

# Environmental Assessment Document

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## Initial Environmental Examination

Grant Number: 0093 NEP

July 2011

## Nepal: Rural Reconstruction and Rehabilitation Sector Development Program

## Karki-Kol-Hukam-Maikot Road Subproject, Rukum 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)**  
  
of  
  
**Kakri-Kol-Hukam-Maikot Road Sub-Project**  
(Rukum District, Nepal)

Submitted to:

**Ministry of Local Development  
Government of Nepal**

Proponent:

**District Development Committee/  
District Technical Office  
Rukum District**

July, 2011

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Prepared By:  
**District Project Office, Rukum**

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## ABBREVIATIONS

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

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## NAME AND ADDRESS OF THE PROPONENT

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### Name of Proposal

New Construction of Kakri- Kol- Hukam- Maikot Road Subproject, Rukum District

### Name and Address of Proponent

District Development Committee (DDC), District Project Office (DPO), Rukum District

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## EXECUTIVE SUMMARY

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### Background

Government of Nepal has received financial assistance from ADB, DFID, SDC 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 32.74 km long Kakri- Kol- Hukam- Maikot Road in Rukum District is one of the Subprojects selected under the RRRSDP which is proposed for new construction in earthen standard.

### The Proponent

The District Development Committee (DDC)/District Technical Office(DTO), Rukum is the implementing agency at the district level under RRRSDP and the proponent of the Initial Environmental Examination (IEE) study for the construction of Kakri- Kol- Hukam- Maikot road sub-project.

### Objectives of IEE Study

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

### Relevancy of the Proposal

The project area lies in remote and underdeveloped South-Eastern part of the Country within Rukum District, the area has high potential in production of apple, chiuri, vegetable, milk and other Agricultural Product. The proposed Subproject will provide access to district headquarter, It helps to connectivity to the other parts of the country. The proposed road will enhance access to market and social services to the people of the area, and will significantly contribute in their socio-economic development. Better access will also open door to new development opportunities.

### 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 April/May 2009. The survey methods included walk-through survey along the proposed alignment with checklists, conduction of sample household survey, organizing focus group discussions (FGD) in the related VDCs, and information supplemented by the resettlement and technical team of the Subproject.

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

### Existing Environmental Condition

The road starts from Kakri at Kakri VDC and ends at Okhma of Kol VDC. Various kinds of rock such as Schist, Quartzite, Gneiss, migmatites, augen-Gneiss etc. were observed along the road alignment. Generally, residual soil and colluvial soil are found along the road alignment. Main waterbody found across the road alignment is Uttarganga River. Ambient air and water quality in the proposed subproject area is found to be good and there's also no noise pollution. The road mainly passes through cultivated land, forest, barren land and settlements.

The dominant forest species found in the road alignment are Salla (*Pinus roxburghii*), Cheure (*Bassia butyracea*), Uttis (*Alnus nepalensis*), and the main NTFP species found along the road alignments are Amriso (*Thysanolaena maxima*), Barro (*Terminalia bellirica*), Chiraito (*Swertia chirayta*), Majitho (*Rubia manjith*), Harro (*Terminalia chebula*), Okhar (*Juglans regia*), Aaru (*Prunus Persica*), Banana (*Musa Nepalensis*) and Lapsi (*Choerospondias axillaries*). Jackal (*Canis aureus*), Squirrel (*Ratufa Indica*), Ban biralo (*Felis Chaus*), Malsapro (*Martef Flabigula*) are the wild animals reported in the forests of proposed road area. Similarly birds are Laughing Dove (*Streptopelia senegalensis*), Crow (*Corvus splendens*), Bhyakur - Eye – browed Thrush (*Turdus obscurus*), Peacock (*Hubaropsis Bengalensis*), Hutityau (*Tringa hypoleucos*). The road does not fall under any protected or buffer zone area.

There are 8 major settlements along the Zol of Kakri, Kol and Taksera VDCs total population of 6232 persons (1187 households) and average family size of 5.25. Diverse ethnic groups such as Chhetri, Brahman, Thakuri, Dalit and Magar live along the Zol of road alignment.

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

### **Beneficial Impacts**

The development efforts particularly the development of transportation network will have multifold beneficial impacts. The immediate beneficial impacts from road development are apparent in the construction phase like there will be various employment opportunities (27,660 skilled and 120,700 unskilled person days) for the local population, supports for the transfer of construction work skills and technical know-how to the local workers.

During operation stage, an improved road access will bring an improvement of food security situation and overall economic and social stability. The road will also provide cheap, safe and fast transport of goods and services from rural areas to urban centers and vice versa. The farmers will be more interested to increase agricultural production due to market accessibility. This will contribute significantly to increase the productivity in rural areas and eventually improve the overall socio-economic condition of the people. Once this road is on operation, trade and business activities will be further promoted. There is a possibility of increased economic opportunities and significant growth and extension of the local markets along the road alignment like in Kakri, Kyubang, Falne, Tallosera, Takagaun, Bachhigaun, Birgum, and Okhama. In addition, construction of road will lead to appreciation of land values particularly near the market and settlement areas.

### **Adverse Impacts**

The physical adverse impacts during construction will be due to change in land use, slope instability and air, dust and water pollution, quarry sites and spoil disposal. No trees will be affected during construction of road.

The adverse physical impacts during road operation are slope instability and management, air and noise pollution, road safety. Likewise, biological impacts are depletion of forest resources and disturbance to wildlife. Socioeconomic impacts are due to new settlement and market center development, change in social behavior etc. Construction of road will convert agricultural land (4.20 ha), barren land (11.8 ha), forest land (1.91 ha) and built up area (0.87 ha) into road structure. The construction of road will affect 3 residential houses (Ch. 4+850, 22+276 and 13+950), 1 Cattle Shed (Ch. 5+550) and 1 Water Mill (Ch. 22+331) which will be compensated according to resettlement plan.

## Mitigation Measures

The various benefit augmentation measures and adverse impact mitigation measures have been proposed in the report to make this project environment friendly. Other than land donated by local people for the projects, adequate compensation will be provided to affected poor and marginalize household for all the lands that need to acquire. The construction of road will be based on Labour-based, Environment friendly and Participatory (LEP) Approach. Affected families will be given high priority for employment and skill development trainings. Necessary measures will be taken to reduce the adverse effects that might arise from site clearance, cutting of slopes, disposal of spoils and quarrying activities. Necessary trainings and awareness programs will be conducted. Necessary measures will be adopted for protection of flora and fauna. At construction site, the workers will be provided insurance, first aid facilities and safety equipments. Roadside plantation shall be done along the RoW. 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.

The study recommends the site-specific protection of slopes at landslide and erosion affected sites, DDC and Village Development Committees (VDCs) shall be facilitated and trained in monitoring and controlling the emergence of roadside settlements to avoid haphazard encroachment along the road alignment, and to minimize the risk of landslides and air (dust), water pollution and noise level.

## 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	
2	Insurance of workers	500,000.00	
3	Bio-engineering and Roadside tree plantation cost	3,134,950.48	
4	Resettlement and Land Acquisition	5,104,302.82	
5	Restoration or relocation of affected infrastructures, Spoil management, Reinstatement of quarry, stockpiling etc.	1,000,000.00	
6	Compensatory Plantation	950,150.00	
7	Social Action Plan Cost	967,000.00	
8	Occupational health and safety	500,000.00	
9	Information signboard	100,000.00	
10	Monitoring	200,000.00	
	<b>Total</b>	<b>12,656,403.30</b>	

### **Conclusion and Recommendation**

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

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# 1. INTRODUCTION

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## 1.1 Background

1. The Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) covers 20 districts spread over the country, which focuses on immediate post conflict development priorities for accelerated poverty reduction and inclusive development, thereby enhancing the effectiveness and efficiency of the delivery of public services, and improving access of rural people to economic opportunities and social services. The RRRSDP is financed by the Government of Nepal (GoN), Asian Development Bank (ADB), Department for International Development (DFID), Swiss Development Cooperation (SDC), Nepal and OPEC Fund for International Development (OFID). Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) under the Ministry of Local Development (MLD) is the executing agency (EA). The DDCs are the Project Implementing Agencies and the DTO of each respective DDC is responsible for technical and project management. The DTO will be supported by District Implementation Support Team (DIST) which includes engineering, safeguards and social mobilization. Rukum District is one of the project districts under RRRSDP. This Proposal is for new construction in earthen standard of the 32.74 Km long Kakri- Kol- Hukam- Maikot road in Rukum District.

## 1.2 The Name and Address of Proponent

Name of Proposal : New Construction of Kakri- Kol- Hukam- Maikot Road Subproject,  
Rukum District, Nepal  
Name of Proponent : District Development Committee, District Technical Office, Rukum  
Address of Proponent : Khalanga, Rukum District  
Phone No: 088-680063/019-657004  
Fax No: 088-649091/019-657005

## 1.3 Needs and Objectives of the IEE Study

2. **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.

**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 whether the IEE or EIA is required for the proposed road sub-project.

## 1.4 Methodology adopted for IEE study

3. The IEE study has followed the provisions of the EPA, 1997 and EPR, 1997, the provisions of ADB and approved ToR for IEE Study by MoLD on 2066/02/25 BS. It follows methodology suggested in the approved Terms of Reference for IEE Study (please refer Annex I). For the collection of environmental features related to bio physical environment, maximum 100 meter distance observable from the centre of the road alignment was taken as an influence area and socio-economic and cultural environment was taken of Zol (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 April/May 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.



## 1.5 Public Consultation

4. 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 1st of Shawan 2066 in the Gorkhapatra, a national daily newspaper seeking written opinion from concerned VDCs, DDC, schools, health posts and related local organizations (**see Annex V**). 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 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 in all three VDCs to collect and solicit their suggestion on protection of bio-physical and socio-economic and cultural Environment in the Zone of influence (ZOI) of the road. Summary of minutes of meeting with local people is given in **Annex IX** and following Table 1.1.
- Draft IEE report will be sent to Kakri, Kol and Taksera VDCs for public Disclosure. Recommendation letters were also obtained from above mentioned VDCs as given in **Annex X**. A copy of draft IEE will also be kept in information center of DDC, Rukum for Public disclosure. After reviewing draft IEE report and incorporating the suggestions from the concerned stakeholders, final IEE report will be prepared and sent to PCU for approval from MLD and ADB.

**Table 1.1: Summary of meeting minutes**

Location	Date	No of participants		Issues/Suggestions	Decision
		Male	Female		
Kakri gaun, Kakri VDC	2066/4/9	13	5	<ul style="list-style-type: none"> <li>• The construction activities shall not affect any infrastructure and any activity that causes soil erosion due to road construction shall be minimized with proper means.</li> <li>• Construction of road shall not have adverse impact on the culture and cultural assets of the communities.</li> <li>• The community building along the road alignment shall be protected from damage during the road construction.</li> <li>• Training for income generating activities should be provided to local People.</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructures along the road alignment shall be protected from damage as far as possible. However, any damage caused to the infrastructure shall be compensated and reinstated. Adequate slope protection measures will be taken.</li> <li>• Measures will be taken to protect the culture of the project area.</li> <li>• LEST trainings and other trainings will be provided under social plan of the project.</li> </ul>
Bachigaun, Taksera VDC	2066/4/11	7	6		
Falne, Kol VDC	2066/4/12	6	3		
Takagaun, Taksera VDC	2066/4/5	11	5		
Tallosara, Taksera VDC	2066/4/9	11	2		
Qubang, Kol VDC	2066/4/7	13	2		
Birgum, Kol VDC	2066/4/14	11	1		

## 1.6 Information Disclosure

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

1. District Development Committee, Rukum
2. District Technical Office, Rukum
3. District Project Office, Rukum
4. District Implementation Support Team, Rukum

5. Kakri, Kol and Taksera VDCs
6. Ministry of Local Development
7. Department of Local Infrastructure Development and Agricultural Roads
8. Project Coordination Unit, RRRSDP
9. Asian Development Bank, Nepal Resident Mission

## 2. DESCRIPTION OF PROPOSAL

6. The proposed new construction of Kakri-kol-Hukam-Maikot road lies in Rukum district of Mid Western Development region. Total length of this road is 32.74 Km. Kakri-kol-Hukam-Maikot (Kakri-Kol section) road starts from Kakri and ends at Okhma of Kol VDC. In between, the road passes through different settlements like Qubang, Falne, Tallosera, Takagaun, Baachigaun, Birkham of Kankri, Taksera and Kol VDCs. This road is the shortest possible corridor to link the district with the nearest road head at Rukumkot of Rukum district. Earthen road was constructed from Khalanga to Dhaune under GTZ in 2065 B.S. and from Dhaune to Kakri is underconstruction by DDC. This Road is given Priority no. I in class A Road in DTMP of Rukum district.

### **Salient Features of the Subproject:**

1. Name of the Project	: New construction of Kakri-Kol-Hukam-Maikot Road
1.1 Project Activities	Sub-Project : <i>Construction Stage:</i> Site clearance, Earthwork, Structural work (Toe wall, retaining wall, breast wall, Gabion, Masonry Wall), Bio-engineering, Cross drainage works and Side drain works. <i>Operation Stage:</i> Maintenance Works
2. Location	
2.1 Geographical Location	
2.1.1 District	: Rukum
2.1.2 Zone	: Rapti
2.1.3 Start Point	: Kakri of Kakri VDC
2.1.4 End Point	: Okhma of Kol VDC
2.2 Geographical Features	
2.2.1 Terrain	: Mountainous
2.2.2 Altitude	: 2100 m amsl to 2800 amsl
2.2.3 Climate	: Cool, Temperate
2.2.4 Soil	: Colluvial soil, residual soil and alluvial soil
3. Classification of road	: District road
4. Length of road	: 32.74 km
5. Standard of Pavement	: Earthen Road
6. Design Standard	
6.1 Road type	: Class 'A' District Road (Hilly)
6.2 Carriageway width	: 3.0 m
6.3 Shoulder width	: 1.0m (Either side of the road)
6.4 Total formation width	: 5.0m
6.5 Right of way	: 10.0 m (5m each side from centerline)
6.6 Design speed	: 20 km/h
6.6 Minimum radius of Horizontal curve	: 10m
6.7 Minimum radius of Vertical curve	: 20m
6.8 Maximum gradient	: 12%
6.9 Minimum gradient	: 1%
6.10 Cross Slope in carriageway	: 5%
6.11 Cross Slope in shoulder	: 5%
6.12 Lane	: Single
7. Major settlements	
7.1 Major settlements	: Kakri, Kyubang, Falne, Tallosera, Takagaun, Bachhigaun, Birgum, Okhama
7.2 No. of households	: 1187 HH
7.3 VDCs along the road	: Kakri, Taksera and Kol VDCs

8. Earthwork	
8.1 Cutting	: 267678 m <sup>3</sup>
8.2 Filling	: 69679 m <sup>3</sup>
9. Structural Works	
9.1 Proposed Gabion Retaining wall	: 6353 m <sup>3</sup>
9.2 Proposed Dry Retaining wall	: 6004 m <sup>3</sup>
10. Drainage Works	
10.1 Side Drain	: Earthen
10.2 Number of Slab culvert 6 m and 1 m span	: 2 and 71
10.4 30 cm HDPE for Irrigation Crossing	: 30 nos
11. Project Cost	
11.1 Total Cost	: NRS. 169,650,489.00
11.2 Per km cost	: NRS.5,181,749.00
13. Employment Generation	
13.1. Skilled	: 27,660
13.2. Unskilled	: 120,700
14. DTMP No	:

## 2.1 Relevancy of the proposal

7. Despite the project area being in remote and underdeveloped Mid-Western part of the Country within Rukum District, the area has high potential in production of apple, chiuri, vegetable, milk and other Agricultural Product. The proposed Subproject will provide access to district headquarter, It helps to connectivity to the other parts of the country. The proposed road will enhance access to market and social services to the people of the area, and will significantly contribute in their socio-economic development. Better access will also open door to new development opportunities.

## 2.2 Construction Approach and Activities

8. The construction approach will be Labour-based, Environment-friendly and Participatory (LEP) 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.

9. Activities to be carried under this subproject are Site clearance, Earthwork, Camber Correction, Structural work (Toe wall, retaining wall, breast wall, Gabion, Masonry Wall), Bio-engineering, Cross drainage works (Culvert, Hume Pipe) and Side drain works.

## 2.3 Proposed Schedule for Implementation of Sub-project

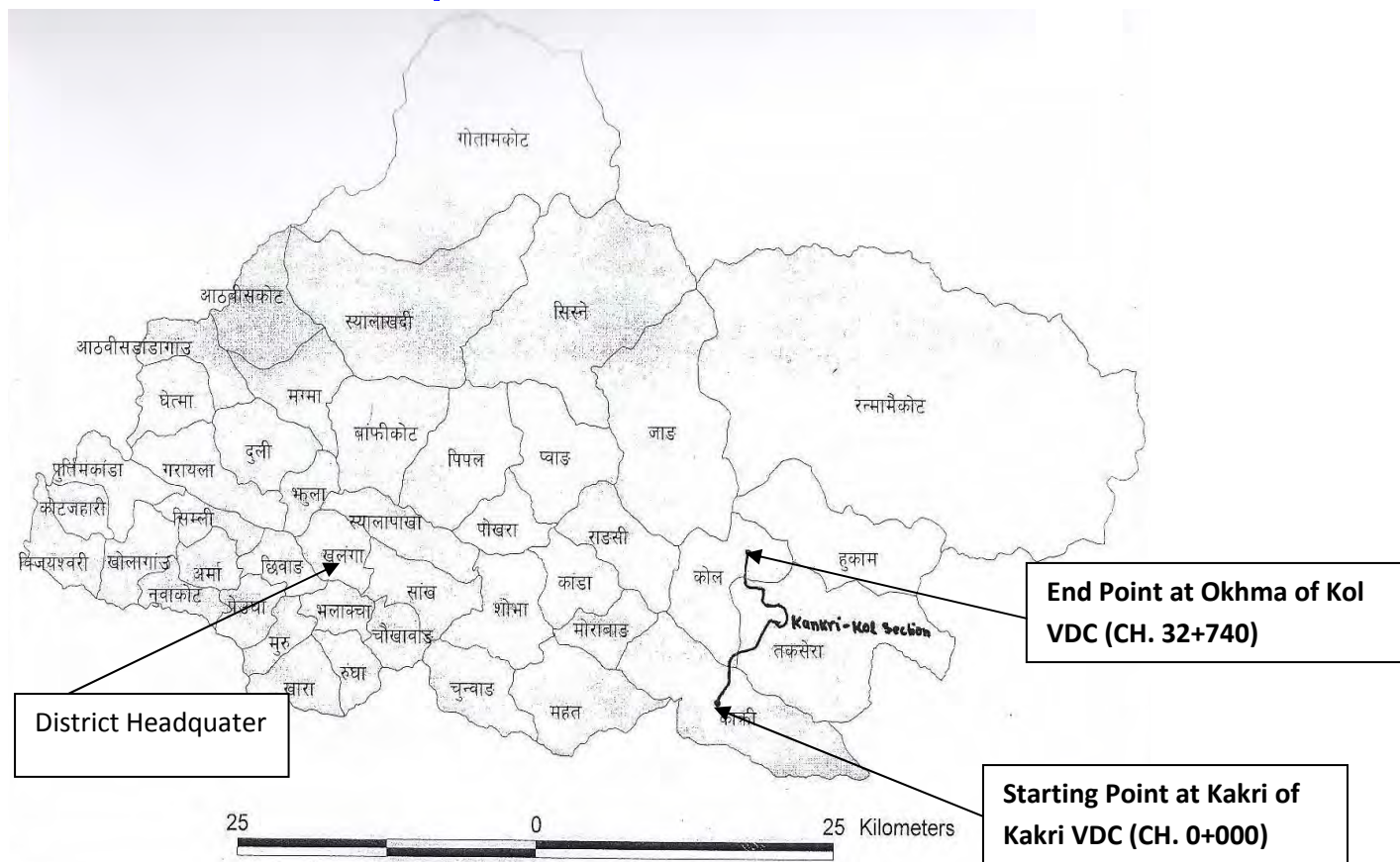
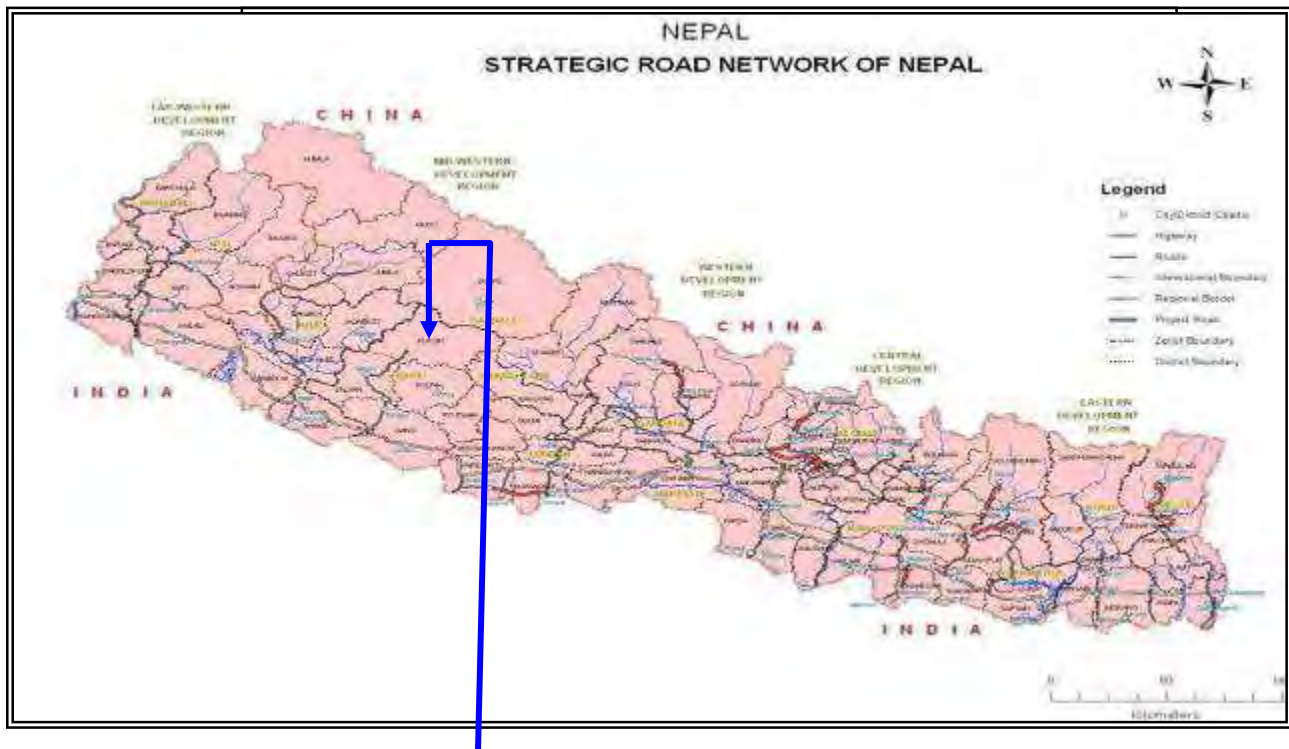
10. Following table shows the proposed implementation schedule for Kakri-Kol-Hukam-Maikot road sub-project:

