

Environmental Assessment Document

Initial Environmental Examination

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March 2010

Nepal: Rural Reconstruction and Rehabilitation Sector Development Program

Mijhing Runiban-Badachaur-Gumchal-Harjang- Syuri-Gam Road Subproject, Rolpa District

Prepared by the Government of Nepal

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

Initial Environmental Examination (IEE) Report

Of

Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam Road Sub project

Submitted to:
Ministry of Local Development
Government of Nepal

Proponent:
District Development Committee
District Technical Office
Liwang, Rolpa

March, 2010

Prepared By:
District Implementation Support Team (DIST)
HERD consult Pvt. Ltd.

TABLE OF CONTENTS

ABBREVIATIONS	i
NAME AND ADDRESS OF THE PROPONENT	ii
EXECUTIVE SUMMARY(Nepali)	iii
EXECUTIVE SUMMARY(English)	vi
1.0 Introduction	1
1.1 Background.....	1
1.2 The Name and Address of Proponent.....	1
1.3 Relevancy of the proposal	1
1.4 Need and Objectives of the IEE Study	1
1.5 Methodology Adopted.....	2
1.6 Description of the Proposal.....	2
1.7 Construction Approach and Activities.....	4
1.8 Proposed Schedule for Implementation of Subproject.....	4
2.0 Public Consultation and Information Disclosure	7
2.1 Public Consultation	7
2.2 Information Disclosure	7
3.0 Review of Relevant Acts, Regulations and Guidelines	8
4.0 Existing Environmental Condition	10
4.1 Physical Environment	10
4.2 Biological Environment	11
4.3 Socio-economic and Cultural Environment	12
5.0 Project Alternatives	15
5.1 No Action Option	15
5.2 Proposal Alternatives.....	15
5.3 Alternative Alignment.....	15
5.4 Alternative Design and Construction Approach.....	15
5.5 Alternative Schedule and Process.....	15
5.6 Alternative Resources	16
6.0 Identification of Impacts and Mitigation Measures	17
6.1 Mitigation Measures During Pre-Construction Phase.....	17
6.2 Beneficial Impacts and Benefit Augmentation Measures.....	17
6.3 Adverse Impacts and Mitigation Measures	19
7.0 Environmental Management Plan	25
7.1 Institutions and Their Roles	25
7.2 Reporting	26
7.3 Environmental Management Plan	26
7.4 Mitigation Cost	35

7.5	Implementation of Mitigation Measures.....	36
7.6	Environmental Monitoring.....	36
8.0	Conclusion and Recommendations	40
8.1	Conclusion	40
8.2	Recommendation	40
	References	41

ANNEXES

Annex I:	Terms Of Reference
Annex II:	Rapid Environmental Assessment (REA) Checklist
Annex III:	Abstract Of Cost
Annex IV:	RRRSDP Environmental Checklist
Annex V:	Public Notice
Annex VI:	Deed Of Enquiry (<i>Muchulka</i>)
Annex VII:	Name Of The Organizations
Annex VIII:	List Of Persons Consulted
Annex IX:	Summary Of Meeting Minutes With Local People
Annex X:	Recommendation Letters From VDCs
Annex XI a:	Distribution of households by major occupation
Annex XI b:	Number of Household belonging to diferent food security category
Annex XI c:	Land holding pattern of settlement within Zol
Annex XI d:	Summary of public services and infrastructures
Annex XII:	List of Trees To Be Removed
Annex XIII:	Photographs
Annex XIV:	Summary Of Cross Drainage Structures
Annex XV:	Structure For Slope Stabilization
Annex XVI:	DDC Meeting Minutes
Annex XVII:	Focused Group Discussion Meeting Minutes

LIST OF FIGURES

Figure No.	Description	Pages
Fig 1.1	Map of Nepal showing the location of Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam road Subproject in Rolpa District	5
Fig. 1.2	Topo. Map showing the alignment of Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam road	6
Fig. 7.1	Environmental Management Organizational Structure	26

LIST OF TABLES

Table No.	Description	Pages
Table 1.1	Sub-Project Implementation Schedule	4
Table 2.1	Summary of FGD Meeting Conducted Under IEE Study	7
Table 3.1	Review of Environmental Acts, Regulations And Guidelines	8
Table 4.1	Geological Features Along The Road Alignment	10
Table 4.2	Summary of Land Use Pattern Along The Road Alignment	11
Table 4.3	House/Sheds, Public Services and Infrastructures Along The Road Alignment	13
Table 4.4	Development Potentialities in Various Sectors	14
Table 6.1	Potential Spoil Disposal Sites	19
Table 6.2	Recommended Quarry Sites	20
Table 6.3	Impact on Private Properties/Community Infrastructure and Mitigation Measures	22
Table 7.1	Institutions and Their Roles	25
Table 7.2	Beneficial andAdverse Impacts and Proposed Enhancement Measures (Road Subproject)	27
Table 7.3	Beneficial and Adverse Impacts and Proposed Mitigation Measures (Bridge)	32
Table 7.4	Cost Estimate For Environmental Enhancement and Mitigation Measures	35
Table 7.5	Environmental Monitoring Cost	36
Table 7.6	Compliance Monitoring For Mijhing -Gam Road Construction Work	37
Table 7.7	Impact/Effect Monitoring For Mijhing -Gam Road Construction Work	39

ABBREVIATIONS

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 Consultants	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	SMO	Social Mobilization Officer
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		

NAME AND ADDRESS OF THE PROPONENT

Name of Proposal

New construction of Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam Road Sub project
Rolpa District, Nepal

Name and Address of Proponent

Office of District Development Committee (DDC)/ District Technical Office (DTO), Liwang,
Rolpa District
Phone No: 086-440261
Fax No: 086-440062

Name of Preparer

Er. Raj Bikram Dangi (Environmental Specialist)

Data Collection and Support

Er. Gangadhar Pandit (DTL)
Mr. Binod Prasad Dangal (Social Development Specialist)
Mr. Jog Raj Peneru (Social Mobilizer)
Mr. Tek Bahadur Bhat (Social Mobilizer)
Ms. Pushpa Pun (Social Mobilizer)
Ms. Sunita Chaudhary (Social Mobilizer)
Mr. Dilip Mandal (Sub-Engineer)
Mr. Arbinda Shah (Sub-Engineer)

मिभिङ-गाम सडकको प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदनको कार्यकारी सारांश

पृष्ठभूमि

नेपाल सरकारले लामो दून्दले 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 विसवटा जिल्लाहरूमा संचालन गरिरहेको छ । रोल्पा जिल्लामा अवस्थित प्रस्तावित मिभिङ रुनीवान-गाम ग्रामीण सडकको नयाँ निर्माण गर्नसोही कार्यक्रम अन्तर्गत संचालन गर्न लागिएको एक उप-आयोजना हो । उप-आयोजना (प्रस्ताव) अन्तर्गत ३५.१० कि.मी. लामो उक्त सडक नयाँ निर्माण गर्न प्रस्ताव गरिएको छ ।

प्रस्तावक

प्रस्ताव (प्रस्तावित सडक उप-आयोजना) को प्रारम्भिक वातावरणीय परीक्षणको प्रस्तावक *जिल्ला विकास समिति र जिल्ला प्राविधिक कार्यालय, रोल्पा* हुन् । प्रस्तावकको प्रारम्भिक वातावरणीय परीक्षण स्विकृत गर्ने सम्बन्धित निकाय *स्थानिय विकास मन्त्रालय* हो ।

प्रारम्भिक वातावरणीय परीक्षण अध्ययनको उद्देश्य

प्रारम्भिक वातावरणीय परीक्षण अध्ययनको मुख्य उद्देश्य प्रस्तावित उप-आयोजना निर्माण तथा संचालन बाट उक्त क्षेत्रको भौतिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक वातावरणमा पर्न सक्ने 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 सार्वभिकता

प्रस्तावित सडकले रोल्पा जिल्लाको सुदुर दुर्गम भेगका वासिन्दाहरूलाई सदरमुकाम संगको पहुँच बढाउनेछ भने स्थानिय स्तरमा उत्पादन हुने तरकारी, दुध तथा बाँसका सामग्रीहरू लाई बजार संग जोडी स्थानिय आय आर्जनमा अभिवृद्धि गर्नेछ ।

अध्ययन प्रकृया

जुलाई, २००९ मा फिल्ड सर्वेक्षणबाट लिइएको तथ्याङ्क तथा अन्य उपलब्ध तथ्याङ्कहरूको साथै सामाजिक तथा प्राविधिक टोलीबाट पुनर्वास कार्यको समेक्षणको सिलसिलामा संकलन गरेका तथ्याङ्कहरू केलाएर प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन तयार गरी निष्कर्ष तथा सुझावहरू दिइएको छ । यो प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन नेपाल सरकारको वातावरण संरक्षण ऐन २०५३, वातावरण संरक्षण नियमावली 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 रोल्पा जिल्लाको सुदुर दुर्गम भेगका वस्तीहरूलाई जिल्लाको सदरमुकाम संग जोड्दछ । यसको कूल लम्बाइ ३५.१ कि.मि. छ । यो सडक छवटा गाउँ विकास समितिहरू क्रमशः मिभिङ, वडाचौर, गुमचाल, हारजड, स्युरी र गाम भएर जान्छ । सडकको कुल चौडाइ ५ मि. हुनेछ । सडकमा दुई वटा पुलहरू (Ch. 0+250 र 1+400 मा निर्माण गर्नु पर्ने देखिन्छ । यस उप-आयोजनाको कूल अनुमानित लागत रु.१५०,९००,६०२ र प्रति कि.मी अनुमानित लागत रु.४,२९९,१६२ लाग्ने देखिन्छ ।

विद्यमान वातावरणीय स्थिति

यो सडक मिभिङ गा.वि.स.को रुइनिवाड बाट समुद्री सतहदेखि ८६६ मी. को उचाईबाट शुरु भएर १८२२ मी. उचाईको गाम गा.वि.स.मा पुग्छ । सडक खण्डमा ठूला पहिरोको समस्याहरू देखिदैन । सडक खण्डमा पर्ने पानीको मुख्य श्रोतहरूमा लुग्री, वोजयान र गाम खोला पर्दछन् । प्रस्तावित पुलहरू यस सडक खण्डमा पर्ने लुग्री र वोजयान खोलामा पर्दछन् । प्रस्तावित सडक क्षेत्रको वायु तथा पानीको स्तर सफा रहेको देखिन्छ साथै ध्वनि प्रदूषणको समस्या देखिदैन । यो सडक प्रायः खेती गरिएको जमीन तथा वन र बस्तीहरू भएर जान्छ ।

यस सडक खण्डमा पाइने मुख्य रुखको प्रजातिहरूमा खिरो, चिलाउने, लालीगुरास, उत्तिस, कटुस, अमलिषो, खेन्यू, सल्ला, धुपी आदी पर्दछन् । बाँदर, फ्याउरो, बनविरालो, लोखर्के आदि वन्य जन्तुका साथै ढुकुर, जुरेली, काग, भँगेरा, परेवा आदि पक्षीहरू सडक छेउको वनमा पाईन्छ । यो सडक खण्ड संरक्षित क्षेत्र वा मध्यवर्ती क्षेत्रमा पर्दैन ।

यो सडक खण्डको प्रभावित क्षेत्र भित्र जम्मा घरधुरी संख्या ११८९ र जनसंख्या ७४६७ रहेको छ र सरदर परिवार संख्या ६.२८ छ । यहाँ ब्राहमण, क्षेत्री, तामाङ, मगर तथा दलित (दमाई, कामी) जातीहरु बसोबास गर्दछन् ।

यहाँका बासिन्दाहरुको मुख्य पेशा कृषि र पशुपालन हो । यातायातको राम्रो सुविधा नभएको तथा पहाडी क्षेत्र भएकोले कृषि उब्जनीले मात्र पर्याप्त नहुने हुँदा यहाँका अधिकांश मानिसहरु श्रम रोजगारीका अन्य पेशामा काम गर्ने साथै उल्लेखनीय प्रतिशत मानिसहरु जीविकोपार्जनको सिलसिलामा हिउँदमा काठमाडौँ तथा भारत लगायतका ठाउँमा रोजगारीको लागि जाने गर्दछन् ।

प्रमुख वातावरणीय प्रभावहरु

सकारात्मक प्रभाव

उप(आयोजना बाट तत्कालै हुने लाभमा स्थानीय स्तरमा रोजगारीको सिर्जना हुनेछ । आयोजना संचालनको लागि करिब १५३७८७ मानवदिन वरावरको अदक्ष र ६११० मानवदिन वरावरको दक्ष श्रमशक्तीको आवश्यकता पर्नेछ । आयोजना संग सम्बन्धित कार्यमा (रोजगारीमा) गरीब, महिला तथा पिछ्छिडएका स्थानीय जनताले प्राथमिकता पाउनेछन् । यस चरणमा हुने अन्य लाभहरुमा बन्द व्यापारको बृद्धि, उप(आयोजनाले प्रदान गरेको शीपमुलक तथा जनचेतनामुलक तालिम तथा उप(आयोजना निर्माण कार्यमा सहभागी भई स्थानीय जनताको शीप बृद्धि हुने अवसर पर्दछन् ।

सडक सञ्चालनका चरणमा सडकले प्रभावित क्षेत्रका बासिन्दालाई बजार, सामाजिक सेवा प्रदायक स्थान तथा देशका अन्य भागहरुसम्म पुग्न छिटो, छरितो तथा सुविधाजनक पहुँचको अवसर प्रदान गर्नेछ । सडक सुविधाको कारण मल तथा किटनाशक औषधीहरुको सस्तो तथा सुलभ आपूर्तिले कृषिको उत्पादकत्वमा अभिवृद्धि हुनेछ । यसले स्थानीय जनताको आय तथा खाद्य सुरक्षामा अभिवृद्धि हुनेछ साथै स्थानीय श्रोत साधनको उपयोग गर्ने साना कृषि उद्योगहरुको प्रवर्द्धन हुनेछ । पहुँच तथा यातायातको अवसर संगै शिक्षा, स्वास्थ्य, संचार, बजार, बैकिङ तथा अन्य आर्थिक तथा सामाजिक क्षेत्रहरुको विकास हुनेछ । यसले यस क्षेत्रका मानिसहरुको समग्र जीवनस्तर उकास्न मद्दत पुऱ्याउनेछ । सडकको सञ्चालनले स्थानीय जग्गा जमिनको मुल्य बृद्धि गर्न सहयोग पुऱ्याइ स्थानीय जग्गाधनीलाई लाभ पुऱ्याउनेछ ।

उप(आयोजना कार्यन्वयनबाट पर्न सक्ने नकारात्मक प्रभावहरु:

सडक निर्माणको क्रममा भिरहरु काट्दा, खन्दा निस्किएको माटो तथा ग्रेगर थुपार्दा, निर्माण सामग्री भिक्नलाई खानी सञ्चालन गर्दा त्यस क्षेत्रको भिरालो ठाँउहरुमा असर पर्न गई पहिरो तथा भु(क्षय हुन सक्ने सम्भावना रहन्छ । फोहर तथा खन्दा निस्किएका माटो, ग्रेगर को उचित व्यवस्थापन हुन सकेन भने यसले भु(क्षय बढाउन तथा जल प्रदुषण गराउन सक्छ । सडक निर्माणको दौरान बाटो चौडाई गर्नको लागि ३.५ हेक्टर जंगल क्षेत्र प्रयोग हुनेछ, तथा विभिन्न जातका गरी करिब २२९९ वटा रुख विरुवाहरु काटिनेछन् सरकारी वनको साना ठुला रुख गरी जम्मा १५०८ वटा र निजी ७९१ वटा रुखहरु पर्दछन् । सडक निर्माण क्रियाकलापबाट जीवजन्तुलाई असर पर्ने तथा सडक निर्माण कार्यमा खटिएका कामदारहरुले वनका जीवजन्तुलाई जिस्क्याउने तथा तिनको शिकार गर्नसक्ने सम्भावना रहन्छ ।

सडक निर्माण कार्यको दौरान ०.७५ हेक्टर निजी जग्गा अधिग्रहण गर्नुपर्ने हुन्छ जसले गर्दा वार्षिक मकै तथा तरकारी वालीको उत्पादनमा असर पुग्नेछ । सडक निर्माण कार्यको दौरान ५ वटा निजी घरहरुलाई क्षति पुग्ने देखिन्छ । निर्माण कार्यको क्रममा श्रमिकहरु तथा स्थानीय जनताको स्वास्थ्यमा असर पर्ने अथवा अप्रिय दुर्घटनाहरु घट्न सक्ने सम्भावना रहन्छ ।

सडक सञ्चालनको चरणमा सवारी साधनको आवगमनबाट, वर्षायामको पानीबाट तथा स्थानीय भिरपहराहरुमा गाईवस्तु चराउदा वा रुख विरुवा काट्दा भिरपहराहरुमा अस्थिरता बढ्न गई पहिरो जान सक्छ । सडक किनाराका नाला बाट वगेको अनियन्त्रित पानीले सडक मुनिका खेतवारीमा भु(क्षय हुन सक्छ । सवारी साधनको बृद्धिले धुलो तथा ध्वनी प्रदुषण बढ्नेछ । त्यसैगरी सडकको सुधार संगै वन क्षेत्रसम्म भएको पहुँचको बृद्धिले वन सम्पदा तथा वन्य जन्तुमा चाप बढ्न गई वन सम्पदाको क्षय र जीवजन्तुलाई असर पर्न सक्छ । सडकको सुधार संगै बस्ती र बजारको अव्यवस्थित विस्तार हुने सम्भावना र सडक क्षेत्र मिच्ने प्रवृत्ति देखिन सक्छ ।

यस सडक मा पर्ने लुग्री खोला (०+२५०) र वोजयान खोला (१+४००) मा पुलहरु निर्माण गर्दा ०.११ हेक्टर खाली जग्गा सफा गर्नुपर्नेछ। यस निर्माण कार्य ले गर्दा त्यहाँका पानी मा बस्ने जीवजन्तुलाई असर पर्न सक्छ ।

प्रभाव न्युनिकरणका उपायहरु:

यस उपआयोजनालाई वातावरण मैत्री बनाउनका लागि सकारात्मक प्रभावलाई बढावा गर्ने तथा नकारात्मक प्रभावहरुलाई नियन्त्रण या न्युनिकरण गर्ने थुप्रै उपायहरु यस प्रतिवेदनमा प्रस्तावित गरिएको छ । जनताले राजी खुशीले बाटोको लागि दिएको वाहेक आयोजनाले गरिवीको रेखामुनि परेका परिवारहरुको अधिग्रहण गर्ने सबै जग्गाको प्रचलित मुल्य अनुसार क्षतिपुर्ति दिनेछ । सडक LEP (श्रम मुलक, वातावरण मैत्री, सहभागीता मुलक) तथा मेसीन प्रविधि मार्फत निर्माण गरिने

छ। उप(आयोजनाले प्रभावित जनतालाई निर्माण कार्यमा रोजगारीमा तथा शिपमूलक तालिममा प्रथमिकता दिनेछ। उप(आयोजना निर्माणको क्रममा जग्गा फँडानी गर्दा, जमिन काट्दा, खानी सञ्चालन गर्दा, खन्दा निस्किएका माटो, ग्रेगर थुपार्दा तथा अन्य कार्य गर्दा त्यस क्षेत्रको संवेदनशील वातावरणलाई सुरक्षित राख्न विशेष ध्यान दिनेछ। निर्माण कार्यमा कार्यरत श्रमिकहरुको विमा गरिने छ तथा सुरक्षाका सम्पूर्ण सामग्री श्रमिकहरुलाई प्रयोगमा ल्याउन दिइने छ। वन, जीवजन्तुको संरक्षण गर्न तथा सामाजिक अक्षुण्णतालाई कायम राख्न जनचेतनामूलक कार्यक्रमहरु तथा तालिमहरु सञ्चालन गरिनेछ। निर्माण स्थलहरुमा प्राथमिक उपचारको सामग्रीहरुको व्यवस्था गरिने छ। काटिएका रुख विरुवाहरुको क्षतिपूर्ति वापत १:२५ अनुपातमा र १०% थप वृक्षारोपण गरिनेछ साथै निजि जग्गाको हकमा १:१ को अनुपातमा वृक्षारोपण गर्न प्रोत्सान गरिनेछ। वृक्षारोपणमा संरक्षित तथा स्थानिय प्रजातिहरुलाई प्राथमिकता दिइनेछ। सडक सञ्चालनका क्रममा सडकमा देखिएका अस्थिरताहरुलाई नियमित रुपमा मर्मत सभार गरिनेछ। सडकमा तथा सडकको कारण नजिकैको खेतवारीमा पानी जम्मा हुन नदिन उचित निकासको व्यवस्थापन गरिनेछ। सडक दुर्घटना बाट बचाव गर्न उपायहरु अवलम्बन गरिनेछ। पुलहरुको संरक्षणको लागी सिभिलसंरचनाहरुका साथै बायो-इन्जिनियरिङ्ग कार्य गरिनेछ।

