Environmental Assessment Document

Initial Environmental Examination

Grant Number: 0093 NEP

June 2011

Nepal: Rural Reconstruction and Rehabilitation Sector Development Program

Hille-Utterpani-Chhingtang Road Subproject, Dhankutta District

Prepared by the Government of Nepal

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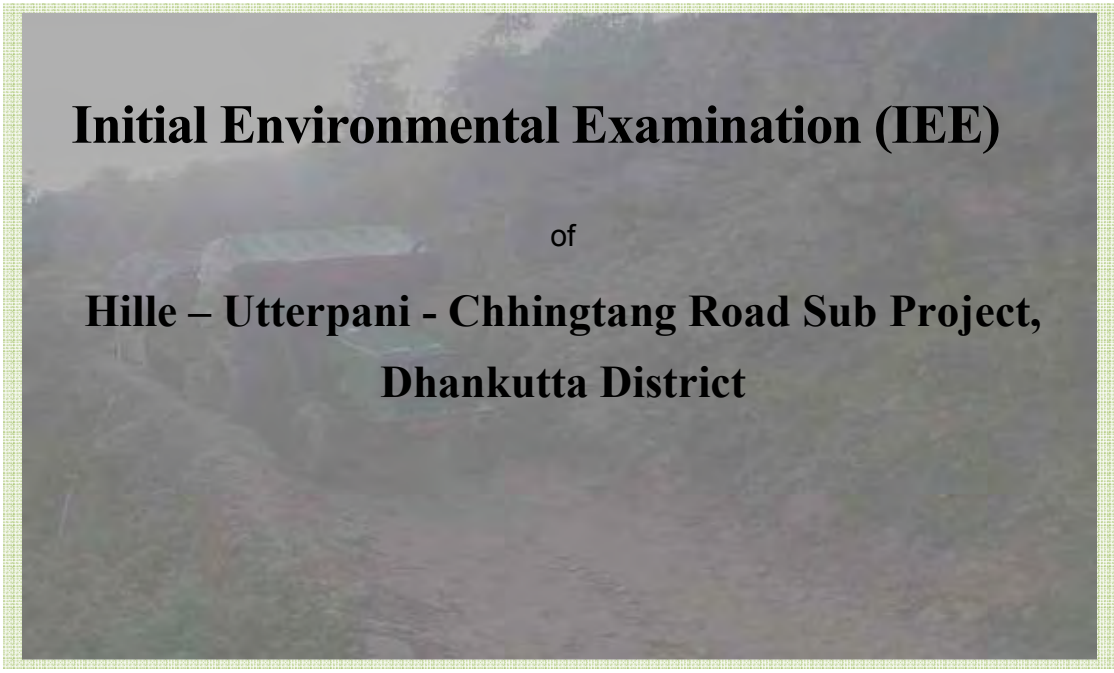
Government of Nepal
Ministry of Local Development
Department of Local Infrastructure Development and Agricultural Roads

Rural Reconstruction and Rehabilitation Sector Development Program
[ADB Grant 0093 NEP]



Initial Environmental Examination (IEE)

of

Hille – Utterpani - Chhingtang Road Sub Project, Dhankutta District

Submitted to:

Ministry of Local Development

Government of Nepal

Proponent:

District Development Committee/ District Technical Office

Dhankuta District

June 2011

Prepared by:

District Implementation Support Team (DIST)

EastConsult (P.) Ltd. JV with B.N. Consultancy (P.) Ltd., SITARA & PARD Consult (P.)Ltd.

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ABBREVIATIONS

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

NAME AND ADDRESS OF THE PROPONENT

The Name and Address of Proponent

The District Development Committee (DDC)/ District Technical Office (DTO), Dhankuta are the implementing agencies at the district level under RRRSDP and entrusted the consultant for the task of carrying out Initial Environmental Examination (IEE) Study of 'Hille-Utterpani-Chhingtang Road Sub-project'.

Name of Proposal

Upgrading of Hille-Utterpani-Chhingtang Road Sub-project, Dhankuta District, Nepal.