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

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

Note: I - January, February, March  
II - April, May, June

III - July, August, September,  
IV - October, November, December



**Figure 2.1 Map of Nepal Showing Kakri- Kol-Hukam-Maiko t Road**



**Figure 2.2. Topo Map showing the alignment of Kakri-Kol-Hukam-Maikot Road**



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

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

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

SN	Environmental Acts, Regulations and Guidelines	Description of Requirements
1	Three Years Interim Plan, 2007/08-2009/10, GoN	Requires all projects will be formulated and constructed based on methods that optimally utilize the local skill and resources and generate employment opportunities.
2	Environmental Protection Act, 2053 BS (1997 AD), GoN	Any development project, before implementation, shall pass through environmental assessment, which will be either IEE or an EIA depending upon the location, type and size of the projects.
3	Environmental Protection Rule 2054 BS (1997 AD) (amendment, 2007), GoN	The EPR and its schedules clearly provide various step-wise requirements to be followed while conducting the IEE study. It also obliges the Proponent to timely consult and inform the public on the contents of the proposal and IEE study.
4	Forest Act, 2049 BS (1993 AD) (amendment, 2007), GoN	Requires decision makers to take account of all forest values, including environmental services and biodiversity, not just the production of timber and other commodities. It includes several provisions to ensure development, conservation, management, and sustainable use of forest resources based on approved work plan.
5	Forest Rules, 2051 BS (1995 AD), GoN	Elaborates legal measures for the conservation of forests and wildlife. Expenses incurred for cutting trees and transportation shall be borne by proponent.
6	<i>Batabaraniya Nirdesika</i> (Nepal; MLD), 2057, GoN	The directive is focused in the practical implementation of small rural infrastructures through the minimization of environmental impacts. This directive includes the simple methods of environmental management in the different phases of the project cycle.
7	Child Labor (Prohibition and Regulation) Act, 2056 (2000)	No child having not attained the age of 14 years shall be engaged in works as a laborer.
8	Local Self Governance Act 2055 BS (1999 AD) (1999) and Regulation 2055 BS (1999 AD), GoN	Empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities
9	Land Acquisition Act, 2034 BS (1977 AD) and Land Acquisition Rules, 2026 BS (1969 AD), GoN	Specifies procedural matters on land acquisition and compensation
10	National Environmental Impact Assessment Guidelines, 1993 (2050 BS), GoN	Provides guidance to project proponent on integrating environmental mitigation measures, particularly on the management of quarries, borrow pits, stockpiling of materials and spoil disposal, operation of the work camps, earthworks and slope stabilization, location of stone crushing plants etc.
11	APPROACH for the Development of Agricultural and Rural Roads, 1999 (2055 BS), GoN	Emphasizes labor based technology and environmental friendly, local resource oriented construction methods to be incorporated actively in rural infrastructure process.
12	RRRSDP Environmental	For preparation of environmental assessments of future subprojects under

	Assessment & Review Procedures (EARP), 2007, GoN	Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP), this EARP includes: i) The process to be adopted while preparing environmental reports, ii) the potential environmental impacts that could result from undertaking the Project based on the Initial Environmental Examinations (IEEs) of sample core subprojects; iii) the proposed mitigation measures to avoid the identified impacts; iv) institutional capacity assessment and strengthening arrangements; v) legal framework for environmental assessment, domestic and the Asian Development Bank (ADB) environmental assessment and review procedures; and finally vi) the approaches to be adopted during implementation of the Project in order to ensure that environmental aspects are dealt with in a comprehensive manner.
13	Reference Manual for Environmental and Social Aspects of Integrated Road Development, 2003 (2060 BS), GoN	Suggests stepwise process of addressing environmental and social issues alongside the technical, financial and others
14	Green Roads in Nepal, Best Practices Report: An Innovative Approach for Rural Infrastructure Development in the Himalayas and Other Mountainous Regions, 1999 (2055 BS), GoN	Focuses on participatory, labor based and environment friendly technology with proper alignment selection, mass balancing, proper water management, bioengineering and phased construction
15	Environmental Assessment Guidelines, 2003, ADB	Requires that environmental considerations be incorporated into ADB operations where environmental assessment is the primary administrative tool to integrate environmental considerations into decision-making of all types of development initiatives
16	Safeguard Policy Statement, 2009, ADB.	ADB's Safeguard Policy Framework consists of three operational policies on the Environment, Indigenous people and Involuntary resettlement. It requires that (i) impacts are identified and assessed early in the project cycle, (ii) plans to avoid, minimize, mitigate or compensate for the potential adverse impacts are developed and implemented and (iii) affected people are informed and consulted during project preparation and implementation.
17	The Interim Constitution of Nepal, 2063 (2007).	Has provision of right regarding environment - Every person shall have the right to live in clean environment.
18	The Labor Act, 2048 BS (1992 AD)	Regulates the working environment and deals with occupational health and safety.



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## 4. EXISTING ENVIRONMENTAL CONDITION

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

### 4.1 Physical Environment

#### 4.1.1 Topography

13. The altitude of the project area varies from 2100m to 2800m from amsl. The latitude of the project area is 28° 29' to 29° 00' and longitude of the project area is 82° 12' to 82° 53'.

#### 4.1.2 Geology and soil type

14. Geologically, the road alignment lies in in the Mahabharat Range. The road section comprises of different types of rocks: Schist, Quartzite, Gneiss, migmatites, augen-Gneiss. The road corridor falls in the Lesser Himalayan Sediments zone where the predominant soil types are residual soil and Colluvial deposits, which are extensively distributed along the hillslopes.

**Table 4.1: Types of soil recorded by survey team during field study**

S.N.	Chainage Range	Length (m)	Soil type
1	00+000 to 1+546	1546	Hard Soil
2	1+546 to 2+062	516	Hard Soil
3	2+062 to 2+826	764	Hard Soil
4	2+826 to 4+687	1861	Hard Soil
5	4+687 to 5+437	750	H.S 30%,M.R 70%
6	5+437 to 6+281	844	H.S 60%,O.S20%,S.R20%
7	6+281 to 7+312	1031	H.S 60%,O.S40%
8	7+312 to 7+875	563	H.S 60%,O.S40%
9	7+875 to 10+985	3110	H.S 60%,O.S.20%,S.R20%
10	10+985 to 12+540	1555	H.S 40%,M.R20%,O.S40%
11	12+540 to 14+137	1597	H.S 40%,M.R20%,O.S40%
12	14+137 to 17+200	3063	H.S 40%,M.R20%,O.S 40%
13	17+200 to 23+250	6050	H.S 45%,O.S25%,.H.R 30%
14	23+250 to 28+050	4800	H.S 45%,O.S25%,.H.R 30%
15	28+050 to 32+740	9520	H.S 55%,O.S25%,.H.R 20%

Source: Field survey, 2009

#### 4.1.3 Land use

15. Land use pattern of the area through which the road passes have been classified into four types: cultivated land, barren land, forest and built up area and which is listed in the **Table 4.2** below.

**Table 4.2: Summary of Land use pattern along the road alignment**

Land use	Total Length(m)	Area required (sq.m)	Area required (ha)
Cultivated land	8408	42040	4.20
Barren and Pasture land	23540	117700	11.8
Forest(community and private and government )	3822	19110	1.91
Built up area	1730	8650	0.87
<b>Total</b>	<b>37500</b>	<b>187500</b>	<b>18.78</b>

Source: Field survey, July, 2009

#### 4.1.4 Climate

16. Kakri-kol-Hukam-Maikot (Kakri-Kol section) road lies in Sub-Tropical and temperate climatic zones. Generally, rainy season starts from May and ends in August. The meteorological record shows unevenly distributed monsoon rain in the project area with the total average annual rainfall is 2000 mm. The maximum recorded temperature in Rukum district is around 34.40° Celsius and minimum temperature is 0.40° Celsius. (Source: District Profile of Rukum, 2061)

#### 4.1.5 Hydrology and Drainage System

17. The main river in the project area is Uttarganga River. Other rivers & kholsi lies in the alignment are as follows:

**Table 4.3: Rivers and Kholsi in the alignment**

SN	Chainage	Water stream name	Location	Remarks
1	5+185	Kholsi	Kakri	Spring-fed
2	18+467	Uttarganga river	Taksera	
3	18+900	Kholsi	Taksera	Spring-fed

Source: Field survey, 2010

18. The alignment of the road has been selected through safe route so that no erosion and flooding can affect the road stability. Furthermore, adequate number of cross drainage structures has been provisioned to have safe and fair weather mobility.

#### 4.1.6 Soil Erosion and Sedimentation

19. 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 areas but many small slides and erosions area are found along the road. The locations are Ch 0+500, 0+600, 0+900, 1+200, 5+220, 10+150, 11+100, 13+350, 13+850, 14+150, 15+530, 18+800, 20+500, 22+800, 28+200 and 30+020.

#### 4.1.7 Air, Noise and Water Quality

20. The air, noise and water quality are not tested, but are observed to be within acceptable limit. Only water in the local streams gets polluted with flash flood, which carries sediments with it during rainy season. No any significant causes of noise pollution are observed.

### 4.2 Biological Environment

#### 4.2.1 Vegetation

21. The road does not fall under any protected or buffer zone area.

22. The dominant species found in the forest area along the road alignment is Salla (*Pinus roxburghii*). The list of Plant species recorded during the field survey is listed in the **Table 4.4** below:

**Table 4.4 List of Plant species recorded during the field survey**

S.N.	Local Name	Scientific Name
1	Siris	
2	Salla	<i>Pinus roxburghii</i>
3	Gurans	<i>Rhododendron spp.</i>
4	Cheure	<i>Bassia butyracea</i>
5	Uttis	<i>Alnus nepalensis</i>
6	Dhupe	<i>Juniperus cummunis</i>
7	Baj	
8	Lapsi	<i>Choerospondias axillarias</i>
9	Katus	<i>Castanopsis indica</i>

Source: Field Survey, 2009

#### 4.2.1.1 NTFPs

23. Non timber forest products (NTFPs) are important resources of the country and play important role in changing the socio-economic condition of the rural people. The species of non-timber forest products available within the project area are presented in **Table 4.5**

**Table 4.5: Non timber forest product found in the road alignment and project area**

S.N.	Local Name	Scientific Name	Remark
1	Amriso	<i>Thysanolaena maxima</i>	
2	Barro	<i>Terminalia bellirica</i>	
3	Chiraito	<i>Swertia chirayta</i>	
4	Majitho	<i>Rubia manjith</i>	
5	Harro	<i>Terminalia chebula</i>	
6	Lapsi	<i>Choerospondias axillarias</i>	
7	Okhar	<i>Juglans regia</i>	
8	Banana	<i>Musa Nepalensis</i>	
9	Aaru	<i>Prunus Persica</i>	

Source: Field Survey, 2009

#### 4.2.1.2 Forest

24. The road alignment passes through Rika Community Forest from Ch. 3+200-6+880.

#### 4.2.2 Wildlife

25. The forest within the road corridor is sparse and managed by communities and DFO office. These forests provide habitats for several wildlife and bird species.

##### Mammals

26. Mammal species like Jackal (*Canis aureus*), Squirrel (*Ratufa Indica*), Ban biralo (*Felis Chaus*), Malsapro (*Martef Flabigula*) etc. are found in the project area.

##### Birds

27. The major bird species in the project area are Laughing Dove (*Streptopelia senegalensis*), Crow (*Corvus splendens*), Bhyakur - Eye – browned Thrush (*Turdus obscurus*), Peacock (*Hubaropsis Bengalensis*), Hutityau (*Tringa hypoleucos*).

##### Reptiles and Amphibians

28. According to the local people, species of snake named as Shirishe is found.

##### Fishes

29. The proposed road alignment intercepts mainly Uttarganga River. Sometimes migratory fishes species have been found in the project area.

##### Endangered and protected species

30. *Faunal species*: Among the fauna present in the forest area along the road alignment, Jackal (*Canis aureus*) is listed in Appendix III, Squirrel (*Ratufa Indica*) is listed in Appendix II of CITES.

31. *Floral Species*: Okhar (*Juglans regia*) are protected plant species according to Forest Act 1993 which is categorized into timber trees banned for felling, transportation and export for commercial purposes, Lapsi (*Choerospondias axillarias*) is listed as Rare Species in IUCN Red Data Book.

## 4.3 Socio-economic and Cultural Environment

### 4.3.1 Population, Household and Ethnicity

32. The total HHs and population within Zol along the road corridor is 1187 and 6232 respectively and the average house hold size is 5.25. The major ethnic groups found on the project area are Magar, Chhetri, Brahman, Dalit and Gurung.

**Table 4.6: Demographic Profile of VDCs**

SN	Name of Influence VDC	Total Household	Total Population	Household within ZOI	Population within ZOI
1	Kakri	927	4979	405	2175
2	Kol	628	3312	397	2092
3	Taksera	857	4373	385	1965
<b>Total</b>		<b>2412</b>	<b>12664</b>	<b>1187</b>	<b>6232</b>

Source: Field Survey, 2009

### 4.3.2 Main occupation

33. The main occupation of the people residing within the Zol of the proposed road alignment is agriculture and livestock. Due to limited transportation facilities and higher altitude, agriculture farming is not enough for subsistence level. Therefore, people are carrying out other economic activities like working in collection of herbal (most of local people), apple farming, involved in government and non government organizations, business, employment in foreign countries, labour and porters and cottage industries.

### 4.3.3 Public Services and Infrastructures

34. There are various social sector facilities and infrastructure in different settlements. Details about public services and infrastructures according to the settlements are as follows:

#### Education

35. The proposed project area consists of a total of 8 educational institutions ranging from primary level to college level education. Primary schools are found in all of the VDCs. The detail is given in **Annex XI b**.

#### Health Facility

36. In health sector, there is 1 Illaka Health Post in Kol and one each Sub-Health Post at Kakri and Taksera. For serious health problem, people go to district hospital in Khalanga & Nepalgunj also.

#### Communication

37. Regarding communication, V-Sat telephone facilities are available in Kankri, Qubang, Falne, Tallosera, Takagaun, Baachigaun, Birkham, Okhama etc

#### Electricity

38. Electricity facilities are not available in Project area. For the electric use to small power people have Solar power system in almost all households and for higher power people use people overthere has no option.

#### Business Facilities

39. There are grocery shops, tea stalls and lodges available in the majority of the settlements and number is more in potential market centers like Kankri, Qubang, Falne, Tallosera, Takagaun, Baachigaun, Birkham, Okhama etc.

#### Water Supply

40. People use near by stream water as major water source for drinking. Piped drinking water supply are also found in few settlements.

## **Irrigation**

41. Local farmers have managed themselves for the irrigation of their land on the basis of traditional technique, that is, from the irrigation channel originated from the seasonal springs and most part of the land depends upon the monsoon rain.

## **Other Infrastructures**

42. The man made infrastructure within the project area includes trails, mule tracks, irrigation systems, drinking water systems, bridges, schools, health posts, and drinking water systems

## **Financial Institutions**

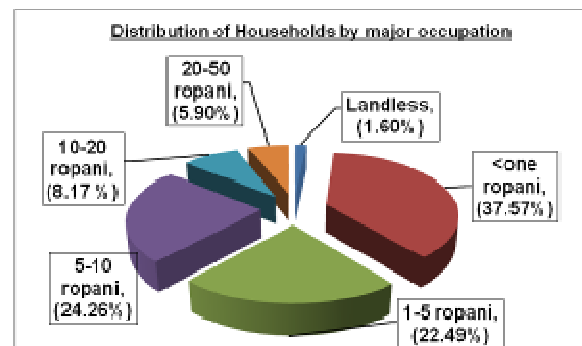
43. There is a Nepal Bank Ltd in Khalanga, District headquarter.

## **Community Development Facilities**

44. Community based organizations particularly, women saving and credit groups are found in three settlements. Play grounds, ghat (cremation site) and community centers are found in majority of the settlements.

### **4.3.4 Land holding pattern**

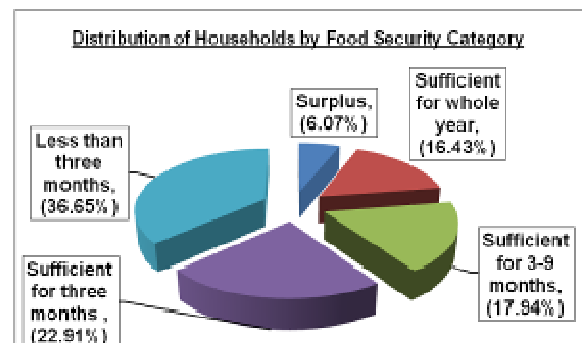
45. Land holding pattern within the Zol of the road project demonstrates that majority of households, 37.57 % have less than 1 ropani land (approximately 1 ha = 19.8 ropani), 22.49% households have 1 to 5 ropani land, 24.26% households have 5-10 ropani land, 8.17% households have 10 to 20 ropani land, 5.9% households have 20 to 50 ropani land where as landless are 1.6 %.



Source: Field survey, July 2010

### **4.3.5 Food Security**

46. Food security category within the Zol of the road project demonstrates that, 36.65 % household have food security for less than three months, 22.91 % households have sufficient food for 3 months, 16.43% households have sufficient food for whole year, 17.94 % households have sufficient food for 3 to 9 months where as 6.07 % households are food surplus ones.



Source: Field survey, July 2010

### **4.3.6 Migration pattern**

47. Permanent migration takes place in limited scale towards Terai and other places like Kathmandu. However, people migrate to foreign countries like India, Qatar, U.A.E, and Malaysia in search of employment opportunity almost from all the settlements. Seasonal migration occurs during slack farming season from Mangsir to Poush mainly in various parts of India. This shows poor economic status of the people in the proposed road corridor. This could be reduced by providing employment opportunities at the local level.

#### **4.3.7 Potential Development area**

48. The proposed road passes through a potential area for Rice cultivation and also potential for the production of different type of Herbal, Chhiraito, Ritha etc. All settlement are potential for tourism development.

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

49. There are Shiddi Mandir, Dhorala Thana, Chandrakot Mandir, Shiddabarahha Mandir, Shidda Thana, Bana Gufa, Bhagwati Mandir, Taka gaun and Charch Ghar within Zol of the the road alignment but not any cultural or religious sites are affected during road construction. Details of Historical and religious sites within Zol of the proposed project area are given in **Annex XVI**. This site is visited, and used for worship, by the local residents. However, they are not popular or famous outside the locality and this temple and religious site don't fall in the proposed road alignment and there displacement is not needed.

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## 5. PROJECT ALTERNATIVES:

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

### 5.1 No action alternatives

51. 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 Project Alternatives

52. Construction of other supporting roads could be the options for achieving the transportation and access. Considering other project alternatives, the proposed road project can be the best option to serve the purpose of efficient transportation requirement.

### 5.3 Alternative Route

53. During the course of Feasibility survey and design the following three alternative routes were assessed in the terms of technical, environmental, financial and social aspects. The three routes are:

Alignment I: Kakri-Upallo Seragaun-Bachhigaun-Okhma

Alignment II: Kakri-Kol-Hukam-Maikot (Okhma)

Alignment III: Kakri-Phalne-Tharpu-Birgum-Okhma

54. Among above three, **Alignment II** is most appropriate for technical as well as socio-economic & Environmental point of view due to following reasons.

- This alternative alignment passes through mostly stable land.
- Centre line of the road can be placed carefully to balance cut and fill in comparison with two remaining alignments.
- Minimum damage of vegetation & trees during construction in comparison with other two
- Have not large scale and highly unstable fragile zone along the route in comparison with two remaining alignments.
- This alignment touches more village settlements than other two alignments.

### 5.4 Alternative design and construction approach

55. The proposed road has been designed considering both the contractor and LEP approach for works possible through manual labour.

### 5.5 Alternative Schedule & Process

56. During the rainy season, the construction work is stopped to allow the natural compaction of the road 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

57. The physical resources consumed for the construction of the proposed road will mainly include boulders for gabions and stone for dry masonry wall, which will be available from identified quarry sites. The proposed construction will optimally use the local labor force and hence, the benefits will also be distributed locally.

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## 6. IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT; BENEFICIAL AUGMENTATION AND MITIGATION MEASURES

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58. The identification and assessment of impacts has been carried out by considering the proposed proposal activities in terms of construction and operation stage. The impact of the activities will be on physical, biological. Socio-economic and cultural resources within the Zol. The impacts generated are both beneficial as well as adverse. The environmental impacts have been identified for a number of issues based on the analysis of the environmental baseline information and activities that are to be undertaken (during construction, rehabilitation and subsequent operation phase). Most of the identified impacts have been quantified to the extent possible.

59. The impacts have been predicted in terms of their nature, magnitude, extent and duration. The possible impacts from the proposal during the construction and operation stages are presented as following:

### 6.1 Beneficial Impacts

#### 6.1.1 Construction Stage

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

60. *Impacts:* One of the major direct beneficial impacts during road construction stage is the creation of employment opportunity to the local community. 27,660 person days of skilled and 120,700 person days of unskilled manpower will be required for construction work. The amount of money earned as wages will directly support various economic activities of the people, and assist towards enterprise development with multiplier effect if wage is used for economic investments. This is one of the direct and significant impacts of the project but it is of short-term and local in extent.

61. *Measures:* Priority for employment will be given to local poor, dalit, vulnerable groups and women. They will be given training to do the job. Livelihood Enhancement Skills Training (LEST) program will be conducted (which include Apple production and marketing training, Walnut production and marketing, Advanced tailoring Training) and awareness programs. The costs of LEST program is allocated as NRs. 652,000 which is included in cost of Social Plan of the subproject.

##### **Skill Enhancement**

62. *Impacts:* Although many people in the project area are unskilled at present, the construction of road is likely to enhance their skills during 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 for long-term.

63. *Measures:* Members of the Road Building Group will be given training on masonry, netting wires and construction of gabion wall, slope cutting, bioengineering works. Proponent will conduct different trainings under Livelihood Enhancement Skills Training (LEST) program.

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

64. *Impacts:* During construction period, different types of commercial activities will come into operation in order to meet the demand of workers. Since they will have good purchasing power, they will regularly demand for different types of food, beverage and other daily necessary items. To meet these demands, many local and outside people may operate a number of small shops and restaurants around the vicinity



of the construction sites at Kakri, Qubhan, Falne, Okhma, Tallosera and Bachigaun. Various farm based enterprises including wide range of agricultural and livestock products will also gain momentum as a result of increased demand by labors during construction period. This will increase local trade and business in the area. This impact is direct, low significance, local and for short term.

65. *Measures:* Livelihood Enhancement Skills Training (LEST) program will be conducted (which include Apple production, walnut production and advanced tailoring trainings) and awareness programs. The costs of these training under LEST programs are allocated as NRs. 652,000 which is included in cost of Social Plan of the project.

### **Community Empowerment and Ownership**

66. *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 for short term.

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

### **Women Empowerment**

68. *Impacts:* Women 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.

69. *Measures:* Assist to organize women groups, provide training and social mobilization, provide micro-finance and encourage cooperatives to undertake commercial scale farming activities. Training will be organized according to Gender Action Plan (GAP), which includes trainings such as Legal and women human right literacy classes, Reproductive cum maternity health care orientation classes and Women leadership development training. The budget allocated for GAP is NRs. 195,000 which is included in Social Plan of the project.

### **6.1.2 Operation Stage**

70. Following beneficial impacts of the proposed road project are anticipated during the operational stage:

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

71. *Impacts:* Access to inputs and services is expensive and not regular at present due to unavailability of motorable road. Once the road is in operation, people would have cheaper and improved access to many inputs such as seeds, chemical fertilizer and technology leading to increased agricultural production and diversification. The current transportation of goods by porter will be substituted by vehicles with very less cost for many of the inputs that are used by farmers in the farm and other goods. This impact is direct, high, regional and for long term.

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

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

73. *Impacts:* When completed, road will bring more opportunities for the promotion of trade and business. Productivity will increase due to cheaper transportation of agricultural inputs. Sale of farm and livestock products will increase in the bigger markets of district headquarter of Rukum. This will ensure continuous flow of products and commodities to Kakri, Qubhan, Falne, Tallosera, Takagaun, Bachigaun, Birgum and Okhma market centers along the road. The impact will be indirect, high, local and long term.

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

### **Appreciation of Land Value**

75. *Impacts:* The construction of road will leads to appreciation of land values particularly near the market and settlement areas. The land price would increase due to the availability of reliable transportation facilities. Mainly the land value will increase in Kakri, Qubhan, Falne, Okhma Tallosera and Bachigaun. There will be rapid increase in the commercial production of agricultural crops due to road accessibility which is also a major factor to raise the land value. Financial institutions may accept their land as mortgage for lending. The impact is indirect, medium, local and for long term.

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

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

77. *Impacts:* Local people may spend more on health and sanitary facilities, education facilities and other community services due to reduced transportation cost. 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 will also encourage students to enroll in campuses for higher studies. People will get health services easily due to the regular and cheaper transportation facilities. This is indirect, significant, regional and long-term impact of the proposed project.