वातावरण व्यवस्थापन योजना

यस प्रतिवेदनमा वातावरण व्यवस्थापन योजना अन्तर्गत उप(आयोजनाबाट पर्ने संभावित असरहरु, असरहरुको प्रभाव, न्युनिकरण विधि, अनुगमन विधि तथा कार्यतालिका प्रस्तावित गरिएको छ। यसका साथै न्युनिकरणका उपायहरुको तथा अनुगमन कार्यको कार्यान्वयन गर्ने जिम्मेवार निकायहरुको पनि पहिचान गरिएको छ। अनुगमनका लागी आवश्यक भौतिक, जैविक, सामाजिक-आर्थिक तथा साँस्कृतिक वातावरणका विभिन्न अनुगमन सुचाङ्कहरुको पनि पहिचान गरिएको छ। वातावरण व्यवस्थापन योजना कार्यान्वयन गर्न निम्नानुसार खर्च हुने अनुमान गरिएको छ:

क्र. सं.	विवरण	रकम (ने.रु.)	कैफियत
१.	वातावरण सम्बन्धी जनचेतनामूलक तालिम तथा अन्य तालिम	२००,०००/-	आयोजनाको बजेटमा समावेश गरिने।
२.	श्रमिकहरुको विमा	४००,०००/-	BoQ मा समावेश गरिने।
३.	बायो-इन्जिनियरिङ्ग	५,२५६,४९३/-	BoQ मा समावेश गरिने।
४.	पुनर्वास तथा जग्गा अधिग्रहण	६,४८६,४३६/-	पुनर्वास योजनामा समावेश गरिने।
५.	पुनर्निर्माण तथा अन्य	५००,०००/-	BoQ मा समावेश गरिने।
६.	क्षतिपूर्ति वृक्षारोपण	२,५६०,८३७/-	आयोजनाको बजेटमा समावेश गरिने।
७.	सामाजिक कार्य लागत (एच. आई. भी. रोकथाम तथा अन्य चेतनामूलक कार्यक्रमहरु जस्तै: युवा साक्षरता, स्थानीय विद्यालय सहयोग आदि)	१,३६५,०००/-	सामाजिक योजना तथा आयोजनाको बजेटमा समावेश गरिने।
८.	पेशागत स्वास्थ्य सुरक्षा तथा जानकारीमूलक सूचनापाटी	५५०,०००/-	BoQ मा समावेश गरिने।
९.	अनुगमन तथा मुल्यांकन	२००,०००/-	आयोजनाको बजेटमा समावेश गरिने।
	जम्मा :	१७,५१८,७६६/-	

निष्कर्ष

परिचान गरिएका प्रायः वातावरणीय प्रभावहरु कम महत्वका तथा मुख्य गरी निर्माणकार्यका वखतमा सिमित रहेको पाइएको छ। वातावरण व्यवस्थापन योजना अन्तर्गत उल्लेख गरिएको उपायहरुको कार्यान्वयन गरिएमा यस आयोजनाको कार्यान्वयनले आयोजना क्षेत्रको भौतिक, जैविक, सामाजिक - आर्थिक तथा साँस्कृतिक वातावरणमा उल्लेखनीय नकारात्मक प्रभाव नपार्ने देखिन्छ। यस प्रारम्भीक वातावरणीय अध्ययनको आधारमा यस प्रतिवेदनमा उल्लेख गरिएको वातावरणीय व्यवस्थापन योजनालाई पूर्ण रुपमा लागु गरी प्रस्तावित उप(आयोजना कार्यान्वयन गर्न सिफारिश गरिन्छ। उप(आयोजनाको 'वातावरणीय प्रभाव मुल्याङ्कन' स्तरमा अध्ययन गर्न आवश्यक नरहेको सिफारिश समेत गरिन्छ।

EXECUTIVE SUMMARY

Background

Government of Nepal has received financial assistance from ADB, SDC, DFID and OFID for implementation of the Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP). The RRRSDP aims for reconstruction and rehabilitation of rural infrastructures damaged in the twenty conflict affected districts of the country. The Proposed 35.10 km long Mijhing Runiban-Gam Rural Road in Rolpa District is one of the Subprojects selected under the RRRSDP. It is an alignment proposed for new construction.

Project Proponent

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

Objectives of the IEE Study

The objectives of the IEE study is to identify the impacts on the physical, biological, socio-economic and cultural environment of the project influence area from construction and operation of the Proposal, and recommend site-specific adverse impact mitigation measures and beneficial impact augmentation measures. The Study will assess if the IEE level study is sufficient for the Subproject.

Relevancy of the Proposal

The proposed Subproject will connect a remote rural area of Rolpa district with the district headquarters. It will provide easier access to people to social services, and market access for local products like vegetables, milk and bamboo products. As a result, the Subproject will assist to promote economic activities, reduce poverty and increase socio-economic conditions of the people of the area.

Study Methodology

The IEE study has been conducted through review of secondary information collected from relevant agencies, and primary information collected from the field survey in July 2009. The survey methods included walk-through survey along the 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, 1997 and Environmental Protection Rules, 1997 (second amendment 2007) of the Government of Nepal (GoN); and Environmental Assessment Guidelines, 2003, and Safeguard Policy Statement, 2009 of ADB. The report follows the Terms of Reference for IEE Study approved by MoLD on 25/02/2066 BS.

Brief Description of the Subproject

The proposed road lies at the remote south-eastern part of Rolpa district. The proposed 35.1 km road passes through Mijhing, Badachaur, Gumchal, Harjang, Syuri and Gam Village Development Committees (VDCs). Average width of the road will be 5m. Two bridges are required at 0+250 and 1+400, and improvements in geometry and grade of the road will be required and surface will be gravelled. Total project cost is NRs. 150,900,602 and per km cost is NRs. 4,299,162.

Existing Environmental Condition

The road starts from Runiban of Mijhing VDC at 866m amsl and end in Gam VDC at 1822amsl. The slope along the road alignment is stable. Lungri Khola, Bajoyan Khola and Gam khola are the major natural drainages. The proposed bridges lie on Lungri khola and Bojayan khola. Ambient air and water quality of the proposed project area is observed to be good and there is no noise pollution. The road passes through cultivated land, forest and settlements.

The dominant vegetation found in the road alignment are *Alnus nepalensis* (Uttis), *Schima wallichii* (Chilaune), *Ficus semicordata* (Khnew), *Sepium insegne* (Khiro), *Castanopsis indica* (Katus), *Thysolaena maxima* (Amliso), *cryptomeria japonica* (Dhupi), *Rhododendron arboretum* (Laliguras), *Pinus roxburghii* (Salla). *Felis chaus* (Jungle Cat), *Macaca mulatta* (Monkey), *Vulpes sp.* (Fox), *Ratufa sp.* (Squirrel) are the common mammals. Dhukur, Jureli, *Corvus splendens* (Crow), *Passer domesticus* (Sparrow), *Columba livia* (Pigeon) are the birds found in the Subproject area. The road

does not fall under any protected area or their buffer zones. Total population of the Subproject area is 7467, total household number is 1189, and average family size is 6.28. Brahmin, Chettri, Magar, Tamang and occupational caste (Damai, Kami) are the main castes living in the area.

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. Moreover, significant percentage of the economically active male population also migrates to various places including Kathmandu 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 require about 153787 person days of unskilled and 6110 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 Zone of Influence (Zol)¹ will get easy and fast accessibility to markets, social services and other regions of the country. The fertilizers and pesticides will become cheaper with better transportation facility hence, agricultural production will increase. This will ensure better economic condition and food security of the people living in the Zol of the project area. Moreover this will promote the small agro based industries that uses local resources. Easy access and opportunity of better transportation system will develop other sectors like education, health, communication, market, banking and other socio-economic sectors. This will increase the overall living condition of the people living in Zol 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 quarryies might result in on erosion and landslide during construction and operation. Futhermore, spoils generated during construction can create the water pollution to the nearby water sources.

During road widening and construction required 3.5 Ha of forest area and different type of tree total 2299 nos will have to be cleared. Among them from private land 791 trees and from forest area 1508 nos. of tree /shrub will be affected by project construction. 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 road construction, there will be loss of 0.75 Ha of agricultural land which results in annual reduction of agricultural production mainly maize and vegetables. Five houses structures will be affected during road construction. Labours and local people are prone to health effects and accidents relating to construction activities.

During operation stage, monsoon rain, grazing of animals and 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 expanse and this may increase encroachment of the RoW.

Due to construction of Bridges at 0+250 (Lungri khola) and at 1+400 (Bojayan khola), there will be site clearance of about 0.11 ha. Barren land. During construction period, there may be potential impact on aquatic life of those rivers.

Mitigation Measures

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

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

the lands that need to acquire. The construction of road will be based on Labour-based, Environment friendly and Participatory (LEP) and Machine Intensive Road Construction Approach. Affected families will be given high priority for employment and skill development trainings. Necessary measures will be taken to reduce the adverse effects that might arise from site clearance, cutting of slopes, disposal of spoils and quarrying activities. Necessary trainings and awareness programs will be conducted. Necessary measures will be adopted for protection of flora and fauna. At construction site, the workers will be provided insurance, first aid facilities and safety equipments. Loss of trees will be compensated by planting of trees in the ratio of 1:25 and added 10% in forest land and in private land compensatory plantation will be encouraged in the ratio 1:1. Protected species will be given emphasis for plantation. Proper maintenance and proper drain system will be provided to prevent accumulation of water on the nearby agricultural lands during operation. Adequate road safety measures will be provided to minimize road accident. For bridge protection, construction of civil structures as well as bio engineering will be done.

Environmental Management Plan

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

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

SN.	Description	Amount (NRs.)	Remarks
1	Environmental awareness raising training and other training	200,000.00	To be included in project cost
2	Insurance of workers	400,000.00	To be included in BoQ
3	Bio-engineering	5,256,493.00	
4	Resettlement and Land Acquisition	6,486,436.00	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	25,608,37.00	To be included in project cost
7	Social Action Cost (Health / HIV AIDS / STD prevention awareness; other awareness program such as adult literacy; support to local school etc.)	1,365,000.00	To be included in Social plan, project cost
8	Occupational health and safety, Information signboard	550,000.00	To be included in BoQ
9	Monitoring	200,000.00	To be included in project cost
	Total	17,518,766.00	

Conclusion and Recommendation

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

1.0 Introduction

1.1 Background

1. The Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) focuses on immediate post conflict development priorities for accelerated poverty reduction and inclusive development, thereby enhancing the effectiveness and efficiency of the delivery of public services, and improving access of rural people to economic opportunities and social services. The Program is financed by the Government of Nepal (GoN), Asian Development Bank (ADB), Department for International Development (DFID), Swiss Development Cooperation (SDC), Nepal and OPEC Fund for International Development (OFID). The Program covers twenty districts spread over the country. Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) under the Ministry of Local Development (MLD) is the executing agency (EA). The District Development Committees (DDCs) / District Technical Office (DTO) are the Project Implementing Agencies. The DDC/DTO are supported by District Implementation Support Team (DIST) with engineering, safeguards and social mobilization responsibilities.
2. Rolpa District is one of the project districts under RRRSDP. This Proposal is for new construction of the 35.1 km long Mijhing Runiban -Gam district road in Rolpa District.

1.2 The Name and Address of Proponent

Name of Proposal :	New Construction of Mijhing Runiban -Gam District Road, Rolpa District, Nepal
Name of Proponent :	District Development Committee, District Technical Office, Rolpa
Address of Proponent :	Liwang, Rolpa District
	Phone No: 086-440261
	Fax No: 086-440062

1.3 Relevancy of the proposal

3 The Project area is located at remote and underdeveloped North-eastern part of Rolpa district. The area has high potential in production of vegetable and milk. In this regard, the proposed New construction of the road will enhance access of people to social services and market centers with significantly reduced travel time and cost, and will contribute in their socio-economic development. Access shall also attract other development infrastructures and open door to further development opportunities in the area.

4. Term of reference of Phagam Dadachaur- Badachaur-Gumchal -Harjang-Syuri-Gam road Sub-project Rolpa district; approved by the Secretary level decision of the Ministry of Local Development (MLD) on 2066/2/25 B.S, covers Phagam, Badachaur, Gumchal, Harjang, Syuri, and Gam VDCs and starts from Dahachaur in Phagam VDC which is 3.0 Km far from Sulichaur Market area and passes only 250m in Phagam VDC. However, as there are not major settlements and market centres at Phagam, the starting point of the road subproject was changed to Runiban of Mijhing VDC according to community demand and multi parties' decision in DDC. The meeting note is given in **Annex XVI**. Now this alignment starts from Runiban in Mijhing VDC. Runiban is Centrel Market area of many VDCs such as Badachaur, Gumchal, Harjan, Syuri, Gam, Sirp, Pang, Aresh ,Uawa, Tewang, Seram, Phagam and Gelwang. The changed alignment is from starting point at Runiban up to Airport at ch.8+500. From Airport, the alignment is same as in Approved ToR. This alignment (Mijhing Runiban-Badachaur-Gumchal-Harjan-Syuri-Gam) is highly suitable according to Technical, Social, Environmental and Resettlement aspect.

1.4 Need and Objectives of the IEE Study

5. **Need:** An IEE study of the Proposal is a legal requirement according to the Environment Protection Act, 1997; and Environment Protection Rule, 1997 (Amendment 2007) of GoN; and according to the provisions of the Environmental Assessment Guidelines, 2003; and Safeguard Policy Statement, 2009 of ADB.

6. **Objectives:** The main objective of the IEE study is to identify the impacts from the construction and operation of the Proposal on the physical, biological, socio-economic and cultural environment of the

Subproject area. The IEE study recommends practical and site specific environmental mitigation and enhancement measures, prepare and implement environmental monitoring plan and make sure that IEE is sufficient for the proposed road sub-project.

1.5 Methodology Adopted

7. The IEE study has followed the provisions of the EPA, 1997 and EPR, 1997, and the provisions of ADB. It follows methodology suggested in the approved Terms of Reference for IEE Study by MoLD on 25/02/2066 (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. The IEE study has been conducted through review of secondary information collected from relevant agencies, and primary information collected from the field survey in July 2009. 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, VCDs 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.

1.6 Description of the proposal

8. The proposed 35.1 km long earthen Mijhing Runiban-Badachaur-Harjang-Syuri-Gam road Subproject lies in the North-East part of Rolpa district in Mid Western Development Region of Nepal which links the remote area of the district to its headquarter. After detail survey length of road is changed to 35.1 Km which was 35 Km in ToR. This Subproject starts from Runiban of Mijhing Village Development Committee (VDC) and ends at Gam of Gam VDC. In Between the road passes through Gumchal, Harjang, Syuri VDC.

9. The alignment requires widening, geometrical correction in bends, grade improvements and bridge construction at Ch. 0+250 and Ch. 1+400. At present detail survey is ongoing and the length of bridge is not fixed because detail design is not completed. The location and alignment of the road is given in **Figure 1.1 and 1.2**. The total project cost is NRs 201,036,929.00 and per km cost is NRs. 5,727,547.00 as shown in **Annex III**.

Salient Feature of the Road Subproject

1. Name of the Project	: Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam Road
2. Location	
2.1 Geographical Locations	
2.1.1 Start Point	: Runiban of Mijhing VDC
2.1.2 End Point	: Gam of Gam VDC
2.2 Geographical Feature	
2.2.1 Terrain	: Mountainous
2.2.2 Altitude	: 866 m amsl at Runiban to 1822m amsl at Gam
2.2.3 Climate	: Sub-Tropical/ Temperate
2.2.4 Soil	: Residual, Alluvial soil, colluvial soil
3. Classification of Road	: District Road (Rural Road Class A)
4. Status of road	: New construction road
5. Length of Road	: 35.1 km
6. Standard of Pavement	: Earthen
7. Construction Period	: 270Days
8. Design speed	: 20 km/hr
9. Major Settlements:	
9.1 Major Settlements	: Runiban, Kilaurchaur, Sewar, Upplo Gumchal, Tallo Gumchal, Pate Gumchal, Rajipati, Chhaharekhum, Ghoga, Bhanli, Shikum, Bowang, Kuipadhara and Maulaban.
9.2 No. of Household	: 1189 HHs
9.3 VDCs along the Road	: Mijhing, Badachaur, Gumchal, Harjang, Syuri, Gam
10. Cross Section	
10.1 Right of way	: 5m each side (center line)
10.2 Formation width	: 5 m
10.3 Carriageway width	: 3.5 m
10.4 Lane	: Single
11. Structures	
11.1 Retaining Structures	

11.1.1 Dry Stone Massonary	: 4624.92 Cum.
11.1.2 Gabion Wall	: 7358 Cum.
11.1.3 Stone Pitching	: 50.2 Cum.
12. Bio-Engineering / Road side Plantation	: 3% to total cost (NRs. 5,256,493.00)
13. Earth Work	
13.1 Cutting	: 447743.49 Cum
13.2 Filling	: 264764.19 Cum (No filling work in significant amount)
14. Project cost for Road	
14.1 Total Cost (NRs)	: NRs 150,900,602.05
14.2 Costs per km (NRs.)	: NRs 4,299,162.44
15. Employment generation:	
15.1 Total employment	: 159897 (person days)
15.1.1 Skilled	: 6110
15.1.2 Unskilled	: 153787

Salient Feature of Bridge

1.	Name of River	: Lungri Khola, Bojayan Khola Ch.0+250(at Lungri khola) and Ch.1+400(at Bojayan khola)
2.	Location	
	2.1 Development Region	: Western
	2.2 Zone	: Rapti
	2.3 District	: Rolpa
	2.4 Geographical Location	: Easting: 3776000 Northing: 3126500 Elevation: 822 m Left Bank: Mijhing VDC, Rolpa (Lungri Khola) Right Bank: Mijhing VDC, Rolpa (Lungri Khola) Left Bank: Mijhing VDC, Rolpa (Bojayan Khola) Right Bank: Badachaur VDC, Rolpa (Bojayan Khola)
3.	Technical Characteristics	
	3.1 Type of Bridge	: Steel Bridge with RCC decking
	3.2 Span arrangement	: 35m, 40 m
	3.3 Carriageway width	: 4.25 m
	3.4 Total Width of Deck	: 5.3 m
	3.5 Type of Foundation	: Open foundation with RCC footing
4.	Design Data	
4.1	Design Load	: IRC Class A
	4.2 Design Discharge	: 2627.67 cum/sec
	4.3 Design Method	: Working Stress
	4.4 Design Code	: IRC Code of Practice
5.	Materials	
5.1	Concrete for Superstructure	: M 25
5.2	Concrete for Substructure	: M 20
5.3	Reinforcement	: Fe 415 Deformed Steel bars conforming to IS: 1786
6.	Total Cost	:
	Lungri Khola	: 34,053,445.09
	Bojayan Khola	: 38,918,222.96
7.	Employment generation:	
	18.1 Total employment	: 80830 (person days)
	18.1.1 Skilled	: 20207
	18.1.2 Unskilled	: 60623

1.7 Construction Approach and Activities

10. This road will be constructed using the labour-based, environment-friendly and participatory (LEP) approach and Machine Intensive Road Construction Approach. The important features of the LEP approach are (i) phased construction with balanced cut and fill; (ii) manual work and use of hand tools and small equipment rather than heavy machinery; (iii) bio-engineering for slope stabilization; (iv) avoid blasting; (v) use soft engineering structures; and (vi) use of contractors only in the works that cannot be done through manual labour. Machine Intensive Road Construction Approach will be used in works that cannot be done manually through road building groups. In such works, the construction will be carried by using the equipment and machineries but it will be used in such a way to ensure the minimum environmental damage. Activities included during the road construction are: Site clearance, Pavement work, Earthwork, Retaining structures, Gravelling, Bioengineering, cross drainage works and side drain works.

