997,237.73</b>
	<b>Grand total</b>				<b>83,941,992.40</b>
	<b>Cost Per KM</b>				<b>7,867,103.32</b>



## Annex IV: RRRSDP Environmental Checklist

## A. GENERAL SOCIO-ECONOMIC SITUATION OF THE INFLUENCE AREA<sup>2</sup>

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

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

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

## 2. Economic activities/main occupation

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

### 3. Existing services and infrastructures

[illegible]



S N	Service/Infrastructure Category	Settlement Code											
		A	B	C	D	E	F	G	H	I			
2.2	Health Post (no.) Sub-Health Post (no.)												
<b>3</b>	<b>COMMUNICATION</b>												
3.1	Telephone/fax												
3.2	Mobile/CDMA												
3.3	Post Office												
<b>4</b>	<b>ELECTRICITY SUPPLY</b>												
4.1	from Micro-hydro												
4.2	from Mini-hydro												
4.3	from National Grid												
4.4	from Solar System												
4.5	from Diesel Generator												
<b>5</b>	<b>BUSINESS &amp; COMMERCE</b>												
5.1	Hotels & Lodges (no.)												
5.2	Restaurant & Tea Stall (no)												
5.3	Grocery Shops (no.)												
5.4	Other Shops (no.) (e.g. stationery, medicine, tailoring, etc.)												
<b>6</b>	<b>DRINKING WATER SUPPLY SCHEMES</b>												
6.1	Gravity-Flow Scheme (capacity)												
6.2	Tube-wells (no.)												
6.3	Spring/Dug-wells (no.)												
<b>7</b>	<b>IRRIGATION SCHEMES</b>												
7.1	Surface Irrigation (ha.)												
7.2	Groundwater (ha.)												
<b>8</b>	<b>OTHER INFRASTRUCTURES</b>												
8.1	Micro-hydro scheme (no. & capacity.....kw)												
8.2	Water Mill (no.)												
8.3	Suspension Bridges (no.)												
8.4	Wooden Bridges (no.)												
8.5	Other Bridges (specify)												
<b>9</b>	<b>INDUSTRY</b>												
9.1	Weaving Industry (no.)												
9.2	Rice & flour Mills (no.)												
9.3	Other Industries (specify)												
<b>10</b>	<b>FINANCIAL INSTITUTIONS</b>												
10.1	Bank (no.)												
10.2	Cooperative												
<b>11</b>	<b>COMMUNITY USE</b>												
11.1	Ghat (no.)												
11.2	Hatia/Bazaar (no.)												
11.3	Playground (no.)												
11.4	Community Centre (no.)												
11.5	Others (specify)												

A.                      B.                      C.  
D.

#### 4. Land holding pattern



Land holding Pattern	Settlement Code (HH No.)												Remarks
Landless													
less than 1 ropani)													
1 to 5 ropani													
5 to 10 ropani													
10 to 20 ropani													
20-50 ropani													
> 50 ropani													

A. \_\_\_\_\_ B. C.  
D.

#### 4. Food grain availability

S N	VDC	Settlement	Number of HHs having food sufficiency for					Total HHs
			Surplus (Sufficient for > 12 months)	Sufficient for whole years	Sufficient for 6 months	Sufficient for 3 months	Hand to mouth existence	
1								
2								
3								
4								
5								

Source: field survey, May/June, 2009



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

S. No.	Type of Agriculture Production	Settlements									
		A	B	C	D	E	F	G	H	I	
<b>1.0</b>	<b>CEREALS</b>										
1.1	Rice										
1.2	Wheat										
1.3	Maize										
1.4	Millet										
1.5	Junelo										
1.6	Phaper										
1.7	Others (list)										
<b>2.0</b>	<b>CASH CROPS</b>										
2.1	Oil Seeds										
2.2	Beans/Dal										
2.3	Tobacco										
2.4	Potato										
2.5	Vegetables										
2.6	Fruits										
2.7	Tea/Coffee										
2.8	Amliso										
2.9	Sericulture										
2.10	Others (list)										
<b>3.0</b>	<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										

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

D. Bayaleneta

7. Migration for employment

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

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

Name of settlement:

- (b) Seasonal migration in search of work.

Month	No. of Total HH	Destination	Purpose




**8. Dominant off-farm occupation in the settlement in descending order**

**B. DEVELOPMENT POTENTIAL ACCORDING TO SETTLEMENT**

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

<b>S. N.</b>	<b>Name of Area</b>	<b>Description of Development Potential</b>
1		
2		

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

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

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

<b>Type of Resource</b>	<b>Name/specification</b>	<b>Affecting activities</b>	<b>Location from project</b>



गर्भर्नरमा...

\* ਪ੍ਰਥਮ ਕਲਾ ਕਾਨਫਰੰਸ:

१ परछाँ

॥ वैद्य भण्डालाल खमिली व  
जन्म १९०८ धरमपुर ॥  
॥ साहय निरुक्तिपत्र मुद्रित  
॥ वैद्यकी शास्त्र मर्यादा २६  
॥ साहय तीन भाग्याधारे

टमेल्ट

हाइपा १९औं रास्ता स्वयंपा  
इन पडाव गन सल्लिने वक्त  
साली, विदेशी मुद्रा सट्टी,  
कमि अनायासी छः  
दुद सेवा दिने जेवयभनार  
धरा लागतखेल, धरान,  
मादको छुः आगामी दुद  
ज्याउने समय रैखने छः  
५६ लाख ६२ करोड ५०  
सैठ ५० जना प्रवाह गरिने  
५० करोड ३० लाख रैखने  
१९९ करोड ४० लाख

## गलीन सेवा

१. जर्मनी की लवण खनिकों पर पारि  
सुद्धा २०१५ दिने मैक्सिड  
जिन्स, कोटिंगर, जोरपाटी,  
(१) मैक्सिड लवणखनिकों एक  
करोड कर्जा प्रवाह गरेको  
मानने बताए । २५ लाख  
रुपैयाँ दिने ।

## मास

लक्ष्मणस्य शब्दान् अनुसराम्य  
 स्ने मागं नैपातं दुरसम्भारं  
 । अश्वत्थामा कर्मक्षारीणां  
 तं गन्ते अण्णस्यै लक्ष्मणस्य  
 ६ ।

१. दुःख-भने अमोघक राखी  
साधनादोना भुरीछन सजानी  
उजानी भाग्य-हो तापु-हो  
हो जायय पैरिहो सेना मुल मन  
सोना डेकलेन घुसी जासो गोरछ  
विजय सो मरि सख्य होय  
[धने, बलिकन पैरिहायै राहु  
भासायैयै केंदरुन आरिहिन  
र मरौ छै दिन सखेन करेको  
प्रभ-महान हुने भोको।  
सो-सहज छै विरहना शान्ता  
देने निर्यायै स्यासी सैरको  
गोरकसायैयै राहु, डेकले  
रकोको प्रतिभाता उगीरको  
हुन। आरिहिन र खासमयिहिन  
छै होर केव विदेयना विहतर  
मर सौ मरि अरिहो विजय  
शान्ता-सोय बहल नसकेको  
विजय शान्ता-कोन।

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जाने सम्बन्धमा निर्वाह गरिसकेको बताए । 'सम्बन्धमा आएको कुराका आधारमा सरकारको निर्वाचक विभागमा पुग्ने टिप्पणी रैख' देखिने थियो । सरकारको मान्नामा आधारमा टिप्पणी गर्ने थियो ।