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

## **6.2 Adverse Impacts**

79. The proposed road project activities during construction and operation will create following adverse impacts on the local environment:

### **6.2.1 Construction Stage**

80. The proposed road will be constructed according to Contractor modality and LEP approach. The likely impacts on physical, biological, socio-economic and cultural resources of the proposed road area and respective mitigation measures are presented here under.

### **Physical Impacts**

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

81. *Impacts:* Construction of road will convert agricultural land (4.20 ha), barren land (11.8 ha), forest area (1.91 ha) and built up area (0.87 ha) into road structure. The impact will be high, direct, local and for long term.

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

#### **Spoil Disposal**

83. *Impacts:* Unmanaged disposal of spoil may cause: gullying and erosion of spoil tips especially when combined with unmanaged surface water runoff, damage to farm lands, and destruction of vegetation,

crops and may threat settlements. The impact from spoil disposal will be direct, high, local and for long term.

84. *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. Compaction and trimming the slope of disposed spoils and use of Bioengineering measures (Grass, Shrubs, Tree plantation). Potential safe spoil management areas are given in Table 6.1.

**Table 6.1 Potential Spoil Disposal Sites**

SN	Chainages	Recommended Spoil disposal sites
1	1+020	At kholsi near Kankri
2	3+200	lower side of Rikha height
3	5+200	At Kholsi near Qubhan
4	9+800	Lower side of Falne
5	15+300	At kholsi at Takagaun
6	18+000	Lower side of Takagaun
7	20+500	Near kholsi between Takagaun and Baachigaun
8	28+100	At Uttarganga River
9	32+300	Lower side of Baachigaun height

Source: Field survey, July 2010

### Slope Instability

85. *Impacts:* Removal of vegetation and open cuts with exposed soil to rain will cause soil erosion as well as landslide. The stability of slopes along the road corridor depends upon slope angle, the material constituting the slope, rock discontinuities and hydrological conditions. The degree of sliding increases during the road excavation and it may cause regular sliding during operational phase. These slides are still active and will undoubtedly cause more problems during monsoon period. The areas of concern with minor landslides are at Ch 0+500, 0+600, 0+900, 1+200, 5+220, 10+150, 11+100, 13+350, 13+850, 14+150, 15+530, 18+800, 20+500, 22+800, 28+200, 30+020. The impact is direct, medium, site specific and medium term.

86. *Measures:* Cut slope will be maintained depending upon the soil type; use of Bio-engineering techniques (Shrub/Tree plantation, Grass plantation, Brush layering); no construction work during rainy season; and use of soft engineering structures (dry wall, gabion wall) before disposing spoil. Recommended civil engineering structures and bioengineering measures necessary at various chainages for slope stabilization have been given in Annex XIV.

### Drainage Management

87. *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 for medium term.

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

### Air, Noise and Water Pollution

89. *Impacts:* The ambient air quality data of the project area is not available at present. The road construction work is carried out manually by the local labour. For rock cutting, hand tools will be used and if the rock is hard, drilling machine will be used. The road side dwellers and workers may be affected by

emission of dust during road construction. This may affect the health of the labourers and people living nearby areas. Impact on air quality will be direct, low, local, reversible and for short term.

90. The project area at present does not experience higher levels of noise pollution. However, the increased construction activities like rock cutting may cause noise pollution to some extent to the workers and people living in nearby areas. The impact of road construction on the noise level will be direct, low, site specific, reversible and short term.

91. 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.

92. *Measures:* The mitigation measures will include use of face mask by the workers working in the areas of high dust generation; avoid disposal of excavated materials in the waterbodies; use of ear muffs, helmet to lessen noise pollution during rock breaking and quarrying. Both the sides of the road alignment will be planted with trees, as far as possible which will act as sound and noise barrier.

### **Quarrying and Borrow Pit**

93. *Impacts:* The construction of road requires large quantity of stones and boulders and other type of construction materials for retaining structures. Stones will be extracted using optimum rock cutting techniques like chiseling and hammering, heating and breaking and drilling and breaking. Blasting will not be done for quarrying purpose. 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.

94. *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.	0+000	100 m far from the 0+000 of proposed road.
2.	10+800	Stone quarry site, 700 m far from the road
3.	18+500	Stone collection from Uttarganga River

Source: Field survey, July 2010

### **Biological Impacts**

95. The following are possible identified impacts based on baseline information related with the implementation of the proposed project.

### **Loss or degradation of Forest and Vegetation**

96. *Impacts:* Road alignment passes through government forest and community forest from Ch. 3+200-6+880. Construction of road will change 1.91 ha of forest which will clear 191 trees and 500 saplings of Okhar (*Juglans regia*) trees from forest areas. The impact will be direct, low, local and medium term. The details of affected trees are provided in **Annex XII**.

97. *Measures:* Compensatory plantation will be done for 691 affected trees in 19,003 numbers at the 1:25 ratio and additional 10 % for each number of trees that need to be cut down. Furthermore, road side tree plantation shall be done along the RoW whose cost will be included in Bioengineering/ Road side tree plantation cost.

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

98. *Impacts:* The construction of road may disturb wildlife and bird species present along the road corridor due illegal poaching and increased noise level. The impact will be indirect, low, local and long term.

99. *Measures:* The mitigation measures to be adopted will include limiting work within road width; workers shall be strictly discouraged from collecting fuel wood or poaching/harassing of wildlife.

### **Impacts on flora and fauna (as listed in CITES and IUCN Red data book)**

100. *Impacts:* The construction of road may disturb wildlife like Jackal (*Canis aureus*) due to increased level of noise but this is less likely. However, Saal and 500 saplings of Okhar (*Juglans regia*) will be affected from constructing this road. The impact will be direct, low, local and medium term.

101. *Measures:* Compensatory plantation of Okhar (*Juglans regia*) will be done in the ratio 1:25 and additional 10 % at the forest areas, for the trees that need to be cut down. Workers shall be strictly discouraged from collecting fuel wood or poaching/harassing of wildlife

### **Socio-economic Impacts**

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

102. *Impacts:* There will be loss of 4.20 ha of cultivated land due to road construction resulting in the annual loss of 7.14 MT of agricultural crops. This will lead to loss of food grain production among the families losing lands to the project. Moreover, spoils on farm land will also affect the production of agricultural crops. Consequently, it will affect the livelihood of the households residing near the road alignment. The impact will be direct, medium, local and long term.

103. *Measures:* Compensation for the loss of property will be provided to the affected people. A separate Resettlement Plan will be prepared to address land acquisition and compensation issues.

#### **Loss of private properties and community infrastructure**

104. *Impacts:* The proposed road alignment passes through nearby the settlements of Kakri, Taksera and Kol VDCs. During the construction phase, the people of such settlements suffer by their property losses and damage by road construction works in some extent. 3 residential houses (Ch. 4+850, 22+276 and 13+950), 1 Cattle Shed (Ch. 5+550) and 1 Water Mill (Ch. 22+331) will be affected during road construction. Irrigation canal and water source at Ch 2+700 and 4+000 will be affected. The impact will be direct, high significance, site specific, and long term.

105. *Measures:* Compensation for the loss of property will be provided to the affected people. Affected irrigation canal, water sources will be reinstated. A separate Resettlement Plan has been prepared to address land and property acquisition as well as compensation issues. Budget for resettlement plan is allocated as NRs. 5,104,302.82. Furthermore, Livelihood Enhancement Skills Training (LEST) program under Resettlement plan will be provided for affected families whose budget is allocated as NRs. 1,218,000.00 and included in resettlement plan cost.

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

106. *Impacts:* Cultural, religious sites are within Zol of the the road alignment. They are not affected due to the construction of the road. There will be likely no impact on local culture and tradition during construction stage.

## **Decline in Aesthetic Value**

107. *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.

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

## **Health and safety matters**

109. *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. 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.

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

### **6.2.2 Operation stage**

111. The following are possible identified impacts based on baseline information related with the operation of the road:

## **Physical Environment**

### **Road Slope Stability and Management**

112. *Impacts:* The destabilization of slope may also be expedited due to human activities in the road neighbourhood such as quarrying stones or soil, animal grazing, irrigated cultivation. This may cause damage to road section, disruption to transportation and other social impacts in the nearby areas. The inadequate maintenance of the road due to the blockage of drains damages the road surface that can lead to slides and slope failure. Sensitive areas for possible minor slope stability problems are Ch 0+500, 0+600, 0+900, 1+200, 5+220, 10+150, 11+100, 13+350, 13+850, 14+150, 15+530, 18+800, 20+500, 22+800, 28+200 and 30+020. The impact will be direct, medium local and long term nature.

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

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

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

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

116. *Measures:* Measures to be adopted will include plantation of trees along RoW 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.

## ***Biological Environment***

### **Depletion of Forest Resources**

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

118. *Measures:* Encourage and support local community for controlling illegal harvesting of forest resources; awareness programmes shall be organized to educate local people on the conservation of forest.

### **Disturbance to the wildlife and Illegal Poaching**

119. *Impacts:* Although the wildlife population is reported low, however, they may be disturbed due to the frequent movement of the vehicles. Vehicular flow, horn blowing in the forest area will have impact on the wildlife and bird species. Furthermore, illegal poaching may also increase due to rapid flow of people. The impact will be indirect, low, local and long term in nature.

120. *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.

## ***Socioeconomic and Cultural Impacts***

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

121. *Impacts:* Expansion of settlement area and market can be observed at Kakri, Qubhan, Falne, Tallosera, Takagaun, Bachigaun, Birgum and Okhma. 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.

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

### **Change in Social behaviour**

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

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

### **Road Accidents**

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

126. *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.

## 7. ENVIRONMENTAL MANAGEMENT PLAN

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

### 7.1 Institutions and Their Roles

**Table 7.1: Concerned Institutions and Their Roles**

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

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



## 7.2 Reporting

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

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

131. The monthly 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.

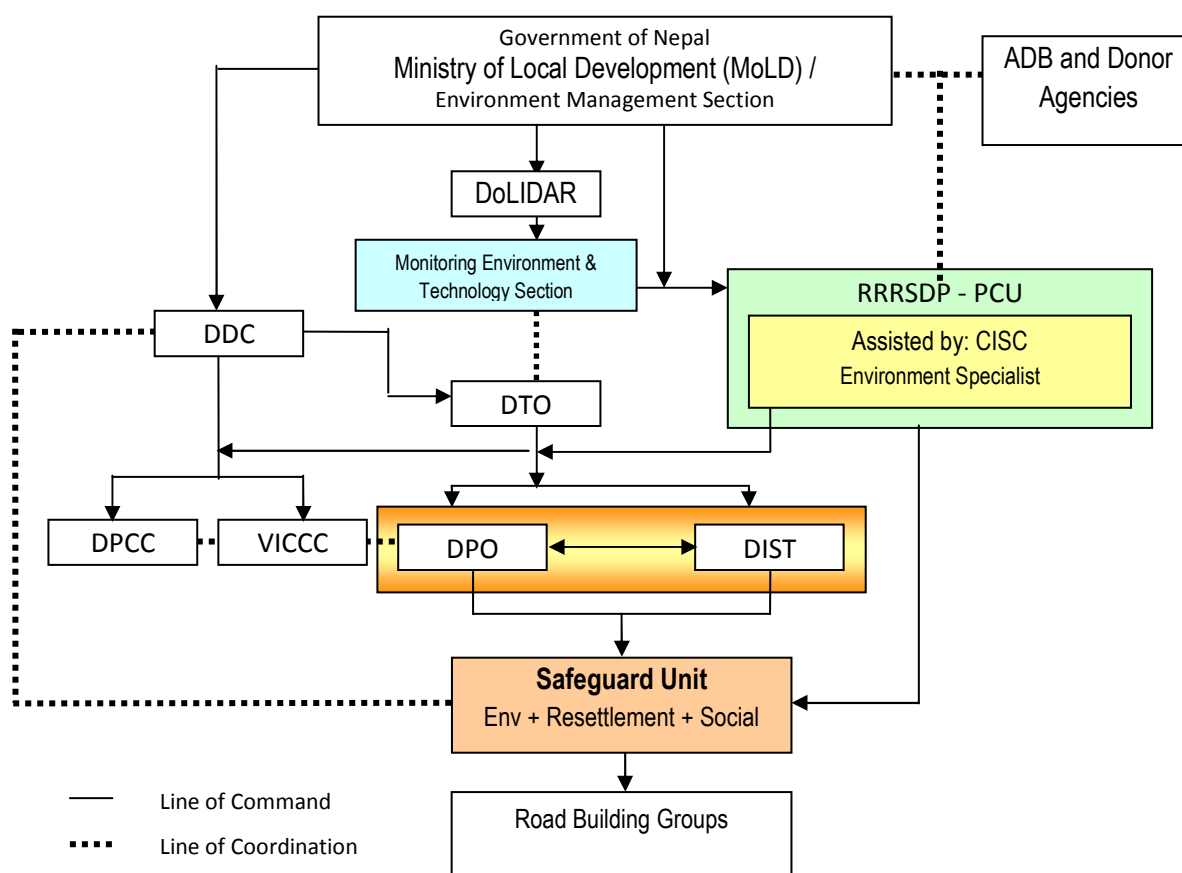


Figure 7.1: Environmental Management Organization Structure

## 7.3 Benefit Augmentation and Mitigation Measures Implementation Strategy

132. 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: 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 road	Employment Generation and Increase in Income	Increase in income level	D	H	L	ST	Maximize manual work through local, poor, vulnerable and women. Training in income generation and skill enhancement. Skilled 27,660 person days, unskilled 120,700 person days. LEST programs under Social Plan of the subproject will be conducted.	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. LEST programs under Social Plan of the subproject will be conducted.	DPO/DIST	DDC/DTO / CISC/PCU	
Construction of road	Enterprise Development and Business Promotion - mainly at Kakri, Qubhan, Falne, Okhma Tallosera and Bachigaun	Enhancement in local economy	D	L	L	ST	LEST programs under Social Plan of the subproject will be conducted (which include Apple production, walnut production and advanced tailoring trainings).	RBG	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	
Trainings and road construction	Women Empowerment	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. Training under Gender Action Plan (GAP) of Social Plan will be organized.	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	Minor local markets like to Kakri, Qubhan, Falne, Tallosera, Takagaun, Bachigaun, Birgum and Okhma will grow.	IN	H	L	LT	Manage planned growth with required infrastructure facilities in the market areas. Agriculture extension services, market linkages and networking for better market price.	DPO	DDC/VDC	
Operation of Road	Appreciation of Land Value - Mainly the land value will increase in Kakri, Qubhan, Falne, Okhma Tallosera and Bachigaun.	Improvement in local economic condition	IN	M	L	LT	Promotion of land development activities and control of encroachment within RoW. Awareness program shall be organized on use of high value land to get bank loans for setting up enterprise ventures.	DDC/DPO	DDC/VDC	
Operation of Road	Enhancement of Community Development Services	Ease of access to social service and raise in quality service	IN	H	R	LT	Keep road maintained to ensure access facility that will attract development of other social services facilities	Local people, DDC, VDC	DDC, VDC	

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

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact *)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Executing Agency	Supporting Agency
Construction Stage										
Physical Environment										
Construction of Road, site clearance, drainage work	Change in land use	Agricultural land (4.20 ha), barren land (11.8 ha), forest area( 1.91 ha) and built up area (0.87 ha) need to be acquired.	D	H	L	LT	IR	Compensation will be given for affected private properties. Plantation of trees will be done to increase greenery in the area.	DDC/DTO	DIST
Site clearance, slope excavation	Slope instability	Major instability areas along the road alignment are at Ch. Ch 0+500, 0+600, 0+900, 1+200, 5+220, 10+150, 11+100, 13+350, 13+850, 14+150, 15+530, 18+800, 20+500, 22+800, 28+200, 30+020	D	M	SS	MT	Re	Civil structures with bio-engineering application (Such as Grass plantation, Tree/Shrub plantation, Brush layering etc.) shall be used to stabilize the slopes.	DDC/DTO	DIST
Construction of Road, earth works	Spoil Disposal	Gully erosion, landslide, disruption of road, damage to farmland, water pollution etc.	D	L	L	LT	Re	Proper site selection and management of spoil at designated areas approved by Engineer; provision of proper drainages, toe walls; Proposed spoil disposal sites are 10+20, 3+200, 5+200, 9+800, 15+300, 18+000, 20+500, 28+100, 32+300.	DDC/DTO	DIST/VIC CC/ VDC
Construction of Road, drainage works	Drainage Management, generation of large volume of surface runoff	Erosion, landslide, damage to farmland	IN	M	SS	MT	Re	Proper drainage structures and proper spoil disposal, Avoid blockage or diversion of natural channels due to construction of road and disposal of spoils.	DDC/DTO	DIST
Construction works, (Earthworks, spoil and waste disposal)	Air pollution due to dust from exposed surface	Affect on local people and workers health and affect on agriculture.	D	L	L	ST	Re	Use of face mask while working on dust prone areas, covering of dust sources. Plantation of local species trees along the RoW on both sides of road	DDC/DTO / RBGs	DIST
	Noise pollution	Disturbance and annoyance.	D	L	L	ST	Re	Restrict horn near school, health posts, settlement, and forest areas. Plantation of local species trees along the RoW on both sides of road.	DDC/DTO	DIST
	Water pollution due to sediment level, open defecation	Risk of water borne diseases	D	L	L	ST	Re	Proper spoil management and restriction in urination and defecation in open areas	DDC/DTO/ RBGs	DIST/VIC CC
Quarrying and borrow pit operation	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 0+000, 10+800, 18+500	DDC/DTO/ RBGs	PCU/CISC /DIST/ VICCC
Biological Environment										
Construction of road	Loss or degradation of Forest and Vegetation	Loss of 691 trees (191 trees and 500 saplings of Okhar ( <i>Juglans</i>	D	L	L	MT	Re	Compensatory plantation will be done for 691 affected trees in 19,003 numbers at the 1:25 ratio	DDC/DTO/ DFO	DFO/CFU

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
		regia) from community forest)						and additional 10 % for each number of trees that need to be cut down.		Gs/DIST
Construction of road	Impact on Wildlife Due To Loss of Habitat and Poaching	Killing and harrasing of wildlife; Loss of biodiversity and valuable species of wildlife	IN	L	L	LT	IR	Work only in day time, do not disturb wildlife, Workers will be given orientation and strict instructions not to harm wild flora and fauna, as well as ensure their own safety from wildlife attack.	DDC/DTO/DFO	DFO/CFU Gs/DIST
Construction activity	Impacts on flora and fauna (as listed in CITES and IUCN Red data book)	Loss of biodiversity and valuable species of wildlife.	IN	L	L	LT	IR	Work only in day time, do not disturb wildlife, Workers will be given orientation and strict instructions not to harm wild flora and fauna, as well as ensure their own safety from wildlife attack.	DDC/DTO/DFO	DFO/CFU Gs/DIST
<b>Social-economic Environment</b>										
Acquisition of land for maintaining road width	Loss or Degradation of Farm Land – Loss of 4.2 Ha cultivated land and 7.12 MT of agricultural crops	Reduced production, hardship, food shortage	D	M	L	LT	IR	Minimize productive land acquisition through alignment selection, Compensation for affected people	DDC/DTO	CFC DIST/VICC C
Acquisition of land and property for maintaining road width	Loss of Private Properties	Displacement of people, hardship, 3 residential houses (Ch. 4+850, 22+276 and 13+950), 1 Cattle Shed (Ch. 5+550) and 1 Water Mill (Ch. 22+331), Irrigation canal and water source at Ch 2+700 and 4+000 will be affected.	D	H	SS	LT	IR	Compensation and resettlement to the owner as described in resettlement plan. Budget for resettlement plan is NRs. 5,104,302.82, and LEST program for APs will be provided whose budget is NRs. 1,218,000.00 and included in RP Cost. Affected irrigation canal, water sourcres will be reinstated.	DDC/DTO	CFC/DIST
Construction of road	Occupational Health and safety matters	Injury, fatal accidents, outbreak of epidemics and diseases, decline in capacity to work	D	H	L	ST	IR	Occupational health and safety regulations, first aid facility at sites with health treatment arrangements, contingency planning; Proper drinking water and toilet facility for construction crew	DDC/DTO / Contractors	DIST/CISC
Quarry operation, earthworks, spoil disposal	Decrease in aesthetic value	Disturbances in working areas and scar on topography.	D	L	L	ST	Re	Discourage indiscriminate dumping of spoil material; quarry sites will be properly closed to suit the local landscape and cover by plantation of local species trees.	DPO in assistance by DIST / Contractors	PCU / CISC / Users Committee / VDC
<b>Operation Stage</b>										
<b>Physical Environment</b>										
Operation of road	Road Instability	Destabilization of slope, erosion, water	D	M	L	LT	Re	Regular maintenance of slope protection structures, Selection of healthy upland farming techniques.	DDC/DTO/ VDC	DoLIDAR , DFO,

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
		logging. Disturbance to traffic flow, pollution of water bodies, impacts on agriculture land, loss of vegetation. Sensitive areas for possible slope stability problems are Ch 0+500, 0+600, 0+900, 1+200, 5+220, 10+150, 11+100, 13+350, 13+850, 14+150, 15+530, 18+800, 20+500, 22+800, 28+200 and 30+020.								Water Induced Disaster Control Division Office (WDCCDO)
Operation of vehicles, Inadequate drainage	Air, Noise and Water Pollution	Disturbance to students, patients, wildlife, effect to nearby agriculture land and crops	D	L	L	LT	Re	Speed limit for vehicles, no horn signs, use vegetation barrier; Regular maintenance of drainage.	DDC/DTO	DoLIDAR/ Local administration
<b>Biological Environment</b>										
Road operation	Depletion of Forest Resources	Depletion of forest resources due to human pressure on forest to meet increasing needs of heating and cooking, illegal felling/cutting of trees for timber	IN	L	L	LT	IR	Encourage and support local community for controlling illegal harvesting of forest resources; awareness programmes shall be organized to educate local people on the conservation of forest.	DTO/ CFUGs	DDC/CDO / DFO
Road operation	Disturbance to the Wildlife and Illegal Poaching	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
<b>Social-economic Environment</b>										
Easy Access by road operation	Unplanned New Settlement and Market Center Development	Encroachment of Row, increased accidents, delay in traffic movement, depletion of local resources, water pollution	D	M	L	LT	IR	Awareness program, enforcement of law, planning of land development, plantation of trees.	DDC/DTO	CDO / VICCC
Operation of Road	Change in Social behavior	Social and cultural conflicts	IN	M	L	LT	IR	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.	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

133. The estimated cost for beneficial augmentation measures like awareness raising program, skill training, promotion of small scale industries, and income generation activities will be covered by RRRSDP. Costs for income generation and awareness programme activities for Affected Persons (APs) are included in Resettlement Plan. The design and cost estimate for most of the suggested mitigation measures such as slope stabilization, quarry site management, spoil disposal, supply of face masks, helmets, muffles, accidental insurance, bioengineering measures, plantation, land slide rehabilitation, supporting CFUGs shall be incorporated in the design and cost estimates. Therefore, most of the mitigation measures suggested would be a part of road design and construction without additional cost. All proposed mitigation measures will be integrated in the project design so that these measures may automatically form part of the construction and operational phases of the project. The indicative cost for environmental enhancement and mitigation is presented in the **Table 7.2**.