1.8 Proposed Schedule for Implementation of Sub-project

11. Following table shows the proposed implementation schedule for Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam road sub-project:

Table 1.1: Sub-project implementation schedule

SN	Activity	2008 IV	2009				2010				2011	
			I	II	III	IV	I	II	III	IV	I	II
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 1.1 Map of Nepal showing the location of Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam road Subproject in Rolpa District

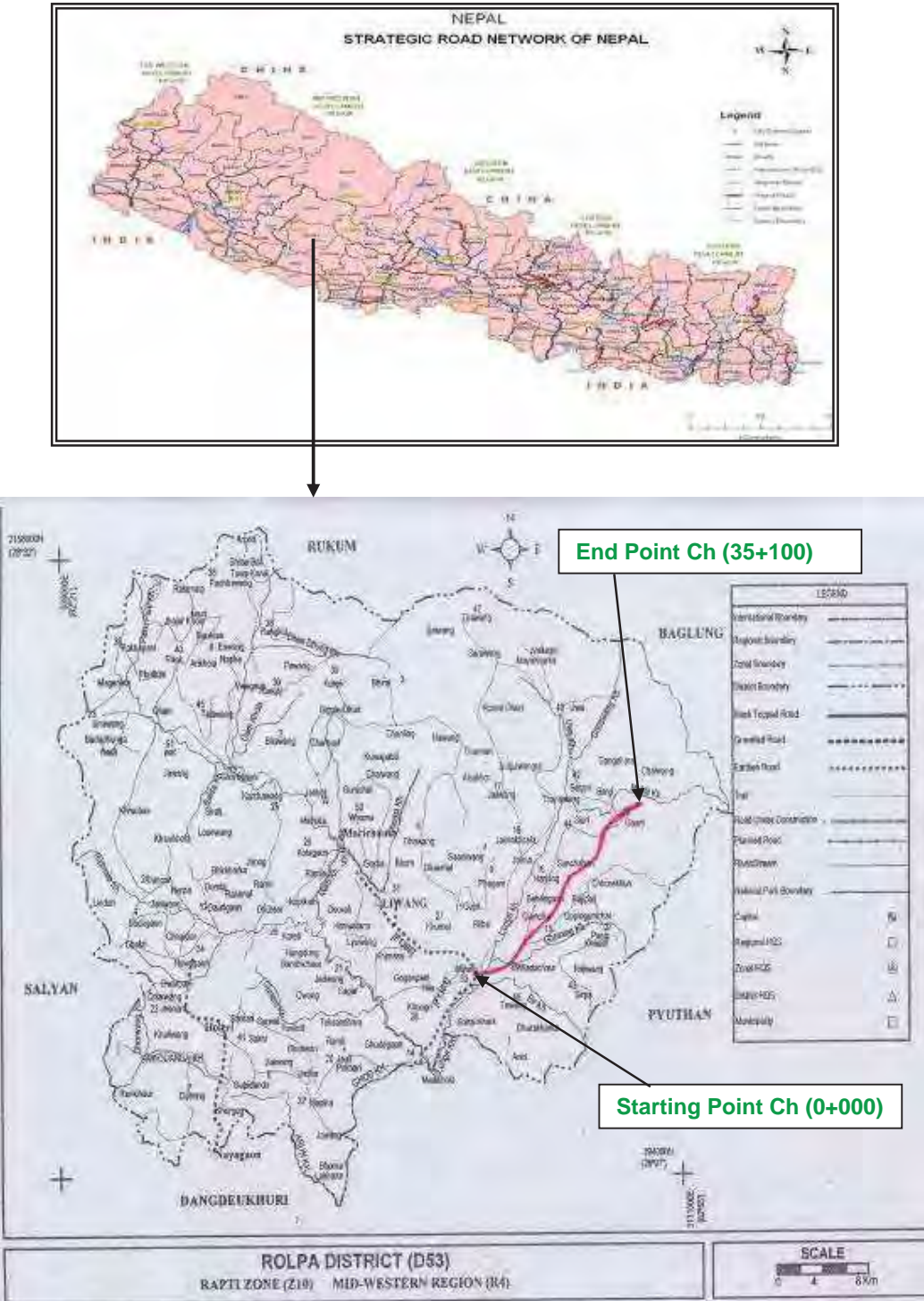


Figure 1.2. Topo. Map showing the alignment of Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam road



2.0 Public Consultation and Information Disclosure

2.1 Public Consultation

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

- Publication of notice- a 15 days public notice was published on 2066/4/9 in the Gorkhapatra, 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 different 6 VDCs along the Zol of the road and the results of FGD are mentioned in chapter 4. Existing environmental conditions and socio-economic data are tabulated in **Annex XI a, b, c and d**.
- Draft IEE report will be sent to Mijhing, Badachaur, Gumchal, Harjang, Syuri and Gam VDC 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, Rolpa for Public disclosure. After reviewing draft IEE report and incorporating the suggestions from the concerned stakeholders, final IEE report will be prepared and sent to PCU for approval from MLD and ADB.

Table 2.1: Summary of FGD Meeting

Location	Date	No. of Participants		Issues and Suggestion
		Male	Female	
Mijhing	2066/4/16	14	5	1. FGD program disseminated information on the project. 2. Participants committed on providing land voluntarily for the road. 3. Cash compensation should be provided for land and crop, free distribution of seedlings for private planting, good drainage system, and protection of water sources. 4. Project work should be careful to protect environment.
Badachaur	2066/4/18	22	2	
Gumchal	2066/4/19	23	1	
Harjang	2066/4/20	22	4	
Syuri	2066/4/11	26	2	
Gam	2066/4/21	21	7	

2.2 Information Disclosure

13. Draft IEE was kept at information center of DDC Rolpa 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, Rolpa
2. District Technical Office, Rolpa
3. District Project Office, Rolpa
4. District Implementation Support Team, Rolpa
5. Mijhing, Badachaur, Gumchal, Harjang, Syuri and Gam VDCs, Rolpa
6. Ministry of Local Development, Environment Management Section
7. Department of Local Infrastructure Development and Agricultural Roads
8. Project Coordination Unit, RRRSDP
9. Asian Development Bank, Nepal Resident Mission

3.0 Review of Relevant Acts, Regulations and Guidelines

14. 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	Environmental Protection Act, 1997	Any development project, before implementation, shall pass through environmental assessment, which may be either IEE or an EIA depending upon the location, type and size of the projects.
2	Environmental Protection Rule 1997 (amendment, 2007)	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.
3	Forest Act, 1993 (amendment, 2007)	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.
4	Forest Rules, 1995	Elaborates legal measures for the conservation of forests and wildlife. Expenses incurred for cutting trees and transportation shall be borne by proponent.
5	<i>Batabaraniya Nirdesika</i> (Nepal; MLD), 2057	The directive is focused in the practical implementation of small rural infrastructures through the minimization of environmental impacts. This directive includes the simple methods of environmental management in the different phases of the project cycle.
6	National Park and Wildlife Conservation Act, 1973	Addresses for conservation of ecologically valuable areas and indigenous wildlife. 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.
7	Local Self Governance Act (1999) and Regulation (1999)	Empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities
8	Land Acquisition Act, 1977 and Land Acquisition Rules, 1969	Specifies procedural matters on land acquisition and compensation
9	National Environmental Impact Assessment Guidelines, 1993	Provides guidance to project proponent on integrating environmental mitigation measures, particularly on the management of quarries, borrow pits, stockpiling of materials and spoil disposal, operation of the work camps, earthworks and slope stabilization, location of stone crushing plants etc.
10	APPROACH for the Development of Agricultural and Rural Roads, 1999	Emphasizes labor based technology and environmental friendly, local resource oriented construction methods to be incorporated actively in rural infrastructure process.
11	RRRSDP Environmental Assessment & Review Procedures (EARP), 2007	For preparation of environmental assessments of future subprojects under Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP), this EARP includes: i) The process to be adopted while preparing environmental reports, ii) the potential environmental impacts that could result from undertaking the Project based on the Initial Environmental Examinations (IEEs) of sample core subprojects; iii) the proposed mitigation measures to avoid the identified impacts; iv) institutional capacity assessment and strengthening arrangements; v) legal framework for environmental assessment, domestic and the Asian

		Development Bank (ADB) environmental assessment and review procedures; and finally vi) the approaches to be adopted during implementation of the Project in order to ensure that environmental aspects are dealt with in a comprehensive manner.
12	Reference Manual for Environmental and Social Aspects of Integrated Road Development, 2003	Suggests stepwise process of addressing environmental and social issues alongside the technical, financial and others
13	Green Roads in Nepal, Best Practices Report: An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions, 1999	Focuses on participatory, labor based and environment friendly technology with proper alignment selection, mass balancing, proper water management, bioengineering and phased construction
14	ADB Environmental Assessment Guidelines, 2003	Requires that environmental considerations be incorporated into ADB operations where environmental assessment is the primary administrative tool to integrate environmental considerations into decision-making of all types of development initiatives
15	Three Years Interim Plan, 2007/08-2009/10	Requires all projects will be formulated and constructed based on methods that optimally utilize the local skill and resources and generate employment opportunities.
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, 1992	Regulates the working environment and deals with occupational health and safety.

4.0 Existing Environmental Condition

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

4.1.1 Topography

16. The elevation of the starting point of the road at Runiban is 866m amsl and at the end of road at Gam is 1822m amsl. The road alignment passes through the Lower valley slopes and ridges of middle hills and ascends up to Airport and then descends to Maulaban.

4.1.2 Geology and Soil Type

17. The road section comprises of different types of quartzite and schists. In general, soil type along the alignment can be classified as alluvial, colluvial, residual, boulder mixed soil, hard and soft rock.

4.1.3 Climate

18. The road lies in the Subtropical/ Temperate climatic region. Generally, rainy season starts from June and ends in September. The meteorological record shows unevenly distributed monsoon rain in the project area with the total average annual rainfall of 1612 mm. Average minimum temperature of 3.60° C and average maximum temperature of 31.32°C is observed in the area. (Source: District Profile of Rolpa, 2065-66)

4.1.4 Hydrology and Drainage System

19. There are 3 numbers of major perennial rivers along the road alignment which are Lungri Khola, Bajayan Khola and Gam Khola. Two bridges are required at 0+250 in Lungri Khola and at 1+400 in Bajayan Khola. The summary of the cross drainage works along the road alignment is given in **Annex XIV**.

4.1.5 Soil Erosion and Sedimentation

20. The stability of slopes along the road corridor depends upon slope angle, the material constituting the slope; rock discontinuities and hydrological conditions. Proposed alignment does not pass through major landslides or erosion prone area. There is existing landslide near the chainage 16+800 and erosion prone areas at Ch 1+200, 2+550, 5+400, 16+620, 18+960, 21+320, 29+700 and 33+410. Following **Table 4.1** presents the geological features observed along the road alignment.

Table 4.1 Geological features along the road alignment

Chainage	Location	Terrain slope	State of Land	Land Use Pattern	Geological Problem	Soil type
0+000 - 0+500 Km	Mijhing	Moderate	Dry	Cultivated + Barren land	Gully erosion	OS 60%,HS 35%,OR 5%
1+500 - 11+000 km	Badachaur	Moderate	Dry	Cultivated + forest	Gully erosion	OS 55%,HS 53% OR 6%, MR 4%
11+000 -1 6+920 km	Gumchal	Moderate	Dry	Barren land+Cultivated	Small scale landslide	OS 44%,HS 50%,OR 4%,HR 2%
16+920 - 19+000 km	Harjang	Moderate	Dry	Forest + Barren +Cultivated	Gully erosion	OS 45%,HS 52%,OR 1%,MR 2%
19+000 -29+000 km	Syuri	Moderate	Moist	Barren +Forest	Gully erosion	OS 35%,HS 50%,OR 9%,HR 6%
29+000 -35+100 Km	Gam	Moderate	Dry	Barren Land	Gully erosion	OS 40%,HS 46%,OR 5%,HR 9%

Source: Field survey, July, 2009

4.1.6 Existing Traffic Situation

21. No any vehicle movement in this proposed road alignment. Approximately 250-350 pedestrian move on the foot trail.

4.1.7 Land Use

22 Land use pattern of the area through which the road passes cultivated land, barren, forest and settlement as shown in Table 4.2. About 0.11 ha of barren land will be cleared (Site clearance) during bridge construction.

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

Type of Land	Chainage		Length(m)	Width(m)	Area(Sq.m)	Area (ha)
	From	To				
Built up area	0+00	00+150	150	5	750	0.075
	0+600	0+750	150	5	750	0.075
	5+500	7+650	2150	5	10750	1.075
	8+400	9+180	780	5	3900	0.39
	15+360	15+560	200	5	1000	0.1
	20+800	22+526	1726	5	8630	0.863
	25+416	25+950	534	5	2670	0.267
	27+050	27+500	450	5	2250	0.225
	33+800	35+100	1300	5	6500	0.65
Sub total			7440		37200	3.72
Agricultural land	0+150	0+600	450	5	2250	0.225
	20+000	20+800	800	5	4000	0.40
	25+166	25+416	250	5	1250	0.125
Sub total			1500		7500	0.75
Forest	3+100	5+500	2400	5	12000	1.2
	10+100	11+700	1600	5	8000	0.8
	15+000	15+360	360	5	1800	0.18
	22+526	25+166	2640	5	13200	1.32
Sub total			7000		35000	3.50
Barren Land	7+650	12+900	5250	5	26250	2.625
	12+500	15+000	2500	5	12500	1.25
	15+560	20+000	4440	5	22200	2.22
	26+000	27+350	1350	5	6750	0.675
	27+500	30+000	2500	5	12500	1.25
	31+000	33+320	2320	5	11600	1.16
Sub total					91800	9.18
Total					171500	17.15

Source: Field Survey, July, 2009

4.1.8 Air, Noise and Water Quality

23. 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

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

4.2.1 Vegetation

25. The dominant forest and fodder species reported in the road alignment are *Pinus roxburghii* (Salla), *cryptomeria japonica* (Dhupi), *Rhododendron arboretum* (Laliguras), *Alnus nepalensis* (Uttis), *Schima wallichii* (Chilaune), *Thysolaena maxima* (Amliso), *Castanopsis indica* (Katus), *Ficus semicordata* (Khnew) and *Sepium insegue* (Khiro). Major NTFPs are not found along the road alignment.

26. The road alignment passes through government/community forest in different locations, Badachaur Community forest at chainages 3+100 to 5+500, Gumchal Community forest at chainages 10+100 to 12+500, Harjang Community forest at chainages 15+000 to 17+360 Syuri Community forest at chainages 18+500 to 23+526 and Gam Community forest at chainages 24+100 to 26+166.

4.2.2 Wildlife

27. *Vulpes sp.* (Fox), *Macaca mulatta* (Monkey), *Felis chaus* (Jungle Cat), *Ratufa sp.* (Squirrel) are the common wildlife found in the surrounding forest along the road alignment. Dhukur, Jureli, *Corvus splendens* (Crow), *Passer domesticus* (Sparrow), *Columba livia* (Pigeon) are the birds found in the Subproject area. *Ratufa sp.* (Squirrel) is listed in Appendix II of CITES.

4.2.3 Aquatic Life

28. Fish species found in water bodies along the road alignment are Asala (*Schizothorax plagiostomus*), Katle (*Accrocheilus spp.*), Hile, and Buduna. These fish species are mainly found in Lungri Khola, Bajoyan Khola and Gam khola.

4.3 Socio-economic and Cultural Environment

4.3.1 Population, Household and Ethnicity

29. The alignment covers Six VDCs namely: Mijhing, Badachaur, Gumchal, Harjang, Syuri and Gam . The ZOI population and Household in Mijhing VDC (254) and (85) Badachaur VDC (1805) and (333), Gumchal VDC (2484) and (369), Harjang VDC (1609) and (20), Siuri VDC (636) and (312), and Gam VDC (768) and (70). Major settlements within ZOI of the project are Runiban, Kilaurchaur, Sewar, Upplo Gumchal, Tallo Gumchal, Pate Gumchal, Rajipati, Chhaharekhum, Ghoga, Bhanli, Shikum, Bowang, Kuipadara and Maulaban. Major castes in the area are Chhetri, Brahman, Magar, Tamang and Dalit. Major occupations include agriculture, business, livestock and services.

4.3.2 Main Occupation

30. The main occupation of all people residing within the ZOI of the proposed road alignment is agriculture and livestock. However, agriculture farming is not enough for subsistence level due to small landholding size and lack of irrigation facilities. Therefore people are carrying out other economic activities like labour for different works. There are not any dependent fisher people on Lungri khola and Bojayan khola.

4.3.3 Market Centres and Business Facilities

31. There are grocery shops and tea stalls available in the almost all settlements. Runiban Bazaar and Gumchal have also some hotels. Necessity of sewerage/drainage system has been felt in these places. Other smaller market centres with shops of daily commodities are also found along the road alignment.

4.3.4 Local Economy

32. The economy of the area is predominantly agriculture based some are harvesting forest products such as Uttis for timber. Local people are gradually attracted towards cultivation of cash crops such as orange, amliso, ginger. Dairy production and selling it to the local market has been also another source of income for local farmers. Over 65 percent populations base upon agricultural activities for their livelihood. With growing closeness of the project area with Runiban bazar due to porter, 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 in Sulichaur bazar area. Many people seasonally migrate to Kathmandu and even different parts of India to earn some money for their livelihood.

4.3.5 Agriculture Pattern

33. 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 orange, ginger, amliso and vegetables.

4.3.6 Livestock

34. 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. This alignment people used to carry milk on their back or hire porters to sell it to Sulichaur and they were not encouraged to produce milk in commercial scale due to time consumption and difficult access.

4.3.7 Industry

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

4.3.8 Trade and Commerce

36. Goods of daily commodities are major imports in the project area, which includes salt, sugar, packed food items, spices, clothes and other items of daily uses. Similarly, major items exported from the project area are milk, vegetables, fruits, timber, bamboo products.

4.3.9 Tourism Related Services

37. Some hotels are in operation in Runiban Bazaar and Gumchal area. Since the ZOI of the project and its surrounding area has potentiality of various types of tourism promotion. People may engage themselves in various kinds of tourism related activities such as porter, promotion of local handicrafts and other local products if they are provided appropriate training and support.

4.3.10 Health and Sanitation

38. Major health problems observed in the area are gastric, water borne diseases, gout, respiratory diseases, skin, malnutrition, typhoid etc. Sanitation awareness among local people is increasing and many of them have toilets in their home, but there is no public sewerage system. People discharge their wastewater in the nearby natural streams.

4.3.11 Public Services and Infrastructures

39. **Education:** The proposed project area consists of a total of 15 educational institutions ranging from primary level to college level educational institutions. There is a higher secondary school in Badachaur settlement. 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 65 percent.

40. **Health Facility:** There are altogether 5 sub health posts and one district hospital within Zol.

41. **Communication:** All of the settlements have telephone facilities mostly with CDMA connection. Five post offices have been serving the local people.

42. **Transportation:** No any vehical movement in this alignment.

43. **Electricity:** Almost all settlements in Zol are use lplight.

44. **Water Supply:** Piped drinking water supply is available to all settlements.

45. **Irrigation:** No irrigation facility has been observed in Zol of the project area.

46. **Other Infrastructures/services:** There is a Suspension Bridge, water mills; and Veterinary Service Sub Centre are also available in the project area.

47. **Industries:** Cottage and other industries are not well developed within the Zol. There are some rice and flour mill in various settlements. Many people have skills of weaving bamboo baskets; woolen cloths etc. and these skills can be commercialized to increase there income.

48. **Financial Institutions:** There are Nepal Bank Ltd and Krishi Bikash Bank in Liwang.

49. **Community Development Facilities/Organizations:** Several community centers, community based organizations, youth clubs, women's group, NGOs and water/forest users groups are also active in Zol of the project.

50. Following House/Sheds, Public Services and Infrastructures are affected during road construction.

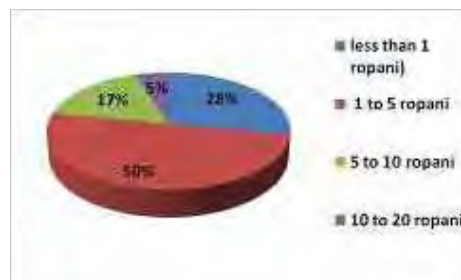
Table 4.3: House/Sheds, Public Services and Infrastructures along the Road Alignment

Type of Public Service and Infrastructure	Chainage	Location	Distance from CL of the road
Trail bridge	0+455	Mijhing	About 10m
House	0+450	Mijhing	Within formation width
House	0+750	Mijhing	Within formation width
Trail bridge	1+415	Mijhing	About 10m
House	2+020	Mijhing	Within formation width
Airport	6+500	Badachaur	About 50m
Sub Healthpost	16+500	Gumchal	About 30
House	16+650	Gumchal	Within formation width
House	17+450	Gumchal	Within formation width

Source: Field Survey, July, 2009

4.3.12 Land Holding Pattern

51. Land holding pattern within the Zol of the road project demonstrates that about 28% households have less than 1 ropani, about 50% households have land between 1 to 5 ropani, 17 % households have 5 to 10 ropani land and about 5% households have 10 to 20 ropani land. Details about land holding pattern are given in the **Annex XI c.**



4.3.13 Food Security

52. About 27% of the households can meet food supply for only up to three months. While 36% of the households of the project area have food sufficiency for 6 months, 18% households produce food sufficient for whole years, 6% households have surplus food for more than 12 months and 13% households is in hand to mouth existence. Food sufficiency condition is given in **Annex XI b**.



4.3.14 Migration Pattern

53. Permanent migration takes place in limited scale towards Liwang. Similarly, seasonal migration also takes place during slack farming season from Mangsir to Poush mainly in Kathmandu and various parts of India.

4.3.15 Settlement Pattern

54. Most of the settlements within Zol of the project are scattered type. Housing pattern of these settlements are mostly Slat plate roofed House. Some of them are also thatch roofed buildings. RCC buildings have been started to appear in market centres such as Runiban Bazaar.

4.3.16 Potential for Development

55. Many of the places, areas and settlements within Zol of the project have the potentialities in various sectors. These sectors and their potentialities have been mentioned in **Table 4.4** below.

Table 4.4: Development Potentialities in Various Sectors

SN	Sector	Development potentiality
1	Agriculture	Maize, Wheat, Potato, Orange, Amsilo, Soyabean, oil seed, timber (uttis) production, within the whole Zol
2	Tourism Promotion	There are many places along the alignment in which the tourism activities can be enhanced such as in Runiban, Gumchal.
3	Trade and business	Development several rural market centres at various places along the road alignment and main market centres at Runiban, Gumchal, Shikum and Bowang

Source: Field Survey, July, 2009

4.3. 17 Religious, Cultural and Historical Sites

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

5.0 Project Alternatives

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

5.1 No Action Option

58. This alternative does not allow the implementation of the Proposal. As the proposed road connects few major settlements with high potential in vegetable and milk products, the no action option will increase the transportation time and cost for the local people to the district headquarter and markets and vice versa resulting into low level of productivity and prevalence of poverty. The no action option will conserve some of the environmental adverse impacts at the cost of poverty and hardship of the people.

5.2 Proposal Alternatives

62. Considering other project alternatives, the proposed road project can be the best option to serve the purpose of efficient transportation requirement. This alignment covers six VDC and linkage to Ares-Tewang road and Sirp -Pang road.