Name and Address of Proponent

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- Netra Bikram Thapa Social Mobilizar
- Rajendra Sharma Social Mobilizar

EXECUTIVE SUMMARY IN NEPALI

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EXECUTIVE SUMMARY IN ENGLISH

Background
Government of Nepal has received financial assistance from ADB, SDC, DFID and OFID for implementation of the Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP). The RRRSDP aims for reconstruction and rehabilitation of rural infrastructures damaged in the twenty conflict affected districts of the country.The proposed 23.9 km long Hille-Utterpani–Chhintang Rural Road in Dhankuta District is one of the Sub Project under RRRSDP. It is an existing fair weather road proposed for rehabilitation in gravel standard.

Project Proponent
The proponent of the proposed road Subproject is District Development Committee (DDC)/District Technical Office (DTO), Dhankuta District. Ministry of Local Development (MoLD) is the 'Concerned Agency' for approving the IEE Study.

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

Relevancy of the Proposal and Study Methodology
The proposed Sub-project will connect rural area of Dhankuta district to district headquarter. It helps to connectivity to the other parts of the country, all weather serviceability, safety after upgrading the road in gravel standard. As a result socio-economic condition of people living in that area will enhance as local products like orange, vegetables will get access to market.

The findings and conclusions of the report are based on the analysis of the information collected from the field during November, 2009 by undertaking a walk-through environmental survey along the proposed route and secondary information supplemented by information collected by the social and technical teams working on the resettlement survey and detail survey. The IEE report has been prepared following the Environmental Protection Act, 1997 and Environmental Protection Rules, 1997 (second amendment 2007) of the Government of Nepal (GoN); and Environmental Assessment Guidelines, 2003, and Safeguard Policy Statement, 2009 of ADB. This report is based on the Terms of Reference (ToR) approved on 2066/03/09 B.S by Secretary level decision of Ministry of Local Development (MoLD).

Project Description
The proposed road links with remote south-west part of the rural community of Dhankuta with district headquarter. At present, the road is motorable in whole alignment. The road passes through five village development committees namely Chungmang, Belhara, Khoku, Ankhisalla and Chhintang VDCs. The formation width of the road is 5 m and geometry will be improved as per design required. The total project cost is NRs. 129,694,881.00 and per km cost is NRs. 5,156,854.00.

Existing Environmental Condition
It starts from Hille Bazaar of Dhankuta Municipality at altitude of 1918 m amsl (maximum) and passes through Kagune at altitude of 1000m amsl (minimum), which ends at Jyamire, ward no. 6 of Chhingtang VDC at altitude of 1053m amsl. The road alignment is composed of various kinds of rock such as quartzite, schist etc. Generally, alluvial, residual and clay mixed sandy soil are found along the road alignment. Ambient air and water quality of the proposed project area is observed to be good and there is no noise pollution. The road mainly passes through cultivated land, forest and settlements.

The dominant forest species are *Alnus nepalensis* (Uttis), *Schima wallichii* (Chilaune), *Castanopsis indica (*Katus), *Pinus roxburghii* (Salla) found in the road alignment. *Panthera pardus* (Leopard), *Hystix indica* (Porcupine), *Canis aureus* (Jackal), *Macaca mulatta* (Monkey), *Sus scrofa* (Bandel), *Felis chaus* (Jungle Cat), Fyauro (*Vulpes Montana), Ratufa spp.(*Lokharke) are the wild animals reported in the forests of proposed road area. Similarly, birds like *Lophura lencomelana* (Kalij pheasant), *Columba livia* (Pigeon), *Corvus splendens* (Kag), *Passer domesticus* (Bhangero), *Streptopelia spp.* (Dhukur), *Gallus gallus* (Jungle fowl), *Psittacula kramen* (Suga) etc. are found in the project area. The road does not fall under any protected or buffer zone area.

The major settlements along the ZoI of the proposed road alignment are Uttarpani, Dharmasala, Marga, Sukeahal, Thalthale, Panchakanya, Pipledanda and Sambu gaun. The total household number is 2718 and total population of project area is 15,974 persons with average family size of 6. Diverse ethnic groups such as Rai, Chettri, Brahmin,

Tamang, Magar and occupational caste (Damai, Kami) live along the ZoI of road alignment. Occupational caste households are distributed in almost all the settlements.