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

SN.	Environmental Protection Measures	Estimated Budget (NRs.)	Remarks
<b>1. Benefits Augmentation Measures</b>			
1.1	Training to DDC/DTO/DPO/DIST to conduct environmental monitoring and reporting	50,000.00	
1.2	Training to Naika of RBGs	50,000.00	
1.3	Enhancement in Technical Skills (Bio-engineering)	100,000.00	
	<b>Sub-Total (1)</b>	<b>200,000.00</b>	
<b>2. Adverse Impacts Mitigation Measures</b>			
2.1	Bio-engineering + Road Side Tree Plantation	3,134,950.48	
2.2	RBG Insurance	500,000.00	
2.3	Information Signboard	100,000.00	
2.4	Resettlement and Rehabilitation Cost (Compensation/rehabilitation of properties, structures; LEST program for APs)	5,104,302.82	
2.5	Compensatory Plantation of 19,003 numbers of trees (at 1:25 + 10% ratio)	950,150.00	
2.6	Restoration or relocation of affected infrastructures, spoils disposal site management and rehabilitation, Irrigation, reinstate of quarry etc.	1,000,000.00	
2.7	Social Cost (Social Action Plan, Gender Action Plan)	967,000.00	
2.8	Occupational health and safety; First aid boxes, campsite sanitation (Pit latrine); solid waste management, Safety measures for workers (Helmets, gloves, masks, boots, etc.)	500,000.00	
	<b>Sub-Total (2)</b>	<b>12,256,403.30</b>	
	<b>Total</b>	<b>12,456,403.30</b>	

## 7.5 Implementation of Mitigation Measures

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

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

## 7.6 Environmental Monitoring

136. The IEE prescribes the mitigation measures in order to minimize adverse impacts and to enhance beneficial impacts. Environmental monitoring plan is an important tool to ensure the implementation of mitigation measures for minimizing adverse impacts and maximizing the beneficial impacts. Environmental monitoring generates useful information and improves the quality of implementation of mitigation measures.

### 7.6.1 Monitoring Responsibility

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

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

139. DDC/DTO with RRRSDP PCU support should make arrangements for sub-project level monitoring. It should constitute a monitoring team, which must be independent from the implementation team and should consist of relevant persons in the context of a sub-project being monitored, for example persons from the forest, agriculture, social and NGO sectors. The monitoring team will be constituted separately for each monitoring event. Project's district management team should be responsible for forming the monitoring team, financing the monitoring works, providing logistics and other necessary support. Thus, it is recommended that an external team hired by DDC/DTO takes responsibility for periodic monitoring of the environmental performance, in addition to the regular supervision and guidance provided by the DIST at the site. The sub-project specific monitoring plan as given in **Table 7.5** shall be followed. DIST team will conduct regular environmental monitoring. The sub-project level monitoring team should submit its report to RRRSDP district management, which should forward a copy to the RRRSDP Project Coordination Unit. Total cost of environmental monitoring (field visits, observation, review of reports and report preparation) is estimated NRs. 200,000 as given in **Table 7.5**.

**Table 7.5: Environmental Monitoring Cost**

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

140. Thus, total environmental monitoring and management cost is NRs. 12,656,403.30.

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

141. There will be basically three types of monitoring baseline, compliance and impact monitoring. But the this Road Subproject will follow compliance and impact monitoring:

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



**Table 7.6: Compliance Monitoring for Kakri- Kol-Hukam-Maikot Road Subproject.**

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

Parameter/Indicator	Responsible Implementing Agency	Verifiable Indicators	Verification Methods	Schedule	Responsible Monitoring Agency
pollution prevention, water and soil management, slope stabilisation, cut and fill, waste management, spoils, sensitive habitats and critical sites, protection of fauna and flora		labourers to prevent impacts on wildlife sensitive habitats, forests and fuel wood use.	specific impacts, photos, laboratory tests where required. Existing patrol, control and enforcement mechanisms, enforcement records		
Vegetation clearance	RBG / DIST	Actual number of trees felled during construction works	Record, inspection and interview with local people and CFUGs	After detail design and before construction work	CFUGs/DTO/DC/DFO
Measures to avoid pressure on forest and wildlife	RBG/DIST	Use of firewood or fossil fuel by construction crew, events of poaching of wildlife	Inspection, interview with local people and CFUGs	Once a month during construction	DDC/DTO/CFUGs
Measures to protect environment from air & noise pollution	RBG/DIST	Dust level and noise level at work sites, major settlements and sensitive spots like health centres and schools	Visual observation and discussion with residents and workers	Once in a month during construction	DDC/DTO
Measures to protect water bodies from pollution	RBG/DIST	Visual observation, observation of open defecation and waste disposal around water sources near construction sites	Site inspection, test of site-selected samples of local streams water using standard field kit, interview	Once in a month during construction; upon demand for testing with field kit	DDC/DTO
Restoration, rehabilitation, reconstruction of all infrastructure services disrupted or damaged by the proposal activities	RBG/DIST	Continued services by the facilities and functional public life	Site observation; VDC/DDC records; public consultation meetings; photos	Once in 15 days during construction	DDC/DTO
Adequate technical and environmental supervision	DIST	Adequate number of technicians regularly at site with ability to implement labour based road construction concept	Check number and type of technicians available at site; skill of work carried out; discussion	Twice a month during construction	DDC/DTO
Clean up and reinstatement of the construction sites (camps, quarries)	RBG /DIST	Decommissioned sites indicate no adverse/residual environmental impacts, and are rehabilitated to the satisfaction of the supervisor and land owners	Site observation; comparing photos; consultation with land owners and community based organizations	At the end of construction period	DDC/ DTO

**Table 7.7: Impact/Effect Monitoring for the Kakri- Kol-Hukam-Maikot Road Subproject**

<b>Parameters /Impacts</b>	<b>Verifiable Indicators</b>	<b>Verification Methods</b>	<b>Location</b>	<b>Schedule</b>	<b>Responsible Implementation and Monitoring Agency</b>
Slope stability and erosion	Inclination, slope failures, causes; drainage facilities such as catch drain, side drains and functionality of cross drainage structures; fresh gullies and erosion; success/failure of bio-engineering solutions	Site observation, photos discussion with people and technicians	Near steep slopes and at landslide areas and sites	Continuously during construction and operation	DIST during construction; DDC/DTO/Soil Conservation Office during operation
Bio-engineering of disturbed slopes	Re-vegetation through bio-engineering application on disturbed slope; establishment of nursery	Site observation; inspection of nursery and its production rate, photos, measurements	Cut slope area, where vegetation is cleared; nursery siyes	During and at end of project construction	DIST/DDC/DTO
Disposal of spoils and construction wastes	Affected aesthetic value, affected forest and agriculture, initiated land erosion by local blocked drainage, hazard to downhill slope residents and agricultural lands	Site observation and interviews, photos, geo-referencing sites	At specific locations where such sites occur	During construction	DIST/DDC/DTO
Quarrying of construction materials	Initiated erosion, changes in river regime, erosion by river systems, landslide due to quarrying, degradation of vegetation, water logging, waterborne diseases	Site observation, photos, records from local health centres	Quarry site areas	During construction	DIST/DDC/DTO
Disruption of drainage system	Status of rehabilitation, service status of irrigation and water supply system; operation and maintenance requirement	Observation and interviews, photos, records	Irrigation schemes and water supply system	During construction	DIST/DDC/DTO
Loss or degradation of farmland, houses and properties	Status of road side land; Production / yield; Status of road side houses; Status of standing crop along alignment	Observation, data collection and analysis and interview with stakeholders	Road side land and houses	During construction	DDC/DTO/DIST/VICCC
Water pollution	Observation of open defecation and waste disposal around water sources near construction sites	Visual observation, measurement of water sample using field kit	Local streams	During construction; upon demand for testing with field kit	DDC/DTO/DIST/VICCC
Dust pollution	Dust cloud in work sites. Dust collected on leaves of nearby vegetation	Visual inspection	At construction sites and at sensitive spots (schools, health spots, major	During construction	DDC/DTO/DIST

<b>Parameters /Impacts</b>	<b>Verifiable Indicators</b>	<b>Verification Methods</b>	<b>Location</b>	<b>Schedule</b>	<b>Responsible Implementation and Monitoring Agency</b>
			settlements)		
Deforestation and illegal logging	Numbers of trees, presence of ground vegetation, signs of illicit logging and extraction of NTFPs	Observations, DFO records, photos; interview with CFUGs members	In and around the construction sites, markets,	During construction and operation	DIST/ CFUGs/DFO during construction; CFUGs/DFO/DDC during operation
Killing/Poaching of wildlife	Wildlife poaching trapping and poaching by work force, trade of wildlife, road accidents inflicting wildlife	Interview with local people/ DFO/CFUGs members, photos, observations	Forest areas at roadside	Twice a year during construction and routine during operation	DIST during construction; CFUGs/DFO/DDC during operation
Change in economy	Numbers of people employed by the project during construction, numbers of women in work forces	Records kept by the project management, discussion with stakeholders	Project area	Trimester during construction phase	DDC/DTO/DIST
Trade and commerce	Numbers of shops increased or decreased, rental of houses and land spaces	Records, interviews, observations, photos	Throughout project area	Once in a year	DDC/DTO/DIST/VDC
Occupational safety and hazard	Type and number of accident occurred during construction; adequacy of occupational safety measured provided; compensation provided in case of fatal accidents or invalidity	Observations, photos, spot checks, contractors' and health centre records interview with workers	Throughout project area	During construction	DIST/Proponent
Change in socio-economic structure	No and extent of new settlements/types and ethnic groups; nos and extent of new businesses; nos and extent of new services and utilities, social conflicts	Observations, interview with local people, DDC Police and VDC records	Throughout project area	During operation	DDC/DTO/VDC
Ribbon Settlement along, alignment	Congestions to road users nos. of accidents, RoW encroachment	Records, observations	Throughout project area	During operation	DDC/DTO/Local administration

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## **8. CONCLUSION AND RECOMMENDATIONS**

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### **8.1 Conclusion**

142. The IEE study of the proposed Kakri- Kol-Hukam-Maikot Road Subproject does not pass through any environmentally sensitive area, and have minimal adverse impact associated with loss of agricultural land. Most of the adverse impacts predicted are of low significance and short term as well as reversible. The rehabilitated road will provide better access to market and social services, and is expected to enhance productivity and improving quality of life of the people. Local people will get direct employment opportunity as workers during construction works, which will contribute in improving their income. 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.

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

### **8.2 Recommendation**

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

145. 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 will have to be acquired for the upgrading of the proposed road. A Resettlement Plan will be required to ensure that the persons affected by these losses are properly compensated.

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## 9. MISCELLANEOUS

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**ANNEX**

## Annex I: Terms of Reference



नेपाल सरकार  
स्थानीय विकास मन्त्रालय  
(तात्कालिक कार्यालय भवन)  
नेपाल सरकार  
स्थानीय विकास मन्त्रालय

फोन नं. ४४४४४४४४  
फ्याक्स नं. ४४४४४४४४  
वेब साइट : [www.mlg.gov.np](http://www.mlg.gov.np)  
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Web : [www.mlg.gov.np](http://www.mlg.gov.np)

पत्र संख्या ०६४/०६६  
च.नं. २६२

मिति:- २०६६/२/२५

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

स्थानीय पूर्वाधार विकास तथा कृषि सडक विभाग,  
जावलाखेल ।

ग्रामीण पुननिर्माण तथा पुनर्स्थापना आयोजना (RRRSDP) अन्तर्गत निम्न जिल्ला विकास समितिको कार्यालयबाट निम्नानुसारका सडकहरूको प्रारम्भिक वातावरणीय परीक्षणको कार्यसूची (IAE) कार्यसूची (TOR) नं.१२१ 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 शान २/२ यसै पत्रसाथ पठाइएको व्यहोरा अनुरोध गरिन्छ ।

निम्न

१. निम्नापनी-हवास बारा चौर, दोभिल्ला-फलेवास, दुल्लान-सलिजा, काकीनेटा लुङ्कु सडक खण्ड (पर्वत जिल्ला) ✓
२. नदुवा राईजिल्ला, काकीनेटा-हुकुम माईकोट, छिन्खेत-स्यापु सडक खण्ड (हुकुम जिल्ला) ✓
३. खगेश्वरी-रिदरोड, सीखु-जर्सिङ पैवा-फटेकेश्वर जर्सिङ-गोवा-भोटेचौर, छ्याम्पेडोल-आगम-ज्याङ (काठमाण्डौ जिल्ला) ✓
४. नाम्दु-मार्बु-छाप (दोलखा जिल्ला) ✓
५. तेलकोट-छालिङ-चौगु, च्यामासिंग-अमालडोल-नाला (भक्तपुर जिल्ला) ✓
६. पिपल भञ्ज्याङ-हैवार (सिन्धुली जिल्ला) ✓
७. काले बुढौली-लिम्बा, जोरपोखरी आहाल डोडा-जरी भञ्ज्याङ-ओनात, फिदिम-राती गाँउ-यासोक, काले बुढौली-दुर्दिम्बा (पाँचथर जिल्ला) ✓
८. कागम-बहबौर-हर्जन-सिउरी (सोल्सा) ✓

  
(विभागाध्यक्ष सुवेदी)  
राख्दा अधिकृत



रुकुम मिति: २०१९/२/२९



**Terms of Reference (ToR)**  
for  
Initial Environmental Examination (IEE)  
of  
**Kakri-Kol-Hukam-Maikot  
Road Sub-Project**

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



Proponent:  
**District Development Committee (DDC)/  
District Technical Office (DTO)  
Rukum**  
Telephone No. – 088-680063/019-657004  
Fax No. – 088-649091/019-657005

May 2009

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## ABBREVIATIONS

ADB	Asian Development Bank
Ch	Chainage
CF	Community Forest
CISC	Central Implementation Support Consultants
CITES	Convention on International Trade in Endangered Species of Flora and Fauna
DDC	District Development Committee
DG	Director General
DIST	District Implementation Support Team
DLIDAR	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
EP Rules	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
MoLD	Ministry of Local Development
NGO	Non-Governmental Organization
PAM	Project Administrative Memorandum
PCU	Project Coordination Unit
REC	Rapid Environmental Checklist
RRSDP	Rural Reconstruction and Rehabilitation Sector Development Project
SF	Social Funding
SADC	Swiss Agency for Development and Cooperation
SOS	Social Development Specialist
SM	Social Mobilizer
TA	Technical Assistance
TR	Terms of Reference
VDC	Village Development Committee
ZoI	Zone of Influence






## 1.8 NAME AND ADDRESS OF THE PROPONENT

The District Development Committee (DDC)/District Technical Office(DTO), Rukum is the implementing agency at the district level and the proponent of the Initial Environmental Examination (IEE) study for the construction of Kakri - Kol-Hukam-Mukot(Kakri-Kol section) 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  
District Technical Office, Rukum, Musikot  
Telephone No. - 019-657004, 088-680063  
Fax No. - 019-657003, 088-649091

## 2.0 INTRODUCTION

### 2.1 GENERAL INTRODUCTION

Government of Nepal has received a grant from ADB, DFID(Department for International Development) and loan assistance from OPEC, Fund for International Development to finance the Rural Reconstruction and Rehabilitation Sector Development Project (RRRSDP). The project goal is to reduce rural poverty in 20 very poor remote Terai, Hill and Mountain districts affected by the conflict. RRRSDP focus on immediate post conflict development projects for accelerate poverty reduction and inclusive development, thereby enhancing the effectiveness and efficiency of the delivery of public service and improving access of rural people to economic opportunities and social services. The purpose is to achieve sustainable increased access to economic and social services, and enhanced social and financial capital for people in the project area, particularly poor and disadvantaged groups. Labour-based, environmentally friendly, and community approaches (LEP) will ensure that the investment in construction and rehabilitation of infrastructure results in sustainable, improved access to economic and social services, and enhanced social and financial capital.

Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) is the executing agency. The implementing arrangements are as following: DoLIDAR has established a project coordination unit (PCU) in Kathmandu, headed by a project coordinator to coordinate all project activities. The PCU will be responsible for guiding and monitoring district development committees (DDCs) as they implement project components. At the district level, project implementation will be the responsibility of the district project office (DPO) within the district technical office of each DDC. A local engineering consultant (DIST) to cover technical issues and social mobilization and support for rural infrastructure building groups, will support the DPO.

The Terms of Reference (ToR) is prepared to conduct an IEE of Kakri - Kol-Hukam-Mukot(Kakri-Kol section)road sub-project in Rukum District. This road has been selected after the walkover survey of Kakri - Kol-Hukam- Mukot(Kakri-Kol section) road from the sub-list on the basis of prioritization criteria. This is a high priority road in Rukum district and is proposed for construction under RRRSDP.

## 2.1 BACKGROUND OF THE SUB-PROJECT

The proposed road is the shortest possible corridor to links the district with the nearest road at Kakri of Rukum District. Earthen Road was constructed from Khalanga to Rukumkot under GTZ in 2065 B.S and from Rukumkot to Kakri is under construction under Nepal Army. Kakri is not connected by motorable road but there is a mule road from Rukumkot, is under progress extending along so that Kakri will be near to Road link. The Kakri- Kol sector is about 37+570 km. in length. This road corridor passes through different settlements of Kakri, Taksera and Kol VDCs. About one third people of village will be directly benefited by this road. It provides services to the people of upper village like Kakri, Taksera, KOL, Hukam, Rangsi, Maikot etc,

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



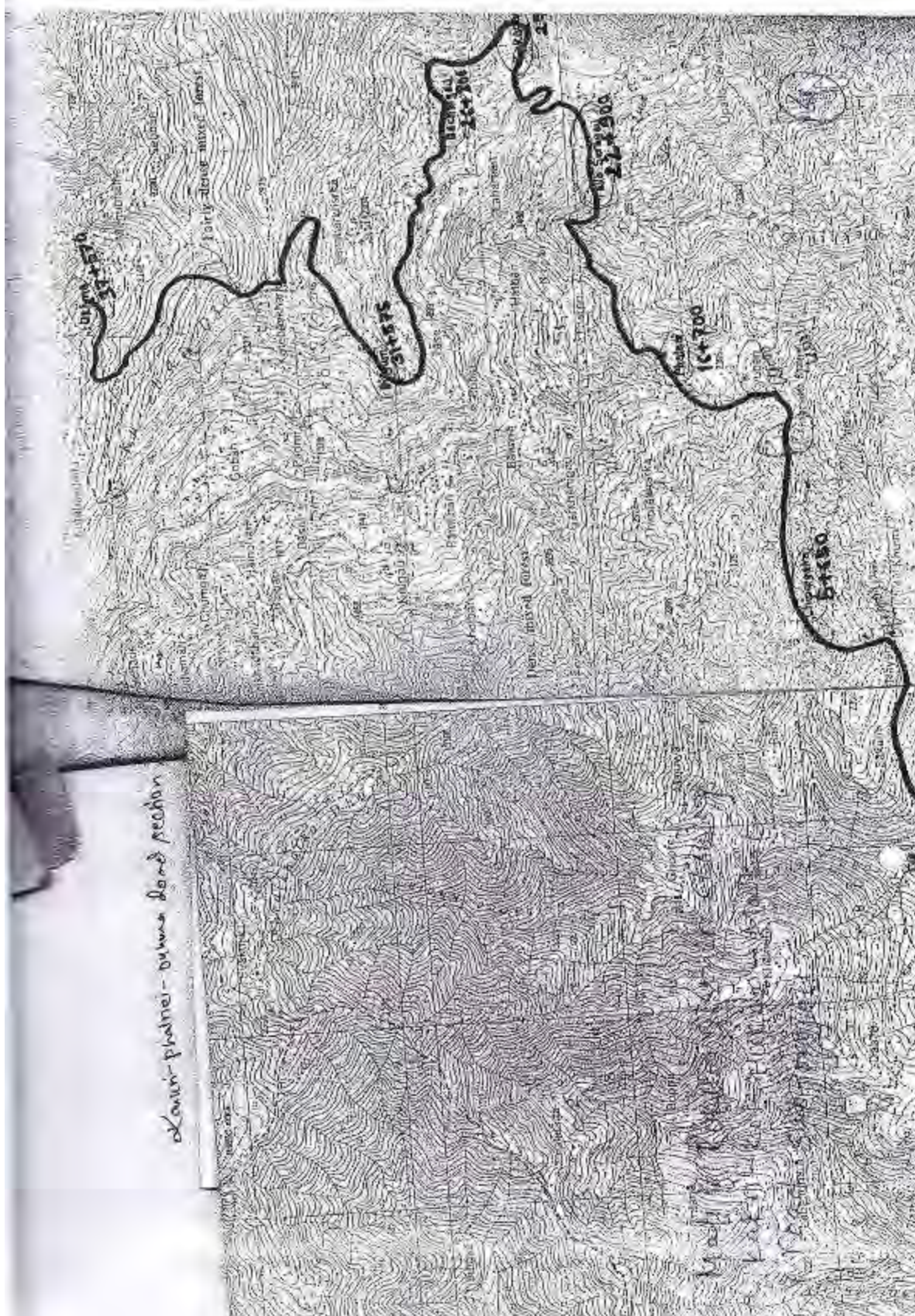
0

25 Kilometers

3



Kauri-phatnei - Burma land pechan





### 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 Kakri-Kol-Hukam-Maikot (Kakri-Kol section) road links many Village Development committees of Rukum District to district headquarter. This road is considered as an important road for the people of Rukum district. This road is given Priority No. 1 in Class A Road in DTMP of Rukum District. This road further can be extended to Dolpa and Tibet.

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. An IEE of a district road is a legal requirement according to Environmental Protection Act, 1996 (EPA, 1996) and Environmental Protection Rules, 1997 (EPR, 1997). Preparation of IEE report by concerned District Development Committee (DDC) and approval of IEE report by the Ministry of Local Development (MLD) according to Nepali legal provision is considered sufficient by the ADB.

### 3.0 REVIEW OF RELEVANT LAWS, RULES AND GUIDELINES

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

- Environment Protection Act, 1997 and Environment Protection Rules, 1997 (amended 1999)
- Forest Act, 1993 and Forest Rules, 1995
- *Batabaranyia Nirdestika* (Nepal; MLD), 2057
- National Park and Wildlife Conservation Act, 1973
- Local Self Governance Act, 1999 and Local Self Governance Rules, 2000
- Land Acquisition Act, 1977 and Land Acquisition Rules, 1969
- National Environmental Impact Assessment Guidelines, 1993
- APPROACH for the Development of Agricultural and Rural Roads, 1999 (DoLIDAR)



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

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

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

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

The following steps will be followed during the desk review:

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

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

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

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

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

The IEE team will walk through along the road alignment visiting the significant environmental features in the probable influence corridor, and make necessary measurements, inspect/observe and discuss it with the local stakeholders. The

information collection will be made covering physical, biological, socio-economic and cultural aspects of the environment.

## 5.0 ALTERNATIVES FOR THE IMPLEMENTATION OF THE PROPOSAL

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

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

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

## 6.0 REQUIREMENT OF THE IEE STUDY

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

### 6.1 TIME SCHEDULE

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

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

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

### 6.2 ESTIMATED BUDGET AND STUDY TEAM

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

- Landslides, slope stability, bio-engineering and erosion

ToR for IEE of Kakri-Kol-Bukam-Mulhot road sub-project in Rukum District



- 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 Sindhu. 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 officer. 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 on short term basis if needed.

## 7.0 ENVIRONMENTAL BASELINE

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

## 8.0 ANALYSIS AND INTERPRETATION

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

## 9.0 IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT

The identification and prediction of impacts shall be carried out by considering the proposed project 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 radius).

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

*(Signature)*

beneficial impacts will be on the physical and socio-economic environment as given below:

**9.1.1 Construction Stage**

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

**9.1.2 Operation Stage**

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

**9.2 ADVERSE IMPACTS**

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

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

***Physical environment***

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

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

***Biological environment***

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

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

- Impacts on flora and fauna (as listed in CITES and IUCN Red data book)

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

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

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

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

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

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

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

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

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

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

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

The IEE study will propose site-specific benefit 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.