5.3 Alternative Alignment

63. The alignment of the Runiban -Mijhing -Badachaur-Gumchal-Harjan-Syuri-Gam road is an existing foot trail. This alignment is proposed for New Construction.

64. During the Feasibility survey two routes were chosen, 1st route passes through Phagam Dahachaur -Badachaur -Gumchal- Harjan-Syuri-Gam road and 2nd route passes through Mijhing Runiban-Badachaur-Gumchal-Harjan-Syuri-Gam road. The 2nd routes were chosen as Runiban is the major market centre of many VDCs such as Badachaur, Gumchal, Harjan, Syuri, Gam, Sirp, Pang, Aresh ,Uawa, Tewang, Seram, Phagam and Gelwang. The selected 2nd route, Runiban -Mijhing-Badachaur- Gumchal-Harjan-Syuri-Gam, is selected for the following regions.

- This alignment passes through mostly stable land.
- Centre line of the road can be placed carefully to balance cut and fill
- Minimum damage of vegetation & trees during construction.
- This alignment touches more village settlements.
- This alignment passes through river side
- This alignment directly and indirectly beneficial for many VDCs such as Badachaur, Gumchal, Harjan, Syuri, Gam, Aresh, Tewang ,Sirp, Pang .
- This route more economic in Resettlement aspect than Phagam Dahachaur -Gam route.

5.4 Alternative Design and Construction Approach

65. There are two types of road design and construction methods: Machine Intensive Road Construction Approach and LEP approach. In Machine Intensive Road Construction Approach method, heavy machineries and equipment, heavy concrete structures with the application of Earthen surfacing, Earthen side drains, bridges and culverts etc. are involved.

66. Labour based, Environment friendly and Participatory (LEP) approach focuses to conserve the delicate mountain ecology through the protection of vegetation cover and least disturbance to the local geology as means of soil conservation. Under this approach, construction work is done manually from the local labour without using heavy machinery and explosives. Spoil disposal is minimized through balance in cutting and filling. Simple dry stone walls and stone causeways will be used. Preservation of vegetation cover is maintained through application of re-vegetation and stabilization of slopes by bio-engineering.

67. The proposed road has been designed considering LEP approach to extent possible. 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 but blasting will not be used .

5.5 Alternative Schedule and Process

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

5.6 Alternative Resources

69. 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 ch.1+550 and 16+900. The proposed construction will optimally use the local labour force and local materials.

6.0 Identification of Impacts and Mitigation Measures

70. The identification and assessment of impacts has been carried out by considering the proposed proposal activities examined in terms of its current condition and likely impacts during construction and subsequent operation phases. The impacts have been predicted in terms of their nature, magnitude, extent and duration. The possible impacts (positive and negative) in construction and operation phases are presented in the following sub-sections. Beneficial impacts maximization and adverse impacts mitigation measures are suggested hereunder and the detail impact of bridge construction is given in separate table (see Table 7.2 and 7.3 in Chapter 7).

6.1 Mitigation Measures During Pre-construction phase

6.1.1 Route Selection

71. Since, this alignment is proposed for new construction the alignment shall be followed with required geometrical design and new construction of the road to the specified width of 5m. Local conditions and requirement for private land acquisition and protection of forest will be taken into due consideration while designing the road new construction work.

6.1.2 Detailed Survey and Design

72. The road design will follow the rural road standards of DoLIDAR. The works will be executed through labor intensive construction method as far as possible. Bio-engineering technique will be applied for stabilization of slopes. Land for lay-bys and other improvement works will be selected by avoiding private land. Due care shall be taken to avoid acquisition of houses.

6.1.3 Land and Property Acquisition, Compensation and Resettlement

73. ADB Guidelines has necessary provisions for resettlement assistance including entitlements to replacement of land and other assets and/or compensation in case of involuntary resettlement, compensation cost for houses and other affected structures without deduction for depreciation or salvageable materials. However, the resettlement framework also allows land donations in cases where the donation is made freely in public and without coercion, does not affect household food security (>9 months), where land donated is <20% of family holding, and adequate income restoration support exists for the household. The proponent commit the above and voluntary contribution will be accepted if the said criteria are met. However, land taken in the past for existing alignment will not be compensated. Structures and crops will be compensated at replacement cost and lost trees at the cost of harvesting (felling and sectioning) and transportation from the site to home. Proponent will assist to form Compensation Determination Committee (CDC) under the Chairmanship of Chief District Officer. The Committee will decide the rates applicable for compensation. The concerned households whose land will be acquired for the project will be informed about the land donation process and entitlements. Finally, the Memorandum of Understanding (MoU) will be prepared and households donating the land will sign it with DDC. If the owner of land could not be contacted an equivalent amount shall be kept separately in the DDC fund until the process is complete.

6.2 Beneficial Impacts and Benefit Augmentation Measures

6.2.1 Construction Stage

6.2.1.1 Employment Generation and Increase in Income

74. *Impacts:* Employment opportunity for local people during construction of the road with 6110 for skilled and 153787 for unskilled labor. Efforts will be made to employ more than 50% women workers. The amount of money earned as wages will directly support various economic activities of the people, and assist to empower women and indigenous people. It will assist towards enterprise development with multiplier effect if wage is used for economic investments. This is one of the direct and significant impacts of the project but it is of short-term and local in nature.

75. *Measures:* Work will be implemented manually through the local Road Building Groups (RBGs). Priority for employment will be given to local poor, dalit, vulnerable groups and women. They will be given training to do the job. Proponent will implement skill training, awareness, and income generation programs encouraging them to utilize their money earned through wage.

6.2.1.2 Skill Enhancement

76. *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 indirect, medium, local and long-term in nature.

77. *Measures:* Members of the Road Building Group will be given training on masonry, netting wires and construction of gabion wall, slope cutting, bioengineering works.

6.2.1.3 Enterprise Development and Business Promotion

78. *Impacts:* During construction period, different types of commercial activities will come into operation in order to meet the demand of workers. Since they will have good purchasing power, they will regularly demand for different types of food, beverage and other daily necessary items. Development of several rural market centres at centres at Runiban, Gumchal, Shikum and Bowang. This impact is direct, low significance, local and short term in nature.

79. *Measures:* Training in cooperatives, and promote use of local products by the construction crews.

6.2.1.4 Community Empowerment and Ownership

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

81. *Measures:* The coordination committees will be constituted and training will be given to them.

6.2.1.5 Women and Indigenous People Empowerment

82. *Impacts:* Women and indigenous people in particular may be benefited more from improved access to the market centers and various service providing agencies like health centers, banks, training institutes, women development office etc. Frequency of visit to such agencies will increase awareness level and empowerment. The impact will be indirect, significant, local and for long-term.

83. *Measures:* Assist to organize women groups, provide training and social mobilization, provide micro-finance and encourage cooperatives to undertake commercial scale farming activities.

6.2.2 Operation Stage

6.2.2.1 Improvement in Accessibility and Saving of Time and Transportation Cost

84. *Impacts:* New construction of road will enhance the access of people to social services, and quick transportation of goods. Travel time and cost will be cheaper. People need 2 days to reach Gam from Sulichaur but after transportation facilities it will take 4 hour only. Once the bridge is completed, it makes all weather road and makes easier access for both the people and vehicles. This impact is direct, high, regional and long term.

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

6.2.2.2 Increase in Trade, Commerce and Development of Market

86. *Impact:* There is a possibility of increased economic opportunities and significant growth and extension of market centers at Runiban, Gumchal markets will grow. Productivity such as Maize, Wheat, Potato, Soyabean, oil seed, timber (uttis) will increase due to cheaper transportation. Sale of farm and livestock products will increase in the bigger markets of Rolpa district. This will support the economy of rural area. The impact will be indirect, significant, local and long term in nature.

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

6.2.2.3 Appreciation of Land Value

88. *Impacts:* Construction of road will lead to appreciation of land values by more than two times due to availability of reliable access facility lead to appreciation of land values due to availability of reliable

access facility. This will uplift the economy of local people. Financial institutions may accept their land as mortgage for lending. The impact is indirect, medium, local and for long term.

89. *Measures:* 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.

6.2.2.4 Enhancement of Community Development Services

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

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

6.3 Adverse Impacts and Mitigation Measures

6.3.1 Construction Stage

92. The proposed alignment will be constructed according to LEP approach where manual works are possible; and Machine Intensive Road Construction Approach such as in bridge construction, where the work cannot be done manually. The likely impacts on physical, biological, socio-economic and cultural resources of the proposed road area and respective mitigation measures are presented hereunder.

6.3.1.1 Physical Impacts

1. Change in Land Use

93. *Impacts:* Construction of road will convert 0.75 ha. of cultivated land, 9.18 ha. of barren land, 3.5 ha. of forest and 3.72 ha. of settlement areas into road structure and 0.11 ha of barren land needs to clear during bridges construction. The impact will be high, direct, local and for long term.

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

2. Slope Instability

95. *Impacts:* 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. Major instability areas along the road alignment are at Ch 1+200, 2+550, 5+400, 16+620, 16+800, 18+960, 21+320, 29+700 and 33+410. The likely impact is direct, high, site specific and medium term.

96. *Measures:* 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 on Ch 1+200, 2+550, 5+400, 16+620, 16+800, 18+960, 21+320, 29+700 and 33+410, like Grass plantation, Shrub/Tree plantation, Brush layering; no construction work during rainy season; and use of soft engineering structures (dry wall, check dams) before disposing spoil. For protection of bridge embankment, Gabion structures and Bioengineering measures (Grass plantation, Brush layering and tree plantation is proposed. At down stream of the bridge site, Lurching apron is proposed for the protection of scouring. Recommended civil engineering structures and bioengineering measures necessary at various chainages for slope stabilization have been given in Annex XV.

3. Spoil Disposal

97. *Impacts:* Unmanaged disposal of spoil may cause gulying and erosion, block drainages, damage farm lands, crops and forest, waterlogging and may threat settlements. The impact from spoil disposal will be direct, high, local and long term in nature.

98. *Measures:* Spoil will be safely disposed and managed at designated site with minimum environmental damage. Engineer will give approval for disposal site of spoil. 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 drainage, vegetation and adequate protection against erosion. Potential safe spoil management areas are given in Table 6.1.

Table 6.1 Potential Spoil Disposal Sites

S. No	Chainage	Location
1	1+400	Badachaur
2	1+900	Badachaur

3	19+620	Chaughare
4	21+550	Ghoga

Source: Field survey, July, 2009

4. Quarry/ Borrow Operation

99. *Impacts:* Potential adverse impacts are accelerated land erosion, landslides, disturbance in natural drainage patterns, water logging and water pollution. The likely impact will be direct, medium in magnitude, site specific in extent and short term in duration.

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

Table 6.2: Recommended Quarry Sites

SN	Chainages	Places of recommended quarry sites
1.	1+550	Stone quarry for wall in a limited scale.
2.	16+900	Stone quarry is available approximately 20m far from the road alignment.

Source: Field Survey, July, 2009

5. Air, Noise and Water Pollution

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

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

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

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

6. Water Management

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

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

7. Location of Camp Sites and Storage Depots

107. *Impacts:* Camp will not be required for RBGs. However, contractor will establish camp if he bring labors from outside the area. Siting of camp may cause encroachment of forest, agriculture land, alteration of drainage, solid waste and waste water problems. Impact will be direct, medium significance, site specific and short-term.

108. *Measures:* The mitigation measures will be use of local labors to avoid camp; rent local house instead of camp to keep labors; camp away from productive lands and forest areas; compensation will be paid for using private farm or lands for storage or camp; provide drinking water facilities, first aid and pit latrine at campsite; soak pit for waste water; fuel and chemical storage areas will be on paved surface

with surrounding catch drain to protect soil from leakage. Appropriate camp sites have been observed at 5+560 near Airport, at 18+200 near Chharekhum, and at 23+395 near Kuipadhara.

8. Crusher Plants

109. *Impacts:* The crusher plant operation may cause dust and noise pollution. Impact will be direct, high significance, site specific and short-term.

110. *Measures:* The mitigation measures will be to procure gravel from market as far as possible; if crusher plant is necessary, it will be located far from settlement and sensitive ecological areas; water sprinkle frequently, fencing the crusher plants area; operation will be done only in day time.

9. Construction equipments

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

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

10. Chemical Issues:

113. *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.

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

6.3.1.2 Biological Impacts

1. Loss or Degradation of Forests and Vegetation

113. *Impacts:* Total 3.5 ha of forest will be permanently lost and 2299 trees will be removed, of which 1508 from forest and remaining 791 from private land (see Annex XII). The impacts on vegetation/forest resources have been considered to be direct, high in magnitude, site specific in extent and long term in duration. During bridge construction there is no need of removing tree.

114. *Measures:* The loss of trees can not be minimized; however, it can be compensated by replantation. Following the 'Work Procedure for Providing the Forest Land for Other Use, 2063' of Government of Nepal (cabinet decision of 10.11.2063 B.S.), Proponent will manage a nursery to grow tree sapling and plant them in 1:25 ratio and added 10% in forest land and 1:1 in private land for each cleared tree. Trees will be planted on both sides of the road as far as possible. Bioengineering measures will be done for bridge embankment protection.

2. Impact on Wildlife Due To Loss of Habitat and Hunting

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

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

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

117. *Impacts*: Among the flora and fauna found in the ZOI of the Subproject area, *Ratufa sp.* (Squirrel) is listed in Appendix II of CITES.

118. *Measures*: Wildlife irrespective of common species will be protected.

6.3.1.3 Socio-economic Impacts

1. Loss or Degradation of Farm Land and Productivity

119. *Impacts*: There will be permanent loss of 0.75 ha of agricultural land due to road construction. This may reduce annual production of 0.562 Mt maize, 0.632Mt wheat, millet and vegetable. Dust settling on crop and vegetation will also affect production. This impact is expected to be direct, high in magnitude, local in extent and long term in duration

120. *Measures*: Minimize acquisition of productive land; compensate for loss of property; compensate for loss of standing crops and temporary use of agriculture land; plant trees along both sides of the road to act as dust and noise barrier. Tree planted along RoW will protect settlement and crops from dust.

2. Loss of Private Properties

121. *Impacts*: The proposed road alignment will damage five houses. The location and detail of affected houses are presented in Table 6.3. The impact will be direct, high significance, site specific, and long term.

121. *Measures*: A Resettlement Plan will be prepared to address acquisition and compensation issues through the Compensation Determination Committee under chairmanship of the Chief District Officer.

3. Impact on Community Infrastructure

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

Table 6.3: Impact on Private Properties/Community Infrastructure and Mitigation Measures

Infrastructure	Location	Distance from the Road CL	Mitigation Measure
Trail bridge	0+455,1+415	About 10 m	Need not to relocate
Foot Trail	2+020, 8+600,10+200,19+550	Within formation width	Damaged during road construction, required to relocate.
House	0+450	Within formation width	Damaged during road construction, required to relocate.
House	0+750	Within formation width	Damaged during road construction, required to relocate.
House	2+020	Within formation width	Damaged during road construction, required to relocate.
Airport	6+500	About 50 m	Need not to relocate
Sub Healthpost	16+500	About 30m	Need not to relocate
House	16+650	Within formation width	Damaged during road construction, required to relocate.
House	17+450	Within formation width	Damaged during road construction, required to relocate.

4. Health and Safety Matters

123. *Impacts*: During construction, workers will be exposed to respiration and eye diseases due to exposure to dust, risk of accident during work, polluted drinking water, unhygienic sanitary facilities, hearing loss due to high level of noise. Increased contact between local and migrated workers can cause spread of serious health risks like STDs and HIV/AIDS. This impact is direct, high in magnitude, short term and local.

124. *Measures*: Make mandatory the use of helmets, safety belts, masks, gloves and boot by workers depending on nature of work; sprinkle water at high dust sites; provide clean drinking water at sites and camp; pit toilets at sites and camp; first aid facilities at sites and camp with training to use them; provide

group accidental insurance for workers. Awareness generation to local people and workers on HIV/AIDS and other communicable diseases. Safety measures for bridge construction (Helmets, boots, Gloves).

5. Decline in Aesthetic Value

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

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

6. Impacts on Cultural, Religious and Archeological Sites

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

6.3.2 Operation Stage

6.3.2.1 Physical Environment

1. Road Slope Stability and Management

128. *Impacts:* Destabilization of slope (quarrying stones or soil, animal grazing, irrigated cultivation, opening of branch roads), poor maintenance of road, blockage of drains can lead to slides and slope failure. Sensitive areas for possible slope stability problems are the areas of steep cut; and surroundings of streams at 0+250(river), 1+400(river), 19+620(Kholsi). The impact will be direct, medium local and long term nature.

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

2. Impact Due to Air, Noise and Water Pollution

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

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

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

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

6.3.2.2 Biological Environment

1. Depletion of Forest Resources

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

135. *Measures:* The mitigation measures recommended are support District Forest Office and VDCs to encourage and support local community in controlling illegal harvesting of forest resources; awareness programs organized to educate local people on the importance of forest conservation. Improved access will facilitate easy transportation of LPG Gas and kerosene to replace use of firewood.

2. Disturbance to Wildlife and Illegal Hunting

136. *Impacts:* Although there are no significant habitats of wildlife in the ZoI, they may be disturbed due to the frequent movement of vehicle and blowing of horn in the forest area. Poaching or illegal hunting of wildlife may occur due to easy access. The impact will be indirect, low, local and long term in nature.

137. *Measures:* Mitigation measure will be to erect appropriate sign boards informing drivers on prohibition of blowing horns in the forest areas. Community and authorities will remain vigilant and alert on illegal felling of timber and killing of wildlife.

6.3.2.3 Socio-economic and Cultural Impacts

1. New Settlement and Market Center Development

138. *Impacts:* Expansion of settlement area and market can be observed at Runiban Bazaar. Gumchal, Sewar, Maulaban. Encroachment of RoW may take place. This will reduce road capacity, increase road accidents, and adversely impact road. The impact will be direct, medium, local and long term in nature.

139. *Measures:* The mitigation measures to be adopted include regulation of settlement with proper planning; plantations of trees in the RoW so that it is not encroached; provide sewerage in market areas. Authorities and VDCs will control encroachment of road.

2. Change in Social Behavior

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

141. *Measures:* Support awareness raising programs and strengthen communities against such nuisances.

3. Issues on Road Safety

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

143. *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. Delinator will be placed at both side of bridge.

7.0 Environmental Management Plan

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

7.1 Institutions and Their Roles

Table 7.1: Concerned Institutions and Their Roles

Institution	Role	Responsibility in the Project	Remark
Ministry of Environment	Mandated to formulate and implement environmental policies, plans and programs at national level	Facilitate when needed on environmental safeguards	No direct responsibility in the project
Ministry of Local Development (MLD)	It is concerned line ministry, 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"> To review IEE ToR and Report, and give approval. Coordinate with project on safeguard issues Conduct environmental monitoring from central level. 	Executing Agency
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.	Executing Agency
RRRSDP- Project Coordination Unit	Project specific unit.	Technical Unit to support and coordinate all activities for implementation of RRRSDP. Review, comment, and forward IEE ToR and Report for review to ADB and for approval to MLD	First Class Officer / DDG of DoLIDAR has been heading the PCU.
District Development Committee / District Technical Office	DDC/DTO is Project Implementing Agency.	<ul style="list-style-type: none"> Prepare IEE ToR and submit for approval to PCU/MLD Conduct IEE Study, Public Consultation, and prepare IEE Report Receive comments from PCU/ADB/MLD and modify accordingly. Get final approval from MLD. Conduct environmental safeguard monitoring Reporting 	District Technical Officer is the Project Manager
District Project Office	Project implementation office working directly under DDC/DTO.	Responsible for overall activities related to implementation of the works at field level.	Implementing Agency
Central Implementation Support Consultant (CISC)	Support consultants at central level	Technical and management support to PCU	Consultant
District Implementation Support Team (DIST)	Support consultants at district level	Technical and management support to DPO	Consultant

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

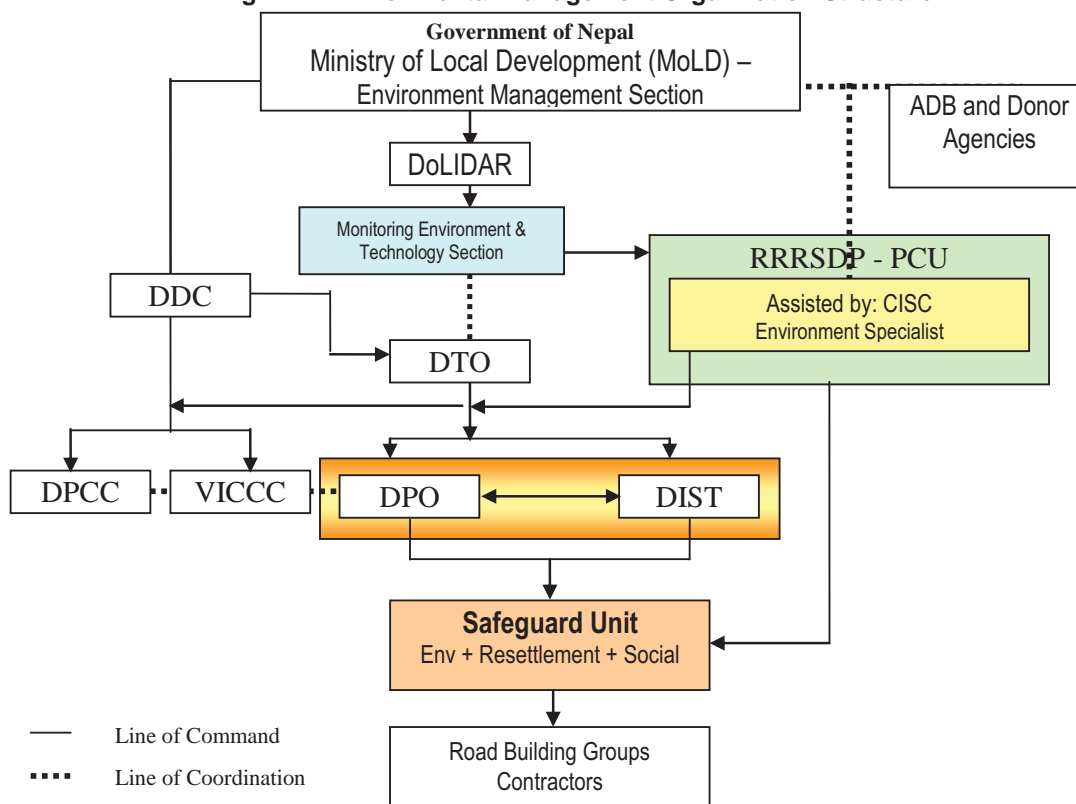
7.2 Reporting

146. 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.