पारिश्रमिक पाएनन

विद्यार्थी, पृष्ठ संशोधनकर्ता, १९९९



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

ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना  
जिल्ला आयोजना कार्यालय, पर्वत, कश्मा

**प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी  
राय सुझावका लागि सार्वजनिक सुचना**

सूचना प्रकाशित मिति : २०१६/४/१०

प्रमिष्ठ पुनर्विनिर्माण तथा पुनर्स्थापना आयोजना (RRRSDP) अन्तर्गत एग्रीकल्चरल डेवलपमेन्ट बैंक (ADB), अन्तर्राष्ट्रिय विकास विभाग (DFID), स्वीस सरकार विकास विभागको (SDC) अनुदान सहयोग तथा जर्मनको (GIZ) को सहयोग तथा नेपाल सरकार, निजामतीकरण समिति र तान्त्रिकी समेतको वित्तियानीय स्थानान्तरण गर्नुको लागि प्रस्ताव गरिएको गम्भिर डेवलपमेन्ट-फलेबल, कुम्हा-पुनर्-स्थापना, विपत्तिप्राती-हाना-वर्गीकरण र कार्बनिड-मुक्त सडक उप आयोजनाको प्राथमिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यन्वयन गर्न निम्त्याइएको वातावरणीय सर्वेक्षण विभागको २०४४ (पछिल्लो संशोधन २०४४ साल) को नियम ३३.२ अनुसार को कार्यनिष्ठ सुचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम : जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय/ जिल्ला आयोजना कार्यालय/पर्वत ।  
प्रस्तावित सहक उपआयोजनाहरूको विवरण :-

क्र.सं.	सङ्घको नाम	प्रभाव पार्ने गा.वि.स.हरू	प्रस्तावको विवरण	नम्बर
१	दीर्घलला- फलेवास सङ्घ उप आयोजना	चुवा, पकवा, पिपलटारि, कटुवापौपारी, मडिकुवा र देविस्थान	यो उपआयोजना चुवा गा.वि.स अन्तर्गत पोखरा बगरासुङ्ग राजमार्गको खुम्चे खोलाबाट शुरू भई देविस्थान गा.वि.स को फलेवास ब्यापक भौममा गई दुईछ्छ । यो सङ्घमा दीर्घलला, गिल्ली, मोभगाउ, सासाचौर, नुहरे, देविलासपुर, साईकुलचौक, सितवा, एकधरे, सतगीरी,छुङ्ग, सेराचौर, राहाले, बरुनटार फलेवास गा.वि.स वस्ति हरु पर्दछन् ।	१५ को.मी.
२	कुशवा -दुर्लङ -सोहिजा सङ्घ उप आयोजना	शिकारय, दुर्लङ र नयाङ	यो उपआयोजना शिकारय गा.वि.स को दुर्लङ खोक (पोखरा-बगरासुङ्ग राजमार्ग) बाट शुरू भई ब्याङ गा.वि.स को लेखार खोलासम्म गई दुईछ्छ । यो सङ्घमा दुर्लङ चोक, कामि डाडा, पारिटोल, गढान्ग, रासोट, भाटचौर, खोटेला, देउदाली, गौडामनी, काफ्लेबाट, साकिटोल, कोटथर, मुजेनथान, सलरी हलसले, भगेरीचौर, माथिल्लो हलसले, मेख्यार १ र लेखार आदि वस्ति हरु पर्दछन् ।	२० को.मी.
३	चिसापानी बजार बराचौर सङ्घ उप आयोजना	हुवास, विरेणी, मडलियास, उरामौखरा, भालिग्राम र बराचौर ।	यो उप आयोजना हुवास, गा.वि.स को चिसापानीबाट शुरू भई बराचौर गा.वि.सको बराची भन्ज्याङमा गई दुईछ्छ । यो सङ्घमा जित्तनचोक, इतेमालोचौक, अर्जुन बजार, डाडा, कचहरे, बिस्मडाङ, र बराची भन्ज्याङ आदि वस्ति हरु पर्दछन् ।	१५ को.मी.
४	काकीनेटा सुङ्ग सङ्घ उप आयोजना	काकीनेटा, बाफाधाना र भगेरा ।	यो उप आयोजना काकीनेटा, गा.वि.स र यो हिलेखोला बाट शुरू भई भगेरा गा.वि.स र ख्याङ्खा जिल्लाको धिमान बगालेनेटामा गई दुईछ्छ । यो सङ्घमा बुङ्गे घाटी टोल, सतामाटा, घोप्टे चौर, काकीनेटा बजार, खगालेनेटा, आदि वस्ति हरु पर्दछन् ।	१० को.मी.

उक्त प्रसंगको कथानुसार वातावरणमा पर्ने सबै प्रभावका बारेमा सम्बन्धित गा बि से विभागले व्याख्या नौको  
बम उपभोक्ता समिति तथा अन्य संस्थाहरूलाई व्यक्तित्व वा संस्थाले यो सूचना प्रकाशित भएको बित्तिकै १५  
(पन्ध्र) दिन भित्र निम्न ठेगानामा आफूको राय सुन्काय पठाइ सम्बन्धी गरी यिन् हुम अनुरोध गरिन्।  
राय सुन्काय पठाउने ठेगाना:-

जिल्ला विकास समितिको कार्यालय पर्वत फोन नं ०६७-४२०२५६ फ्याक्स नं ०६७-४२०२४४	जिल्ला प्राविधिक कार्यालय पर्वत फोन नं ०६७-४२०१५१, ०६७-४२११६५
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## Annex VI: Deed of Enquiry (Muchulka)

ने निम्नानुसारको सूचना यस कार्यालयको सूचना पाटीमा टाँसेको व्योहोरा प्रमाणित गरिन्छ ।  
नेपाल सरकार

स्थानीय विकास मन्त्रालय  
जिल्ला विकास समितिको कार्यालय/  
जिल्ला प्राविधिक कार्यालय  
पर्वत

प्रारम्भिक वातावरणीय परीक्षण सार्वजनिक रूप सुझावका लागि सार्वजनिक सूचना

(प्रकाशित मिति ०५.०५.२०१४)

यामौण पुर्ननिर्माण तथा पुर्नस्थापना आयोजना (RRRSDP) अन्तर्गत एशियाली विकास बैंक, डेफिड तथा स्वीस सरकार विकास नियोगको अनुदान सहयोग तथा ओफिडको ऋण सहयोग तथा नेपाल सरकार, जिल्ला विकास समिति र लाभग्राही समेतको लगानीमा निर्माण गर्ने प्रस्ताव गरिएको दोबिस्वा-फलेवास, कुश्मा-दुर्लुङ-साँतजा, चिसापानी-हुवास-बराचौर र काकीनेटा-लुब्धु सडक उपआयोजनाको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) कार्यान्वयन एवं हिलोमिलामा वातावरण संरक्षण नियमावली २०५४ (पहिलो संसोधन, २०५५) को नियम ७ (२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ ।