The major occupations of the people are agriculture and livestock farming. 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, porters while some people work in government and non-government organizations, and few are doing business. Moreover, significant percentage of the economically active male population also migrates to various places including Kathmandu and India seasonally during slack farming season for employment.

MAJOR ENVIRONMENTAL IMPACTS

Beneficial Impacts

The immediate benefit from this road Subproject is employment opportunities. The implementation of subproject require about 155,634 person days of unskilled and 38,908 person days of skilled manpower. The project will give priority to the poor, ethnic minorities and disadvantaged local people for employment opportunity. Other beneficial impacts include enhancement of local business, development in skills of local people from skill developing training, awareness raising training and involvement in the construction of the project.

During operation stage of road, the people from the ZoI will get easy and fast accessibility to markets, social services and other regions of the country. All weather serviceability, safety after upgrading the road in gravel standard. This will ensure better economic condition and food security of the people living in the ZoI of the project area. Moreover this will promote the small agro based industries that uses local resources. Easy access and opportunity of better transportation system will develop other sectors like education, health, communication, market, banking and other socio-economic sectors. This will increase the overall living condition of the people living in ZoI of project area. The better land network will result in increased land price which will be beneficial for land owners.

Adverse Impacts

During the construction phase, cutting hill slope or spoil disposal and earth material deposit, operation of quarries might result slope failure, soil erosion and landslide. Futhermore, spoils generated during construction can create the water pollution to the nearby water sources. During road widening and construction, 1.87 ha. of agricultural land, 0.46 ha. of baerren land, 0.67 ha of builtup and 0.24 ha. of forest area will be affected and different type of tree total 1028 nos. from private land will have to be cleared. 20 private structures (ch 2+850, 2+960, 2+970, 3+030, 3+740, 4+220, 4+230, 4+240, 9+860, 9+870, 9+900, 9+940, 9+950, 11+250, 18+000, 18+250, 18+260, 18+320, 19+770 and 19+780) will be affected during construction. Also during construction of road, there might be possible impacts on wildlife as workers might harass/ hunt the wildlife in the nearby forests, however, such effects are very minimum.Labours and local people are prone to health effects and accidents relating to construction activities. The labours and local people may suffer by health and accidental problems.

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

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 Contractor based and RBG as far as possible. Affected families will be given high priority for employment and skill development trainings. Necessary measures will be taken to reduce the adverse effects that might arise from site clearance, cutting of slopes, disposal of spoils and quarrying activities. Necessary trainings and awareness programs will be conducted. Necessary measures will be adopted for protection of flora and fauna. At construction site, the workers will be provided insurance, first aid facilities and safety equipments. Loss of trees will be compensated by planting of trees in the ratio of 1:1 for the numbers of private tress that need to be cut down during construction. Proper maintenance and proper drain system will be provided to prevent accumulation of water on the nearby agricultural lands during operation. Adequate road safety measures will be provided to minimize road accident.

Environmental Management Plan

Environmental management plan is prepared to ensure the implementation and monitoring of mitigation measures for minimizing adverse impacts and maximizing the beneficial impacts. The necessary mitigation measures together with environmental monitoring process and responsible bodies for environmental monitoring have been

identified. Similarly, for environmental monitoring various sections of physical, biological, socio-economic and cultural environment have been identified to generate useful information and improves the quality of implementation of mitigation measures.
The cost for implementing environmental management plan has been identified as follows:

S.N.	Description	Amount (NRs.)	Remarks
1.	Environmental awareness raising training and other Technical Skill Enhancement trainings	150,000.00	
2.	Insurance of workers	400,000.00	
3.	Bio-engineering / Road side plantation	3,777,520.00	
4.	Information Signboard	50,000.00	
5.	Resettlement and Land Acquisition	8,960,092.00	
6.	Restoration or relocation of affected infrastructures, Spoil management, Reinstate of quarry, stockpiling etc.	500,000.00	
7.	Compensatory Plantation cost	240,000.00	
8.	Social Action Plan.	1,050,000.00	
9.	Occupational health and safety Cost	500,000.00	
10.	Environmental Monitoring and Evaluation	200,000.00	
	Total	15,827,612.00	