147. 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.

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

Fig. 7.1: Environmental Management Organization Structure



7.3 Environmental Management Plan

149. The DDC/DTO with support of DPO/DIST at local level and PCU/CISC at central level will be responsible for conducting careful and routine monitoring of EMP compliance. Overall implementation of the EMP will be the responsibility of the Proponent. Framework for implementing environmental management plan is shown in Table 7.2 & 7.3

Table 7.2: Road Subproject

A.Beneficial Impacts and Proposed Enhancement Measures

Activity	Effect	Related Beneficial Impacts	Type of Impact ^{*)}				Benefit Augmentation Measures	Responsible Agencies	
			Nat	Ma g	Ex t	Dur		Executing Agency	Supporting Agency
Construction Stage									
Construction of road	Employment Generation and Increase in Income	Increase in income level Skilled 6110 person days, unskilled 153787 person days	D	H	L	ST	Maximize manual work through local, poor, vulnerable and women. Training in income generation and skill enhancement.	DDC/DTO DIST	DPCC / VICCC / CISC/PCU
On the job training to local labour	Skill Enhancement	Increase in income generating activities, employment opportunities	IN	M	L	LT	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 Business Promotion	Enhancement in local economy	D	L	L	ST	Training in cooperatives, and promote use of local products by the construction crews in Sewar, Tallo Gumchal and Chharekhum.	Contractor/ RGB	DIST/ CISC/PCU
Construction coordination committee and RBG program	Community Empowerment and Ownership	Increase in income and ownership.	IN	L	L	ST	Coordination committees will be constituted and training will be given to them.	DPO/DIST	DDC/DTO / CISC/PCU
Operation of Road	Women and Indigenous People Enhancement	Poor, indigenous and women will have easy and frequent access to social services (education, health, community development, bank,training, CBOs and networking)	IN	H	L	LT	Assist to organize women's groups, provide training in enterprise development, organize cooperatives, provide micro-financing to undertake production of commercial products, provide market services.	VDC / DDC	VDC / DDC
Operation Stage									
Operation of Road	Improvement in Accessibility and Saving of Time and Transportation Cost	Saving in travel time and travel cost	D	H	R	LT	Proper maintenance (regular, emergency) , continuation of bioengineering	DTO/DDC	DoLIDAR
Operation of Road	Increase in Trade, Commerce and Development of Market centers	Shifts towards improved commercial agriculture and increase in non-agricultural occupation	IN	H	L	LT	Manage planned growth with required infrastructure facilities in the market areas. Agriculture extension services, market linkages and networking for better market price.Sewar,Tallo Gumchal and Gam village develop in market centers	DPO	DDC/VDC
Operation of Road	Appreciation of Land Value	Improvement in local economic condition	IN	M	L	LT	Promotion of land development activities in Sewar,Tallo Gumchal,Kuipadhara,Gam and control of encroachment within RoW. Awareness program shall be organized on use of high value land to get bank loans for setting up enterprise ventures.	DDC/DPO	DDC/VDC
Operation of Road	Enhancement of Community Development	Ease of access to social service	IN	H	R	LT	Keep road maintained to ensure access facility that will attract development of other social services facilities	Local people.	DDC, VDC

Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies	
			Nat	Mag	Ext	Dur		Executing Agency	Supporting Agency
	Services	and raise in quality service						DDC, VDC	

B: 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		Executin g Agency	Supporting Agency	
Construction Stage											
Physical Environment											
Construction of Road, site clearance	Change in land use (Loss of agricultural land (0.75 ha.); forest area (3.5 ha.), barren land (9.18 ha.), settlement area (3.72 ha.). Further 0.11 ha of barren land needs to clear during bridge construction.)	Cause production loss, loss of property, loss of forest area.	D	H	L	LT	IR	Minimize use of fertile land, forest, settlement areas.	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	H	L	LT	IR	Proper site selection and management of spoil at designated areas approved by Engineer; provision of proper drainages, toe walls; Proposed spoil disposal sites are 1+400, 1+900, 19+620, 21+550	DDC/DTO	DIST/VICCC/ VDC	
Site clearance, excavation	Slope Instability, site clearance for bridge	Erosion, landslide, loss of property. Areas of concern are at Ch 1+200, 2+550, 5+400, 16+620, 18+960, 21+320, 29+700, 33+410.	D	H	SS	MT	Re	Civil structures with bio-engineering application (Such as Grass plantation, Tree/Shrub plantation, Brush layering, Palisades, Bamboo plantation, Live checkdam construction etc.) shall be used to stabilize the slopes. Drainage management (Catch drain, rip-rap drain, checkdam etc.)	DDC/DTO	DIST	
Construction of Road	Water Management, generation of large volume of surface runoff	Erosion, landslide, damage to farmland	IN	M	SS	MT	Re	Proper drainage structures and proper spoil disposal, Avoid blockage or diversion of natural channels due to construction of road and disposal of spoils. Not affected to river flow during bridge construction.	DDC/DTO	DIST	
Construction works, operation of construction	Air pollution due to dust from exposed surface, from construction equipments	Affect on local people and workers health and affect	D	L	L	ST	Re	Use of face mask while working on dust prone areas, covering of dust sources. Sprinkling of water during surfacing of the road.	DDC/DTO / RBGs	DIST	

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
vehicles, material hauling and unloading etc. Slope cutting, spoil and waste disposal.	and vehicles	on agriculture.								
	Noise pollution	Disturbance and annoyance around school, health posts, forest areas.	D	L	L	ST	Re	Restrict horn near school, health posts, settlement, forest areas. Locate crusher plant away from these areas; cover material during transportation. Use of ear muffs, helmet to lessen noise pollution during rock breaking and quarrying and bridge works.	DDC/DTO / Contractor	DIST
	Water pollution due to sediment level, spills and leakage of oils and chemicals to water bodies	Risk of water borne diseases	D	L	L	ST	Re	Proper spoil management, and prevention of leakage and spills of construction chemicals, restriction in urination and defecation in open areas	DDC/DTO / Contractor /RBGs	DIST/VICCC
Cutting of slopes	Quarry/borrow operation and its potential effect on instability, landslide	Change in river regime, instability, land slide; damage to forest, farmland and property; water pollution	D	M	SS	ST	Re	Proper selection and management of quarry sites, rehabilitation of quarry/borrow sites after completion of work. Recommended quarry sites are Ch 1+550,16+900 for Dry wall, Gabion wall and Stone Pitching.	DDC/DTO / Contractor /RBGs	PCU/CISC/DIST/ VICCC
Construction of road	Location of Camp Sites, Storage Depots	Encroachment of forest, agriculture land, solid waste, and waste water may cause pollution	D	M	SS	ST	Re	Locate camp site away from productive land and forest area (potential sites at 5+560, 18+200, 23+395); use local labor and local houses as camp; pay compensation to land owner of camp area; proper storage of chemical and materials.	DPO assisted by DIST/ Contractor	DIST/VICCC
Operation of heavy equipments	Crusher Plants	Dust and Noise pollution and health risks to workers	D	H	SS	ST	Re	Locate site away from farm and forest area; away from settlement and sensitive habitat; do not operate at night; water sprinkling facility to reduce dust.	DPO assisted by DIST/ Contractor	DIST/CISC/PCU
Operation of construction equipments	Construction machineries and tools (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
Storage of Chemicals and operation of machineries	Spillage of fuels and chemicals.	Pollution to the nearby water sources and soil. Health hazards to the workers	D	M	L	ST	Re	Store fuels and chemicals on paved surface with surrounding catch drain to protect soil from leakage. Provide information signboards. Use of safety gears. Close monitoring during operation of machineries.	DTO/DIST / Contractor	PCU/CISC/DIST
Biological Environment										

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Clearance of vegetation necessary for road formation	Loss or Degradation of Forests and Vegetation (3.5 Ha, and 2299 no.of trees) During bridge construction there is no need of removing tree.	Loss of green cover; loss of environmental benefits from vegetation, disturbance in ecological function (dust and noise absorbance, aesthetic value etc	D	H	SS	LT	Re	Cutting of tree only in formation width, compensatory plantation of local species of tree at 1:25 +10% in forest area and 1:1 in private land. Compensatory plantation of 42261 no. 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	M	L	ST	Re	Minimum site clearance, discouraging workers for collecting fuel wood from forest or hunting/harassing faunas	DDC/DTO /DFO	DF/CFUGs/DIST
Social-economic Environment										
Acquisition of land for maintaining road width*	Loss or Degradation of Farm Land and Productivity (0.75 Ha)	Reduced production, hardship, food shortage	D	H	L	LT	IR	Minimize productive land acquisition through alignment selection, Compensation for affected people	DDC/DTO	CFC ² DIST/VICCC
Acquisition of land and property for maintaining road width	Loss of Private Properties	Displacement of people, hardship	D	H	SS	LT	IR	Compensation and resettlement to the owner as described in resettlement plan	DDC/DTO	CFC ³ /DIST
Demolition of structures along road alignment	Impact on Community Infrastructure	Loss of services (see table 6.3)	D	M	SS	ST	Re	Restoration or relocation of affected infrastructures: Foot Trail (2+020, 8+600, 10+200, 19+550), Houses (0+450, 0+750, 2+020, 16+650,17+450) at different locations, Trail bridge (0+455,1+415)Airport (6+500), Sub health post (16+500)	DDC/DTO	PCU DIST/CISC/VICCC/VDC
Occupational health and safety aspects	Health and safety matters	Injury, fatal accidents, outbreak of epidemics and diseases, decline in capacity to work	D	H	L	ST	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	DDC/DTO / Contractor	DIST/CISC

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

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

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
								crew. During bridge construction safety measures will be adopted.	s	
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 Stage										
Physical Environment										
Quarrying, operation of construction equipments	Road Slope Instability and Management	Slides and slope failure , Disturbance to traffic flow, pollution of water bodies, impacts on agriculture land, loss of vegetation.	D	M	L	LT	Re	Regular maintenance of slope protection structures, Selection of healthy upland farming techniques	DDC/DTO /VDC	DoLIDAR , DFO, District Watershed and Soil Conservation Office (DWSSC)
Operation of vehicles, Inadequate drainage	Air, Noise and Water Pollution	Disturbance to students, patients, wildlife, effect to nearby agriculture land and crops	D	L	L	LT	Re	Speed limit for vehicles, no horn signs, use vegetation barrier; Regular maintenance of drainage.	DDC/DTO	DoLIDAR/Local administration
Biological Environment										
Road operation	Depletion of Forest Resources	Loss of timber, forest resources and benefits	IN	M	L	LT	IR	Enforcement of law, vigilance and monitoring, participation of community	DFO/ CFUGs/V DCs	DDC/CDO
Road operation	Disturbance to the Wildlife and Illegal Hunting	Collision of wildlife with vehicles, disturbance in their normal activities, Loss of biodiversity	IN	L	L	LT	IR	Warning traffic signal, Awareness training to driver to limit speed and horn use	DTO/ CFUGs	DDC/CDO / DFO
Social-economic Environment										
Easy Access by road operation	New Settlement and Market Center Development	Encroachment of Row, increased accidents, delay in traffic movement, depletion of local resources, water pollution	D	M	L	LT	IR	Awareness program, enforcement of law, planning of land development, plantation of trees.	DDC/DTO	CDO / VICCC
Operation of Road	Change in Social behavior	Social and cultural conflicts	IN	M	L	LT	Re	Awareness, Enforcement of law and order, Provision of training for skill	DTO	DDC/DoLIDAR
Operation of Road	Road Accidents	Increase in accidents	D	M	L	LT	IR	Appropriate road safety measures, Safety signs along the road. Delinator will be placed at both side of bridge.	DTO	DDC/DoLIDAR

7.3: Bridge

A. Beneficial Impacts and Proposed Enhancement Measures

Activity	Effect	Related Beneficial Impacts	Type of Impact *)				Benefit Augmentation Measures	Responsible Agencies		
			Nat	Mag	Ext	Dur		Executing Agency	Supporting Agency	
Construction Stage										
Construction of bridge	Employment Generation and Increase in Income, temporary tea stall, shop	Increase in income level , Enhancement in some peoples economy	D	H	L	ST	Involve local people to the extent possible , 20207 labour skilled and 60623 unskilled will be required for bridge construction)	DDC/DTO/DIST	DPCC / VICCC CISC/PCU	
On the job training to local labour	Skill Enhancement	Increase in income generating activities, employment opportunities	IN	M	L	LT	Priority to Affected Peoples (APs) and vulnerable groups, job training on Bridge maintenance.	DPO/DIST	DDC/DTO / CISC/PCU	
Operation Stage										
Operation of bridge	Improvement in Accessibility and Saving of Time and Transportation Cost	Saving in travel time and travel cost	D	H	R	LT	Proper maintenance (regular, emergency) , continuation of bioengineering	DTO/DDC	DoLIDAR	
Operation of bridge	Appreciation of Land Value	Improvement in local economic condition	IN	M	L	LT	Management, observe that RoW is not encroached. Locals will be made aware on this fact so that they can rip its benefit.	DDC/DPO	DDC/VDC	

B. Adverse Impacts and Proposed Mitigation Measures

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Construction Stage										
Construction of bridge, site clearance	Change in land use Loss of 0.11 ha. of barren land needs to clear during bridge construction.	Loss of barren land	D	H	L	LT	IR	Project site is selected to minimum loss or damage of agriculture land, forest, private land or property.	DDC/DTO	DIST
Construction of bridge, earth excavation	Spoil disposal and imposed weight of spoil on fragile slopes	Gully erosion, landslide, disruption of road, damage to farmland, water pollution etc.	D	M	SS	ST	Re	Proper management of spoils and waste, provision of proper drainages, toe walls Proposed spoil disposal sites are Ch. 0+600, 1+400	DDC/DTO	DIST/VICCO VDC

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Construction of bridge	Water Management	Affected on river flow, Erosion, landslide, damage to farmland	IN	M	SS	MT	Re	Site is selected maximum flow of water location for bridge so water can easily flow out and events of flooding, and further damage of the road and other nearby infrastructures can be prevented. No affect on river flow during bridge construction. Bridge protection work such as Bio-engineering, Gabion protection work, Lurching apron are proposed.	DDC/DTO	DIST
Construction works, operation of construction vehicles, material hauling and unloading etc.	Air , dust, noise and water pollution	Affect on local people and workers health and affect on agriculture, excavated material of bridge affect on rivers aquatic life	D	L	L	ST	Re	Use of ear muffles, helmet to lessen noise pollution during rock breaking and quarrying and bridge works. Strictly follow excavated materials will be disposed in proposed location.	DDC/DTO/ Contractor/RBGs	DIST
Collection of Construction materials	Quarry site, or boulder, sand and aggregates	Water pollution, damage to farmland, disturbance in natural drainage damage forest and vegetation	D	L	L	ST	Re	Proper selection and management of quarry sites, rehabilitation of quarry sites after completion of work. Recommended quarry sites are Ch 0+240, 500m far from the site, and 1+400 1 km far from the site.	DDC/DTO/ Contractor/RBGs	CISC/DIST/ VICCC
Construction of Bridge	Location of Camp Sites, Storage Depots	Encroachment of forest, agriculture land, alteration of drainage, disposal of solid waste, and waste water	D	L	L	ST	Re	Proper selection of camp sites away from forests, proper sanitary facilities by providing Pit Latrine, sockpit. Appropriate camp sites are 0+200 near Runiban, at 2+200 open area.	DDC/DTO/ Contractor	DIST/VICCC
Occupational health and safety aspects	Health and safety matters	Injury, fatal accidents, outbreak of epidemics and diseases, decline in capacity to work	D	H	L	ST	Re	During bridge construction safety measures (ear muffles, helmet) will be provided to workers, first aid facility at sites with health treatment arrangements, contingency planning; Proper drinking water and toilet facility for construction crew.	DDC/DTO / Contractor	DIST/CISC/PC U
Operation Stage										
Operation of bridge	Community infrastructures access road will be in risk due to flood (flow of water), Scouring	Slides and slope failure , Disturbance to traffic flow.	D	M	L	LT	IR	Regular maintenance of road and bridge. Necessary structures such as check dam, lurching apron will be placed for protection of bridge at 1+400.	DDC/DTO/V DC	DoLIDAR , DFO, District Watershed and Soil Conservation Office (DWSSC)

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Operation of bridge	Accident	Increase in accede	D	M	L	LT	IR	Delineator will be placed at both side of bridge.	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

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

Table 7.4: Cost Estimate for Environmental Enhancement and Mitigation Measures

SN.	Environmental Protection Measures	Estimated Budget (NRs.)	Remarks
1. Benefits Augmentation Measures			
1.1	Training to DC/DTO/DPO/DIST to conduct environmental monitoring and reporting	50,000.00	To be included in project cost
1.2	Training to Naike of RBGs	50,000.00	To be included in project cost
1.3	Enhancement in Technical Skills (Bio-engineering)	100,000.00	To be included in project cost
	Sub-Total (1)	200,000.00	
2. Adverse Impacts Mitigation Measures			
2.1	Bio-engineering work/Road side plantation	5,256,493.00	To be included in project cost
2.2	RBG Insurance	400,000.00	To be included in project cost
2.3	Information Signboard (6 nos)	50,000.00	To be included in BoQ
2.4	Compensation for properties (Land, Structures, Trees and Crops)	6,486,436.50	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
2.7	Compensatory plantation of 42261 no. of trees (41470 no. of trees from forest and 791 no. of trees from private land) Re-plantation / Re-forestation	2,560,837.00	To be included in project cost
2.8	Social Cost (Health / HIV AIDS / STD prevention awareness; other awareness program such as adult literacy; support to local school etc.).	1,365,000.00	To be included in Social plan, project cost
2.9	Occupational health and safety; First aid boxes, campsite sanitation (Pit latrine); solid waste management, Safety measures for workers (Helmets, gloves, masks, boots, etc.)	500,000.00	To be included in BoQ
	Sub-Total (2)	17,118,766.00	
	Total	17,318,766.00	

7.5 Implementation of Mitigation Measures

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

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

7.6 Environmental Monitoring

7.6.1 Monitoring Responsibility

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

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

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

Table 7.5: Environmental Monitoring Cost

S. No.	Detail	Unit	Quantity	Rate	Total (NRs.)
1	Environmental Management Specialist	Man-month			Included in the Cost of DIST
2	Sociologist / Public Relation Expert	Man-month			Included in the Cost of DIST
3	Stationary and Computer		LS		70,000.00
4	Printing and Photocopies		LS		30,000.00
5	Transportation		LS		50,000.00
6	Cost for Monitoring by MoLD/DoLIDAR		LS		50,000.00
	TOTAL				200,000.00

156. Thus, total environmental monitoring and management cost is NRs. **17,518,766.00**, including cost of resettlement and bio-engineering.

7.6.2 Types of Monitoring and Monitoring Parameters

157. There will be basically two types of monitoring:

- Compliance Monitoring – that verifies whether the EMP provisions are properly implemented in the field. The framework for compliance monitoring is given in the Table 7.6.
- Impact Monitoring - that confirms the result of implementing mitigation measures. The framework for impact monitoring is given in the Table 7.7.