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

प्रस्तावित सडक उपआयोजनाहरूको विवरण :-

क्र.सं.	सडकको नाम	प्रभाव पार्ने गा.वि.स.हरु	प्रस्तावको विवरण	तम्बाई
१	दोबिस्वा-फलेवास सडक उप आयोजना	चुवा, पकवा, पिपलटारी, कटुवाचौपारी, मडिकुवा र देविस्वान	यो उपआयोजना चुवा गा.वि.स अन्तर्गत पोखरा वाग्लुङ्ग राजमार्गको सुन्तरे खोला बाट शुरु भई देविस्वान गा.वि.स को फलेवास क्याम्पस चौकमा गई टुङ्गिन्छ । यो सडकमा दोबिस्वा, सिल्मी, माफगाउँ, जामचौर, बडहरे, वेडलिबजार, साईफलचोक, सिस्वा, एकधरे, सातवीरे,डाडा, सेराचौर, राहाले, चम्पनटार फलेवास आदि वस्ति हरू पर्दछन् ।	१५ की मी.
२	कुश्मा-दुर्लुङ-साँतजा सडक उप आयोजना	शिवालय, दुर्लुङ र क्याङ्ग	यो उपआयोजना शिवालय गा.वि.स को दुर्लुङ चोक (पोखरा-वाग्लुङ्ग राजमार्ग) बाट शुरु भई क्याङ्ग गा.वि.स को लेस्पा चौतारामा गई टुङ्गिन्छ । यो सडकमा दुर्लुङ चोक, कामि डाडा, परिटोल, गोदाम्, रंहीटे, भाटचौर, खोरटोल, देउराली, गौडामनी, काफलचौट, साँफेढोल, कोटधर, भुजुरथान, तल्मी हलहले, भगेशीचौर, माथिल्लो हलहले, मेक्खार र लेस्पा आदि वस्ति हरू पर्दछन् ।	२० की मी.
३	चिसापानी हुवास बराचौर सडक उप आयोजना	हुवास, विडेणी, वेडलिवास, उरामपोखरा, साँतेशाम र बहाँक ।	यो उप आयोजना हुवास, गा.वि.स को चिसापानी बाट शुरु भई बहाँकी गा.वि.स को बहाँकी भन्ज्याङ्गमा गई टुङ्गिन्छ । यो सडकमा चिसापानी चौक, हातेमालीचौक, अर्धुन बजार, डाडा, कपहर, भिसुन डाडा, र बहाँकी भन्ज्याङ्ग आदि वस्ति हरू पर्दछन् ।	१५ की मी.
४	काकीनेटा लुब्धु सडक उप आयोजना	काकीनेटा, थापाधाना र भगाँरा ।	यो उप आयोजना काकीनेटा, गा.वि.स को हिलेखोला बाट शुरु भई भगाँरा गा.वि.स र स्याङ्जा जिल्लाको सिमाना बगालेनेटामा गई टुङ्गिन्छ । यो सडकमा दुई खोटी टोल, रातोमाटा, घोम्टे चौक, काकीनेटा बजार, बगालेनेटा, आदि वस्ति हरू पर्दछन् ।	१० की मी.

उक्त प्रस्तावको कार्यान्वयन बाट वातावरणमा पर्नेसक्ने प्रभावको बारेमा सम्बन्धित गा.वि.स., विद्यालय, स्वास्थ्य चौकी, वन उपभोक्ता समिति तथा अन्य संयोजकवाला व्यक्ति वा संस्थाले यो सूचना नोखापत्रमा प्रकाशित भएको मितिले १५ (पन्ध्र) दिन भित्र आफ्नो राय सुझाव पठाई सहयोग गरिदिनुहुन अनुरोध गरिन्छ । साथै यसै चमोजिमको राय सुझाव स्थानीय पूर्वाधार विकास तथा कृषि सडक विभाग, जावलाखेल तथा स्थानीय विकास मन्त्रालय पुल्चोक, काठमाडौं मा पनि पठाउन सकिनेछ । राय सुझाव पठाउने ठेगाना

जिल्ला विकास समितिको कार्यालय, पर्वत फोन नं ०६७-४२०२४६ फ्याक्स नं ०६७-४२०१४४	जिल्ला प्राविधिक कार्यालय, पर्वत फोन नं ०६७-४२०१४१, ०६७-४२११५४ फ्याक्स नं
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सूचना टाँसेको प्रमाणित गर्ने कुसंबारीको नाम : जिल्ला विकास समिति  
पद : सचिव  
कार्यालयको छाप :

हस्ताक्षर :  
कार्यालयको नाम :  
मिति :



21416181

पर्वत

(प्रकाशित मिति)

प्रस्तावकको नाम : प्रस्तावकको नाम : जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, पर्पट  
प्रस्तावित सडक उपायोजनाहरूको विवरण :-

**प्रस्तावित सड़क उपआयोजनाहस्ता विवरण :-**

उक्त प्रस्तावकको कार्यन्वयनबाट वातावरणमा तनिएको समस्याको अरिमा सम्बन्धित वा.वि.स. विद्यालय, स्वास्थ्य चौकी, वन उपभोक्ता समिति तथा अन्य सरोकारवाला ब्यक्ति ज जसस्थले यो सूचना गौरापात्रमा प्रकाशित भएको मितिले १५ (पन्ध्र) दिन भित्र आफ्नो राय सुझाव पठाई सहयोग गरिदिनुहुन अनुरोध गरिन्छ । साथै यसै बमोजिमको राय सुझाव स्थानीय प्रशासक विकास तथा कृषि सडक विभाग, जावलाखेल तथा स्थानीय विकास मन्त्रालय पुल्चोक, काठमाडौंमा पनि पठाउन सकिन्छ । राय सुझाव पठाउने ठेगाना:

निम्ना प्राविधिक कार्यालय, पर्वत  
कोन नं ०६७-४२०९५१, ०६७-४२११५४  
क्याक्स नं

हस्ताक्षर: अ. व. प. १२  
 उपर्यालयको नाम: आ. व. प. १२ ज. वि. वि.  
 मिति: २०७३/०५/०५

पुनः

कार्यालयको रूप

ज. वि. वि. सन्निव

मिनि

055/18795



यो ग्रामीण स्त. निर्माण तथा पुनर्स्थापना आयोजना, पर्वत  
मंगारा गा.वि.स. कार्यालयमा सुचना पालेको होसको समेत प्रमाणित गरिनेछ ।

नेपाल सरकार  
स्थानीय विकास मन्त्रालय  
जिल्ला विकास समितिको कार्यालय  
जिल्ला प्राविधिक कार्यालय  
ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना  
जिल्ला आयोजना कार्यालय, पर्वत, कुरुमा  
प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावका लागि  
सार्वजनिक सुचना  
सूचना प्रकाशित मिति: ०६८/०६/१०

ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना (RRRSDP) अन्तर्गत एशियाली विकास बैंक डिफिड तथा स्वीस सरकार विकास नियोगको अनुदान सहयोग तथा ओफिडको ऋण सहयोग तथा नेपाल सरकार, जिल्ला विकास समिति र लामछाही समेतको लगानीमा स्तरोन्नति गर्नेको लागि प्रस्ताव गरिएको दोबिला-फलेवास, कुरुमा-दुर्लु-सालिजा, चिसापानी-हुवास बराचौर र कार्कीनेटा-लुखु सडक उप आयोजनाको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने सिलसिलामा वातावरणीय संरक्षण नियमावली २०५४ (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सुचना प्रकाशित गरिएको छ।

प्रस्तावकको नाम : जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय, पर्वत  
प्रस्तावित सडक उपआयोजनाहरूको विवरण :-