Conclusion and Recommendation

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

CHAPTER – 1

1. INTRODUCTION

1.1 Background

1. The Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) covers 20 districts spread over the country, which focuses on immediate post conflict development priorities for accelerated poverty reduction and inclusive development, to improve the connectivity, enhance economic and employment opportunities, increase access to market and social services of rural communities. Dhankuta District is one of the project districts under RRRSDP.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 (MoLD) is the executing agency (EA). The District Development Committees (DDCs) are the Project Implementing Agencies and DTO of each respective DDC is responsible for technical and project management. The District Technical Office (DTO)- Dhankuta will be supported by District Implementation Support Team (DIST) for rehabilitation of the proposed road which includes engineering design, safeguards and social mobilization.

1.2 Name and Address of Proponent

2. Name of Proposal: Upgrading of Hille-Utterpani-Chhingtang District Road Sub-project,
Name of Proponent: District Development Committee, District Technical Office, Dhankuta
Address of Proponent: Dhankuta District, Nepal
Telephone No.: 977- 026-520920
Fax No.: 977- 026-521481

1.3 Need and Objectives of the IEE Study

Objectives: The main objective of the IEE study is to identify the impacts on physical, biological, socio-economic and cultural environment of the sub-project area from the implementation and operation of the Proposal. It recommends practical and site-specific environmental mitigation and enhancement measures, as well as environmental monitoring plan and make sure whether the IEE or EIA is required for the proposed road sub-project.

1.4 Methodology Adopted

3. The IEE study has followed the provisions of the EPA, 1997 and EPR, 1997, the provisions of ADB and approved Terms of Reference (please refer Annex I) for IEE study. It follows methodology as suggested and stipulated in the TOR[i] for IEE study. At the sametime, the relevant laws and regulations were also reviewed to refresh the procedures that have to be pursued during the study. A public notic was given beforehow and Local people, DDCs officials, VDCs, local politicians and different community groups were consulted for information. The IEE study has been conducted through review of secondary information collected from relevant agencies, and primary information collected from the field survey in November, 2009. Primary level of information was collected

through questionnaires, checklist, data sheets, walk-over survey and own perception of IEE team judgment. 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, VDCs 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.

4. The geographical boundary of ZoI was drawn on the topographical maps for physio-biological and socio-economic environment. For the collection of environmental features related to bio physical environment, maximum 100 meter distance observable from the centre of the road alignment was taken as an influence area and socio-economic and cultural environment was taken of ZoI (one and half hour walking distance from the centre line of the road) information of the sub-project area.

1.5 Public consultation and information Disclosure

5. 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 17th Ashad of 2066 B.S (1st July 2009) in the Rajdhani, a national daily newspaper (**see Appendix-V**) seeking written opinion from concerned VDCs, DDC, schools, health posts and related local organizations. A copy of the public notice was also affixed in the above mentioned organizations and deed of enquiry (*muchulka*) was collected (see **Appendix-VI** for deed of inquiry and **Appendix-VIII** for the names of organizations).
- IEE team also carried out interaction and group discussion with local communities and related stakeholders such as District Development Committee, District Forest Office, Village Development Offices, District Soil Conservation Office, District Agricultural Development Office and others during field survey to collect the public concerns and suggestions**.**
- Recommendation letters were also obtained from the concerned VDCs (see **Appendix-XI**). FGDs were held at major different settlements along the ZoI of the road. 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 MoLD and ADB.