Table 7.6: Compliance Monitoring for Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam Road Construction Works

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

Parameters/Issues	Responsible Implementing Agency	Verifiable Indicators	Verification Methods	Schedule	Responsible Monitoring Agency
vulnerable groups and women	RBGs / Contractor	especially vulnerable groups and women and their wage rate.		period where labour work is contracted	district and PCU/CISC at center
Awareness and orientation training on road construction locally employed labourers	DPO / DIST	Training programmes for skill development, occupational safety and environmental protection associated with road construction works; employment generation skill	Training records, assess feedback from participants	Beginning of construction and during construction	DPO / DIST at district and PCU/CISC at center (DTO)
Compliance to occupational health and safety matters	DPO / DIST; Contractor (if involved)	Health and safety regulations, first aid and medical arrangements, contingency plan, number and type of safety equipments such as mask, helmet, glove, safety belt.	Spot checks at work sites, accident records, safety equipment at site; discussion with workers	throughout construction stage	DPO / DIST at district and PCU/CISC at center
Vegetation clearance	Contractor; DPO / DIST	Actual number of trees felled during construction works	Record, inspection and interview with local people and CFUGs	Before construction work	DPO / DIST at district and PCU/CISC at center; CFUGs
Measures to avoid pressure on forest and wildlife	Contractor / RBG / DIST	Use of firewood or fossil fuel by construction crew, events of hunting and poaching of wildlife	Record verification, interview with local people and CFUGs	Once a month during construction	DPO / DIST at district and PCU/CISC at center / CFUGs
Restoration, rehabilitation, reconstruction of all infrastructure services disrupted or damaged during the construction work	Contractor / RBG / DIST	Continued services by the facilities and functional public life	Site observation; Public Consultation Meetings	Once in 15 days during construction	DPO / DIST at district and PCU/CISC at center
Clean up and reinstatement of the construction sites (camps, quarries, borrow pits)	Contractor	Decommissioned sites indicate no adverse/residual environmental impacts, and are rehabilitated to the satisfaction of the supervisor and land owners	Site observation; Comparing photos; Consultation with land owners	At end of construction period	DPO / DIST at district and PCU/CISC at center

Table 7.7: Impact / Effect Monitoring for Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam Road Construction Works

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

8.0 Conclusion and Recommendations

8.1 Conclusion

158. The IEE study of the proposed Mijhing Runiban-Badachaur-Gumchal-Harjang-Syuri-Gam road Subproject does not pass through any environmentally sensitive area, and have minimal adverse impact associated with loss of forest and agricultural land. Most of the adverse impacts predicted are of low significance and short term as well as reversible. The new road construction will provide better access to market and social services, and is expected to enhance productivity and improving quality of life of the people. Local people will get direct employment opportunity as workers during construction works, which will contribute in improving their income. The beneficial impacts from the implementation of the proposed road are more significant and long term in nature against the adverse impacts most of which could be avoided or minimized or compensated.

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

8.2 Recommendation

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

161. 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 some houses will have to be acquired for construction of the proposed road. The detail will be given in resettlement plan to ensure that the persons affected by these losses are properly compensated.

References

- ADB, 2003 Environmental Assessment Guidelines. Asian Development Bank, Manila, The Philippines
- ADB, 2007, Summary Initial Environmental Examination, RRRSDP Project, ADB TA 4919 NEP, Final Draft Report
- Center I, 1997 "Environmental Impact Assessment, Mac-Grw Hill Inc. USA"
- District Profile of Rolpa District
- Department of Roads, 2002, Reference Manual for Roadside Bioengineering
- Department of Roads, 2002, Site Handbook for Roadside Bioengineering
- Department of Roads, 2003, Reference Manual for Environmental and Social Aspects of Integrated Road Development
- Department of Roads, GEU. 1996 "Bio-Engineering Information"
- Department of Roads, GEU. 1997 "Environmental Impact Assessment Guidelines for the Road Sectors"
- DoLIDAR 1999 APPROACH for the Development of Agricultural and Rural Roads. Department of Local Infrastructure Development and Agricultural Roads, 1999
- DoLIDAR Green Road Approach Manual
- DRILP 2006 Environmental Guidelines (Draft), Decentralized Rural Infrastructure and Livelihood Project, GoN, DoLIDAR.
- GoN 2006 Environmental and Social Management Framework. Road maintenance and Development Project, Department of Roads, Ministry of Physical Planning and Works, November 2006
- GoN/DoLIDAR, 2007 Environmental Assessment and Review Procedures for RRRSDP (Draft)
- GTZ, SDC, 1999 Green Roads in Nepal, Best Practices Report – An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions.
- GTZ/SDC, 2000 Green Road: Best Practices
- ICIMOD, 1998 Access Improvement and Sustainable Development, Rural Road Development in Nepal, Durga P. Poudyal
- RRRSDP, 2008 Project Administrative Memorandum

ANNEXES

Annex I: Terms of Reference



नेपाल सरकार
स्थानीय विकास मन्त्रालय
(कातावरणीय परीक्षण विभाग)
नेपाल सरकार
स्थानीय विकास मन्त्रालय

फोन नं. ५५४८५९४
फ्याक्स नं. ५५४८५९४
web page - www.mld.gov.np
Email: gov@mld.gov.np
Web: www.mld.gov.np

पत्र संख्या ०६५/०६६
च.नं. २२२

मिति: २०६६/२/२५

विषय:- प्रारम्भिक वातावरणीय परीक्षण (IIE) को कार्यसूची (TOR) स्वीकृत भएको ।

स्थानीय पूर्वाधार विकास तथा कृषि सडक विभाग,
आवलाखेल ।

ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना (RRRSDP) अन्तर्गत निम्न जिल्ला विकास समितिको कार्यालयबाट निम्नानुसारका सडकहरूको प्रारम्भिक वातावरणीय परीक्षणको कार्यसूची (IIE) कार्यसूची (TOR) तयार गरी त्यहाँ विभाग मार्फत वातावरणीय संरक्षण नियमावली, २०५४ अनुसार स्वीकृतिको लागि यस मन्त्रालयमा पेश भएकोमा नेपाल सरकारको मिति २०६६/२/२५ को निर्णय (सचिवस्तर) अनुसार स्वीकृत भएको प्रतिवेदन थान-२/२ यसै पत्रसाथ पठाइएको व्यहोरा अनुरोध गरिन्छ ।

निम्न

१. चिसापानी-हवास बारा चौर, दोभिला-फलेवास, दुल्लान-सलिजा, काकीनेटा-लुङखु सडक खण्ड (पर्वत जिल्ला)
२. नदुवा-राडीजिउला, काकीडोल-हुकम माईकोट, छिन्खेत-स्थापु सडक खण्ड (रुकुम जिल्ला)
३. खगेश्वरी-रिङरोङ, साँखु-जर्सिङ, पौवा-फटकेश्वर-जर्सिङ पौवा-भोटेचौर, घ्याम्पेडोल-वाणभञ्ज्याङ (काठमाण्डौ जिल्ला)
४. नाम्दु-मार्बु-छाप (दोलखा जिल्ला)
५. तेलकोट-छालिङ-चाँगु, घ्यामासिंग-अमालडोल-नाला (भक्तपुर जिल्ला)
६. पिपल भञ्ज्याङ-हैतार (सिन्धुली जिल्ला)
७. काले बुढौली-लिम्बा, जोरपोखरी-आहाल डाँडा-चरी भञ्ज्याङ-ओमाम, फिदिम-रानी गाँउ-यामोक, काले बुढौली-दुर्दिम्बा (पाँचथर जिल्ला)
८. फागम-बहचौर-हर्जन-सिउरी (सोलु)

(विजयराज सुवेदी)

शाखा अधिकृत

०६५

स्वीकृत मिति: २०६६/२/२५



Terms of Reference (ToR)

for

Initial Environmental Examination (IEE)

of

**Phagam Dahachour-Badachour-Gumchal-Harjan-
Syuri-Gam Road Sub-Project**

32/04/2009
2068/04/26

Submitted to:

**Government of Nepal
Ministry of Local Development**



Proponent:

**District Development Committee (DDC)
District Technical Office (DTO)
Rolpa**

Telephone n.-086680337

Fax n.-086440062

April 2009

2/4
आयोजना प्रमन

0.9	NAME AND ADDRESS OF THE PROPONENT	1
2.0	INTRODUCTION	1
2.1	GENERAL INTRODUCTION	1
2.2	BACKGROUND OF THE SUB-PROJECT	2
2.3	OBJECTIVES	3
2.4	RELEVANCY OF THE SUB-PROJECT	3
3.0	REVIEW OF RELEVANT LAWS, RULES AND GUIDELINES	5
4.0	PROCEDURE TO BE ADOPTED WHILE PREPARING THE REPORT	6
4.1	DESK REVIEW	6
4.2	PUBLIC CONSULTATION AND INFORMATION DISCLOSURE	6
4.3	FIELD WORK	7
5.0	ALTERNATIVES FOR THE IMPLEMENTATION OF THE PROPOSAL	7
6.0	REQUIREMENT OF THE IEE STUDY	8
6.1	TIME SCHEDULE	8
6.2	ESTIMATED BUDGET AND STUDY TEAM	8
7.0	ENVIRONMENTAL BASELINE	9
8.0	ANALYSIS AND INTERPRETATION	9
9.0	IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT	9
9.1	BENEFICIAL IMPACTS	9
9.2	ADVERSE IMPACTS	10
10.0	BENEFIT AUGUMENTATION/MITIGATION MEASURES	12
11.0	ENVIRONMENTAL MANAGEMENT PLAN	12
12.0	IEE REPORT FORMAT	12

Table 1. Proposed Work Schedule for Conducting IEE Study 8

Figure 1. Map of Nepal Showing Location of Phagam Dahachour-Badachour-Gamchal-Harjan-Syuri-Gam Road Sub-Project in Rolpa District..... 3

Figure 2. Map of Rolpa District Showing Phagam Dahachour-Badachour-Gumchal-Bharjan-Syuri-Gam Road Sub-Project in Rolpa District 4

Table 10: CEE Program Dahachour-Badochour-Gumchal-Harjun-Syuri-Gamt and sub-project in Rolpa District

आयोजना प्रभार



ABBREVIATIONS

ADB	Asian Development Bank
Ch	Chainage
CF	Community Forest
CISC	Central Implementation Support Consultants
CITES	Convention on International Trade in Endangered Species of Flora and Fauna
DDC	District Development Committee
DG	Director General
DIST	District Implementation Support Team
DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DPO	District Project Office
DPCC	District Project Coordination Committee
DTO	District Technical Office
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management Section
EPA	Environmental Protection Act
EPB	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

ToR for IEE Phagun Dohachout-Badachauri-Gunduli-Harad-Sauri-Gant road sub-project in Rolpa District.



1.8 NAME AND ADDRESS OF THE PROPONENT

The District Development Committee (DDC)/District Technical Office (DTO), Rolpa is the executing agency at the district level and the proponent of the Initial Environmental Examination (IEE) study for the new construction of Dahachour-Lamchuli-Airport-Gowar-Gluze-Upallo-Gumehal-Harjan-Sunchari-Syuri-Maulaban-Gam section of Phagam Dahachour-Badachour-Gumehal-Harjan-Syuri-Gam Rural Road sub-project. The Ministry of Local Development (MLD) is the concerned authority for the approval of IEE study report.

Address of the Proponent:

District Development Committee (DDC)
District Technical Office (DTO)
Rolpa
Telephone n. -086680337
Fax n. -086440062

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.

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


आयोजना प्रमुख

This Terms of Reference (ToR) is prepared to conduct an IEE study of Phagam Dahachour-Badachour-Gumchal-Harjan-Syuri-Gam Rural Road sub-project in Rolpa District.

2.2 BACKGROUND OF THE SUB-PROJECT

The proposed of Phagam Dahachour-Badachour-Gumchal-Harjan-Syuri-Gam Rural Road sub-project sub-project lies in the north-eastern part of Rolpa district of Mid Western Development region of Liwang district headquarter. Major settlements along the road alignment are Dahachour-Lanchuli-Sewar-Ghage-Upallo-Gumchal-Harjan-Sunchari-Kaipadlaha-Syuri-Maulaban-Gam. Total length of the road alignment is 35 km.

The starting point of the road Dahachour-Lanchuli-Badachour-Gumchal-Harjan- Syuri-Gam Road Sub-Project in Rolpa District. It is a point 82 km away from Bhaluwang in Dang district (National Highway check) and of 26 km far from district headquarters of Rolpa. Total Road Length is New Construction. Almost all alignment of the road passes from lower valley to upper hill.

The people in this project area are having many types of transportation problems due to the steep topography and worse condition of road. Local people have no good access to the market centres of the district to sell their milk product named as khuwa which is famous of these VDC and vegetatives products such as potato, Brinjal, tomato, onion, cauliflower etc. to sustain their daily livelihood. Hence, the locally produced materials such as Milk product and Vegetatives products are getting low prices than it may fetch. Other development facilities such as water supply, bio-gas plant and telephone are also poor along the road corridor of some Gam VDC. Having lots of transportation difficulties, local People, of the road corridor too do not have the fast and appropriate access road to reach the Market, Sulichaur and district headquarters.

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

This road is identified as a priority road in the District Road construction committee (DRCC) meeting. Construction of this road will provide physical and economical access to the people of north-eastern part of the district with district headquarter and other part of Nepal.

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

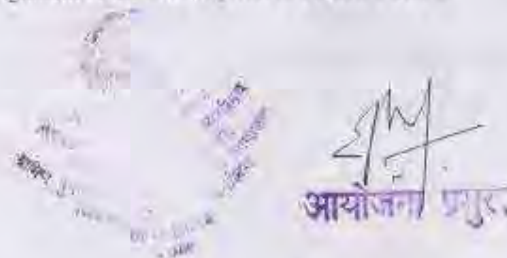


Fig.no.2: Topographical map showing Phagam Dabachour- Badachour-Gunchal-Harjan-Syuri-Gam road sub-project in Ro



आयोजना प्रमुख

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

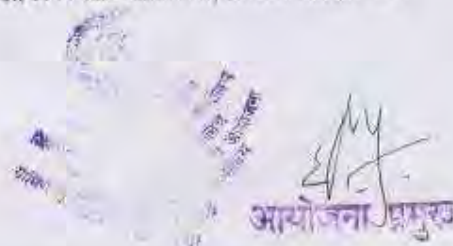
The proposed road will connect Phagam, Gumchal, Harjan, Syuri and Gam, VDCs with trails to Market area of Sulichour and district headquarter, Rolpa. This road starts from Dahachour of Phagam VDC which is 3.5Km from Sulichour Market in Mijhiang VDC and 85 km away from Bhaluwang in Dang district and is a small Village area likely to be changed to a Market area by different VDCs due to economical growth. Then the road runs towards North-east direction to uphill side in between the Mahabharat range with low hills and high hills. The end point of this construction section of road is Gam, which is nearly last boundary line of Rolpa and start from boundary line of pyuthan and Baglung district. The end point of the road deserves the possibility of being market centre for several VDCs.

An IEE of the proposed road is necessary in order to assess the environmental consequences of the proposed rural road construction activities and suggest appropriate, practical and site specific mitigation and enhancement measures. Since this is a Village 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
- *Batubharajya Nirdeshika* (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


आयोजना प्रमुख

- 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

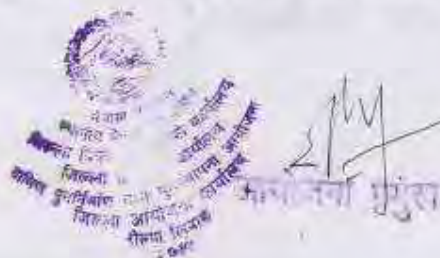
The following steps will be followed during the desk review:

- 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 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

आयोजना प्रमुख

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 Rolpa. 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.


मसिर्जना निफर

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 IEF 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.

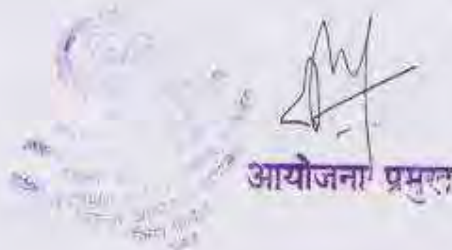
9.0 IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT

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:


आयोजना प्रमुख

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
- 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

आयोजना प्रमुख

Biological environment

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

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

Socio-economic and cultural environment

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

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

9.2.2 Operation stage

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

Physical environment


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

Biological environment

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

Socio-economic and cultural environment

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


आयोजना प्रमुख

10.0 BENEFIT AUGMENTATION/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 Relevant Acts, Regulations and Guidelines:

During the study relevant policies, legislations and guidelines should be reviewed and their salient features should be mentioned in this section. Similarly related institutions should be consulted.

ix. Existing Environmental condition:

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

x. Project Alternatives:

This section summarizes the alternatives by environmental comparison. This may include the following sub-headings.

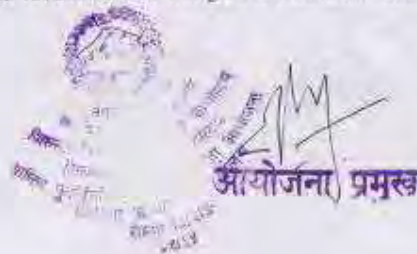
- a. Project alternative
- b. Alternative routes
- c. Alternative design and construction approach
- d. Alternative schedule and process
- e. Alternate resources
- f. Any other alternatives

xi. Identification of Impacts and Benefit Augmentation/Mitigation Measures:

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

- a) **Physical Impacts:** such as land, air, water, noise, infrastructure impacts and other factors
- b) **Biological Impacts:** such as flora, and fauna, population, and natural habitats and ecosystems
- c) **Socio-economic-cultural impacts:** such as agricultural land, human health, social, cultural and religious values, implications of physical and biological impacts and other relevant socio-cultural-economic impacts.

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


 आयोगना प्रमुख

xii. Environmental Management Plan:

This section summarizes the recommended implementation of IEE, monitoring parameters/indicators, activities, methods and responsibilities.

xiii. Conclusion and Recommendations:


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

xiv. Miscellaneous:

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

xv. Annexes

- ToR of IEE
- Rapid Environmental Assessment (REA) Checklist
- Abstract of cost
- RRRSDP environmental checklist
- Public notice
- Deed of enquiry (*maachulka*)
- 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 Zel
 - d. Number of households belonging to different food security category
- List of trees
- Maximization of slope cutting and preservation of vegetation cover
- Photographs


District Environment Officer
Dhangadhi
2018

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:

Mijhing Runiban-Gam

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

SCREENING QUESTIONS	Yes	No	REMARKS
<ul style="list-style-type: none"> Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction? 		✓	
<ul style="list-style-type: none"> Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing? 	✓		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"> Noise and vibration due to blasting and other civil works? dislocation or involuntary resettlement of people 		✓	
<ul style="list-style-type: none"> Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress? 		✓	
<ul style="list-style-type: none"> Hazardous driving conditions where construction interferes with pre-existing roads? 		✓	
<ul style="list-style-type: none"> Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations? 		✓	
<ul style="list-style-type: none"> Creation of temporary breeding habitats for mosquito vectors of disease? 		✓	
<ul style="list-style-type: none"> Dislocation and compulsory resettlement of people living in right-of-way? 		✓	
<ul style="list-style-type: none"> Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life? 		✓	
<ul style="list-style-type: none"> Increased noise and air pollution resulting from traffic volume? 		✓	
<ul style="list-style-type: none"> Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road? 		✓	

Source: Field survey, July, 2009

Annex III: Abstract of Cost

Rural Reconstruction and Rehabilitation Sector Development Program Rolpa

Summary of Cost (Item-wise) Mijhing Runiban-Gam Road Sub Project

Chainage: 0+000 to 35+100

District: Rolpa

S N	Description of works	Unit	Estimated	Rate/Unit (NRs)	Amount
			Quantity	In Figure	(NRs)
A.					
1	RBG Insurance				400,000.00
2	Occupational Health and Safety				500,000.00
B.	Roadway Works				-
2	Clearing and grubbing including the cutting of trees having girth of less than 30 cm when measured at 1 m above the ground. [1] DoLIDAR	Sqm.	45100.00	9.06	408786.40
3	Compensatory Plantation (Cutting of trees in nos. 112 from Private land and in nos. 113 from Forest land)	Nos.	3,220.00	42.50	136,850.00
4	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 and also the disposal of the unsuitable cut materials in specified manner. This further covers trimming and finishing of the road way. For (2) DoLIDAR				-
	a) ordinary soil	Cum.	209325.27	113.30	23716553.07
	b) hard soil	Cum.	206121.36	135.96	28024260.57
	c) ordinary rock	Cum.	17203.87	453.20	7796794.75
	d) medium rock	Cum.	12446.93	906.40	11281898.39
	e) hard rock	Cum.	2646.06	3852.20	10193148.53
	f) E/W excavation for Structure	Cum.	817.55	135.96	111154.37
5	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; [2] DoLIDAR				
	a) ordinary soil	Cum.	264764.19	56.65	14998891.11
C.	Structure Works				
7	Heavy Coated GI wire gabion boxes, hexagonal mesh size (100x120mm), mesh wire 10SWG selvedge wire 8SWG, binding wire 12SWG including transportation, waving, packing with rubble stones, laying them in final position, stretching, binding them together and tying down lids (17-1.4, 17-5, 17-6 DoLIDAR)	Cum.	7358	4503.00	17507665.63
8	Dry stone masonry works for dry wall including transportation	Cum.	4624.92	1388.50	6421706.97
	waving, packing with rubble stones, laying them in final position. (8 DoLIDAR) (400 to 600 m distance)				
9	Dry stone masonry works for dry stone causeway including transportation, placing	Cum.	50.2	71,362.75	3,582,410.05

	A Total				125,080,119.84
10	Bio-engineering works/Road side plantation(3 % of A)	Lumpsum			5,256,493.00
	B Total				130,336,612.84
11	Provision for tools and equipments(3% of B)				5,414,188.22
	C Total				135,750,801.06
12	Provision for UC's operational expenses(3% of C)				5,576,613.86
	D Total				141,327,414.92
13	Provision for Contingencies(5% of D)				9,573,187.13
	E-Grand Total				150,900,602.05
	Total Length of Road		35.10		
	Cost Per Kilometer				4,299,162.45

ANNEX-IV: RRRSDP Environmental Checklist

A. GENERAL SOCIO-ECONOMIC SITUATION OF THE INFLUENCE AREA⁴

1. Overview of settlements in the zone of influence (Zol) 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]

A. _____ B. _____ C. _____
D. _____ E. _____ F. _____
G. _____ H. _____ I. _____

5 Food grain availability

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

Source:

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

[illegible]

3.11	Others										
------	--------	--	--	--	--	--	--	--	--	--	--

A. _____ B. _____ C. _____
D. _____ E. _____ F. _____
G. _____ H. _____ I. _____

7. Migration for employment

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

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

(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).