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

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

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

**xv. Annex**

- ToR of IEE
- Rapid Environmental Assessment (REA) Checklist
- Abstract of cost
- RRRSDP environmental checklist
- Public notice
- Deed of enquiry (*michulka*)
- Name of the organizations
- List of person contacted
- Meeting minutes of community consultation
- Recommendation letters from municipality and VDC's

- Existing condition
  - a. Distribution of household by major occupation
  - b. Summary of public services and infrastructures according to settlement
  - c. Land holding pattern of settlements within ZoI
  - d. Number of households belonging to different food security category
- List of trees
- Maximization of slope cutting and preservation of vegetation cover
- Photographs





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

### Instructions:

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

**Country/Project Title:**

Nepal/Rural Reconstruction and Rehabilitation Sector

**Subproject::**

Kakri-Kol-Huasm-Maikot(Kakri-Kol Section)

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

SCREENING QUESTIONS	Yes	No	REMARKS
<ul style="list-style-type: none"> <li>▪ encroachment on precious ecology (e.g. sensitive or protected areas)?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ noise and vibration due to blasting and other civil works?</li> <li>▪ dislocation or involuntary resettlement of people</li> </ul>	√		Dislocated people will be compensated and included in resettlement plan.
<ul style="list-style-type: none"> <li>▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ hazardous driving conditions where construction interferes with pre-existing roads?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ creation of temporary breeding habitats for mosquito vectors of disease?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ dislocation and compulsory resettlement of people living in right-of-way?</li> </ul>	√		There are 3HHs that should be dislocated. Dislocated people will be compensated.
<ul style="list-style-type: none"> <li>▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ increased noise and air pollution resulting from traffic volume?</li> </ul>		√	
<ul style="list-style-type: none"> <li>▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?</li> </ul>		√	

### Annex III: Abstract of cost

**Road: Kakri-Takshera-Kol Road Sub Project**  
**Chainage: 0+000-32+740**

SN	Description of works	Unit	Estimated Quantity	Rate(NRs) In Figure	Amount (NRs)
<b>1</b>	<b>General</b>				
1.1	Provision for Insurances as specified in the[General Conditions of RBGs agreement, Clause-13 )	LS			500,000.00
1.2	Providing site office ( s ) for supervision team	LS			600,000.00
	<b>Sub Total of General Item</b>				<b>1,100,000.00</b>
<b>2</b>	<b>Earthwork</b>				
2.1	Site Clearance including Clearing and grubbing as per specification(DoLIDAR'- 1-1)	Sq.m.	163700.00	12.65	2,070,805.00
	<b>Sub Total of site clearance Item</b>				<b>2,070,805.00</b>
2.2	Excavation in roadway including removal and satisfactory disposal and stacking or hauling (to sites of embankment construction) of suitable cut materials as required.(DoLIDAR SN 5, Clause 2-1.2.2, 2-1.8, 2-1.9)				
	a) OrdinarySoil	Cu.m.	71477.37	158.13	11302359.67
	b) Hard soil	Cu.m.	196201.22	189.75	37229180.87
	c) Soft Rock	Cu.m.	24150.01	632.50	15274880.95
	d) Mediam Rock	Cu.m.	16470.85	1265.00	20835627.02
	e) Hard Rock	Cu.m.	3805.07	5376.25	20457018.88
2.3	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; (DoLIDAR clause 2-5)	Cum.	69679.56	79.06	5509040.21
	<b>Sub Total of earthwork in roadway Item</b>				<b>110608107.59</b>
2.4	Excavation foundation for gabion and retaining wall structures including removal and satisfactory disposal and stacking or hauling (to sites of embankment construction) of suitable cut materials as required.(DoLIDAR SN 5, Clause 2-1.2.2, 2-1.8, 2-1.9)				
	a) OrdinarySoil	Cu.m.	3554.81	158.13	562104.96
	b) Hard soil	Cu.m.	8722.54	189.75	1655101.07
	c) Soft Rock	Cu.m.	1011.78	632.50	639950.53
	d) Mediam Rock	Cu.m.	729.22	1265.00	922465.83
	e) Hard Rock	Cu.m.	189.61	5376.25	1019413.34

2.5	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; (DoLIDAR clause 2-5)	Cum.	1240.20	79.06	98052.92
	<b>Sub Total of earthwork in structure Items</b>				<b>4,897,088.66</b>
<b>3</b>	<b>Structural work</b>				
<b>3.1</b>	<b>Stone pitching</b>				
<b>3.2.1</b>	Excavation in Hard soil	Cum.	1920.00	189.75	364,320.00
<b>3.2.2</b>	Granular base material in Stone Pitching	Cum.	480.00	131.31	63,030.00
<b>3.2.3</b>	20 cm thick stone pitching on the prepared bedding including supply of stone and river spalls for sealing of voids	Sqm	9600.00	241.06	2,314,200.00
	<b>Sub Total of stone pitching Items</b>				<b>2,741,550.00</b>
<b>3.3</b>	<b>Gabion works</b>				
<b>3.3.1</b>	<b>Box size (2x1x1)</b>				
<b>3.3.1.1</b>	Assembling of gabion baskets and placing them in position including stretching, binding them together and tying down lids	Box	1964.00	28.46	55,900.35
<b>3.3.1.2</b>	Stone Packing in Gabion Crates including stone supply	Box	1964.00	2070.38	4,066,216.50
<b>3.3.1.3</b>	Fabrication of gabion boxes including rolling, cutting, weaving and supply to the site (Hexagonal Mesh Size: 100mm*120mm, selvedge wire-7swg, mesh wire-10 swg & binding wire-12 swg, all heavy coated)	Box	1964.00	3731.13	7,327,929.50
	<b>Sub Total of gabion size (2x1x1) Items</b>				<b>11,450,046.35</b>
<b>3.3.2</b>	<b>Box size (1.5x1x1)</b>				
<b>3.3.2.1</b>	Assembling of gabion baskets and placing them in position including stretching, binding them together and tying down lids	Box	1577.00	22.14	34,910.84
<b>3.3.2.2</b>	Stone Packing in Gabion Crates including stone supply	Box	1577.00	1552.78	2,448,736.03
<b>3.3.2.3</b>	Fabrication of gabion boxes including rolling, cutting, weaving and supply to the site (Hexagonal Mesh Size: 100mm*120mm, selvedge wire-7swg, mesh wire-10 swg & binding wire-12 swg, all heavy coated)	Box	1577.00	2642.48	4,167,190.96
	<b>Sub Total of gabion size (1.5x1x1) Items</b>				<b>6,650,837.83</b>

<b>3.4</b>	<b>Dry Wall</b>				
<b>3.4.1</b>	Dry stone Wall (Road Stone available from road excavation within initial lead from 150m to 200m)-8 [DoLIDAR SN-39,Clause 8)	Cu.m	6004.51	1364.38	8,192,408.79
	<b>Sub Total of drywall Items</b>				<b>8,192,408.79</b>
<b>3.6</b>	<b>6m Span Slab Culvert</b>	No	2.00	4203676.72	4,203,676.72
	<b>Sub Total of 6m spanCause way</b>				<b>4,203,676.72</b>
<b>3.7</b>	<b>Dry Stone Causeway</b>				
<b>3.7.1</b>	Excavation in Hard Soil	Cum.	840.00	189.75	159,390.00
<b>3.7.2</b>	Gabion Works in Causeway	Cum.	336.00	1,987.88	667,926.00
<b>3.7.3</b>	Stone Pitching in box.	Cum.	252.00	2,166.61	545,984.46
<b>3.7.4</b>	Geo-textile works.	sq.m	3,628.80	80.00	290,304.00
<b>3.7.5</b>	Febrication of Gabion Box(2*1*1)	box	168.00	3,731.13	626,829.00
	<b>Sub Total of drystone causeway Items</b>				<b>1,663,604.46</b>
<b>3.8</b>	<b>Slab Culvert span 1mtr.</b>				
<b>3.8.1.1</b>	Earth Work in excavation (HS)	Cu.m	71.78	189.75	13,621.01
<b>3.8.1.2</b>	Dry stone solling work for foundation Wall	Cu.m	11.96	1194.38	14,289.50
<b>3.8.1.3</b>	P.C.C . 1:3:6(M10) Work in Foundation: 75 m.m. thick. PCC (1:3:6) in bed of excaveted trench including mixing, laying, finishing to approved level, lines and dimension and curing all complete as per specification and instruction of engineer.	Cu.m	17.95	5829.80	104,621.59
<b>3.8.1.4</b>	R/R masonry work in 1:4 C/S Mortar	Cu.m	36.15	7109.45	257,006.62
<b>3.8.1.5</b>	P.C.C for R.C.C.(1:1.5:3) ratio made by screened crushed aggregate(special) including mixing, laying, finishing to approved level, lines and dimension and curing all complete as per specification and instruction of engineer.	Cu.m	23.26	9254.08	215,212.77
<b>3.8.1.6</b>	Local wood Formwork (Centering and shuttering with approved materials for RCC works including all necessary propping, scaffolding, staging supporting etc. all complete as per specification and instruction of engineer.)	Cu.m	216.72	3037.50	658,287.00
<b>3.8.1.7</b>	Steel reinforcement bar including straightening, cleaning, cutting, bending, binding with 20 SWG wire and fixing in positions as per drawings, specifications, and instruction of engineer.	MT	1.28	86333.75	110,327.38
<b>3.8.1.8</b>	Gabion Works in 1m Span Slab	Cu.m	80.00	1987.88	159,030.00

	Culvert				
<b>3.8.1.9</b>	Febrication of Gabion Box(2*1*1)	box	40.00	3731.13	149,245.00
	<b>Sub Total of slab 1m span Items</b>				<b>1,681,640.88</b>
<b>4</b>	<b>For purpose of irrigation crossing in 30nos.</b>				
	Earthwork excavation in foundation	Cu.m	<b>200.34</b>	<b>189.75</b>	<b>38,014.52</b>
	Dry stone solling work	Cu.m	<b>41.58</b>	<b>1194.38</b>	<b>49,662.11</b>
	Granular material on beding	Cu.m	<b>94.50</b>	<b>131.31</b>	<b>12,409.03</b>
	Back filling	Cu.m	<b>494.59</b>	<b>79.06</b>	<b>39,103.14</b>
	Laying of 30 cmdia.HDPE	<b>Rm</b>	<b>225.00</b>	<b>5993.64</b>	<b>1,348,569.00</b>
	<b>Sub Total of irrigation crossing Items</b>				<b>1,487,757.80</b>
5	Tools for RBGs @ 75000x60	LS	4500000.00		4,500,000.00
	<b>Sub Total of RBGs tools Items</b>				<b>4,500,000.00</b>
	<b>Grand Total of all Items (A)</b>				<b>161,247,524.08</b>

	Bio-Engineering works@3% of (A) except tools		3,134,950.48
B	Sub Total		164,382,474.56
	VAT @13% of shopping package		3,804,677.60
C	Sub Total		168,187,152.16
	Provision for contingencies @ 5% of shopping package		1,463,337.54
D	Grand Total		<b>169,650,489.70</b>
	<b>Cost Per Kilometer</b>		<b>5,181,749.84</b>

## Annex IV: RRRSDP Environmental Checklist

### A. GENERAL SOCIO-ECONOMIC SITUATION OF THE INFLUENCE AREA<sup>1</sup>

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

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

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

#### 2. Economic activities/main occupation

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

---

### 3. Existing services and infrastructures

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



[illegible]

#### 4. Land holding pattern

[illegible]

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

[illegible]

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

[illegible]

3.2	Horses, Mules										
3.3	Yak										
3.4	Goat										
3.5	Sheep										
3.6	Rabbit										
3.7	Pig										
3.8	Fisheries										
3.9	Poultry										
3.10	Bee-keeping										
3.11	Others										

**7. Migration for employment**

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

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

Name of settlement:

- (b) Seasonal migration in search of work.

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

**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
1		
2		
3		
4		
5		

**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
1		
2		
3		
4		
5		

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

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

# Annex V: Public Notice

सीमा  
 प्रमाण  
 मध्य

**१२** २०६६ साल साउन १ गते बिहीबार  
**Thursday, July 18, 2009**

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

**पारम्भिक वातावरणीय परीक्षण (EIA) सम्बन्धी  
 राय सुझावका लागि सार्वजनिक सूचना**  
 (सूचना प्रकाशन मिति : २०६६/०४/१)

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

प्रस्तावकको नाम :- जिल्ला प्राविधिक कार्यालय, जिल्ला आयोजना कार्यालय, रुकुम

सि.नं.	आयोजनाको नाम	आयोजनाले प्रभावित गर्ने गाविसहरू
१	काँत्री-नक्सारा-कोल-रुक्मण्य मैकौट सडक	काँत्री, कोल, लम्जुरा, हुकाग, रुक्मण्यकौट
२	नदुवा-गढीज्यूला सडक	तम्घा, आदीवासडाडागाउँ, आदीवासका
३	छिन्जेत-स्थापुदह सडक	छोपिकौट

उक्त प्रस्तावको कार्यान्वयनबाट वातावरणमा पर्नसक्ने प्रभावका बारेमा सम्बन्धित गाविस विद्यालय, स्वास्थ्य चौकी, वन उपभोक्ता समिति तथा अन्य सरोकारवाला व्यक्ति वा संस्थाले यो सूचना प्रकाशित भएकी पछिल्लो १५ (पन्ध्र) दिनभित्र निम्न ठेगानामा आफ्नो सुझाव प्रस्तावसहित पठाउनु हुन अनुरोध गरिन्छ।

राय सुझाव पठाउने ठेगाना  
 जिल्ला प्राविधिक कार्यालय, काँत्री, रुकुम  
 ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना  
 जिल्ला आयोजना कार्यालय, रुकुम  
 टेलिफोन नं. ०३३-६८००६३, ०३३-६८२७००६  
 फ्याक्स नं. ०३३-६८२७००७, ०३३-६८२७००८

## Annex VI: Deed of Enquiry (Muchulka)



बाज मिति ०९.११.४०९ मा यस ... गा.वि.स.को ... मा गम्भीर पुनर्निर्माण तथा पुनर्स्थापना आयोजना, रकमका कर्मचारी श्री ... ले वातावरण संरक्षण नियमावली २०५४, (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) बमोजिम प्रारम्भिक वातावरणीय परीक्षण (IEE) गर्ने बारेको मिति २०६६/०४/०९ मा गोरखापत्र मा प्रकाशित सुचनाको टाँस गरेको व्योहोरा प्रमाणित गरिन्छ। उक्त सुचना ... राहको खण्डको लागि टाँस गरिएको व्योहोरा जानकारी गराउँदछौं।

तपसिल

नाम	हस्ताक्षर
१. विष्णु बुढा	
२. आता बुढा	
३. प्राईल बि.स	
४. अनिमल बुढा	
५. विष्णु बुढा	
६. योगेश्वर बुढा	
७. अदिम बि.स	
८. हरिलाल सु.रा.	
९.	

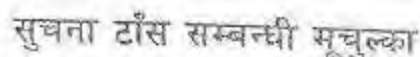
# सुचना टाँस सम्बन्धी मचुल्का

स्थानीय विकास मन्त्रालय  
गाउँ विकास समितिको कार्यालय

आज मिति ०६.६-४-१० मा यस ~~उपेक्षित~~ गा.वि.सको ~~कोल गार्डन~~ मा ग्रासीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना, रुकुमका कर्मचारी श्री ~~मित्र बहादुर~~ ~~पौडेल~~ ले वातावरण संरक्षण नियमावली २०५४, (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) बमोजिम प्रारम्भिक वातावरणीय परीक्षण (IEE) गर्ने वारेको मिति २०६६।०४।०१ मा गौरखापत्र मा प्रकाशित सुचनाको टाँस गरेको व्योहोरा प्रमाणित गरिन्छ। उक्त सुचना ~~बुद्धि, प्रो.ल.~~ ~~अ.क.वेरा~~ सडक खण्डको लागि टाँस गरिएको व्योहोरा जानकारी गराउँदछौ।

तपसिल

नाम	हस्ताक्षर
१) <del>बन बहादुर बुढा</del>	<del>बन बहादुर बुढा</del>
२) <del>अरु प्रकाश राउत</del>	<del>अरु प्रकाश राउत</del>
३) <del>अनिल बुढा</del>	<del>अनिल बुढा</del>
४) <del>बमोजिम बुढा</del>	<del>बमोजिम बुढा</del>
५) <del>गगनधरा बुढा</del>	<del>गगनधरा बुढा</del>
६)	
७)	
८)	
९)	



आज मिति १६१-४०९.३ मा यस कटि ना वि सको ला नि सुचनामा यामीण पुनर्निर्माण तथा पुनस्थापना आयोजना, रकुमका कर्मचारी थी मित्र व डे स्की ले वातावरण संरक्षण नियमावली २०५४, (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) बमोजिम प्रारम्भिक वातावरणीय परीक्षण (IEE) गर्ने वारेको मिति २०६६।०४।०९ मा मोरखापत्र मा प्रकाशित सुचनाको टाँस गरेको व्योहोरा प्रमाणित गरिन्छ । उक्त सुचना ... गौरी, जेल ... सहक खण्डको लागि टाँस गरिएको व्योहोरा जानकारी गराउँदछौ ।

तपसिस्त

नाम	हस्ताक्षर
१) राजधन विक्र	राजी धन
२) धनराज पुन	धनराज
३) सुनू कसाडु पुन	सुनू
४) मोरखे पुन	मोरखे पुन
५) रामधन पुन	रामधन
६) लक्ष्मण पुन	लक्ष्मण
७) गोपे प्रसाद पुन	गोपे प्रसाद
८) रजुग पुन	रजुग
९)	





नेपाल सरकार  
स्थानीय विकास क्षेत्रालय  
जिल्ला विकास समितिको कार्यालय  
मुसिकोट, रुकुम

मिति: २०६९/०४/०९

प.सं. :  
व.सं. :

जो जससँग सम्बन्धित छ।

उपरोक्त सम्बन्धमा आज मिति २०६९/०४/०९ मा यस जि.वि.सको सुचना पाटीमा ग्रामीण पुनर्वर्माण तथा पुनर्स्थापना आयोजना, रुकुमका कर्मचारी श्री केदार धिमिरेले वातावरण संरक्षण निश्चमावली २०५४, (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) बमोजिम प्रारम्भिक वातावरणीय परीक्षण (IEE) गर्ने बारेको मिति २०६९/०४/०९ मा गोरखापत्रमा प्रकाशित सुचनाको टाँस गरेको व्योहोरा प्रमाणित गरिन्छ। उक्त सुचना काँकी-तकसेरा-कोल-सुवगम-मैकोट सडक खण्डको लागि टाँस गरिएको व्योहोरा जानकारी गराउँदछौ।

(हरिप्रसाद कoirala)  
ब.म. स्थानीय विकास अधिकारी  
स्थानीय विकास अधिकारी



## सुचना विभाग सम्बन्धी सूचना

आज मिति २०८०-४-३ मा यस विभागमा वि.सं. ११६/२०७९ मा प्राप्ति  
पुनर्निर्माण तथा पुनर्स्थापना आयोजना, रुकुमका कर्मचारी श्री. वि. न्यौपाने  
ले वातावरण संरक्षण नियमावली २०५४, (पहिलो संशोधन २०५५ समेत) को नियम ७२(२)  
बमोजिम प्रारम्भिक वातावरणीय परीक्षण (IEE) गर्ने बारेको मिति २०८०/०४/०९ मा गौराखापन  
मा प्रकाशित सुचनाको टाँस गरेको व्योहोरा प्रमाणित गरिन्छ। उक्त सुचना ओगरे, बेल  
तकलेरा सडक सण्डको लागि टाँस गरिएको व्योहोरा जानकारी गराउँदछौ।

### तपसिल

नाम	हस्ताक्षर
१) <u>जयकुमारी उदा</u>	<u>जयकुमारी उदा</u>
२) <u>छासुवा बेपली</u>	<u>छासुवा बेपली</u>
३) <u>सुनिल विजु</u>	<u>सुनिल विजु</u>
४) <u>तारा उदा</u>	<u>तारा उदा</u>
५) <u>सविता उदा</u>	<u>सविता उदा</u>
६) <u>सुनिल उदा</u>	<u>सुनिल उदा</u>
७) .....	.....
८) .....	.....
९) .....	.....

## सुचना टाँस सम्बन्धी मूचुल्का

आज मिति २०६१.०४/०६ मा यस ठाँडे गा.वि.स.को ठाँडे प्रसाद मा ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना, रुकुमका कर्मचारी श्री विजु डोपा ले बातावरण संरक्षण नियमावली २०५४, (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) बमोजिम प्रारम्भिक बातावरणीय परीक्षण (IEE) गर्ने वारेको मिति २०६१/०४/०९ मा गोरखापत्र मा प्रकाशित सुचनाको टाँस गरेको व्योहोरा प्रमाणित गरिन्छ। उक्त सुचना ठाँडे, डोला तण्डेरा सडक खण्डको लागि टाँस गरिएको व्योहोरा जानकारी गराउँदछौ।

नाम	हस्ताक्षर
१) <u>हित चर्ति</u>	<u>हित चर्ति</u>
२) <u>सत्य बहादुर बुढा</u>	<u>सत्य</u>
३) <u>श्रीमान बुढा</u>	<u>श्रीमान बुढा</u>
४) <u>निर्भमान बुढा</u>	<u>निर्भमान</u>
५) <u>विसम्भु बुढा</u>	<u>विसम्भु</u>
६) <u>सजीवन गुरुङ</u>	<u>सजीवन</u>
७) <u>दुरव बुढा</u>	<u>दुरव</u>
८) <u>किसमत पुब्ज</u>	<u>किसमत</u>
९) <u>दनीमान बुढा</u>	<u>दनीमान</u>
१०) <u>सिरप्रसाद शेर्पा</u>	<u>सिरप्रसाद शेर्पा</u>



## सुचना टाँस सम्बन्धी मूचुल्का

आज मिति ०६.१.४.१० मा यस नक्सरा गा.वि.स.को महोदय मा वि मा सामीप्य पुनर्निर्माण तथा पुनस्थापना आयोजना, रुकुमका कर्मचारी श्री प्रिय बहादुर जोषा ले वातावरण संरक्षण नियमावली २०५४, (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) बमोजिम प्रारम्भिक वातावरणीय परीक्षण (IEE) गर्ने वारेको मिति २०६६/०४/०९ मा गोरखापत्र मा प्रकाशित सुचनाको टाँस गरेको व्योहोरा प्रमाणित गरिन्छ। उक्त सुचना कोडि, शेला नक्सरा सडक खण्डको लागि टाँस गरिएको व्योहोरा जानकारी गराउँदछौ।

### तपसिल

नाम	हस्ताक्षर
१) <u>शुद्धिराम</u>	<u>[Signature]</u>
२) <u>अमरनाथ पौडेल</u>	<u>[Signature]</u>
३) <u>देव बहादुर बुढा</u>	<u>[Signature]</u>
४) <u>शंकर पुन</u>	<u>[Signature]</u>
५) <u>चन्द्र धर्मा</u>	<u>[Signature]</u>
६) <u>विनिता पुन</u>	<u>[Signature]</u>
७) <u>मन पुमा सुवाल</u>	<u>[Signature]</u>
८) <u>धुव पुन</u>	<u>[Signature]</u>
९)	



## सुचना टाँस सम्बन्धी मूचुल्का

आजभित्ती २०६६-६७ मा यस तर्फे गा.वि.सको वि.पा.सी. प्र.सं. ग.पु.म. मा ग्रामीण पुनर्निर्माण तथा पुनस्थापना आयोजना, रुकुमका कर्मचारी श्री बि.न. बहादुर देवी ले वातावरण संरक्षण नियमावली २०५४, (पहिलो संसोधन २०५५ समेत) को नियम ७२(२) बमोजिम प्रारम्भिक वातावरणीय परीक्षण (IEE) गर्ने बारेको भित्ती २०६६/०४/०१ मा गोरखापत्र मा प्रकाशित सुचनाको टाँस गरेको व्योहोरा प्रमाणित गरिन्छ। उक्त सुचना बि.न. बहादुर देवी तर्फे सडक खण्डको लागि टाँस गरिएको व्योहोरा जानकारी गराउँदछौ।

### तपसिल

नाम	हस्ताक्षर
१) <u>श्याम कुमार</u> <u>तर्फे</u>	<u>श्याम</u>
२) <u>मिली को</u> <u>तर्फे</u>	<u>मिली को</u>
३) <u>तेज को</u> <u>तर्फे</u>	<u>तेज को</u>
४) <u>मैलागी</u> <u>तर्फे</u>	<u>मैलागी</u>
५) <u>गुलाबि</u> <u>तर्फे</u>	<u>गुलाबि</u>
६) <u>श्यामकुमार</u> <u>तर्फे</u>	<u>श्याम</u>
७) .....	.....
८) .....	.....
९) .....	.....