क्र. सं.	सडकको नाम	प्रभाव पर्ने गा.वि.स. हरू	प्रस्तावकको विवरण	लम्बाई
१	दोबिला-फलेवास सडक उप आयोजना	चुवा, पकुवा, पिपलटारी, कटुवाचौपारी, मडकुवा र देविस्थान	यो उपआयोजना चुवा गा.वि.स. को दोबिला चौक बागलुङ राजमार्गबाट शुरुभई देविस्थान गा.वि.स. को फलेवास क्याम्पस चौकमा गई दुईन्छ। यो सडकमा दोबिला, सिल्ली, बाभगाउ, लामाचौर, बडहरे, देउतीबजार, साईकलचौक, सिरुवा, एकघरे, सातवीसे डाडा, सेराचौर, राहाले, घन्दनटार फलेवास आदि बस्ति हरू पर्दछन्।	१५ की.मी.
२	कुरुमा-दुर्लु-सालिजा सडक उप आयोजना	शिवालय, दुर्लु र ब्याङ	यो उपआयोजना शिवालय गा.वि.स. को दुर्लु चौक बागलुङ राजमार्गबाट शुरुभई ब्याङ गा.वि.स. को लेस्वार चौतारामा गई दुईन्छ। यो सडकमा दुर्लु चौक, कामि डाडा, परितोख, गोदामे रोहोटे, माटचौर, खोरटोल, देउराली, गौडामनी, काफलबोट, सार्किटोल, कोटघर, भजेबथान, तल्लो हलहले, धंगरीचौर, माथिल्लो हलहले, मेक्सार र लेस्वार आदि बस्ति हरू पर्दछन्।	२० की.मी.
३	चिसापानी हुवास बराचौर सडक उप आयोजना	हुवास, विवेणी, वेउलिवास, उरामथोखरा, सालिग्राम र बहाकि	यो उप आयोजना हुवास, गा.वि.स. को चिसापानी बाट शुरुभई बहाकी गा.वि.स. को बहाकी भन्ज्याङ गई दुईन्छ। यो सडकमा चिन्तामचौक, हातेमालोचौक, अर्पुन बजार, डाडा, कचहरे, बिम्वुडाडा, र बहाकी भन्ज्याङ आदि बस्ति हरू पर्दछन्।	१५ की.मी.
४	कार्कीनेटा लुखु सडक उप आयोजना	कार्कीनेटा, थापाचाना र मंगारा	यो उप आयोजना कार्कीनेटा, गा.वि.स. को हिलेखोला बाट शुरुभई मंगारा गा.वि.स. को बगालेनेटा गई दुईन्छ। यो सडकमा दुजे खाटी टोल, रातोमाटा, घोटे चौर, कार्कीनेटा बजार बगालेनेटा, आदि बस्ति हरू पर्दछन्।	१० की.मी.

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/पञ्च। दिन भित्र तिमन देगानामा आफ्नो राय सुझाव पठाइ सहयोग गरी दिनु हुन अनुरोध गरिन्छ।

राय सुझाव पठाउने ठेगाना :-

जिल्ला विकास समितिको कार्यालय, पर्वत फोन नं ०६७-४२०२५६ फ्याक्स नं ०६७-४२०१५४	जिल्ला प्राविधिक कार्यालय, पर्वत फोन नं ०६७-४२०१५११ फ्याक्स नं
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सूचना पाएको प्रमाणित गर्ने छाप/हातले

पद गा.वि.स. सचिव

सूचना पाएको प्रमाणित गर्ने छाप/हातले

कार्यालयका नाम :- मंगारा गा.वि.स.

मिति ०६८/०६/१९



## Annex VII: Name of the Organizations

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

SN	Name or Organization	Address	Remarks
1	Office of Village Development Committee,	Karkineta, Parbat	
2	Office of Village Development Committee,	Thapathana, Parbat	
3	Office of Village Development Committee,	Bhangara, Parbat	

Source: Field Survey, , 2009

## Annex VIII: List of persons consulted

List of persons consulted

Name	Designation	Address
Raju Sapkota	DWSCC	Soil Conservation Officer
Kamal Pokharel	DADO	Officer
Harischandra Sapkota	DFO	Forest Officer
Ganesh Lal Koju	DTO	District Technical Office, Kushma, Parbat
Saligram Poudel	Engineer	DPO, Parbat
Gena Lal Chaudhari	Team Leader	DIST, Parbat
Binod Shrestha	Social Worker	Karkineta VDC
Tilakant Sharma	Chairman, VICCC	Karkineta VDC
Narhari Sharma Poudel	Vice-Chairman, VICCC	Karkineta VDC
Til Kanta Sharma	Secretary, VICCC	Karkineta VDC
Nabraj Subedi	Treasurer, VICCC	Karkineta VDC
Binod Shrestha	Member, VICCC	Karkineta VDC
Laxmi Poudel	Enterprenuer	Karkineta VDC
Giri Narayan Shresth	Farmer	Karkineta VDC
Prem Narayan Shrestha	Farmer	Karkineta VDC
Rishi Poudel	Farmer	Karkineta VDC
Megh Lal Bishowakarma	Farmer	Karkineta VDC
Ubraj Subedi	Shopkeeper	Bhangara VDC
Jit Bahadur	Service	Bhangara VDC
Toran Bahadur Gurung	Farmer	Bhangara VDC
Ujeli Nepali	Farmer	Bhangara VDC
Narendra Pr.Sharma Dhakal	Farmer	Bhangara VDC
Baidhnath Saha	Farmer	Bhangara VDC
Dipendra Pr.Poudal	Farmer	Thapana VDC
Mahesh Pr.Sharma	Shopkeeper	Thapana VDC
Tej Bahadur Kuwar	Farmer	Thapana VDC
Shiv Bhakta Sharma	Farmer	Thapathana VDC
Man Bahadur Kuwar	Farmer	Thapana VDC
Padham Pani Updhaya	Teacher	Thapana VDC

Source: Field Survey, May/June, 2009



## Annex IX: Summary of meeting minutes with local people

आजमिति २०६६ साल माघ ५ गतेका दिन ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना अन्तर्गत कार्किर्नेरा - लुम्बु सडकको भँगरा गा.वि.स.को गाउँ स्तरिय पुर्नर्धार निर्माण समन्वय समिति का अध्यक्ष श्री विष्णु प्रसाद शर्मा दलको अध्यक्षतामा वसेको बैठक को उपस्थिति र निर्णय निम्नानुसार छ।

### उपस्थिति

- |                     |    |  |
|---------------------|----|--|
| विष्णु प्रसाद शर्मा | १  | अध्यक्ष - श्री विष्णु प्रसाद शर्मा दल        |
| सत्य                | २  | सदस्य - श्रीदिरामणि रिजाल                    |
| नेवद्वारा           | ३  | " - श्री जगत बहादुर क्षेत्री                 |
| गंगा प्रसाद         | ४  | " - श्री गंगाधर शर्मा                        |
| विष्णु              | ५  | " - श्री टीकाराम भुषाल                       |
| अनाकुमारी           | ६  | " - श्रीमहिमला कुमारी क्षेत्री               |
| श्रीमति गुरुकुम्हार | ७  | " - श्रीमति सावित्री गुरुकुम्हार             |
| श्रीमती नेपाङ्ग     | ८  | " - श्रीमते उजेली नेपाली                     |
| श्रीमती             | ९  | " - श्री सन्तोष कुमार गुरुकुम्हार            |
| श्रीमती             | १० | " - श्री विष्णु बहादुर गुरुकुम्हार           |
| श्रीमती             | ११ | सामाजिक पारिचलक - श्री अरविशम चौधरी (RRRSOP) |