S. N.	Name of Area	Description of Development Potential

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

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

C. Historic and Cultural Resources Within The Settlement

Type of Resource	Name/specification	Affecting activities	Location from project

नमस्ते, मित्र!

जिल्ला विकास समितिको कार्यालय

जिल्हा प्राविधिक कार्यालय

बौद्धधर्मा

प्रारम्भिक वातावरणीय परीक्षणसम्बन्धी

राय सम्भावका लागि सार्वजनिक सूचना

(प्रथमपट्टक प्रकाशित मिति २०६३/४/१)

राष्ट्रीय पुनर्निर्माण तथा पुनर्स्थापना आयोग (RRRSEP) अन्तर्गत एसियाली विकास बैंक, डिभिडिड तथा स्वीस सरकार विकास निधिगतको अनुदान सहयोग तथा ओफिडको ग्रुप सहयोग तथा नेपाल सरकार, विरलु विकास समिति र लाभग्राहीसंगको लागतशुल्क निर्माण गर्ने प्रभाव गरिएको निर्माण १-बडा बाटो-मुगुवा-तारु-तारु-गाम्भेन्द्र, उप-आयोजनाको प्रारम्भिक कार्यहरूको प्रारम्भिक अवधिमा कार्यरत गर्ने सिलसिलामा बाटोको सुरक्षा नियमावली २०१२-पहिलो संशोधन, २०१२ को नियम ७ (२) अनुसार यो सांकेतिक शुल्क प्रकाशित गरिएको छ ।

प्रस्तावकको नाम - जिल्ला विकास समितिको कार्यालय, जिल्ला
प्रविधिक कार्यालय, रौतहट।

प्रस्तावित सहकर्म प्रभावित पार्श्व या वि.स.ह.क. (मैमि) ब्रह्मचर, गुण्यज,
राजेंद्र, मयरी र. गण या वि.स.ह.क.

प्रस्तावकी विवरण: प्रस्तावित मिमिड-रुडनिवाड-रुडनिवाड-गुम्वाल-हजरेड-म्युरी-गाम सड़क ठाण्ठोयोन मिमिड गाविसकी वडा : ७ रुडनिवाडवाट मुन १०० गाम गाविसको नाममा पुगिन्छ । यो सड़क मिमिडको रुडनिवाड, खैरलुङ, कोल्हाडकोला, दोभान, मेसरी, हजरेड भेदान, मेसरी, चारो, उज्ज्या-भुमज्या, फाउडुन, हजरेड, रुनिवाडो, म्युरी, सिक्म, दोहाडुलाड, कुल्हाडो, मिलावन र गाम कलोमम्म जान्छ । यस सड़कको लम्बा लम्बाई ३६ कि.मि. दोर्को छ र यसलाई अर्को टाका जोल्नका लागि प्रस्ताव गरिएको छ ।

उक्त प्रशासकीय कार्यसम्पन्नबाट व्रतावरणमा यसै शासन प्रभावको बारेमा सम्बन्धित गा.वि.स. विद्यालय स्वास्थ्य चौकी, वन उपमैला समिति तथा अन्य सराकारकाला व्यक्ति के संस्थान यो मुचना गौरवान्वयमा प्रकाशित भएको मितिले १५ (पन्ध्र) दिनभित्र आफ्नो तह सुकसि पठाई सहयोग गरिदिनुहुन अनुरोध गरिन्छ । साथै यसै बमोजिमको साथ सुकसि स्थानीय पूर्वाधार विकास तथा कृषि सङ्कट विभाग, तावलासंग, ललितपुर तथा स्थानीय विकास मन्त्रालय, बीमहल, तनचोक, ललितपुरमा पनि पठाउन सकिने छ ।

राय, सुभाष पट्टाभुज डोगाना

जिल्ह्याच्या विकास समितीचा कार्यालय, गेल्या

टेलिफोन नं. ०४६-४४०११४

ଅନୁସନ୍ଧାନ ନଂ. ୫୯୧-୫୪୦୭୭୪

जिम्मा प्राविधिक काण्डेस्तय, रीत्ये


टेलिफोन नं. ८४६१८४७३३३३

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गोरखापत्र दैनिक २०६६/०५/१९

Annex VI: Deed of Enquiry (*Muchulka*)


[illegible]


 १०/६/६४
 ३६
 १०/६/६४
 जनकपुरी सादरसे करें।
 हरे कालदास जी।
 आ. श्री. आ. हर. वि. जी. रोसा
 उपरोक्त एकादशमास एवम् कार्यसमाप्त न. नं. २६ दिनांक १०/६/६४
 के अनुसार प्राप्त हुयस सर्वसुखवादी जनकपुरी सादरसे करें हरे कालदास
 कार्यसमाप्त हुयस एकादशमास एवम् कार्यसमाप्त हरे कालदास
 एवम् कार्यसमाप्त हरे कालदास

[illegible][illegible]


गणतन्त्र नेपाल सरकार
जिल्ला कृषि विकास कार्यालय
 जिला: २०६३/०६४
 मिति: २०६३/०६/१४
 ४६
 जानकारी दिइएको छैन।
 हेर्दै कन्सल्ट (पि.एल.सी. डी.एल.)
 आर. आर. एस. डी. सी.
 रोल्पा।
 सुपरान्त वि.प्र.मा सल्लाहकारको रूपमा
 मिति २०६३/०६/१४ को १२ को पत्रमा
 सुचना प्राप्त गरी दिने अती सुलभतामा
 अनुज्ञा सुचना प्राप्त गरी दिनेको लागि
 अनुरोध गरिन्छ।
 (अन्तर्गतमा छापिएको छैन)
 (अन्तर्गतमा छापिएको छैन)

नेपाल सरकार
 कृषि तथा सार्वजनिक विकास
 विभाग
 क्षेत्रीय कृषि निर्देशनालय
जिल्ला कृषि विकास कार्यालय
 सिन्धु, रोल्पा
 म.सं. - २०६३/०६४
 मिति - २०६३/०६/१४
 म.सं. ११६७
 विषय: - सुचना प्राप्त गरी दिने जानकारी पठाइएको छैन।
 श्री रामेश्वर पुनिलाल तथा पुर्ण स्वाध्याय व्यवस्थापन
 सेवा।
 प्रस्तुत विषयमा जिल्ला कृषि विकास कार्यालयको म.सं. ०६३/०६४ मिति ०६/१४ को पत्र तथा जिल्ला
 कृषि विकास कार्यालयको सुचना जारीमा दिने भाषाको लागि जानकारी दिने अनुरोध गरिन्छ।
 (अन्तर्गतमा छापिएको छैन)
 (अन्तर्गतमा छापिएको छैन)


गणतन्त्र नेपाल सरकार
जिल्ला कृषि विकास कार्यालय
 जिला: २०६३/०६४
 मिति: २०६३/०६/१४
 ४६
 जानकारी दिइएको छैन।
 सुपरान्त वि.प्र.मा सल्लाहकारको रूपमा
 मिति २०६३/०६/१४ को १२ को पत्रमा
 सुचना प्राप्त गरी दिने अती सुलभतामा
 अनुज्ञा सुचना प्राप्त गरी दिनेको लागि
 अनुरोध गरिन्छ।
 (अन्तर्गतमा छापिएको छैन)
 (अन्तर्गतमा छापिएको छैन)

Annex VII: Name of the Organizations

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

SN	Name or Organization	Address	Remarks
1	District Agriculture Development office	Liwang	
2	District Forest Development office	Liwang	
3	Office of Village Development Committee, Mijhing	Mijhing	
4	Office of Village Development Committee, Badachaur	Badachaur	
5	Office of Village Development Committee, Gumchal	Gumchal	
6	Office of Village Development Committee, Harjang	Harjang	
7	Office of Village Development Committee, Syuri	Syuri	
8	Office of Village Development Committee, Gam	Gam	

Source: Field Survey, July, 2009

Annex VIII: List of persons consulted

List of persons consulted

S.N.	Name	Address	Designation	Contact No.
District Level				
1	Ramesh Neupane	Office of District Development Committee, Rolpa	Local Development Officer	
2	Rajendra Koirala	District Agriculture Development Office, Rolpa	Sr. Agriculture Development Officer	
3	Sesh Dutta Chaudhary	District Watershed and Soil Conservation Office, Rolpa	Soil Conservation Officer	
4	Pashupati Koirala	District Forest Office, Rolpa	District Forest Officer	
Mijhing VDC				
1	Bhakta Bhadur Bista	Mijhing-4	President of VICCC	9741128768
2	Kalpana Bista	Mijhing-4	Business	
3	Fageswar Sharma	Mijhing-4	Teacher	
Badachaur VDC				
1	Dujuman Gharti	Badachaur-2	Leader of Political party	
2	Juna bista	Badachaur-4	Member of VICCC	9748521620
Gumchal VDC				
1	Keshar Bahadur bista	Gumchal-5	President of VICCC	
2	Dandaman Rokka	Gumchal-5	Leader of Political party	
3	Puspa Budathoki	Gumchal-5	Business	086680378
Harjang VDC				
1	Bhim Bahadur Gurung	Harjang-6	Ex. VDC President	
2	Duti pun	Harjang-6	Farmer	
3	Bhim Bahadur Pun	Harjang-6	Ex. Armi	
Syuri VDC				
1	Rekha Budamagar	Syuri-5	Business	
2	Karan gharti	Suyuri-6	Teacher	
Gam VDC				
1	Deushing Gharti	Gam-1	Leader of Political party	086680362
2	Keshar Bahadur bista	Gam-1	Business	


Source: Field Survey, July, 2009

Annex IX: Summary of meeting minutes with local people

Table showing summary of meeting minutes



Date	Place	Type of Participants	No.	Issues raised
2066/4/16	Mijhing	Project Affected Families, and local people	19	Cash compensation should be provided for land and crop, free distribution of seedlings for private planting, good drainage system, protection of water sources. Landslide protection works.
2066/4/18	Badachaur	Project Affected Families, and local people	24	Cash compensation should be provided for land and crop, free distribution of seedlings for private planting, good drainage system, and protection of water sources. Landslide protection works.
2066/4/19	Gumchal	Project Affected Families, local People	24	Cash compensation should be provided for land and crop and free distribution of seedlings for private planting Landslide protection works.
2066/4/20	Harjang	Project Affected Families, local People,	26	Road must be constructed, compensation of land and crop is not a priority; mitigation measures could be implemented to minimize the environmental impacts. Landslide protection works.
2066/4/11	Syuri	Project Affected Families, local People	28	Road should be built as soon as possible, mitigation measures should be implemented to minimize the environmental impacts. Landslide protection works.
2066/4/21	Gam	Project Affected Families, local People	28	Road should be rehabilitated, mitigation measures should be implemented to minimize the environmental impacts. Landslide protection works.

Annex X: Recommendation Letters from VDCs


 कार्य विवरण समितिको कार्यालय
 माथ, रोल्पा
 व.सं. - २०७३/१५७
 व.सं. - १४
 दिनांक - २०७३/१५/११
 विषय :- सिक्किम गतिविधि
 १. मे तह रंग हाकात राख्नु।
 अनुसन्धितमात्र भन्ने प्रविष्टि मुगलिनी तथा पुनर्निर्माण
 प्रयोगमात्रो दिने २०७३/१५/१३ को प्रि.प.का प्रकाशित हुनुमा
 गुणा। सुनिश्चित कालपूर्वमा ज्ञात गरी हाकात राख्नु
 सडक निर्माण इदि कालावस्थामा प्रयोजनमात्रो विचार
 हाकात विवरणमात्रा लागि जानकारीमात्रा लागि दिनुमात्रा
 २.

(नेता/मात्रा/विषय)
 माथि ११ नम्वर

[illegible][illegible][illegible]


२६६/१६६
 ४


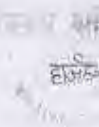
२०६६/१७०

१६६/१६६/१७०

जो जल सेवक द।

उपरोक्त संस्थानों में ग्राहकों के सुविधाओं को बढ़ावा देने के लिए (१६६/१७०) अलग-अलग योजनाओं की व्यवस्था की जा रही है। योजना - दोस्त - कर्मचारी - गृहस्थ - कर्मचारी - ग्राहकों के सुविधाओं को बढ़ावा देने के लिए (१६६/१७०) अलग-अलग योजनाओं की व्यवस्था की जा रही है।


 (दिनांक १६/१७/१७०)
 सचिव


२६६/१६६
 ७७

२०६६/१७०

१६६/१६६/१७०

जो जल सेवक द।

उपरोक्त संस्थानों में ग्राहकों के सुविधाओं को बढ़ावा देने के लिए (१६६/१७०) अलग-अलग योजनाओं की व्यवस्था की जा रही है। योजना - दोस्त - कर्मचारी - गृहस्थ - कर्मचारी - ग्राहकों के सुविधाओं को बढ़ावा देने के लिए (१६६/१७०) अलग-अलग योजनाओं की व्यवस्था की जा रही है।


 (दिनांक १६/१७/१७०)
 सचिव

Annex XI

XI a. Distribution of households by major occupation

XI b. Number of households belonging to different food security category

XI c: Land holding pattern of settlements within Zol

XId: Summary of public services & infrastructures

Annex Xla: Distribution of households by major occupation

S N	VDC	Settlement/ Code	Number of HH and Percentage of Population engaged in					Total HH
			Agriculture & Livestock	Labour & Porter	Business/ Commerce	Cottage Industry	GO/ NGO Employee s	
1	Mijhing	Runiwang	15/23.53%	15/17.65%	33/52.94%	5/5.88%	17/20%	85
2	Badachaur	Kilaurchaur	65/72.22%	15/16.67%	5/5.55%	0/0%	5/5.55%	90
		Sewar	105/43.20%	130/53.50%	3/1.24%	0/0%	5/2.06%	243
3	Gumchal	Upplo Gumchal	95/79.2%	15/12.5%	5/4.15%	0/0%	5/4.15%	120
		Tallo Gumchal	65/67.02%	28/28.86%	2/2.06%	0/0%	2/2.06%	97
		Pate Gumchal	75/83.34%	11/12.22%	4/4.44%	0/0%	0/6%	90
		Rajipati	48/77.42%	10/16.13%	2/3.225%	0/0%	2/3.225%	62
4	Harjang	Chhaharekhum	15/75%	3/15%	0/0%	0/0%	2/10%	20
5	Syuri	Ghoga	32/80%	5/12.5%	1/2.5%	0/0%	2/5%	40
		Bhanli	8/80%	0/0%	0/0%	0/0%	2/20%	10
		Shikum	200/80%	39/15.6%	6/2.4%	1/0.4%	4/1.6%	250
		Bowang	10/83.33%	2/16.67%	0/0%	0/0%	0/0%	12
6	Gam	Kuipadara	18/72%	5/20%	1/4%	0/0%	1/4%	25
		Maulaban	40/77.78%	5/11.11%	15/6.67%	0/0%	2/4.44%	45
		Total	791	283	77	6	49	1189
		Average	66.52	23.80	6.47	0.005	4.12	100.00

Source : Field Survey, July, 2009

Annex XI b: Number of households belonging to different food security category

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	Mijhing	Runiban	5/5.88%	17/23.53%	38/44.71 %	20/23.53 %	2/2.35 %	85
2	Badachaur	Kilaurchaur	10/11.11%	20/22.25%	40/44.45%	10/11.11%	10/11.11%	90
		Sewar	24/9.88%	35/14.4%	60/24.69%	90/37.04%	34/13.99%	243
3	Gumchal Harjang	Upplo Gumchal	9/7.5%	15/12.5%	65/54.17%	20/16.67%	11/9.16%	120
		Tallo Gumchal	7/7.22%	10/10.31%	20/20.62%	45/46.39%	15/15.46%	97
		Pate Gumchal	6/5.56%	20/22.22%	35/38.89%	20/22.22%	10/11.11%	90
		Rajipati	5/8.07%	15/24.20%	30/48.39%	6/9.67%	6/9.67%	62
		Chhaharekhum	0/0%	5/25%	8/40%	5/25%	2/10%	20
4	Syuri	Ghoga	4/10%	12/30%	18/45%	3/7.5%	3/7.5%	40
		Bhanli	0/0%	2/20%	5/50%	2/20%	1/10%	10
		Shikum	6/2.4%	40/16%	75/30%	84/33.6%	45/18%	250
		Bowang	0/0%	2/16.67%	5/41.67%	3/25%	2/16.66%	12
5	Gam	Kuipadara	1/4%	5/20%	10/40%	4/16%	5/20%	25
		Maulaban	2/4.45%	12/26.67%	20/44.44%	6/13.33%	5/11.11%	45
		Total	78	213	429	318	151	1189
		Average %	6%	18%	36%	27%	13%	100%

Annex XI c: Land holding pattern of settlements within Zol

Source: Field Survey, July, 2009

A. Ruoniban	B. Kilachaur	C. Sewar	D. Upplo Gumchal
E. Tallo Gumchal	F. Pate Gumchal	G. Rajipati	H. Chhahrekhum
I. Ghoga	J. BhanliK. Shikum	L. Bowang	
M. Kuipadhara	N. Maulaban		

[illegible]

S N	Service/Infrastructure Category	Settlement Code														
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	(no)															
5.3	Grocery Shops (no.)	1		1	1		1		1		1				1	-
5.4	Other Shops (no.) (e.g. stationery, medicine, tailoring, etc.)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	DRINKING WATER SUPPLY SCHEMES															
6.1	Gravity-Flow Scheme (capacity)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.2	Tube-wells (no.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.3	Spring/Dug-wells (no.)	1	1	-	-	1	1	-	1	1	1	-	1	1	1	1
7	IRRIGATION SCHEMES															
7.1	Surface Irrigation(ha)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.2	Groundwater (ha.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	OTHER INFRASTRUCTURES															
8.1	Micro-hydro scheme (no. & capacity.....kw)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.2	Water Mill (no.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.3	Suspension Bridges (no.)	-	1	1	-	-	-	-	-	-	-	-	-	-		1
8.4	Wooden Bridges (no.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.5	Other Bridges (specify)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	INDUSTRY															
9.1	Weaving Industry (no.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.2	Rice & flour Mills (no.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.3	Other Industries (specify)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	FINANCIAL INSTITUTIONS															
10.1	Bank (no.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.2	Cooperative	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	COMMUNITY USE															
11.1	Ghat (no.)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
11.2	Hatia/Bazaar (no.)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.3	Playground (no.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.4	Community Centre (no.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.5	Others (specify)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: field survey, Feb. 2010

A. Mijhing
E. Tallogumchal
I. ghoga
M. Kuipadhara

B. Kilachaur
F. Rajipate
J. Bhangli
N. Molaban

C. Sewar
G. Pateguchal
K. Syuri
O. Gam

D. Upallogumchal
H. Chhaharekhum
L. Bowang

Annex XII: List of trees to be removed

Details of affected trees

S.N	Name of the owner	Total no. of trees	Local Name	Scientific Name	Location	Chainage	Remarks
1	Bhup narayan Bharti mager	18	Khnew, Khiro	<i>Ficus semicordata</i> , <i>Sepium insegue</i>	Runiban	0+000 - 11+00	
2	Kirte kami	12	Salla	<i>Pinus roxburghii</i>	Sewar		
3	durge B.K	6	Salla	<i>Pinus roxburghii</i>	Sewar		
4	Dil Basnet	5	Salla	<i>Pinus roxburghii</i>	Sewar		
5	Bishnu B.K	77	Salla	<i>Pinus roxburghii</i>	Sewar		
6	Badachaur Community forest	467	Salla	<i>Pinus roxburghii</i>	Badachaur	3+100-5+500	
7	Gumchal Community forest	187	Laligurans	<i>Rhododendron arboretum</i>	Gumchal	10+100-12+500	
8	Khum Bahadur Roka	5	Katus, Chilaune	<i>Castanopsis indica</i> , <i>Schima wallichii</i>	Upplo Gumchal	12+110-14+180	
9	Harjang Community forest	347	Uttis, Chilaune	<i>Alnus nepalensis</i> , <i>Schima wallichii</i>	Harjang	15+000-17+360	
10	Ramu Sunar	44	Uttis	<i>Alnus nepalensis</i>	Harjang	18+220-18+530	
11	Mat Singh B.K	6	Uttis, Chilaune	<i>Alnus nepalensis</i> , <i>Schima wallichii</i>	Harjang	18+630-18+970	
12	Jasram Tomota	10	Katus, Chilaune	<i>Castanopsis indica</i> , <i>Schima wallichii</i>	Bhanli	19+510-20+200	
13	Aasa ram Tomota	31	Chilaune	<i>Schima wallichii</i>	Bhanli		
14	Bire Sharki	55	Laligurans	<i>Rhododendron arboretum</i>	Bhanli		
15	Syuri Community forest	360	Katus, Uttis	<i>Castanopsis indica</i> , <i>Alnus nepalensis</i>	Syuri	20+500-23+526	
16	Puran Gharti	32	Katus	<i>Castanopsis indica</i>	Bobang	23+600-23+860	
17	Harikala Buda	55	Katus, Chilaune	<i>Castanopsis indica</i> , <i>Schima wallichii</i>	Bobang		
18	Thaplal Gharti	33	Katus	<i>Castanopsis indica</i> , <i>Schima wallichii</i>	Bobang		
19	Ramu Sunar	84	Katus	<i>Castanopsis indica</i>	Syuri	23+960-23+975	
20	Ujuram B.K	52	Katus, Uttis	<i>Castanopsis indica</i> , <i>Alnus nepalensis</i>	Syuri	24+275-24+285	
21	Harikala Budha	41	Katus	<i>Castanopsis indica</i>	Syuri	24+965-25+010	
22	Gam Community Forest	147	Katus, Dhupi, Chilaune	<i>Castanopsis indica</i> , <i>Picea Smithiana</i> , <i>Schima wallichii</i>	Gam	24+100-26+166	
23	Tothe Gharti	73	Uttis	<i>Alnus nepalensis</i>	Kuipadhara	28+10-28+110	
24	Nand Bdr. Budha	83	Katus/ Uttis	<i>Castanopsis indica</i> / <i>Alnus nepalensis</i>	Kuipadhara	28+320-28+420	
26	Aas Bdr Gharti	43	Katus	<i>Castanopsis indica</i>	Maulaban	28+420-28+570	
27	Lal Bdr Gharti	26	Uttis/ Chilaune	<i>Alnus nepalensis</i> / <i>Schima wallichii</i>	Maulaban	28+730-28+830	
	Total	2299					

Source: field survey, July, 2009

➤ Detail about the loss of tree and their cost will be included in the resettlement plan.