## Annex-VII:Name of the Organizations

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

SN	Name or Organization	Address	Remarks
1	Kakri VDC	Kakri	
2	Taksera VDC	Taksera	
3	Kol VDC	Kol	
4	P.Tribhene L.S.School	Kakri	
5	Janta P.School	Taksera	
6	Kakri S.Healthpost	Kakri	
7	DDC,Rukum	Khalanga	

Source: Field Survey, 2009

## Annex VIII: List of persons consulted

### List of Person Consulted

S.N	Name	Address	Occupation
1	Mulman pun	Kol VDC	Farmer
2	Karmadan pun	Kol VDC	Farmer
3	Bhan pun	Kol VDC	Farmer
4	Narayan pun	Kol VDC	Farmer
5	Jyoti pd pun	Kol VDC	Farmer
6	Kabita pun	Kol VDC	Farmer
7	Puspa pun	Kol VDC	Farmer
8	Premswar pun	Kol VDC	Farmer
9	Birbal pun	Kol VDC	Farmer
10	Shreeman pun	Kol VDC	Farmer
11	Lal pd pun	Kol VDC	Farmer
12	Balman pun	Kol VDC	Farmer
13	Tekman pun	Kol VDC	Farmer
14	Dal badhur pun	Kol VDC	Farmer
15	Raju pun	Kol VDC	Farmer
16	Chudamany Chantal	Kol VDC	Farmer
17	Bhupendra Guring	Kol VDC	Farmer
18	Chal bd Gurung	Kol VDC	Farmer
19	Sanki Gurung	Kol VDC	Farmer
20	Mokta tula chan	Kol VDC	Farmer
21	Prakash Chantal	Kol VDC	Farmer
22	Jitendra Dharti	Kol VDC	Farmer
23	Kalish Dharti	Kol VDC	Farmer
24	Shyam Budha	Kol VDC	Farmer
25	Bikram Budha	Kol VDC	Farmer
26	Lal kri Budha	Kol VDC	Farmer
27	Kul pd Gurung	Kol VDC	Farmer
28	Dir bd Chantal	Kol VDC	Farmer

29	Ganesh kr Pun	Kol VDC	Farmer
30	Puntha bd Pun	Kol VDC	Farmer
31	Tara pd KC	Kol VDC	Farmer
32	Pul Dharti	Kol VDC	Farmer
33	Chamili Dharti	Kol VDC	Farmer
34	Gita Chantal	Kol VDC	Farmer
35	Chitra bd Dharti	Kol VDC	Farmer
36	Jit bd BK	Kol VDC	Farmer
37	Chandraman Budha	Takshara VDC	Farmer
38	Dilman Budha	Takshara VDC	Farmer
39	Udim Budha	Takshara VDC	Farmer
40	Laxman Budha	Takshara VDC	Farmer
41	Jivan Budha	Takshara VDC	Farmer
42	Shyam Budha	Takshara VDC	Farmer
43	Ashok Sonar	Takshara VDC	Farmer
44	Jaypuri Budha	Takshara VDC	Farmer
45	Mina Budha	Takshara VDC	Farmer
46	Magman Budha	Takshara VDC	Farmer
47	Dhaniman Budha	Takshara VDC	Farmer
48	Bishnu Budha	Takshara VDC	Farmer
49	Kalram Budha	Takshara VDC	Farmer
50	Jyoti parkash Gurong	Takshara VDC	Farmer
51	Shirjan Dharti	Takshara VDC	Farmer
52	Surthan Budha	Takshara VDC	Farmer
53	Sopal Budha	Takshara VDC	Farmer
54	Jivan Budha	Takshara VDC	Farmer
55	Shiva Budha	Takshara VDC	Farmer
56	Jog Dharti	Takshara VDC	Farmer
57	Dilmaya dhalanay	Takshara VDC	Farmer
58	Surya kum Budha	Takshara VDC	Farmer
59	Kaji man Dharti	Takshara VDC	Farmer
60	Sundar Dhatana	Takshara VDC	Farmer
61	Pandav Budha	Takshara VDC	Farmer
62	Bikram Pun	Takshara VDC	Farmer
63	Simgat BK	Takshara VDC	Farmer
64	Sury kr BK	Takshra VDC	Farmer
65	Shreeman BUdha	Takshra VDC	Farmer
66	Chat bd Budha	Kakri VDC	Farmer
67	Mulbir Pun	Kakri VDC	Farmer
68	Byan Budha	Kakri VDC	Farmer
69	Sur bd Budha	Kakri VDC	Farmer
70	Satman Budha	Kakri VDC	Farmer
71	Dhan partap Budha	Kakri VDC	Farmer
72	Manbir Budha	Kakri VDC	Farmer
73	Bikram Budha	Kakri VDC	Farmer
74	Badh Dharti	Kakri VDC	Farmer
75	Kami Budha	Kakri VDC	Farmer

76	Samjhi Budha	Kakri VDC	Farmer
77	Bina B K	Kakri VDC	Farmer
78	Narpur B K	Kakri VDC	Farmer
79	Ratnapura B K	Kakri VDC	Farmer
80	Dota B K	Kakri VDC	Farmer
81	Dhan Kr B k	Kakri VDC	Farmer
82	Sunrupi B K	Kakri VDC	Farmer



# Annex IX: Summary of meeting minutes with local people

आज भेटिने सबैको साथै आफ्नो आफ्नो घरमा भेटिने सबैको साथै	
निर्माण तथा पुनर्स्थापना कार्यहरूमा सम्लग्न नभएको भएतापनि	
समाज सेवाी जस्तै लक्ष्मीको सहायतामा भेटिने सबैको साथै आफ्नो आफ्नो घरमा	
मा भेटिने सबैको साथै आफ्नो आफ्नो घरमा भेटिने सबैको साथै	
समाज	
१. भुवनेश्वर बुढा	सुदामा
२. भुवनेश्वर बुढा	सुदामा
३. भुवनेश्वर बुढा	सुदामा
४. भुवनेश्वर बुढा	सुदामा
५. भुवनेश्वर बुढा	सुदामा
६. भुवनेश्वर बुढा	सुदामा
७. भुवनेश्वर बुढा	सुदामा
८. भुवनेश्वर बुढा	सुदामा
९. भुवनेश्वर बुढा	सुदामा
१०. भुवनेश्वर बुढा	सुदामा
११. भुवनेश्वर बुढा	सुदामा
१२. भुवनेश्वर बुढा	सुदामा
१३. भुवनेश्वर बुढा	सुदामा
१४. भुवनेश्वर बुढा	सुदामा
१५. भुवनेश्वर बुढा	सुदामा
१६. भुवनेश्वर बुढा	सुदामा
१७. भुवनेश्वर बुढा	सुदामा
उत्तरावस्था	
१. भुवनेश्वर बुढा	सुदामा
२. भुवनेश्वर बुढा	सुदामा
३. भुवनेश्वर बुढा	सुदामा
४. भुवनेश्वर बुढा	सुदामा
निर्माण नं. १ उत्तरावस्था नं. १को सहायतामा भेटिने सबैको साथै	
पसमा भेटिने सबैको साथै आफ्नो आफ्नो घरमा भेटिने सबैको साथै	
भुवनेश्वर बुढा	



કુલે કિયેમ કામ સંબંધી સડલ મુત્તાક ગમે નિર્ણય  
સર્વ સદમાને પારિત ગરિયો /

નિર્ણય નં. ૨ પ્રસ્તાવ નં. ૨ મા દલખલ ગર્ધી સડલ સેમમા વેલમા  
પ્રસાદ સમજાવે રિતિરિવાજભાઈ કુમે પાને લગીલાગો જમર  
નપુ-પાઈ સડલ મેનરસ ગમે નિર્ણય સર્વ સદમાને નિર્ણય ગરિયો

નિર્ણય નં. ૩ પ્રસ્તાવ નં. ૩ મા દલખલ ગર્ધી સડલ સેમમા  
પને સામુપાપિલ અપનદમભાઈ કુમે પાને કિયેમમા કોઈ નપુ-પા  
સામુપાપિલ અપનભાઈ સંસ્કાર ગમે સડલ સજાડિ સજાડને  
નિર્ણય ગરિયો /

નિર્ણય નં. ૪ પ્રસ્તાવ નં. ૪ મા દલખલ ગર્ધી પાસ સડલ  
સેમમા સડલ નિર્માલ સંસ્કારે વિધિન કિયેમમા આપમાલીન  
સંસ્કારી કામ સજાડી સજાડને નિર્ણય સર્વ સદમાને નિર્ણય  
ગરિયો /

મુલાવરપા ૫/૧/૨૦૧૬ મુલાવર





मान्यता विरुद्ध चलाई बचाया जाए सम्पदा को विवेक  
गरिया।

निवेदन ३-

प्रस्ताव नं ३ माथि इलाहाबाद स्थापित प्रमाण  
रहेता समुदायिक अवलोकन करि उन खाल्ता कोने पति प्रमाणलाय  
हउ हुन नदिने विवेक गरिया।

निवेदन ४-

प्रस्ताव नं ४ माथि इलाहाबाद स्थापित प्रमाण  
रहेता समुदायिक अवलोकन करि उन खाल्ता कोने पति प्रमाणलाय  
हउ हुन नदिने विवेक गरिया।

निवेदन ५-

प्रस्ताव नं ५ माथि इलाहाबाद स्थापित प्रमाण  
रहेता समुदायिक अवलोकन करि उन खाल्ता कोने पति प्रमाणलाय  
हउ हुन नदिने विवेक गरिया।

भुजगिनि ३०-३३-०४-१२ गते का दिन मल कोटि कोल नवरीय शिखर रज  
भुजगान पर कोल कोटि शिखर में १ भुजगा पर भुजगो गपनो गेवाली नवरीय  
नमोनिमशो उपनिषदिमा भुजगिनि वीजगिनि निमशो भुजगान गते ।

प्राणि

- |   |                  |       |
|---|------------------|-------|
| १ | साँस बहाव        | हल्का |
| २ | गोरी कुम्हार पुल | गोरी  |
| ३ | पुल का पुल       | पुल   |
| ४ | लाल पुल का पुल   | लाल   |
| ५ | पुल का पुल       | पुल   |
| ६ | चमेली            | चमेली |
| ७ | जिवा हल्का       | जिवा  |
| ८ | चित्र का पुल     | चित्र |
| ९ | गीत बहाव चित्र   | गीत   |

22/9/21

७. सड़क निर्माण कार्य सुकाय मौलिक स्वीत मंगने सम्बन्ध
८. वृक्षारोप मित्र दिवाल तथा संस्थाते सम्बन्ध
९. सामुदायिक मठन सुकायका सम्बन्ध
१०. आय-मार्जन कार्यक्रम सम्बन्ध

ਦਿਲੀਪ ਜੀ. ੧

निर्वाप नं. १ अन्वय नं. १ म. एकपत्रे अर्धे मज्जेमे यस्य मज्जेमे  
ते सुदक निर्वापे जले यस्य मज्जेमे मुक्तं वा मुक्तं सति  
मौखिक सति नमुच्यते सुदक निर्वापे मज्जेमे सति  
सर्वसम्पत्ते निर्वापे मज्जेमे ।

2. 2. 2. 2. 2.

प्रियंदा के प्रस्ताव में हमें हमला करने की सलाह  
स्वामी मनाउते वा स्वीकृत स्वरूप रहना प्रितिष्ठित  
ह संस्कारिता कुनै मिश्रितता प्रिति नष्ट-प्राप्ति सहज



સડક નિર્માણ કાંડાઈ લઢાઈનલ્લ લાગઁ નિર્માણ  
સર્વસદ્માતે નિર્ણય ગઁવિયો ।

નિર્ણય નં. ૩

નિર્ણય નં. ૩ ઉસ્તાવ નં. ૩ આ દલખલ ગર્વ અલ્લ  
પસ મેલાલે પસ સમુપાપમ/ સ્વેળા સામુપાપમ/ મેલાલે  
કુતે પલે કિસિમલે સીતે નુપ-પાઈ સડક નિર્માણલાઈ  
કાંડાઈ લઢાઈન સર્વસદ્માતે નિર્ણય ગઁવિયો ।

નિર્ણય નં. ૪

નિર્ણય નં. ૪ ઉસ્તાવ નં. ૪ આ દલખલ ગર્વ અલ્લ  
પસ મેલાલે પસ સર્વમા સડક નિર્માણ રાંગ સગે વિમિલ  
કિસિમલ/ આપં માર્જન સમ્બલ્લી કાર્ય સંચાલન ગર્વ  
લાઈ નિર્ણય સર્વસદ્માતે નિર્ણય ગઁવિયો ।

કુવિદાઈ ડીવ

आजमिति १० ६६-०४-१९७७ गतेका दिन धनु ढाही, डौला, नडपुरा, सडरका  
मा पर्ने लडगाउँमा बसेका गेलाल तपारीका बमोजीमा उपस्थितीमा तपारीका  
जिमेका निर्माणका फारिस गर्दैछ।

### समावेश

१. उपोति प्रकाश गुडा, ~~सुदुर~~
२. शिरमान धर्ते ~~सुदुर~~
३. सुदुरान गुडा ~~सुदुर~~
४. सोमपाल गुडा ~~सुदुर~~
५. जिवन गुडा ~~सुदुर~~
६. शिता गुडा ~~सुदुर~~
७. भोग धर्ते ~~सुदुर~~
८. दलमाध धर्ते ~~सुदुर~~
९. सुपु उमारी गुडा ~~सुदुर~~
१०. गजिमान धर्ते ~~सुदुर~~
११. सोमपाल गुडा ~~सुदुर~~
१२. सुन्दर धर्ते ~~सुदुर~~
१३. पालक गुडा ~~सुदुर~~
१४. विष्णु पुन ~~सुदुर~~
१५. दिगम्बर जिडा ~~सुदुर~~
१६. लिला व गुडा ~~सुदुर~~

### प्रस्तावहरू:

१. सडक निर्माण गर्दा मुद्दाप माथिको धर्ते नगर्ने सम्झौता
२. ब्यागिप शिवि शिवाले तथा अन्काले सम्झौता
३. सम्झौतापछि अघन सुदुराका सम्झौता
४. आय-आर्जन कार्यक्रम सम्झौता

### निर्णय नं १

प्रस्ताव नं १मा दलमाध धर्ते आलका पस मेलाको  
सोमा निर्माण हुने सडकले पस सोमा हुने निर्माणको  
विक शिवि नगर्ने मुद्दाप नगर्ने निर्माण गर्ने सम्झौता गर्ने निर्णय  
गियो।

### निर्णय नं २



निर्णय नं. ३ प्रस्ताव नं. ३ मा दलगत गरी आलको यस  
आले वधानिय स्तरमा मनाउँदै आएका निर्वाचकाल सञ्चालन  
पनि असर नपु-पाठले निर्णय सर्वसहमते निर्णय गरि

निर्णय नं. ३  
निर्णय नं. ३ प्रस्ताव नं. ३ मा दलगत गरी आलको  
मेल यस समुदायमा रहेको सामुदायिक सभालाई कुनै  
नै किसिमको साथै नपु-पाठ काम संचालन गर्ने निर्णय  
रिपो ।

निर्णय नं. ४  
निर्णय नं. ४ प्रस्ताव नं. ४ मा दलगत आलको यस मेलाले  
प. सभामा सडक, निर्माणका सँग सँगै आप-आलन सम्बन्ध  
पुर्कस पनि अगाडी बढाउनुका लागि सर्वसहमते निर्णय  
गरियो ।



आज विधि २०६६-७७ नुसार सबै जसले कोल सङ्ग्रहण २०६७-७८ लागू गर्ने  
 प्रस्तावले लेखेको आ वि.६ पढाउने ६ जसले लेखेको होलमा वसेको नैठकले  
 समीक्षा गरी बस्ने सम्बन्धी लक्ष्यित समीक्षाको उपस्थितिमा तयारीको निर्णय  
 पारित गरियो ।

तयारीको

अनुमान बुढा

दिलमान बुढा

उपिम बुढा

लक्ष्मण बुढा

जि.ब. बुढा

श्याम बुढा

भरत बुढा

अमपुरी बुढा

मिना बुढा

मगमान बुढा

सन्निमान बुढा

विष्णु बुढा

६. कलमान बुढा

जि.ब.

म.म.

उपिम

लक्ष्मण

जि.ब. बुढा

श्याम

भरत

अमपुरी

मिना

मगमान

सन्निमान

विष्णु

प्रस्तावहरू

- १) सडक निर्माण गर्दा भूक्षय भौतिक क्षति गर्ने सम्बन्धमा
- २) सम्पत्ति विवेकिता तथा सम्पत्ति सम्बन्धमा
- ३) अनुमानिक भवन निर्माण सम्बन्धमा
- ४) आवा-आलन कार्यक्रम सम्बन्धमा

निर्णयहरू

निर्णय नं. १ प्रस्ताव नं. १ माथि दलकल गर्दा आलको भेला  
 नै सडक निर्माण गर्दा भूक्षय भौतिक क्षति गर्ने सम्बन्धमा  
 सबै विषयमा सबै सम्पत्ति निर्माण पारित गरियो ।

नि. नं. २

प्रस्ताव नं. २ माथि दलकल गर्दा आलको भेलाको

आजमे स्तरको विविधिवात सस्कारलेलाई मान्यता दिने यसलाई  
हलचल हुन नदिने निर्णय सर्वसहमतले पारित गरियो।  
निर्णय नं. ३

प्रस्ताव नं. २ माथि हलचल गर्दा यस भेलाले समुदाय  
मा रहेका सामुदायिक अग्रजलाई सोबि नपु-पाइ काम सुन्वाल्न  
ने निर्णय सर्वसहमतले निर्णय गरियो।  
निर्णय नं. ४

प्रस्ताव नं. ४ मा हलचल गर्दा बाजको यस भेला  
ले सदस्य निर्माण संग अंगे कुनै पनि आप बाजको सदस्य  
कार्यक्रम गर्नको लागि हलचल गर्दै लाने निर्णय सर्वसहमत  
निर्णय गरियो।

  मि. दा



આન નિર્ણય ૨૦૨૬-૪-૬ ગતેલા દિન થઈ ગયો જોઈ શકાય છે વડા નં ૮ ના  
પત્રે લખવામાં આવેલાં બંધો આમ જોવાની તપશ્ચિત્તે નમોગિતિમાં મુદ્દાવિનિર્ણય  
પાલિકા પ્રજાસભ્યોમાં ફાળવવા અંગે નિર્ણય કરવામાં આવેલો છે.

૧. આગળ મુદ્દાવિનિર્ણય :-

૧. મુલમાન પુત્ર મુલમાન
૨. કમલ પુત્ર કમલ
૩. દેવ પુત્ર દેવ
૪. નારાયણ પુત્ર નારાયણ
૫. જોગિદાસ પુત્ર જોગિદાસ
૬. કવિતા પુત્ર કવિતા
૭. પુસ્પા પુત્ર પુસ્પા
૮. પ્રમદાસ પુત્ર પ્રમદાસ
૯. વિરવલ પુત્ર વિરવલ
૧૦. હીમાન પુત્ર હીમાન
૧૧. લાલ પ્રદીપ પુત્ર લાલ
૧૨. બલમાન પુત્ર બલમાન
૧૩. દેવમાન પુત્ર દેવમાન
૧૪. વલ વપુત્ર વલ
૧૫. રામ પુત્ર રામ

૨. પ્રજાસભ્યો :-

૧. શરત નિર્ણય ગદા મુદ્દાવિનિર્ણય શરત નિર્ણય ગદા મુદ્દાવિનિર્ણય
૨. રૂપાનીય રિતિ રિવાજ તથા સંસ્કૃતિ સંસ્કૃતિ
૩. સામુદાયિક મત સુચના સંસ્કૃતિ
૪. જાતીયતા અંગે સંસ્કૃતિ

૩. નિર્ણય :-

નિર્ણય નં-૧ પ્રજાસભ્ય નં ૧ નામ દેવકલ ગદા આગળ મુદ્દાવિનિર્ણય  
૧૩૭ નિર્ણય ગદા મુદ્દાવિનિર્ણય શરત નિર્ણય ગદા મુદ્દાવિનિર્ણય  
વિષયમાં સર્વ સહમતી થઈ પસંદ કરવામાં આવેલો છે.

निर्णय नं २

प्रस्ताव नं २ माघि हलचल गर्दा आजको मेलको  
स्वागित स्वरुत शिति सिवाय तथा सेहलिलो मान्यता दिने  
पसलाई हलचल हुन नदिने निर्णय सर्वसम्मतिबाट पारित गरियो ।

निर्णय नं - ३

प्रस्ताव नं २ माघि हलचल गर्दा समुदाय स्थापना  
रहेको समुदायिक अवस्था शक्ति पुर्नगठनी काम संचालन गर्ने निर्णय  
पारित गरियो ।

निर्णय नं ४

प्रस्ताव नं ४ माघि हलचल गर्दा स्वरुत रहेको  
समुदाय स्थापना आजभानै कार्यरतको उद्देश्य गर्दै माघि निर्णय  
पारित गरियो ।



११/११/१८



आजमिति २०६६-०४-१४ गतेका दिन गोरुकोला तहसीलाको  
 २५६६ नम्बरको पत्रले विरगम र गोरेलाको संयुक्त भेलामा यसको  
 पुनर्गठन तथा पुनर्स्थापना, भन्नेबारे उक्तकोला तहसीलाको २५६६ नम्बरको पत्रले  
 विरगमको वडाको भेलाले निर्दिष्टा निर्धारणमा दलगत गरी  
 निर्णयहरू पारित गर्दैछ।

### उपस्थिति :-

१. लुङ्गम गी इन्देल मुकुन्दराज
२. मुकुन्द मुकुन्दराज
३. इन्द्रा मुकुन्दराज
४. शक्ति मुकुन्दराज
५. गोरेला मुकुन्दराज
६. मुकुन्दराज इन्देल
७. निर्णय दानि
८. इन्द्रा मुकुन्दराज
९. शक्ति मुकुन्दराज
१०. विरगम मुकुन्दराज
११. लाल मुकुन्दराज मुकुन्दराज
१२. इन्द्रा मुकुन्दराज मुकुन्दराज

### प्रस्तावहरू :-

१. मुकुन्दराज र गोरेला संयुक्त संयुक्त
२. इन्द्रा मुकुन्दराज र इन्द्रा मुकुन्दराज
३. इन्द्रा मुकुन्दराज र इन्द्रा मुकुन्दराज
४. अन्य

### निर्णयहरू :-

निर्णय नं १. - प्रस्ताव नं १माथि दलगत गरी इन्द्रा  
 निर्णय गरी मुकुन्दराज र गोरेला संयुक्त संयुक्त  
 वन्याउर्द निर्णय गरी वन्याउर्द वन्याउर्द गरी निर्णय संयुक्त

नरिले पारित गरियो।

निर्णय नं २.




प्रस्ताव नं २ माथि दलदल गरी स्थानिय जायितर  
ले माने आजाफरा रिनि रिनाज सुदहनि परम्परा लाई स्थान  
दिई निमेण अर्प गर्ने निर्णय गरियो।

निर्णय नं - ३

प्रस्ताव नं ३ माथि दलदल गरी स्थानिय स्थान  
मएडा भौति सूरचना समुदायि मक्का लाई सुदहनि दिई  
सुदह निमेण अर्प सम्पन्न गर्ने निर्णय गरियो।

निर्णय नं ४.

प्रस्ताव नं ४ माथि दलदल गरी सुदह निमेण अर्प  
सुदह अल्प आर्प जाजन सम्पन्न गर्ने कार्य सुदह सम्पन्न गर्ने  
निर्णय गरियो।

# Annex X: Recommendation Letters

ગાંધી વિધાનસભા સમિતિનો સચિવાલય

પાંસ:- ૦૬૬/૬૬  
ચાન:- ૨૬

મિતિ: ૨૦૨૬/૨/૧૯

વિષય:- સીડારિયા તાલુકામાં

શ્રી જો ગસરંગ સમજાવ રાખેલું.

પ્રસ્તુત વિષયમાં ચર્ચા મિલ્લામાં રચનાલિત પ્રાપ્તિ પુનઃ  
નિર્માણ તથા પુનઃપાપના (RPR 520) આયોજના અન્તર્ગત નિર્માણ  
કુલ ચાર ગા. વિ. હ. આયોજના કાઢીયોલ- વઢલરા નેહોર (ગા. વિ.  
કાઢી- વઢલરા) સહકાર નિર્માણ ગાંધી ગસરંગ કુલ પાંચ નિર્માણ  
કાલપરગીયો, સામાજિક, સાંસ્કૃતિક તથા આર્થિક ગસરંગ  
સંચાલના નિર્માણકાર આસર નવન જાનકારી ગાંધી ગાંધી સાથે  
મેં હકક નિર્માણકાર નામ આગાડી કરાવના કુલ હકકાર  
અનુસારગાંધી સાથે સિડારિયા ગાંધી હ.