### प्रस्ताव छ।

१. प्रारम्भिक तातावरणिय प्रभाव सम्बन्धमा।
२. स्वतोपानी आयोजना सम्बन्धमा।

### हलफुल तथा निर्णय छ।

१. प्रस्ताव नं. १ माथि हलफुल गर्दै ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना जिल्ला आयोजना कार्यालय पत्र वा २ कार्यन्वयन हुन लागेको कार्किर्नेरा लुम्बु सडकको प्रारम्भिक वातावरणिय प्रभाव बारे जानकारी तथा हलफुल गरियो सो सडक कार्यन्वयन हुँदा यस गा.वि.स.मा कुनै वातावरणिय प्रभाव पर्ने हुँदा सो सडक आयोजना कार्यन्वयन गर्नेको लागि जिल्ला आयोजना कार्यालयलाई अनुरोध गर्ने निर्णय गरियो।
२. प्रस्ताव नं. २ माथि हलफुल गर्दै यस गा.वि.स.को वार्ड नं. ३ मा स्वतोपानीको अप्रतिष्ठा रहेको हुँदा सो ठाउँमा स्वतोपानीको लागि स्वतोपानी आयोजना सञ्चालन गर्नका लागि आयोजना कार्यालय



आज मंत्री २०६६ साल भाद्र २६ गते यस काङ्ग्रेसले गा.वि.स.का  
गा.वि.स. सचिव तिलकान्त शर्मा को अध्यक्षतामा काङ्ग्रेस-भुखु  
एडको गाउँ स्तरीय पूर्वाधार निर्माण समन्वय समितिको बैठक  
गए निम्नानुसारको प्रस्तावहरु मागि छलफलगरी निर्णय गरियो।

#### उपस्थिति

- |   |  |
|---|--|
|    | १) अध्यक्ष - श्री तिलकान्त शर्मा (गा.वि.स. सचिव) |
|    | २) सदस्य - श्री दिरेन नारायण शर्मा               |
|    | ३) " - श्री विश्वराज शर्मा                       |
|    | ४) " - श्री विष्णु प्रसाद पाहण                   |
|    | ५) " - श्रीमती स्वावित्रा पौडेल                  |
|    | ६) " - श्री मेहराज लाल वि.क.                     |
|    | ७) " - श्री विनोद श्रेष्ठ                        |
|   | ८) " - श्री माते लक्ष्मी पौडेल                   |
|  | ९) " - श्रीमती स्वावित्रा शर्मा                  |
|  | १०) " - श्री जंगरा नारायण श्रेष्ठ                |
|  | ११) राजेन्द्र पौडेल                              |

#### प्रस्तावहरु

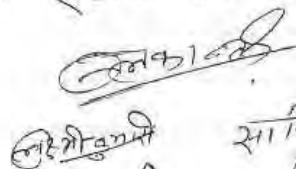
- १) प्रारम्भिक वातावरणीय प्रभाव सम्बन्धमा
- २) विविध

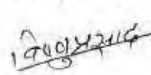
#### छलफल तथा निर्णयहरु

निर्णय नं. १ प्रस्ताव नं. १ वमागि छलफल गर्दा ग्रामिण पुन विमर्श  
तथा पुनर्स्थापना आयोजना जिल्ला आयोजना कार्यालय पद्वि वार्ड कार्यालय  
हुन थालेको काङ्ग्रेस-भुखु एडको उपआयोजनाको प्रारम्भिक वातावरणीय  
प्रभावको बारेमा जानकारी प्राप्त भयो। सो एडको उपआयोजना कार्यालय  
गर्दा यस गा.वि.स.मा कुनै पनि वातावरणीयमा प्रतिकूल प्रभाव पर्ने  
हुँद। सो एडको उपआयोजना कार्यालय गरी आयोजना कार्यालयलाई  
अनुरोध गर्ने निर्णय गरियो।

निर्णय नं. २ प्रस्ताव नं. २ मागि छलफल गर्दा यस गा.वि.स.मा एडको  
उपआयोजनाको लागे किन। सर्वेक्षणमा आउँदा एडको V.I.C.C. को सदस्यहरु  
आफ्नो रोल क्षेत्रमा सहयोग गर्ने निर्णय गरियो।



  
तिलकान्त शर्मा









आज मिति १०८६ साल भद्रे १० उत्तैका दिन ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना अन्तर्गत काँक्रेनेरा लुंगु सडकको थापाहरू गाउँ स्तरीय पूर्वाधार निर्माण समन्वय समितिका अध्यक्ष श्री पूर्णबहादुर भण्डारीको अध्यक्षतामा बसेको समितिको बैठकको उपस्थिति र निर्णय निम्नानुसार छ।

#### उपस्थित

अध्यक्ष	१	अध्यक्ष - श्री पूर्ण बहादुर भण्डारी
उपस्थित	२	सदस्य - श्री जित बहादुर थापा भण्ड
सदस्य	३	" - श्री शिवमन्त शर्मा
सदस्य	४	" - श्री राम बहादुर थापा भण्ड
सदस्य	५	" - श्री देवा कुमारी सापकाँडा
सदस्य	६	" - श्री रोजन वैगम
सदस्य	७	" - श्री भिरी लक्ष्मी
सदस्य	८	" - श्री छोपिला परियार
सदस्य	९	" - श्री रजिन्द्र चौडेल
सदस्य	१०	" - श्री हर्क बहादुर थापा
सदस्य	११	सामाजिक परिसराल - श्री अर्धराम चौडेल (RRRSDP)

#### प्रस्तावहरू

- १ प्रारम्भिक तातावरणीय प्रभाव सम्बन्धमा।
- २ छोडेरै काटो सम्बन्धमा

#### कुलफल तथा निर्णयहरू

निर्णय नं: १ - प्रस्ताव नं: १ माथि कुलफल गर्दा काँक्रेनेरा - लुंगु सडक उपक्रमायोजनाको वातावरणीय प्रभाव बारेमा जानकारी तथा कुलफल गरियो। सो सडक कार्यान्वयन गर्दा यस गा.वि.स.को वातावरणीय प्रभावमा कुनै प्रतिकूल असर पर्ने भएकाले सो सडक उपक्रमायोजना कार्यान्वयन गर्नेको लागि ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना जिल्ला आयोजना कार्यालय पत्रेतराई अनुरोध गर्ने निर्णय गरियो।

निर्णय नं: २ प्रस्ताव नं: २ माथि कुलफल गर्दा यस गा.वि.स.को वाड नं: ६ सुभ रेल देरकी मोटरबागे सम्म पुग्ने बाटो किनेको हुँदा सो बाटोमा छोडेरै काटो निर्माण गराइदिएको लागि जिल्ला आयोजना कार्यालय पत्रे तराई अनुरोध गर्ने निर्णय गरियो।



Annex X: Recommendation Letters from VDC



गाउँ विकास समितिको कार्यालय

पर्वत

पत्र संख्या :- ०६६/०९४  
चलाबी नम्बर :- २८



धनलागिटि अञ्चल  
मिति :- २०६६-०९-१३

विषय :- सिफारिस गरिएको कुरा।

श्री गाम्बिर पुनर्निर्माण तथा पुनर्स्थापना आयोग  
जिल्ला आयोग कार्यालय  
पर्वत, कुम्मा।

सम्बन्धित विषयमा कानिमेच  
लैरु सडक उपआयोजना को प्रारम्भिक बालावरण  
परिचित्र प्रविष्टि सम्बन्धमा यो पत्र लेखिएको छ।  
उक्त प्रस्तावको प्रारम्भिक बालावरणको परिचित्र  
प्रतिवेष्ट मा उल्लेखित गरि विषय नयाँ बाला-  
वरण प्रभाव र संरक्षण उपायहरूको बारे यस कार्य  
लयलाई जानकारी गराइने छ। उक्त प्रस्ताव कार्य  
व्यपन उनको लागि सिफारिस गरिन्छ।

०६६-०९-१३  
तिलकान्त शर्मा  
ना मु  
गा वि स सचिव





# गाउँ विकास समितिको कार्यालय

भैरहवा पर्वत

फोन नम्बर :- ०६६१०६७

सहाजी नम्बर :- ४९

थपलागिदि अन्तरगत

मिति :- ०६६१.०७.११

विषय :- शिफारिस गरिएको कारो.