Annex XIII: Photographs



Mijhing Runiban (Ch. 0+000)Starting point



Affected House at Ch 0+750 (Mijhing VDC)



Affected House at Ch. 2+020 (Badachaur VDC)



Soil erosion (Ch. 5+400)



Forest area (Ch. 5+500)



Airport (Ch. 6+500) (Badachaur VDC)



Tallo Gumchal settlement area (Ch.12+620) Affected House at Ch 16+650 (Gumchal VDC)



Quarry site at Ch 16+900 (Harjang VDC) Proposed Bridge site in Bojayan Khola at Ch 1+400



Proposed Bridge site in Lungri Khola at Ch 0+250 Affected Foot trail at Chainage 0+980

Annex XIV: Summary of Cross Drainage Structures

Summary of Drainage works along the road alignment

Chainages	Necessary Structures for Mitigation Measures
0+250	Bridge at Lungri khola
0+300	cross-drainage structure
0+650	200m side drain on right sides
0+850	Dry stone causeway
0+950	Dry stone causeway
1+220	70m side drain on both sides
1+400	Bridge at Bojayan khola
1+500	Dry stone causeway
1+960	Dry stone causeway
2+600	150m catch drain on right sides
2+810	Dry stone causeway
2+867	Dry stone causeway
4+500-4+900	side drain on right sides
4+800	Dry stone causeway
5+480-5+570	90m side drain on right sides
6+820-6+920	side drain on right sides
7+355	Dry stone causeway
8+110-8+510	side drain on right sides
8+510-10+00	side drain on left sides
10+020+11+700	side drain on left sides
12+800	PCC Causeway, management of water seepage problems
14+550	Management of kulo at right side
20+900	pipe cross drainage for disposal of excess water from water tap
20+950	irrigation canal (kulo) crossing
21+200	drystone causeway
21+900-23+100	sidedrain at right sides
25+100	drystone causeway
25+170	Side drain management
25+440-26+000	sides drain on both sides
25+460	cross drain(kulo)
25+589	cross drain(kulo)
27+050-27+200	side drain on right sides.
27+268	cross drian(kulo)
27+325	cross drian(kulo)
27+782.48-28+012	side drain on left sides
28+305	cross drian(kulo)
28+451	cross drian(kulo)
28+470	drystone causeway
28+547	drystone causeway
29+320	cross drian(kulo)
29+258-29+860	irrigation canal on bith sides of road
29+000-29+500	irrigation canal on bith sides of road
31+300	drystone causeway
32+600	drystone causeway
33+020	side drain on right sides
34+500-35+022	irrigation canal on both sides

Source: Field Survey, July 2009

Annex XV: Structure for Slope Stabilization

Recommended structures necessary for slope stabilization at various places

Chainages	Necessary structures/Mitigation Measures
0+900	Need check wall at D/S beyond retaining wall.(4m*7m) and U/S both
2+160-2+190	Need gabion breast wall (GBW) at upper side(4m*30m)
0+680-0+692	3m*12m dry wall
1+300+1+400	2m*100m breast wall on ride side and dry wall on left side
1+700-1+900	2m*200m gabion breast wall (GBW) on right side
1+930-1+980	2m*200m gabion breast wall (GBW) on right side and provide gabion structure on left side
2+220-2+250	6m*30m gabion retaining wall on left side and breast wall on right side
2+300-2+370	3m*70m breast wall on right side
2+380-2+400	6m*20m gabion toe wall on left side
2+500-2+680	3m*180m gabion breast wall
2+870-2+290	Required gabion check wall at D/S0.8m*20m and rectification of existing check wall with extension at U/S (U shape)
2+940-3+012	3m*72m gabion breast wall on right side and gabion retaining wall
3+110-3+200	3m*90m breast wall
3+400-3+560	2.3m*160m gabion work on left side and breast wall on right side
3+610-3+660	1m*50m dry wall on left side
4+300-4+400	2*200m gabion wall on left side and breast wall on right sides
4+780	2m*30m gabion retaining wall on left side
4+850	4m*40m gabion retaining wall on left side
4+900	5m*8m gabion retaining wall on left side
7+200-7+270	1m*70 m dry wall on both sides
7+420-7+440	2m*40 m Dry wall
7+790	3*10m gabion wall
8+100-8+150	1m*50m dry wall
9+120-9+170	1m*50m dry wall
10+900-10+000	2m*100m breast wall
12+000-12+100	1m*100m dry wall
15+500-15+550	2m*50m breast wall
18+480-18+500	4m*20m gabion wall
22+100-22+150	3m*50m breast wall
25+790-25+830	1m*40m dry wall on left side
32+280-32+500	2m*320m gabion works on right side
34+140-34+200	1m*60m dry wall

Source :Field Survey, July 2009

Annex XVI: DDC Meeting Minutes

[illegible][illegible][illegible]

Annex XVII: Focused Group Discussion Meeting Minutes

$$\frac{1}{\sqrt{10}} \approx 0.316227766$$
[illegible]

क्र.सं.	नाम	पद	विवरण	दिनांक
1	श्री 1 विद्या	विद्यार्थी	विद्यार्थी	1/1/19
2	श्री 2 विद्या	विद्यार्थी	विद्यार्थी	2/1/19
3	श्री 3 विद्या	विद्यार्थी	विद्यार्थी	3/1/19
4	श्री 4 विद्या	विद्यार्थी	विद्यार्थी	4/1/19
5	श्री 5 विद्या	विद्यार्थी	विद्यार्थी	5/1/19
6	श्री 6 विद्या	विद्यार्थी	विद्यार्थी	6/1/19
7	श्री 7 विद्या	विद्यार्थी	विद्यार्थी	7/1/19
8	श्री 8 विद्या	विद्यार्थी	विद्यार्थी	8/1/19
9	श्री 9 विद्या	विद्यार्थी	विद्यार्थी	9/1/19
10	श्री 10 विद्या	विद्यार्थी	विद्यार्थी	10/1/19
11	श्री 11 विद्या	विद्यार्थी	विद्यार्थी	11/1/19
12	श्री 12 विद्या	विद्यार्थी	विद्यार्थी	12/1/19
13	श्री 13 विद्या	विद्यार्थी	विद्यार्थी	13/1/19
14	श्री 14 विद्या	विद्यार्थी	विद्यार्थी	14/1/19
15	श्री 15 विद्या	विद्यार्थी	विद्यार्थी	15/1/19
16	श्री 16 विद्या	विद्यार्थी	विद्यार्थी	16/1/19
17	श्री 17 विद्या	विद्यार्थी	विद्यार्थी	17/1/19
18	श्री 18 विद्या	विद्यार्थी	विद्यार्थी	18/1/19
19	श्री 19 विद्या	विद्यार्थी	विद्यार्थी	19/1/19
20	श्री 20 विद्या	विद्यार्थी	विद्यार्थी	20/1/19

प्रश्नोत्तर :-

- (1) तातावरणीय व्यवस्था सफल होती है।
- (2) खूब खर्च पड़ने के कारण खर्च बढ़ा।

निर्णय नं. 9.

प्रश्नानुसार नं. 9 माथे सलफल गर्दी मिमिड-गाम
खूब खर्च पड़ने के कारण खर्च बढ़ा।
किंतु नकारात्मक उत्तर नपने निर्णय गरिजे।

निर्णय नं. 2

प्रश्नानुसार नं. 2 माथे सलफल गर्दी खूब
खर्च पड़ने के कारण खर्च बढ़ा।
2. खर्च बढ़ने के कारण खर्च बढ़ा।
2. खर्च बढ़ने के कारण खर्च बढ़ा।

निर्णय

कार्यनामिका हो

गंगादेवी

सुनीलजी धने

प्रश्न

प्रश्न

आज दिनि २०६५/०८/१८ गते अक्सनोर् को बिच लवने
 २. पैका वल्लीमा ग्रामीण पुर्ननिर्माण तथा पुर्नस्थापना
 आयोगना (RRRSDP) का बजेट को उत्रे आयोगना
 प्रिभिट्टि कविमार् - वडमोर् - गुम्वान - टाउण्ड - सिद्धी - गाम
 लाक खण्ड को गड्डा सेलावाट आरम्भिक कामकाजमा
 लाग्न लगे गने अथवा अक्सनोर् अतिक्रान्त भए पने पैका
 वल्ली का बाबिदालाई राखी for use के वृत्तांत दिखाने
 गरी इलाकला गरी उपस्थिति कविमार् निर्माण गरीमा ।

क्रमांक	विवरण	माप	माप	माप
१	पिपल - विपल	पिपल - १०	पिपल	पिपल
२	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
३	पिपल - विपल	पिपल - १०	पिपल	पिपल
४	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
५	पिपल - विपल	पिपल - १०	पिपल	पिपल
६	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
७	पिपल - विपल	पिपल - १०	पिपल	पिपल
८	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
९	पिपल - विपल	पिपल - १०	पिपल	पिपल
१०	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
११	पिपल - विपल	पिपल - १०	पिपल	पिपल
१२	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
१३	पिपल - विपल	पिपल - १०	पिपल	पिपल
१४	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
१५	पिपल - विपल	पिपल - १०	पिपल	पिपल
१६	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
१७	पिपल - विपल	पिपल - १०	पिपल	पिपल
१८	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
१९	पिपल - विपल	पिपल - १०	पिपल	पिपल
२०	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
२१	पिपल - विपल	पिपल - १०	पिपल	पिपल
२२	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
२३	पिपल - विपल	पिपल - १०	पिपल	पिपल
२४	पिपल - पुनर्निर्माण	पिपल - १०	पिपल	पिपल
२५	पिपल - विपल	पिपल - १०	पिपल	पिपल

प्रस्ताव नं. १

- (१) बालावर्णीय सम्पत्ति इलाफल गर्ने सम्भवता।
(२) स्टाक खन्दा पहिलो बोलने उपान सम्भवता।

निर्णय नं. १

निर्णय नं. १.

प्रस्ताव नं. १ माथि इलाफल गर्दा भिन्नित-
आम स्टाक खन्दा यस बोलकोर मा भविष्य मा कुनै पनि र-
विशिमको नकारात्मक असर नपर्ने निर्णय गरियो।

निर्णय नं. २

प्रस्ताव नं. २ माथि इलाफल गर्दा स्टाक खन्दा
पहिलो बोलको लागि BSE-Engineer र Rone
plantation लगायत पर्ने निर्णय गरियो।

समाप्ति

चित्तक. बिष्ट
सहस्रमन्त्री के. सी. मोरिस
उपमन्त्री मन्त्री
पुनः

[illegible]

क्र.सं.	नाम	हस्ताक्षर	पद	हस्ताक्षर
१	रमेश महारु विष्णु	मिर्मिडा - १	उपाध्यक्ष	उपाध्यक्ष
२	दुर्गा कुमारी पुन	हारदु - ६	वि. सचिव	उपाध्यक्ष
३	विमल भाषा पुन	" "	वि. सदस्य	विमल भाषा
४	जागिरेदार पुन	" "	प्रतिनिधी	२५
५	रिखा पुन	" "	"	२६
६	रं. पुन	" "	"	२७
७	दुर्गा महारु पुन	" "	वि. सदस्य	२८
८	रमिता वि. क.	" "	"	२९
९	रमलका देवी गुल्ल.	शुद्धी ६	वि. सदस्य	३०
१०	देवनाथ शुभा	शुद्धी ६	उपाध्यक्ष	३१
११	सरोज देवी	" ६	सचिव	३२
१२	रमलका वि. क.	हारदु - ६		३३
१३	कुमान गुल्ल.	६ - ६		३४
१४	रमिता रं. देवी	" ६		३५
१५	मि. व. वि. क.	" ६	सचिव	३६
१६	रमलका पुन	" ६	सचिव	३७
१७	रं. देवी	" ६		३८
१८	मि. व. वि. क.	" ६		३९
१९	रमलका देवी	" ६		४०
२०	वि. क. वि. क.	६ - ६	सचिव	४१
२१	रं. देवी	हारदु १६		४२
२२	रमलका देवी	" ६		४३
२३	वि. क. वि. क.	" ६		४४
२४	रमलका देवी	हारदु ६		४५
२५	वि. क. वि. क.	हारदु - ६		४६
२६	रमलका देवी	६ - ६		४७

प्रस्तावद्वयः

- (१) दयातावरणीय सम्बन्धि दस्तावेज गैर सम्बन्धित।
- (२) सड़क खनद पहिरो रोक्के उपाय सम्बन्धित।

निर्णयद्वयः

निर्णय नं० १.

प्रस्ताव नं० १ माघि दस्तावेज गैर सम्बन्धित।
निर्णय - गाम सड़क खनद यस्तु हजिडा गा० वि० स० को
दयातावरणीय कुनै पनि किसिमको नकारात्मक असर
नपर्ने निर्णय गरियो।

निर्णय नं० २.

प्रस्ताव नं० २ माघि दस्तावेज गैर सम्बन्धित।
क्षेत्रको सड़क खनद पहिरो रोक्के लागे ~~सडक~~
हजिडा गा० वि० स० २ Road ३ Plantation लगाउनु
पैने निर्णय गरियो।

सुलेमान

समिता

जुह

रवि बहादुर

प्रेम

रामेश्वर

क्र.सं.	नाम	वर्ग	प्राप्ति	वर्ग	वर्ग
१	विष्णुभाय पुनः	कृषी	४	कृषी	कृषी
२	रामविनायक पुनः	"	४	"	रामविनायक
३	धनपिकाशा वि.क.	"	४	"	"
४	गुणीवहाड उडा	कृषी	२	"	गुणीवहाड
५	नयभाय पुनः	"	३	"	"
६	राम देहावहाड वि.क.	"	३	"	देहावहाड
७	रामु मी.राम	कृषी	२	कृषी	रामु
८	रामदेव ल. गुरुड.	"	२	"	रामदेव
९	मंगलम गुरुड.	"	२	कृषी	मंगलम
१०	कुलावहाड कुडा	"	२	"	कुलावहाड
११	विनायक देहावहाड	"	२	"	विनायक
१२	मोमलीर वि.क.	"	२	"	मोमलीर
१३	देहावहाड घरी	"	२	"	देहावहाड
१४	विनायक वि.क.	"	२	"	विनायक
१५	वि.क. पुनः	"	६	"	वि.क.
१६	देहावहाड पुनः	"	६	कृषी	देहावहाड
१७	मंगलम वि.क.	"	६	"	मंगलम
१८	गणेश वि.क.	"	६	"	गणेश
१९	लक्ष्मण वि.क.	"	६	"	लक्ष्मण
२०	मंगलम कुडा	"	६	"	मंगलम
२१	देहावहाड पुनः	"	९	कृषी	देहावहाड
२२	देहावहाड घरी	कृषी	६	कृषी	देहावहाड
२३	देहावहाड कुडा	"	२	"	देहावहाड
२४	देहावहाड घरी	"	२	"	देहावहाड
२५	गणेश गुरुड.	"	४	"	गणेश
२६	मंगलम वि.क.	"	४	"	मंगलम
२७	उडा ल. गुरुड.	"	४	"	उडा
२८	देहावहाड मंगल	कृषी	६	"	देहावहाड

प्रस्तावः

- (क) वातावरणीय सम्बन्धि कृषि कार्य करने सम्बन्धी ।
(ख) सड़क खनद पट्टी रोक्ने उपाय सम्बन्धी ।

निर्णयः

निर्णय नं. १-

प्रस्ताव नं. १ माथि हलफन जर्दी यस्त
मिफिड - गा.स. सड़क खनद यस्त स्थरी आबलिमि
को वातावरणमा कुनै पनि लिखिमको नकारात्मक असर
नपर्ने निर्णय गरियो ।

निर्णय नं. २-

प्रस्ताव नं. २ माथि हलफन जर्दी यस्त
क्षेत्रको सड़क खनद पट्टी रोक्नका लागि ७.२०-
८.०० मीटरको रोड प्लान्टेसन लगाउनु
पर्ने निर्णय गरियो ।

रजिस्ट्रार
गणेश
रजिस्ट्रार

वेगम
गा.स.स.

सड़क रोक्नका लागि

आज दिनि 20-6/05/29 गरी आ गाम को किल वली
 9. पोखरा वलीमा उमरीग डुबिगिल रमा भुव (जावन)
 आमाजना (RERSAP) कानगी को उय आकोषना
 मिमि रानिगत - 931-गौद - गुम्बस - हावैरु - बिबुली - गाम
 पल्लु सल को 7257 ओलीवाट मारमिगल लमावलीम
 लान लने गने कन आ गाम गमिदि र मा वने पोखरा
 वली का लानिवाला वली विपुल group discussing
 गरी इलाफल गरी लमावली रानि विनि गरीपी 1

क्र.सं.	नाम	प्रा.सं.	प्रा.सं.	प्रा.सं.
1.	अरु लुङगागर	11	11	11
2.	अरु लुङगागर	11	11	11
3.	अरु लुङगागर	11	11	11
4.	अरु लुङगागर	11	11	11
5.	अरु लुङगागर	11	11	11
6.	अरु लुङगागर	11	11	11
7.	अरु लुङगागर	11	11	11
8.	अरु लुङगागर	11	11	11
9.	अरु लुङगागर	11	11	11
10.	अरु लुङगागर	11	11	11
11.	अरु लुङगागर	11	11	11
12.	अरु लुङगागर	11	11	11
13.	अरु लुङगागर	11	11	11
14.	अरु लुङगागर	11	11	11
15.	अरु लुङगागर	11	11	11
16.	अरु लुङगागर	11	11	11
17.	अरु लुङगागर	11	11	11
18.	अरु लुङगागर	11	11	11
19.	अरु लुङगागर	11	11	11
20.	अरु लुङगागर	11	11	11
21.	अरु लुङगागर	11	11	11
22.	अरु लुङगागर	11	11	11
23.	अरु लुङगागर	11	11	11
24.	अरु लुङगागर	11	11	11
25.	अरु लुङगागर	11	11	11
26.	अरु लुङगागर	11	11	11
27.	अरु लुङगागर	11	11	11
28.	अरु लुङगागर	11	11	11
29.	अरु लुङगागर	11	11	11
30.	अरु लुङगागर	11	11	11
31.	अरु लुङगागर	11	11	11
32.	अरु लुङगागर	11	11	11
33.	अरु लुङगागर	11	11	11
34.	अरु लुङगागर	11	11	11
35.	अरु लुङगागर	11	11	11
36.	अरु लुङगागर	11	11	11
37.	अरु लुङगागर	11	11	11
38.	अरु लुङगागर	11	11	11
39.	अरु लुङगागर	11	11	11
40.	अरु लुङगागर	11	11	11
41.	अरु लुङगागर	11	11	11
42.	अरु लुङगागर	11	11	11
43.	अरु लुङगागर	11	11	11
44.	अरु लुङगागर	11	11	11
45.	अरु लुङगागर	11	11	11
46.	अरु लुङगागर	11	11	11
47.	अरु लुङगागर	11	11	11
48.	अरु लुङगागर	11	11	11
49.	अरु लुङगागर	11	11	11
50.	अरु लुङगागर	11	11	11

प्रस्तावः :

- (५) वाराणसीय स्वतन्त्रि क्लब्स गैर सम्मान ।
(६) सडक खन्दा पहिले रोक्के कुपाय सम्मान ।

निर्णयः ।

निर्णय नं. १.

प्रस्ताव नं. १ माथि क्लब्स गर्दा मसु
मिफिडा - गाभ सडक खन्दा मसु गाभ गणतन्त्र सड
को वातावरण कुनै पनि लिमिटेड नकारात्मक
असर नपने निर्णय गरियो ।

निर्णय नं. २

प्रस्ताव नं. २ माथि क्लब्स गर्दा
मसु क्षेत्रको सडक खन्दा पहिले रोक्के लाग्ने
घरे - Engineering र Road Construction
मसु लगाउनु गैर निर्णय गरियो ।

रामकुमार उज्जर
मानसिंह बस्ती
नरेश्वर शर्मा
देउसी बस्ती