૦૬૬/૨/૧૯  
(ગિસરંગ વિ. ૨)





# માર્ગ વિકાસ સમિતિનો કાર્યાલય

કોળ, રૂઢા

સંસં- ૦૬૬/૦૬૭

સંસં- ૨૭

માર્ગ વિકાસ સમિતિનો કાર્યાલય  
કોળ, રૂઢા

મિતિ ૦૭/૧૧/૧૯૬૭

વિષય:- ચિત્રોલ સમ્બંધી

શ્રી જો જણાવે સમ્બંધ રાખે છે

પ્રસ્તુત વિષયના યાદ જિલ્લાના સેવાલિ  
ગામિણ કુલ નિર્માણ તથા પુનઃ સ્થાપના (R.R.  
૨૫૦૫) અર્થે નિર્માણ હોય તથા જા.વિ.સ. અર્થે જરૂર હોય  
ગોલ, પુલ, રસ્તા પ્રેમી રૂઢા પદ જા.વિ.સ.  
પદ જા.વિ.સ. પદ હોય તથા તરારો સ્વાભાવિક  
વાતાવરણિય, સામાજિક, આર્થિક તથા  
અન્ય કુલ પુનઃ નિર્માણ અર્થે નવ  
જા.વિ.સ. સાથે જોડાયેલ નિર્માણ ગા. જા.વિ.સ.  
હોઈ હોઈ જરૂર હોય તથા ચિત્રોલ માર્ગે છે

ગુજરાત  
(જી.વિ.સ. સમિતિ)  
જા.વિ.સ. સમિતિ





# गाउँ विकास समितिको कार्यालय

तकसार, रुकुम

पं सं०:- ०६६/०६७


सं सं०:- १६

मिति:- २०६६/४/९

विषय:- सिफारीस सम्बन्धमा

श्री ओ एन सम्बन्ध बारम्बार।

प्रस्तुत विषयमा यस जिल्लामा शिञ्चलित ग्रामिण पुन-निर्माण तथा पुनर्स्थापना (RRRSDP) आयोजना अर्न्तगत निर्माण हुने यस गा.वि.स. अर्न्तगतको काँक्री-कोल-तकसार-हुन्नाम-मैनाट (काँक्री-कोल-तकसार) सडक निर्माण गर्दा यसले कुनै पनि किसिमको वातावरणीय, सामाजिक आर्थिक तथा आर्थिक अस्ता क्षेत्रमा नकारात्मक असर नपर्ने जानकारी गराउनका साथै यो सडक निर्माणको काम अगाडी बढाउन हुन हार्दिक अनुरोध बा साथ सिफारिश गरिएको छ।

  
(जीत बहादुर रजक)  
गा. वि. स. सचिव



# श्री जनता प्राथमिक विद्यालय

लांकुरीचौर, तल्लोसेरा, रुकुम



पत्रांक :- ०६६/६०


पानांक :- १८

मिति २०७८/०८/०८

विषय :- सिफारिस सम्बन्धमा

श्री जो अस रंग सम्बन्ध सम्बन्ध

प्रस्तुत विषयमा यस श्री जनता प्रा. वि. लांकुरी-  
चौर तल्लोसेरा रुकुममा यस रुकुम जिल्लाको संचालि-  
त ग्रामीण पुन निर्माण तथा पुनस्थापना (R.R.R.D)को  
परिपत्र २०६६/१५ को पत्र अनुसार कुकुरी भेल  
र यस तल्लोसेरा सडक निर्माण गर्ने यसले कुकुरी  
क्षेत्रको वातावरणमा सामाजिक र सांस्कृतिक तथा  
आर्थिक क्षतिमले लोकारोह असर पार्ने जानकारी  
गराइन्छ /

  
मदनकुमार झाचार्य  
प्रधानाध्यापक





# श्री पर्वत उत्तर माध्यमिक विद्यालय कोलार, रुकुम



प.सं. :- ०६६

च.सं. :- २५

मिति :- २०६६/०८/०९

**विषय :- सिफारिश गरिएको बारे ।**

श्री जी जससैंग सम्बन्धित छ ।

प्रस्तुत विषय सम्बन्धमा यस जिल्लामा सञ्चालित पुनर्निर्माण तथा पुनः स्थापना (RRR/SRP) आयोजना अर्न्तगत निर्माण हुने सडकले यस कोल गाउँकि २० अर्न्तगत सञ्चालित श्री पर्वत उच्च मा० कि० लार् हुने पनि किलिमको नकारात्मक असर नपर्ने गरी यसै सिफारिसाथ जानकारी गराइन्छ ।

श्रीमान श्रीमान

(श्रीमान दास)  
प्रधानाध्यापक





स्वास्थ्य तथा जनसंख्या मंत्रालय

स्वास्थ्य सेवा विभाग

जिल्ला स्वास्थ्य कार्यालय

काँकी

उप स्वास्थ्य चौकी

रुकुम

पत्रांक:- ०६६१६६

चक्रांक:- २०

मिति २०८६/५/०९

विषय:- ओ स्वरुण रम्भा रावद

प्रस्तुत विषयमा यो रिफरिङ गरिन्छ कि, यस काँकी-तकसे  
को लगाने निर्माण गरिने लागेको बाटो जो ग्रामिण पुग्नैमान तथा  
पुर स्थापना आयोजनाले निर्माण गर्ने लागेको छ, यस आयोजनाले  
यस उपस्वास्थ्य चौकी काँकी तर्फ कुनै भौतिक तथा वातावरण  
गतिय असर पर्ने छैन ।

  
अर्जुन कुमार थापा क्षेत्री  
उप स्वास्थ्य चौकी प्रमुख



# શ્રી પ્ર. ત્રિવેણી જિ.ભા. વિદ્યાલય

કાંકી, રુકુમ

સ્થાપના-૨૦૨૦

પ.સ.:- ૦૬૬/૬૬

વ.ન:- ૨૬

મિતિ:- ૦૬/૬-૫-૦૬

વિષય:- સિકારીસ સમ્બંધમાં

શ્રી જી જાનસન સમ્બંધ રાશરૂદ્ધે ।

સંસ્કૃત વિષયમાં થયેલ શ્રી ત્રિવેણી જિલ્લા માધ્યમિક વિદ્યાલય કાગળી રુકુમમાં થયેલ રુકુમ જિલ્લામાં સંચાલિત ગ્રામીણ પુલ નિર્માણ તથા પુલ સ્થાપના (R.R.R S.D.P.) પરીપત્ર ૨૦૬૬/૪/૬એ પગુ અનુસાર કાંકી - વાલુ રૂતકસેરા સત્તુલ નિર્માણ ગાદી થયેલે કુલે કિસામળે વાતાવરણીય સામગ્રીકે ૫ સંસ્કૃતીક તથા વ્યાથીક નિર્માણને નવગરામીકે અસર લાપલે જાતવગરી ગારાઈલે ।

સહનિર્માણકે હુલ  
જિ પ્રધાનમધ્યમીકે

પ્રધાનમધ્યમીકે

## ANNEX XI

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

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

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

### XId. Number of households belonging to different food security category

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

Settlement Name	Number of HH in (in percentage)		
	Agriculture & Livestock	Business/ Commerce	Employees
Kakri	60%	15%	25%
Tallosera	85%	10%	5%
Takagaun	95%	2.5%	2.5%
Bachigaun	90%	7.5%	2.5%
Qubhan	90%	7.5%	2.5%
Falne	95%	3%	2%
Birgum	95%	2.5%	2.5%
Okhma	90%	7.5%	2.5%

Source: Field survey, 2010

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

Settlement Name/ Public services and Infrastructure	School (no)	Health post (no)	Post office (no.)	Communication(no) CDMA/MOBILE	Hydro power (no)	Solar (no)	Shops/lodge (no)	Water supply (no)	Irrigation (KULO)	Mill (no)	Bridge (no)	Community organization (no)	Fin. Institution (no)	Community CENTRE	Industry (no)
Kakri	1	1	1	1	-	22	2	1	1	2	1	-	-	-	1
Qubhan	1		-	-	-	10		3	-	1	-	-	-	-	-
Falne	1		-	-	-	14	1	8	-	1	-	-	-	-	-
Tallosera	1	1	1	1	-	24	1	3	-		-	-	-	-	-
Takagaun	1		-	-	-	17		6	-	1	-	-	-	-	-
Bachigaun	1		-	-	-	12		1	-	1	-	-	-	-	-
Birgum	1		-	-	-	9		2	-	-	-	-	-	-	-
Okhma	1	1	1	1	-	20	1	7	1	3	-	-	-	-	-
<b>Total</b>	<b>8</b>	<b>3</b>	<b>3</b>	<b>3</b>		<b>128</b>	<b>5</b>	<b>31</b>	<b>2</b>	<b>9</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>

Source: Field survey, 2010

**XI c. Land holding pattern of settlements within Zol**

Settlement Name	Number of HH							Total
	Landless	<one ropani	1-5 ropani	5-10 ropani	10-20 ropani	20-50 ropani	>50 ropani	
Kakri	-	40	30	5	10	5	-	90
Qubhan	3	30	25	100	2	-	-	160
Falne	5	15	20	75	60	65	-	240
Tallosera	3	48	42	2	-	-	-	95
Takagaun	-	55	5		-	-	-	60
Bachigaun	-	8	80	40	5	-	-	133
Birgum	3	100	50	56	-	-	-	209
Okhma	5	150	15	10	20	-	-	200
<b>Total</b>	<b>19</b>	<b>446</b>	<b>267</b>	<b>288</b>	<b>97</b>	<b>70</b>	<b>-</b>	<b>1187</b>
<b>Percentage</b>	<b>1.60</b>	<b>37.57</b>	<b>22.49</b>	<b>24.26</b>	<b>8.17</b>	<b>5.90</b>		<b>100</b>

Source: Field survey, 2010

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

Settlement Name	Surplus	Sufficient for whole year	Sufficient for 3-9 months	Sufficient for three months	Less than three months	Total
Kakri	5	10	5	30	40	90
Qubhan	2	100	25	30	3	160
Falne	65	60	75	20	20	240
Tallosera	-	-	2	42	51	95
Takagaun	-	-	-	5	55	60
Bachigaun	-	5	40	80	8	133
Birgum	-	-	56	50	103	209
Okhma	-	20	10	15	155	200
<b>Total</b>	<b>72</b>	<b>195</b>	<b>213</b>	<b>272</b>	<b>435</b>	<b>1187</b>

Source: Field survey, 2009

## ANNEX XII: Vegetation and Wildlife found in the project area

### Vegetation Found in the Project Area

S.N.	Local Name	Scientific Name	Remarks
1	Uttis	<i>Alnus nepalensis</i>	
2	Salla	<i>Pinus roxburghii</i>	
3	Dhupe	<i>Juniperus cummunis</i>	
4	Mango	<i>Mangifera indica</i>	
5	Chiraito	<i>Swertia chirayta</i>	
6	Harro	<i>Terminalia chebula</i>	
7	Okhar	<i>Juglans regia</i>	
8	Aaru	<i>Prunus Persica</i>	
9	Banana	<i>Musa Nepalensis</i>	
10	Cheure	<i>Bassia butyracea</i>	
11	Lapsi	<i>Choeros pondias axillarias</i>	
12	Majitho	<i>Rubia manjith</i>	

Source: Field Survey, 2009

### Wild Animals Found in the Project Area

S.N	Local Name	Common Name	Scientific Name	Remark
<b>Animals</b>				
2	Syaal	Jackal	<i>Canis aureus</i>	
5	Ban Biralo	Jungle Cat	<i>Felis chaus</i>	
6	Malsapro		<i>Martef Flabigula</i>	
7	Lokharke	Squirrel	<i>Ratufa sp.</i>	
<b>Birds</b>				
1	Dhukur	Laughing Dove	<i>Streptopelia senegalensis</i>	
2	Crow	Crow	<i>Corvus splendens</i>	
3	Bhyakur	Eye – browned Thrush	<i>Turdus obscurus</i>	
4	Mayur	Peacock	<i>Hubaropsis Bengalensis</i>	
5	Hutityau	Common Sandpiper	<i>Tringa hypoleucos</i>	

Source: Field Survey, 2009

### List of trees to be removed

SN.	Common name	Scientific Name	Total number	Chainage	
				From	To
1	Salla	<i>Pinus roxburgii</i>	80	3+200	6+800
2	Salla	<i>Pinus roxburgii</i>	2	18+100	18+500
3	Salla	<i>Pinus roxburgii</i>	1	20+200	20+200
4	Salla	<i>Pinus roxburgii</i>	1	34+800	34+800
5	Dhupe	<i>Juniperus cummunis</i>	15	3+200	5+500
6	Salla	<i>Pinus roxburgii</i>	2	0+850	0+950
7	Aaru	<i>Prunus Persica</i>	4	3+200	3+500
8	Guras	-	10	6+150	6+800
9	Bamboo	<i>Bambusa spp</i>	66	1+650	2+150
10	Cheure	<i>Bassia butyracea</i>	10	3+250	4+900
11	Okhar	<i>Juglans regia</i>	500	32+020	32+060
	<b>Total</b>		<b>691</b>		

Source: Field Survey, 2009



### Annex XIII: Photographs



Road alignment near Taksera



Road section that passes through-Bachhigaun-Okhma.



Affected house at Ch 23+150 (Tallosera)



Road alignment passing through bushes at Ch 15+000.



Affected House at Ch 16+900 (Falne)



Affected House at Ch 22+950 (Tallosera)

## Annex XIV: Recommended Structures necessary for slope stabilization

### Gabion Retaining Wall

SN	Chainage	Length (m)	Height (m)	Cross Section (m <sup>2</sup> )	Volume	Sectional Nos.		Total Gabion		Remarks
					m <sup>3</sup>	1x1x1.5	1x1x2	1x1x1.5	1x1x2	
1	0+406.00	12.0	4	6.5	78.0	2.0	2.0	24.0	24.0	Right
2	2+206.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
3	2+526.00	15.0	3	4.5	67.5	2.0	2.0	30.0	30.0	Left
4	4+606.00	20.0	4	6.5	130.0	2.0	2.0	40.0	40.0	Right
5	7+006.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Right
6	7+166.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Right
7	8+906.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
8	8+926.00	20.0	4	6.5	130.0	2.0	2.0	40.0	40.0	Left
9	8+946.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
10	9+066.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
11	9+106.00	6.0	4	6.5	39.0	2.0	2.0	12.0	12.0	Left
12	9+766.00	10.0	5	9	90.0	2.0	3.0	20.0	30.0	Left
13	9+866.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
14	11+006.00	20.0	4	6.5	130.0	2.0	2.0	40.0	40.0	Right
15	11+166.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
16	11+186.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
17	14+226.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
18	14+726.00	14.0	4	6.5	91.0	2.0	2.0	28.0	28.0	Left
19	14+746.00	22.0	5	9	198.0	2.0	3.0	44.0	66.0	Left
20	16+066.00	20.0	3	4.5	90.0	1.0	2.0	20.0	40.0	Left
21	16+346.00	14.0	3	4.5	63.0	1.0	2.0	14.0	28.0	Left
22	16+666.00	15.0	5	9	135.0	2.0	3.0	30.0	45.0	Left
23	16+686.00	15.0	5	9	135.0	2.0	3.0	30.0	45.0	Left
24	17+606.00	15.0	3	4.5	67.5	1.0	2.0	15.0	30.0	Left
25	19+066.00	20.0	4	6.5	130.0	2.0	2.0	40.0	40.0	Left
26	19+546.00	20.0	4	6.5	130.0	2.0	2.0	40.0	40.0	Left
27	20+746.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
28	21+086.00	15.0	5	9	135.0	2.0	3.0	30.0	45.0	Left
29	21+106.00	15.0	6	11.5	172.5	3.0	3.0	45.0	45.0	Left
30	21+126.00	20.0	5	9	180.0	2.0	3.0	40.0	60.0	Left
31	21+146.00	8.0	5	9	72.0	2.0	3.0	16.0	24.0	Left
32	21+186.00	12.0	4	6.5	78.0	2.0	2.0	24.0	24.0	Left
33	21+246.00	18.0	5	9	162.0	2.0	3.0	36.0	54.0	Left
34	21+266.00	6.0	5	9	54.0	2.0	3.0	12.0	18.0	Left
35	21+286.00	14.0	5	9	126.0	2.0	3.0	28.0	42.0	Left
36	21+306.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
37	21+326.00	12.0	5	9	108.0	2.0	3.0	24.0	36.0	Left
38	21+646.00	20.0	5	9	180.0	2.0	3.0	40.0	60.0	Left
39	21+866.00	6.0	5	9	54.0	2.0	3.0	12.0	18.0	Left
40	21+926.00	5.0	5	9	45.0	2.0	3.0	10.0	15.0	Left
41	22+846.00	12.0	5	9	108.0	2.0	3.0	24.0	36.0	Left
42	23+846.00	15.0	4	6.5	97.5	2.0	2.0	30.0	30.0	Left
43	24+766.00	20.0	4	6.5	130.0	2.0	2.0	40.0	40.0	Right
44	24+786.00	9.0	4	6.5	58.5	2.0	2.0	18.0	18.0	Right
45	24+806.00	4.0	4	6.5	26.0	2.0	2.0	8.0	8.0	Right
46	24+826.00	8.0	4	6.5	52.0	2.0	2.0	16.0	16.0	Right
47	24+886.00	15.0	5	9	135.0	2.0	3.0	30.0	45.0	Right
48	25+886.00	10.0	4	6.5	65.0	2.0	2.0	20.0	20.0	Right
49	26+066.00	16.0	5	9	144.0	2.0	3.0	32.0	48.0	Right

50	26+086.00	4.0	5	9	36.0	2.0	3.0	8.0	12.0	Right
51	26+106.00	6.0	5	9	54.0	2.0	3.0	12.0	18.0	Right
52	26+126.00	8.0	5	9	72.0	2.0	3.0	16.0	24.0	Right
53	26+386.00	10.0	3	4.5	45.0	1.0	2.0	10.0	20.0	Right
54	27+206.00	12.0	4	6.5	78.0	2.0	2.0	24.0	24.0	Right
55	27+966.00	15.0	5	9	135.0	2.0	3.0	30.0	45.0	Right
56	27+986.00	6.0	5	9	54.0	2.0	3.0	12.0	18.0	Right
57	28+446.00	10.0	5	9	90.0	2.0	3.0	20.0	30.0	Left
58	30+666.00	9.0	4	6.5	58.5	2.0	2.0	18.0	18.0	Right
59	31+786.00	15.0	3	4.5	67.5	1.0	2.0	15.0	30.0	Left
60	32+086.00	10.0	6	11.5	115.0	2.0	4.0	20.0	40.0	Left
61	32+226.00	15.0	5	9	135.0	2.0	3.0	30.0	45.0	Left
<b>Total</b>		<b>818.0</b>	<b>266.0</b>		<b>5996.5</b>			<b>1577.0</b>	<b>1964.0</b>	

Source: Field Survey, 2009

### Dry Wall

S.N.	Chainage	Length	Height	Area	Quantity	Remarks
		m	m	sq.m.	cu.m.	
1	0+020.00	5	3	4.486	22.430	Dry Wall Right Side
2	0+060.00	5	3	4.486	22.430	Dry Wall Right Side
3	0+206.00	4	2.5	3.494	13.976	Dry Wall Right Side
4	0+226.00	4	2.5	3.494	13.976	Dry Wall Right Side
5	0+366.00	4	2.5	3.494	13.976	Dry Wall Right Side
6	0+506.00	5	3	4.486	22.430	Dry Wall Right Side
7	0+526.00	5	3	4.486	22.430	Dry Wall Right Side
8	0+566.00	5	3	4.486	22.430	Dry Wall Right Side
9	0+606.00	5	3	4.486	22.430	Dry Wall Right Side
10	0+746.00	5	3	4.486	22.430	Dry Wall Right Side
11	0+806.00	5	3	4.486	22.430	Dry Wall Right Side
12	0+846.00	5	3	4.486	22.430	Dry Wall Right Side
13	0+906.00	5	3	4.486	22.430	Dry Wall Right Side
14	0+926.00	5	3	4.486	22.430	Dry Wall Right Side
15	1+026.00	5	3	4.486	22.430	Dry Wall Right Side
16	1+046.00	4	2.5	3.494	13.976	Dry Wall Right Side
17	1+126.00	4	3	4.486	17.944	Dry Wall Right Side
18	1+146.00	6	3	4.486	26.916	Dry Wall Right Side
19	1+226.00	6	3	4.486	26.916	Dry Wall Right Side
20	1+386.00	6	3	4.486	26.916	Dry Wall Right Side
21	1+406.00	6	3	4.486	26.916	Dry Wall Right Side
22	1+426.00	6	3	4.486	26.916	Dry Wall Right Side
23	1+526.00	6	3	4.486	26.916	Dry Wall Right Side
24	1+646.00	6	3	4.486	26.916	Dry Wall Left Side
25	1+746.00	6	3	4.486	26.916	Dry Wall Left Side
26	1+946.00	5	3	4.486	22.430	Dry Wall Left Side
27	2+026.00	5	3	4.486	22.430	Dry Wall Left Side
28	2+046.00	5	3	4.486	22.430	Dry Wall Left Side
29	2+186.00	4	2.5	3.494	13.976	Dry Wall Left Side
30	2+386.00	4	2	2.145	8.580	Dry Wall Left Side
31	2+406.00	4	2	2.145	8.580	Dry Wall Left Side
32	2+446.00	5	3	4.486	22.430	Dry Wall Left Side
33	2+806.00	6	3	4.486	26.916	Dry Wall Right Side
34	2+826.00	4	2.5	3.494	13.976	Dry Wall Right Side
35	3+066.00	5	2.5	3.494	17.470	Dry Wall Right Side
36	3+086.00	4	2.5	3.494	13.976	Dry Wall Right Side
37	3+146.00	6	3	4.486	26.916	Dry Wall Right Side