श्री ग्रासीका पुनर्निर्माण तथा पुनर्स्थापना क्षायेजेता.

जिल्ला क्षायेजेता कार्यालय पर्वत बुद्धा।

प्रस्तुत विषयमा कार्किर्नेका संरुख सुडन क्षायेजेता  
को प्राथमिकताका लागि परिक्षण प्रतिवेदन हेर्नभन्दा  
उक्त तस्तावको प्राथमिकताका लागि परिक्षण प्रतिवेदनमा  
उक्तले भएका विषय तथा कातावरणीय प्रभाव र संरक्षण  
उपायहरूको बारेमा यस कार्यालयमा लै जातकरी गरिने  
उक्त प्रस्ताव कार्यालयमा उनका लागि शिफारिस साथै क्षाये-  
जित्तु

०६६१/०७/११

महोदय





# श्री गाउँ विकास समितिको कार्यालय



पर्वत

पत्र संख्या : ०५५/५६

धवलागिरि अञ्चल

चलानी नं. : १२२

मिति :- २०५५/६१२

**विषय :** सिद्धार्थ गरीबो को ।

श्री ग्रामीण पुनर्निर्माण तथा पुनरस्थापना (हाफेजना)  
जिल्ला (हाफेजना) कार्यालय पर्वत ।

प्रस्तुत विषयमा बाकिनेछ लैरु सबै उपभोक्ता  
को प्रारम्भिक वातावरणमा परिसर प्रतिकेडनमा  
उल्लेख भएका विषय तथा वातावरणीय प्रभाव  
र संरक्षण उपपद्धति को यस कार्यालयमा  
कारी भएकोले उक्त प्रभाव कार्यान्वयन को लागी  
सिद्धार्थ तथा कुनै गरीब ।

२०७१/१२

पूर्ण बहादुर मण्डारी  
ना.स.गा.वि.स.सचिव



## Annex XI

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

### XI b. Summary of public services & infrastructures

### XI c. Land holding pattern of settlements within ZoI

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

#### XIa: Distribution of households by major occupation

Settlement Name	Number of HH in (in percentage)					Total
	Agriculture & Livestock	Labour & Porter	Business/ Commerce	Cottage Industry	Employee s	
Aahal Gairo	68	10	5	3	2	88
Rata Mata	122	12	6	5	5	150
Karkineta	155	50	15	5	15	240
Bayaleneta	138	20	8	2	13	181
<b>Total</b>	<b>483</b>	<b>92</b>	<b>34</b>	<b>15</b>	<b>19</b>	<b>659</b>
<b>Percentage(%)</b>	<b>73.29</b>	<b>13.96</b>	<b>5.16</b>	<b>2.28</b>	<b>5.31</b>	<b>100</b>

Source: Field survey, 2009

#### XI b. Summary of public services and infrastructures according to settlement

Settlement Name/	School (no)	Health post (no)	Post office (no.)	Communication(n) CDMA/MOBILE	Hydro power (no)	Solar (no)	Shops/lodge (no)	Water supply (no)	Irrigation (KULO)	Mill (no)	Bridge (no)	Community organization (no)	Fin. Institution (no)	Community CENTRE	Industry (no)
Aahal Gairo	2	1	1	310	-	-	12	9	2	2	-	2	2	2	1
Rata Mata	2	-	-	57	-	1	2	3	-	1	-	2	1	-	-
Karineta Bazar	2	1	-	208	-	2	11	8	2	1	-	2	2	-	-
Bayaleneta	3	1	-	102	-	2	2	11	2	-	-	1	1	-	-

Source: Field survey, 2009

#### XI c. Land holding pattern of settlements within ZoI

Settlement Name	Number of HH							Total
	Land less	<one ropani	1-5 ropani	5-10 ropani	10-20 ropani	20-50 ropani	>50 ropani	
Aahal Gairo	-	20	52	5	6	5	-	88
Rata Mata	3	40	30	27	40	10	-	150
Karineta Bazar	-	25	25	75	50	65	-	240
Bayaleneta	1	40	60	50	30	-	-	181
<b>Total</b>	<b>4</b>	<b>125</b>	<b>167</b>	<b>157</b>	<b>126</b>	<b>80</b>	<b>-</b>	<b>659</b>
<b>Percentage (%)</b>	<b>0.61</b>	<b>18.97</b>	<b>25.34</b>	<b>23.82</b>	<b>19.12</b>	<b>12.14</b>	<b>0</b>	

Source: Field survey, 2009

#### XI d. Number of Households Belonging to Different Food Security Category

Settlement Name	Surplus	Sufficient for whole year	Sufficient for 3-9 months	Sufficient for three months	Less than three months	Total
Aahal Gairo	20	6	33	20	9	88
Rata Mata	20	20	60	30	20	150
Karineta Bazar	25	25	110	60	20	240
Bayaleneta	30	10	75	46	20	181
<b>Total</b>	<b>95</b>	<b>61</b>	<b>278</b>	<b>156</b>	<b>69</b>	<b>659</b>
<b>Percentage (%)</b>	<b>14.4</b>	<b>9.3</b>	<b>42.2</b>	<b>23.7</b>	<b>10.4</b>	<b>100</b>

Source: Field survey, 2009



**Annex XII: List of trees to be removed**

Chainage	Size (Girth) m		
	(0.3-0.6)m	Total	Remarks
0+300	4	4	Uttis (Alnus nepalensi)
0+415	2	2	Uttis (Alnus nepalensi)
0+430	3	3	Uttis (Alnus nepalensi)
0+480	5	5	Uttis (Alnus nepalensi)
0+950	1	1	Uttis (Alnus nepalensi)
1+258	4	4	Chilaune (Schima wallichii)
1+931	6	6	Chilaune (Schima wallichii)
2+600	2	2	Chilaune (Schima wallichii)
2+735	1	1	Chilaune (Schima wallichii)
2+989	1	1	Katus (Castanopsis indica)
3+780	3	3	Katus (Castanopsis indica)
4+049	2	2	Katus (Castanopsis indica)
5+300	8	8	Katus (Castanopsis indica)
5+900	3	3	Chilaune (Schima wallichii)
5+936	3	3	Chilaune (Schima wallichii)
5+998	2	2	Laligurans (Rhodendron arboretum)
6+972	7	7	Katus (Castanopsis indica), Laligurans (Rhodendron arboretum)
9+560	5	5	Katus (Castanopsis indica), Laligurans (Rhodendron arboretum)
9+960	8	8	Laligurans (Rhodendron arboretum)
10+199	5	5	Katus (Castanopsis indica)
10+460	7	7	Katus (Castanopsis indica)
10+480	9	9	Katus (Castanopsis indica)
<b>Total</b>		<b>91</b>	