38	3+806.00	6	3	4.486	26.916	Dry Wall Right Side
39	3+826.00	5	3	4.486	22.430	Dry Wall Right Side
40	3+986.00	4	2.5	3.494	13.976	Dry Wall Right Side
41	4+626.00	5	3	4.486	22.430	Dry Wall Right Side
42	4+866.00	6	3	4.486	26.916	Dry Wall Right Side
43	4+886.00	5	2.5	3.494	17.470	Dry Wall Right Side
44	5+426.00	4	2.5	3.494	13.976	Dry Wall Right Side
45	6+486.00	4	2.5	3.494	13.976	Dry Wall Right Side
46	6+906.00	6	3	4.486	26.916	Dry Wall Right Side
47	7+026.00	5	2	2.145	10.725	Dry Wall Right Side
48	7+066.00	4	2	2.145	8.580	Dry Wall Right Side
49	7+126.00	5	3	4.486	22.430	Dry Wall Right Side
50	7+266.00	5	2.5	3.494	17.470	Dry Wall Right Side
51	7+666.00	6	3	4.486	26.916	Dry Wall Right Side
52	8+666.00	5	3	4.486	22.430	Dry Wall Left Side
53	8+686.00	5	3	4.486	22.430	Dry Wall Left Side
54	9+166.00	5	3	4.486	22.430	Dry Wall Left Side
55	9+746.00	6	3	4.486	26.916	Dry Wall Left Side
56	9+826.00	6	3	4.486	26.916	Dry Wall Left Side
57	10+166.00	6	3	4.486	26.916	Dry Wall Right Side
58	10+186.00	6	3	4.486	26.916	Dry Wall Right Side
59	10+426.00	6	3	4.486	26.916	Dry Wall Right Side
60	10+726.00	6	3	4.486	26.916	Dry Wall Right Side
61	11+406.00	4	2.5	3.494	13.976	Dry Wall Left Side
62	11+626.00	5	3	4.486	22.430	Dry Wall Left Side
63	11+746.00	4	2.5	3.494	13.976	Dry Wall Left Side
64	11+806.00	5	3	4.486	22.430	Dry Wall Left Side
65	12+026.00	5	3	4.486	22.430	Dry Wall Left Side
66	12+246.00	5	3	4.486	22.430	Dry Wall Left Side
67	12+746.00	5	3	4.486	22.430	Dry Wall Left Side
68	12+766.00	5	3	4.486	22.430	Dry Wall Left Side
69	12+966.00	4	2.5	3.494	13.976	Dry Wall Left Side
70	13+066.00	5	3	4.486	22.430	Dry Wall Left Side
71	13+086.00	5	3	4.486	22.430	Dry Wall Left Side
72	13+526.00	4	2.5	3.494	13.976	Dry Wall Left Side
73	13+546.00	4	2.5	3.494	13.976	Dry Wall Left Side
74	13+586.00	4	2.5	3.494	13.976	Dry Wall Left Side
75	13+606.00	5	3	4.486	22.430	Dry Wall Left Side
76	13+686.00	5	3	4.486	22.430	Dry Wall Left Side
77	13+886.00	5	3	4.486	22.430	Dry Wall Left Side
78	14+006.00	4	2.5	3.494	13.976	Dry Wall Left Side
79	14+066.00	6	3	4.486	26.916	Dry Wall Left Side
80	14+186.00	6	3	4.486	26.916	Dry Wall Left Side
81	14+606.00	6	3	4.486	26.916	Dry Wall Left Side
82	14+686.00	6	3	4.486	26.916	Dry Wall Left Side
83	14+706.00	6	3	4.486	26.916	Dry Wall Left Side
84	14+766.00	6	3	4.486	26.916	Dry Wall Left Side
85	14+786.00	6	3	4.486	26.916	Dry Wall Left Side
86	14+806.00	6	3	4.486	26.916	Dry Wall Left Side
87	14+846.00	6	3	4.486	26.916	Dry Wall Left Side
88	14+866.00	6	3	4.486	26.916	Dry Wall Left Side
89	15+486.00	4	2.5	3.494	13.976	Dry Wall Left Side
90	15+506.00	4	2.5	3.494	13.976	Dry Wall Left Side
91	15+566.00	4	2.5	3.494	13.976	Dry Wall Left Side
92	15+626.00	5	3	4.486	22.430	Dry Wall Left Side
93	15+646.00	5	3	4.486	22.430	Dry Wall Left Side

94	16+706.00	5	3	4.486	22.430	Dry Wall Left Side
95	18+426.00	5	3	4.486	22.430	Dry Wall Left Side
96	18+446.00	5	3	4.486	22.430	Dry Wall Left Side
97	18+466.00	5	3	4.486	22.430	Dry Wall Left Side
98	18+486.00	5	3	4.486	22.430	Dry Wall Left Side
99	18+746.00	5	3	4.486	22.430	Dry Wall Right Side
100	18+906.00	5	3	4.486	22.430	Dry Wall Left Side
101	19+046.00	5	3	4.486	22.430	Dry Wall Left Side
102	19+366.00	5	3	4.486	22.430	Dry Wall Left Side
103	19+446.00	4	2.5	3.494	13.976	Dry Wall Left Side
104	19+466.00	4	2.5	3.494	13.976	Dry Wall Left Side
105	19+506.00	4	2.5	3.494	13.976	Dry Wall Left Side
106	19+526.00	4	2.5	3.494	13.976	Dry Wall Left Side
107	19+586.00	6	3	4.486	26.916	Dry Wall Left Side
108	20+066.00	4	2.5	3.494	13.976	Dry Wall Left Side
109	20+086.00	5	3	4.486	22.430	Dry Wall Left Side
110	20+206.00	6	3	4.486	26.916	Dry Wall Left Side
111	20+286.00	4	2.5	3.494	13.976	Dry Wall Left Side
112	20+306.00	5	3	4.486	22.430	Dry Wall Left Side
113	20+346.00	5	3	4.486	22.430	Dry Wall Left Side
114	20+366.00	5	3	4.486	22.430	Dry Wall Left Side
115	20+426.00	4	2.5	3.494	13.976	Dry Wall Left Side
116	20+446.00	5	3	4.486	22.430	Dry Wall Left Side
117	20+466.00	5	3	4.486	22.430	Dry Wall Left Side
118	20+646.00	5	3	4.486	22.430	Dry Wall Left Side
119	20+666.00	5	3	4.486	22.430	Dry Wall Left Side
120	21+046.00	4	2.5	3.494	13.976	Dry Wall Left Side
121	21+166.00	6	3	4.486	26.916	Dry Wall Left Side
122	21+206.00	6	3	4.486	26.916	Dry Wall Left Side
123	21+226.00	6	3	4.486	26.916	Dry Wall Left Side
124	21+346.00	6	3	4.486	26.916	Dry Wall Left Side
125	21+606.00	6	3	4.486	26.916	Dry Wall Left Side
126	21+626.00	6	3	4.486	26.916	Dry Wall Left Side
127	21+686.00	4	2.5	3.494	13.976	Dry Wall Left Side
128	21+726.00	4	2.5	3.494	13.976	Dry Wall Left Side
129	21+766.00	4	2.5	3.494	13.976	Dry Wall Left Side
130	21+826.00	5	3	4.486	22.430	Dry Wall Left Side
131	21+846.00	5	3	4.486	22.430	Dry Wall Left Side
132	21+906.00	5	3	4.486	22.430	Dry Wall Left Side
133	22+086.00	5	3	4.486	22.430	Dry Wall Left Side
134	22+246.00	5	3	4.486	22.430	Dry Wall Left Side
135	22+366.00	5	3	4.486	22.430	Dry Wall Left Side
136	22+446.00	5	3	4.486	22.430	Dry Wall Left Side
137	22+486.00	5	3	4.486	22.430	Dry Wall Left Side
138	22+526.00	5	3	4.486	22.430	Dry Wall Left Side
139	22+546.00	4	2.5	3.494	13.976	Dry Wall Left Side
140	22+586.00	5	3	4.486	22.430	Dry Wall Left Side
141	22+606.00	5	3	4.486	22.430	Dry Wall Left Side
142	22+646.00	5	3	4.486	22.430	Dry Wall Left Side
143	22+666.00	5	3	4.486	22.430	Dry Wall Left Side
144	22+726.00	5	3	4.486	22.430	Dry Wall Left Side
145	22+746.00	5	3	4.486	22.430	Dry Wall Left Side
146	22+766.00	5	3	4.486	22.430	Dry Wall Left Side
147	22+786.00	5	3	4.486	22.430	Dry Wall Left Side
148	22+866.00	5	3	4.486	22.430	Dry Wall Left Side
149	22+886.00	5	3	4.486	22.430	Dry Wall Left Side

150	22+906.00	5	3	4.486	22.430	Dry Wall Left Side
151	22+946.00	5	3	4.486	22.430	Dry Wall Left Side
152	22+966.00	5	3	4.486	22.430	Dry Wall Left Side
153	23+006.00	5	3	4.486	22.430	Dry Wall Left Side
154	23+606.00	5	3	4.486	22.430	Dry Wall Left Side
155	23+666.00	5	3	4.486	22.430	Dry Wall Left Side
156	23+886.00	5	3	4.486	22.430	Dry Wall Left Side
157	23+926.00	5	3	4.486	22.430	Dry Wall Left Side
158	23+946.00	5	3	4.486	22.430	Dry Wall Left Side
159	24+186.00	5	3	4.486	22.430	Dry Wall Left Side
160	24+206.00	5	3	4.486	22.430	Dry Wall Left Side
161	24+286.00	5	3	4.486	22.430	Dry Wall Left Side
162	24+346.00	4	2.5	3.494	13.976	Dry Wall Right Side
163	24+406.00	3	2	2.145	6.435	Dry Wall Right Side
164	24+426.00	3	2	2.145	6.435	Dry Wall Right Side
165	24+446.00	4	2.5	3.494	13.976	Dry Wall Right Side
166	24+626.00	6	3	4.486	26.916	Dry Wall Right Side
167	24+646.00	6	3	4.486	26.916	Dry Wall Right Side
168	24+666.00	6	3	4.486	26.916	Dry Wall Right Side
169	24+686.00	6	3	4.486	26.916	Dry Wall Right Side
170	24+706.00	6	3	4.486	26.916	Dry Wall Right Side
171	24+906.00	6	3	4.486	26.916	Dry Wall Right Side
172	24+926.00	6	3	4.486	26.916	Dry Wall Right Side
173	24+966.00	6	3	4.486	26.916	Dry Wall Right Side
174	25+046.00	5	2.5	3.494	17.470	Dry Wall Right Side
175	25+186.00	5	3	4.486	22.430	Dry Wall Right Side
176	25+206.00	3	2	2.145	6.435	Dry Wall Right Side
177	25+226.00	3	2	2.145	6.435	Dry Wall Right Side
178	25+246.00	3	2	2.145	6.435	Dry Wall Right Side
179	25+426.00	4	2.5	3.494	13.976	Dry Wall Right Side
180	25+466.00	5	3	4.486	22.430	Dry Wall Right Side
181	25+526.00	4	2.5	3.494	13.976	Dry Wall Right Side
182	25+586.00	5	3	4.486	22.430	Dry Wall Right Side
183	25+626.00	5	3	4.486	22.430	Dry Wall Right Side
184	25+746.00	5	3	4.486	22.430	Dry Wall Right Side
185	25+786.00	4	2.5	3.494	13.976	Dry Wall Right Side
186	25+806.00	5	3	4.486	22.430	Dry Wall Right Side
187	25+866.00	5	2.5	3.494	17.470	Dry Wall Right Side
188	25+926.00	5	2	2.145	10.725	Dry Wall Right Side
189	25+946.00	5	3	4.486	22.430	Dry Wall Right Side
190	25+966.00	5	3	4.486	22.430	Dry Wall Right Side
191	26+026.00	5	3	4.486	22.430	Dry Wall Right Side
192	26+146.00	5	3	4.486	22.430	Dry Wall Right Side
193	26+166.00	5	3	4.486	22.430	Dry Wall Right Side
194	26+186.00	4	2.5	3.494	13.976	Dry Wall Right Side
195	26+326.00	6	3	4.486	26.916	Dry Wall Right Side
196	26+346.00	6	3	4.486	26.916	Dry Wall Right Side
197	26+366.00	4	2.5	3.494	13.976	Dry Wall Right Side
198	26+526.00	4	2.5	3.494	13.976	Dry Wall Right Side
199	26+546.00	5	3	4.486	22.430	Dry Wall Right Side
200	26+566.00	4	2	2.145	8.580	Dry Wall Right Side
201	26+626.00	5	3	4.486	22.430	Dry Wall Right Side
202	26+746.00	5	2.5	3.494	17.470	Dry Wall Right Side
203	26+766.00	5	2.5	3.494	17.470	Dry Wall Right Side
204	26+786.00	5	3	4.486	22.430	Dry Wall Right Side
205	26+806.00	5	3	4.486	22.430	Dry Wall Right Side

206	26+846.00	5	2.5	3.494	17.470	Dry Wall Right Side
207	26+886.00	6	3	4.486	26.916	Dry Wall Right Side
208	26+966.00	6	3	4.486	26.916	Dry Wall Right Side
209	26+986.00	6	2	2.145	12.870	Dry Wall Right Side
210	27+066.00	6	3	4.486	26.916	Dry Wall Right Side
211	27+086.00	6	3	4.486	26.916	Dry Wall Right Side
212	27+106.00	6	3	4.486	26.916	Dry Wall Right Side
213	27+226.00	5	2.5	3.494	17.470	Dry Wall Right Side
214	27+246.00	4	2.5	3.494	13.976	Dry Wall Right Side
215	27+266.00	5	2	2.145	10.725	Dry Wall Right Side
216	27+286.00	3	2	2.145	6.435	Dry Wall Right Side
217	27+486.00	4	2.5	3.494	13.976	Dry Wall Right Side
218	27+526.00	6	2.5	3.494	20.964	Dry Wall Right Side
219	27+706.00	7	2.5	3.494	24.458	Dry Wall Right Side
220	28+006.00	3	2	2.145	6.435	Dry Wall Right Side
221	28+106.00	5	2.5	3.494	17.470	Dry Wall Right Side
222	28+126.00	7	3	4.486	31.402	Dry Wall Right Side
223	28+226.00	7	3	4.486	31.402	Dry Wall Right Side
224	28+246.00	6	2	2.145	12.870	Dry Wall Right Side
225	28+326.00	6	2.5	3.494	20.964	Dry Wall Right Side
226	28+466.00	6	2.5	3.494	20.964	Dry Wall Left Side
227	28+486.00	6	2.5	3.494	20.964	Dry Wall Left Side
228	28+526.00	7	3	4.486	31.402	Dry Wall Left Side
229	28+546.00	5	3	4.486	22.430	Dry Wall Left Side
230	28+626.00	6	3	4.486	26.916	Dry Wall Left Side
231	28+766.00	5	2.5	3.494	17.470	Dry Wall Left Side
232	28+786.00	5	3	4.486	22.430	Dry Wall Left Side
233	28+806.00	5	3	4.486	22.430	Dry Wall Left Side
234	28+866.00	5	3	4.486	22.430	Dry Wall Left Side
235	29+026.00	5	3	4.486	22.430	Dry Wall Left Side
236	29+046.00	5	2.5	3.494	17.470	Dry Wall Left Side
237	29+146.00	5	2.5	3.494	17.470	Dry Wall Left Side
238	29+166.00	5	2.5	3.494	17.470	Dry Wall Left Side
239	29+226.00	5	2.5	3.494	17.470	Dry Wall Right Side
240	29+246.00	5	2.5	3.494	17.470	Dry Wall Right Side
241	29+286.00	5	2	2.145	10.725	Dry Wall Right Side
242	29+306.00	5	3	4.486	22.430	Dry Wall Right Side
243	29+326.00	5	3	4.486	22.430	Dry Wall Right Side
244	29+346.00	5	3	4.486	22.430	Dry Wall Right Side
245	29+366.00	5	2	2.145	10.725	Dry Wall Right Side
246	29+686.00	5	3	4.486	22.430	Dry Wall Left Side
247	29+706.00	5	3	4.486	22.430	Dry Wall Left Side
248	29+926.00	5	3	4.486	22.430	Dry Wall Left Side
249	29+986.00	5	3	4.486	22.430	Dry Wall Left Side
250	30+006.00	6	2.5	3.494	20.964	Dry Wall Left Side
251	30+046.00	7	2.5	3.494	24.458	Dry Wall Left Side
252	30+066.00	7	2.5	3.494	24.458	Dry Wall Left Side
253	30+086.00	6	3	4.486	26.916	Dry Wall Left Side
254	30+106.00	6	3	4.486	26.916	Dry Wall Left Side
255	30+166.00	6	3	4.486	26.916	Dry Wall Left Side
256	30+226.00	6	3	4.486	26.916	Dry Wall Left Side
257	30+246.00	6	3	4.486	26.916	Dry Wall Left Side
258	30+286.00	6	2.5	3.494	20.964	Dry Wall Left Side
259	30+306.00	6	2.5	3.494	20.964	Dry Wall Left Side
260	30+386.00	6	2.5	3.494	20.964	Dry Wall Left Side
261	30+606.00	6	2.5	3.494	20.964	Dry Wall Right Side



262	30+626.00	6	3	4.486	26.916	Dry Wall Right Side
263	30+646.00	6	3	4.486	26.916	Dry Wall Right Side
264	30+686.00	6	3	4.486	26.916	Dry Wall Right Side
265	30+706.00	6	2.5	3.494	20.964	Dry Wall Right Side
266	30+726.00	5	2	2.145	10.725	Dry Wall Right Side
267	30+746.00	4	2.5	3.494	13.976	Dry Wall Right Side
268	30+886.00	5	3	4.486	22.430	Dry Wall Right Side
269	30+906.00	4	2.5	3.494	13.976	Dry Wall Right Side
270	30+926.00	4	2.5	3.494	13.976	Dry Wall Right Side
271	31+266.00	4	2.5	3.494	13.976	Dry Wall Left Side
272	31+286.00	7	3	4.486	31.402	Dry Wall Left Side
273	31+426.00	5	3	4.486	22.430	Dry Wall Right Side
274	31+526.00	3	2	2.145	6.435	Dry Wall Left Side
275	31+546.00	4	2	2.145	8.580	Dry Wall Left Side
276	31+646.00	5	3	4.486	22.430	Dry Wall Left Side
277	31+666.00	6	2	2.145	12.870	Dry Wall Left Side
278	31+846.00	5	3	4.486	22.430	Dry Wall Left Side
279	31+866.00	5	2	2.145	10.725	Dry Wall Left Side
280	31+886.00	5	3	4.486	22.430	Dry Wall Left Side
281	31+986.00	5	2	2.145	10.725	Dry Wall Left Side
282	32+046.00	5	3	4.486	22.430	Dry Wall Left Side
283	32+146.00	4	2.5	3.494	13.976	Dry Wall Left Side
284	32+206.00	5	3	4.486	22.430	Dry Wall Left Side
285	32+246.00	7	3	4.486	31.402	Dry Wall Left Side
286	32+306.00	4	2.5	3.494	13.976	Dry Wall Left Side
287	32+326.00	5	3	4.486	22.430	Dry Wall Left Side
288	32+386.00	4	2.5	3.494	13.976	Dry Wall Left Side
289	32+426.00	6	2.5	3.494	20.964	Dry Wall Left Side
290	32+466.00	6	3	4.486	26.916	Dry Wall Left Side
<b>Total Quantity</b>					<b>6004.514</b>	

Source: Field Survey, 2009



## Annex XV: Purposed Cross Drainage and Side Drainage for Water Management

### Dry stone causeway

SN	Chainage		Length	Earthwork		Gabion		Stone Pitching	
				Area	Quantity	Area	Quantity	Area	Quantity
	From	To	m	sq.m.	cu.m.	sq.m.	cu.m.	sq.m.	cu.m.
1	7+620	7+628	8.0	8.00	40.00	8.00	16.0	8.00	40.0
2	7+145	7+151	6.0	6.00	30.00	6.00	12.0	6.00	30.0
3	10+645	10+651	6.0	6.00	30.00	6.00	12.0	6.00	30.0
4	10+825	10+831	6.0	6.00	30.00	6.00	12.0	6.00	30.0
5	13+040	13+048	8.0	8.00	56.00	8.00	16.0	8.00	56.0
6	18+475	18+483	8.0	8.00	56.00	8.00	16.0	8.00	56.0
7	19+790	19+798	8.0	8.00	56.00	8.00	16.0	8.00	56.0
8	20+480	20+490	10.0	10.00	70.00	10.00	20.0	10.00	70.0
9	21+575	21+583	8.0	8.00	56.00	8.00	16.0	8.00	56.0
10	23+610	23+620	10.0	10.00	70.00	10.00	20.0	10.00	70.0
			<b>78.00</b>	<b>Total</b>	<b>494.00</b>	<b>Total</b>	<b>156.00</b>	<b>Total</b>	<b>494.0</b>

### Item : PCC Causeway

SN	Chainage	Length	Earthwork		Boulder Soling		PCC(1:2:4)	
			Area	Quantity	Area	Quantity	Area	Quantity
		m	sq.m.	cu.m.	sq.m.	sq.m.	sq.m.	cu.m.
1	5440	6	1.5	9	30		1.25	7.5
2	23720	6	1.5	9	30		1.25	7.5
		<b>12.00</b>	<b>Total</b>	<b>18.00</b>	<b>Total</b>	<b>60.0</b>	<b>Total</b>	<b>15</b>
<b>Earthwork</b>			<b>HS</b>	<b>18.00</b>				

- Span of 1.0m Slab culver At Chainages :0+140, 2+600, 8+960, 10+740, 16+880, 17+660, 25+540, 27+440, 28+240 & 31+900
- 30 Nos. 30 cm dia. HDPE pipe for irrigation crossing

### Annex XVI: Religious and Cultural sites of the project area

S.N.	Name of the site	Location	Aesthetic/Historical Importance	Land owned
1	Shiddi Mandir	Kakri VDC	Aesthetic/Historical Importance	Government
2	Dhorala Thana	KakriVDC	Historical	Government
3	Chandrakot	Kakri VDC	Historical	Government
4	Shiddabaraha Mandir	Kol VDC	Aesthetic/Historical Importance	Government
5	Shidda Thana	Kol VDC	Aesthetic/Historical Importance	Government
6	Bana Gufa	Kol VDC	Aesthetic/Historical Importance	Government
7	Bhagwati Mandir	Taksera VDC	Aesthetic/Historical Importance	Government
8	Taka gaun	Taksera VDC	Historical	Community
9	Charch Ghar	Taksera VDC	Aesthetic/Historical Importance	Government

Source: Field survey, 2009

### Annex XVII: School and campus along the road alignment

S.N.	Name of VDCs	School/Campus
1	Kakri	Kakri Primary School
2	Taksera	Mahendra.S.School,Uttarganga Pre-Primary school, Primary school Bachhigaun,Tallosea Pri-Primary School
3	Kol	Parbat S.School,Himalayan Pri-Primary school,Joti Pri-Primary school

Source: Field survey, 2010

## Annex XVIII: Details of Affected Structures and Summary of Resettlement Cost

### Details of Affected Private Structures

SN	Chainage		Name of Owner	Settlement	Ward	VDC	Structure No.	Distance from CL	Material used for Construction	Type of Structure	Estimate Cost	Remarks
	From	to										
Residential House												
1	4+850	4+855	Shuka Bdr Budha	Sanogaun	1	Kankri	1	4	Mud-Stone masonry with Straw roof	Residential House	256397.79	On Public Land
2	22+276	22+331	Harka Bdr Pun	Bachhegaun	9	Takesara	1	1	Mud-Stone masonry with Sleet roof	Residential House	312320.91	Private Land
3	22+276	22+331	Harka Bdr Pun	Bachhegaun	9	Takesara	1	3	Mud-Stone masonry, Iron with strawroof	Ghatta	20000.00	On Public Land
4	13+950	13+960	Ammar Bdr. Chhantel	Kharakhare	9	Kol	1	3	Mud-Stone masonry with Slate roof	Residential House	454792.80	Private Land
5	5+550	5+560	Shira Budha	Sanogaun	1	Kankri	1	1.5	Mud-Stone masonry with Straw roof	Cattle Shed	57452.01	Private Land
Total:							5				1100963.51	
Dismantiling Cost:											100000.00	Lumsum
Total Cost:											1200963.51	

### Summary of Resettlement and Rehabilitation Cost

Item		Unit	Total loss	Amount(NRs)	Remarks
<b>1. DIRECT COSTS</b>					
1.1	Compensation for private land	(sqm)	101819		
A	Donated Land	(sqm)	53381		Cost for donated land is NRs.1714236.00
B	Absentees' Land (Reserve Fund)	(sqm)	48438	1704348.00	As per CDC Rate for 65 HHs
1.2	Compensation for structures	No	5	1100963.51	3 house, 1 shed and 1 ghatta
1.3	Dismantling Costs for Structure	(sqm)	5	100000.00	Lumsum
1.4	Tree		691	281061.31	As per Appendix-4
	<b>Sub-Total</b>			<b>3186372.82</b>	
<b>2. INDIRECT COSTS</b>					
2.1	Movement Allowance	LS:	3 HHs	9000.00	
2.2	Rental Stipend	LS:	3 HHs	18000.00	
2.3	Deed Transfer Assistance	LS:	201 HHs	301000.00	Including NRs. 201000.00 @transportation and daily allowance.
2.5	Official Deed Transfer fees and others	LS	403 plots	80600.00	
2.6	Appreciation Program for APs	LS:	201	200000.00	Lumsum
	<b>Sub Total</b>			<b>608600.00</b>	
3	Livelihood Enhancement Skills Training (LEST)	LS:		<b>1,218,000.00</b>	For APs
	<b>Sub total (2+3)</b>			<b>1826600.00</b>	
4	Contingency (5%)			<b>91330.00</b>	heading (2+3 )
	<b>Grand Total NRs.</b>			<b>5104302.82</b>	heading (1+2+3+4)