Source: field survey, July, 2009



## Annex XIII: Photographs

### Photographs of project Area



Starting Point



Road passing through Karkineta bazar



Affected Foot trail during road construction at Ch. 3+650



Affected water supply pipelines along the road at Ch. 2+500



Water pipe line crossing at Ch. 5+500



Water tap within RoW below the road at Ch.1+650





School at Ch. 5+ 212 within RoW



Existing landslide at Ch.9+860



Irrigation crossing at Ch. 2+412



Access Road at Ch. 5+212



Road Passing through Karkineta Community Forest



End Point at Bayalneta Bazar



## Annex XIV: Summary of Cross Drainage Structures

### Summary of Drainage works along the road alignment

#### Hume Pipe

S.N.	Chainage	Length	Dia.	Quantity
		m	m	no.
1	0+005	7.5	0.3	3
2	0+603	7.5	0.3	3
3	1+275	7.5	0.3	3
4	1+625	7.5	0.3	3
5	1+736	7.5	0.3	3
6	1+980	7.5	0.3	3
7	2+027	7.5	0.3	3
8	2+412	7.5	0.3	3
9	2+615	7.5	0.3	3
10	2+866	7.5	0.3	3
11	2+926	7.5	0.3	3
12	3+416	7.5	0.3	3
13	3+689	7.5	0.3	3
14	3+900	7.5	0.3	3
15	4+400	7.5	0.3	3
16	4+700	7.5	0.3	3
17	5+000	7.5	0.3	3
18	5+212	7.5	0.3	3
19	6+200	7.5	0.3	3
20	7+120	7.5	0.3	3
21	7+940	7.5	0.3	3
22	8+220	7.5	0.3	3
23	8+980	7.5	0.3	3
24	9+480	7.5	0.3	3
25	10+202	7.5	0.3	3

#### PCC Causeway

SN	Chainage	Length	Earthwork		Boulder Soling		PCC(1:2:4)	
			Area	Quantity	Area	Quantity	Area	Quantity
		m	sq.m.	cu.m.	sq.m.	Cum	sq.m.	cu.m.
1	3+645	12.0	1.00	12.00	60.00		1	12.0
2	7+707	12.0	1.00	12.00	60.00		1	12.0

Source: Field survey, May2009



## Annex XV: Affected Houses and Structures along the Road Alignment


S.N	Chainage		Name of House Owner	Settlement Name	Structure	Remarks
	From	To				
1	5+050	5+060	Pitambar B.K	Ratamata	Residential Home	Fully damage
2	5+060	5+070	Padam Kishor Upadhya	Ratamata	Residential Home	Partially damage
3	5+070	5+080	V.D.C. office	Karkineta	Official Building	Fully damage
4	5+080	5+090	Chandra Datta Padhya	Karkineta	Residensial Home	Fully damage
5	5+090	5+100	Harikala Jaisi	Karkineta	Residensial Home	Fully damage
6	5+100	5+110	Devi Chandra Padhya	Karkineta	Residensial Home	Fully damage
7	5+120	5+130	Krishna Prasad Sharma	Karkineta	Residensial Home	Fully damage
8	5+130	5+140	Teelak Ram Poudel	Karkineta	Residensial Home	Fully damage
9	5+140	5+150	Tule Damai	Karkineta	Residensial Home	Fully damage
10	5+150	5+160	Tek Bahadur Kshatri	Karkineta	Residensial Home	Fully damage
11	5+160	5+170	NawaRaj Subedi	Karkineta	Residensial Home	Fully damage


### Summary of Cost for RP

Item		Unit	Total loss	Amount (NRs.)	Remarks
<b>1. DIRECT COST</b>					
1.1	Compensation for private land	sqm	33211		5865053
1.2	Private Trees	No.	0	0	
1.3	Public tree	No.	0	0	
1.4	CFUGs Tree	No.	0	0	
1.5	Private structure	No.	10	2976922.00	
1.6	Public Structure	No	1	401456.00	
	<b>Sub Total (A)</b>			<b>3378378.00</b>	
<b>2.INDIRECT COST</b>					
2.1	Moved allowance	LS		75000.00	
2.2	Rental Stipend		2000*9*3	54000.00	
2.3	Transportation Allowance	LS		100000.00	
2.4	Deed Transfer Assistance	HHN	115	80000.00	
2.5	Official Deed Transfer fees	LS	115	100000.00	
	<b>Sub Total (B)</b>			<b>409000.00</b>	
3	Income generation and Livelihood improvement programme			746588.00	
4	Appreciation Program for APs	LS		50000.00	
	<b>Sub-Total (C)</b>			<b>796588.00</b>	
	<b>Total (A+B+C)</b>			<b>4583966.00</b>	
5	Provisional Sum (5%)			<b>229198.00</b>	
6	Reserve Fund for Absentees HHs			<b>10,00,000.00</b>	
	<b>Grand Total</b>			<b>4813164.00</b>	





## Details of Affected Private properties

House hold No. 01	Structure No.01	Chainage From 5+050 to 5+060 Distance from Centre Line of the Road 1.5 m Address of Structure :- Ratamata				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		2	500.52			
		First		500.52	275	137643.00
		Second		500.52	275	137643.00
		Third				
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				275286.00
Name of owner : Pitamber B K Address:Karkineta 7 Parbat Citizenship Number: 358 Name of father : Tulke BK Map/Sheet No: 093-1061 Plot no: 955 Owner's certificate No: No		Type of structure Kacchi Material used in wall :- Mud, stone. Material used in roof : Jasta Material used in story : wood mud Present use : Residential Construction year : 2037				


House hold No. 02	Structure No.02	Chainage : From 5+060 to 5+070 Distance from Centre Line of the Road : 1.5 m Address of Structure :- Karkineta - 6				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		2	771.42			
		First		109.65	325	35636.25
		Second		109.65	325	35636.25
		Third				
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				71272.50
Name of owner : Padam Kishor poudel Address: Parbat Citizenship Number: Name of father / Husband : Devi Lal Poudel Map/Sheet No : 093-1061 Plot No: 1181 Land Owner's certificate No: No		Type of structure :- Kachchi Material used in wall Mud Wood, Stone Material used in roof : Jasta wood Material used in story: 2 Present use : Residential house Construction year :2037				




House hold No. 03	Structure No.03	Chainage: From : 5+070 to 5+080 Distance from Centre Line of the Road: 1.5 m Address of Structure :- Karkineta				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		2	729.92			
		First		729.92	275	200728.00
		Second		729.92	275	200728.00
		Third				
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				401456.00
Name of owner: VDC Office Address: Parbat Citizenship Number : Name of father : Map/Sheet No: 093-1061 Plot No: Land Owner's certificate No:		Type of structure :- Kacchi Material used in wall :- Mud, Stone Material used in roof : Khar Material used in story : Wood, Mud Present use : Governmental Building Construction year : 2049				


House hold No. 04	Structure No.04	Chainage From : 5+080 to 5+090 Distance from Centre Line of the Road: 1.5 m Address of Structure :- Karkineta				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		2	514.97			
		First		514.97	275	141616.00
		Second		514.97	275	141616.00
		Stall+Averag Top of Home		514.97	275	141616.00
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				424850.00
Name of owner : Chandra Datta Upadhya Address: Parbat Citizenship Number : Name of father : Kashi Ram Upadhaya Map/Sheet No: 093-1061 Plot No 269 Land Owner's certificate No:		Type of structure :- Kachchi Material used in wall :- Stone, Mud Material used in roof : Jasta Material used in story : Wood Mud Present use : Residential House Construction year : 2040				




House hold No. 05	Structure No.05	Chainage : From : 5+090 to 5+100 Distance from Centre Line of the Road: 1.5m Address of Structure :- Karkineta			
	Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
	2	338.62			
	First		338.62	275	93120.00
	Second		338.62	275	93120.00
	Third				
	Veranda				
	Basking				
	Shed				
	Wall				
	Other				186241.00
	Total				
Name of owner : Harikala JaisiS Address: Durlung 3 Parbat Citizenship Number: Name of father / Husband : Padam Pandi Map/Sheet No: 093-1061 Plot No: 143 Land Owner's certificate No:		Type of structure :- Kachchi Material used in wall :- Stone, mud Material used in roof : Jasta Material used in story : Bamboo, Mud Present use : Residential Home Construction year :2040			


House hold No. 06	Structure No.06	Chainage From : 5+100 to 5+110 Distance from Centre Line of the Road: 1.5 m Address of Structure :- Karkineta			
	Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
	2	450.31			
	First		450.31	275	123835.00
	Second		450.31	275	123835.00
	Third				
	Veranda				
	Basking				
	Shed				
	Wall				
	Other				
	Total				247670.50
Name of owner : Devi Chandra Padhya Address: Karkineta 7 Parbat Citizenship Number 363 Name of father : Ram Chandra Padhaya Map/Sheet No: 093-1061 Plot No: 144 Land Owner's certificate No:		Type of structure :- Kacchi Material used in wall :- ,Stone& Mud Material used in roof : Jasta Material used in story : Wood Present use : Residential House Construction year :2036			




House hold No. 07	Structure No.07	Chainage From : 5+120 to 5+130 Distance from Centre Line of the Road: 1.5 m Address of Structure :- Karkineta				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		2	725.5			
		First		725.5	275	199512.00
		Second		725.5	275	199512.00
		Third				
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				399025.00
Name of owner : Krishna Prasad Sharma Address: parbat Citizenship Number: Name of father: Samanta Sharma Map/Sheet No: 093-1061 Plot No: 145 Land Owner's certificate No:		Type of structure :- Kacchi Material used in wall :- Stone, Mud Material used in roof : Jasta Material used in story : Wood, Mud Present use : Residential home Construction year :2020				


House hold No. 08	Structure No.08	Chainage    From : 5+130 to 5+140 Distance from Centre Line of the Road: 1.5 m Address of Structure :- Karkineta				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		2	412.26			
		First		412.26	275	113371.00
		Second		412.26	275	113371.00
		Third				
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				226743.00
Name of owner :Teelak Ram Poudel Address:   Parbat Citizenship Number: Name of father / Husband : Madhusadan Poudel Map/Sheet No: 093-1061 Plot No 146 Land Owner's certificate No:		Type of structure :- Kacchi Material used in wall :- Stone, Mud Material used in roof : Jasta Material used in story : Wood,Mud Present use : Residential Home Construction year : 2040				



House hold No. 09	Structure No.09	Chainage        From : 5+140 to 5+150 Distance from Centre Line of the Road: 1.5 m Address of Structure :- Karkineta				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		2	483.75			
		First		483.75	275	133031.00
		Second		483.75	275	133031.00
		Third				
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				266062.0
Name of owner : Tule Damai Address: Parbat Citizenship Number: Name of father : Jite Damai Map/Sheet No: 093-1061 Plot No: 147 Land Owner's certificate No:		Type of structure :- Kacchi Material used in wall :- Stone, Mud Material used in roof : Jasta Material used in story : wood, Mud, Present use :Residential House Construction year 2032				

House hold No. 10	Structure No.10	Chainage    From : 5+150 to 5+160 Distance from Centre Line of the Road: 1.5 m Address of Structure :- Karkineta				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		3	433.43			
		First		433.43	275	119193.00
		Second		433.43	275	119193.00
		Third		433.43	275	119193.00
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				365829.00
Name of owner :Tek Bahadur Kshetri Address: : Parbat Citizenship Number: Name of father : Ganga Bahadur Chhetri Map/Sheet No: 093-1061 Plot No: 148 Land Owner's certificate No:		Type of structure :- Kachchi Material used in wall :- Brick, Mud Material used in roof : Jasta Material used in story : Wood Mud Present use : Residential House Construction year : 2038				



House hold No. 11	Structure No.11	Chainage                      From 5+160                      To 5+170 Distance from Centre Line of the Road: 1.5 m Address of Structure :- Karkineta				
		Story	Total Area (sq.ft)	Area of land to be acquired ( Sq.ft)	Rate per Sqft.	Total
		3	622.96			
		First		622.96	275	171314.00
		Second		622.96	275	171314.00
		Third		622.96	275	171314.00
		Veranda				
		Basking				
		Shed				
		Wall				
		Other				
		Total				513942.00
Name of owner : Nawa Raj Subedi Address: Parbat Citizenship Number: Name of father : Dilli Ram Subedi Map/Sheet No: 093-1061 Plot no: 149 Land Owner's certificate No:		Type of structure :- Kacchi Material used in wall :- Stone, Mud Material used in roof : Jasta Material used in story : Present use : Residential House Construction year 2040				



## Annex XVI: Structure for Slope Stabilization

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

S.NO.	Description	Chainage	Length	Height	Volume
			m	m	m3
1	Gabion Walls	0+240	12	3	54.00
2	Gabion Walls	0+250	13	3	59.50
5	Gabion Walls	1+066	8	3	36.00
7	Gabion Walls	3+112	9	3	41.50
8	Gabion Walls	3+188	11	3	50.50
9	Gabion Walls	3+339	13	3	59.50
10	Gabion Walls	3+607	8	4	56.00
11	Gabion Walls	3+643	10	3	45.00
12	Gabion Walls	4+534	6	3	27.00
13	Gabion Walls	4+765	12	3	54.00
15	Gabion Walls	5+034	8	4	56.00
16	Gabion Walls	5+101	12	3	54.00
17	Gabion Walls	5+235	12	3	54.00
18	Gabion Walls	5+260	15	3	68.50
19	Gabion Walls	5+495	12	3	54.00
20	Gabion Walls	5+686	12	3	54.00
22	Gabion Walls	5+708	10	4	70.00
23	Gabion Walls	5+720	12	4	84.00
24	Gabion Walls	5+820	8	3	36.00
25	Gabion Walls	5+837	5	3	23.50
26	Gabion Walls	6+220	12	3	54.00
27	Gabion Walls	6+299	14	3	63.00
28	Gabion Walls	6+320	10	3	45.00
29	Gabion Walls	7+950	14	3	63.00
30	Gabion Walls	8+193	10	3	45.00
31	Gabion Walls	8+300	13	3	59.50
32	Gabion Walls	8+420	13	3	59.50
33	Gabion Walls	8+440	12	3	54.00
35	Gabion Walls	8+840	10	3	45.00
36	Gabion Walls	9+505	9	3	41.50
37	Gabion Walls	9+595	6	3	27.00
38	Gabion Walls	9+804	10	3	45.00
39	Gabion Walls	10+000	14	4	98.00
40	Gabion Walls	10+020	12	3	54.00
41	Gabion Walls	10+047	10	3	45.00
42	Gabion Walls	10+242	6	3	27.00
43	Gabion Walls	10+374	12	4	84.00
44	Gabion Walls	10+384	8	5	80.00
45	Gabion Walls	10+400	9	4	63.00

Source: Field Survey, July, 2009