Table 1.1: Summary of FUG and meeting minutes

Location	Date	No. of Participants		Issues and Suggestions of the meeting	Decision
		Male	Female		
Utterpani Boarding School, Uttarpani, Chungwang VDC	2066/07/24 B.S.	15	4	1. Construction of Road is necessary to be carried out even some minimum impacts may occurs. 2.Supplementary infrastructure such as drinking water supply and irrigation schemes should be supported. 3. Storm water drainage need to be properly controlled to save farmland, school and water bodies. 4. Safety measure signs should be kept in School, healthpost area and other appropriate sites.	Adequate benefit augmentation measures and adverse impact mitigation measures shall be taken to enhance the beneficial impact and mitigate the adverse impacts due to implementation of the subproject.
Shree Janakalyan higher secondary school, Marga	2066/07/24 B.S.	12	3		
Ankhisalla Health Post, Ankhisalla VDC	2066/07/26 B.S.	3	3		
Chhingtang VDC Office, Chhingtang	2066/07/25 B.S.	21	3		
Jyamire Settlement, Chhingtang VDC	2066/07/25 B.S.	9	2		

1.6 Information Disclosure

6. Draft IEE will be kept in the information center of DDC Dhankuta for public Dissemination. Information are also be disclosed through person to person contacts and interviews and group Discussions. The approved IEE report will be accessible to interested parties and general public through information center of DDC Dhankuta and websites of ADB, DoLIDAR and RRRSDP.

7. The IEE Report will be forwarded to the following offices:

1. District Development Committee, Dhankuta
2. District Technical Office, Dhankuta
3. District Project Office, Dhankuta
4. District Implementation Support Team, Dhankuta
5. Dhankuta Municipality, Chungbang, Belhara, Khoku, Ankhi salla and Chhintang VDCs
6. Ministry of Local Development, Environment Management Section
7. Department of Local Infrastructure Development and Agricultural Roads
8. Project Coordination Unit, RRRSDP
9. Asian Development Bank, Nepal Resident Mission

CHAPTER – 2

DESCRIPTION OF THE PROPOSAL

8. The proposed Hille-Utterpani-Chhingtang road sub-project lies in the South-west part of Dhankuta district in Eastern Development Region of Nepal. It starts from Hille Bazaar of Dhankuta Municipality and ends at Jyamire, ward no. 6 of Chhingtang VDC. The road passes through Chungbang, Belhara, Khoku, Ankhisalla and Chhintang VDCs. Major settlements along the road alignment are Uttarpani, Dharmasala, Marga, Sukeaahal, Thalthale, Panchakanya, Pipledada and Sambu gaun. The road is one of the important roads of district, which links itself to Dharan-Dhankuta-Hille-Basantapur highway. It is a very useful road for the people of this region including the remote areas of Dhankuta and adjoining districts. Owing to the road, this has been used for the last three years. Commercial establishments and houses have developed along both sides of the road. Since the road will bewiden to 5.0 m land new to be acquired along the road corridor for switchback, lay-byes, extra widening in curves, as well as for mass balancing and safe disposal for the excess excavated material. It will definitely ease the life of rural communities and add them alternative outlets for the goods and other products in easy way.

9. The total length of this road is 23.9 km. (see **Map 1.1** and **Map 1.2**). The total cost of road upgrading is estimated as NRs.129, 694,881.00 as shown in **Appendix-III**.

SALIENT FEATURES

1. Name of the Sub-Project	: Upgrading of Hille-Utterpani-Chhingtang Road
1.1 Project Components	: Road
1.2 Project Activities	: *Construction Stage* Site clearance, Pavement work, Structures work (toe wall, retaining wall, breast wall,), Earthwork, Bio-engineering, Cross drainage works and Side drain works. *Operation Stage* Maintenance Works
2. Location	
2.1 Development Region	: Eastern Region
2.2 Zone	: Koshi
2.3 District	: Dhakuta
2.4 Geographical Location	
2.4.1 Start Point	: Hille Bazaar of Dhankuta Municipality
2.4.2 End Point	: Jyamire, Ward no. 6 of Chhingtang VDC
2.5 Geographical Feature	
2.5.1 Terrain	: Mid-Hills
2.5.2 Landuse pattern	: Agricultural land, forest area and Barren land and Built up area. **This alignment does not pass through any National park, Protected area and Archeological Sites**
2.5.3 Altitude	: Kagune - 1000 m amsl (minimum) and Hille Bazaar –1918 m amsl. (maximum)
2.5.4 Climate	: Cool-temperate Climatic Zone
2.5.5 Soil	: Bolder mixed-soil
3. Classification of Road	: District Road (Rural) Class A
4. Status of road	: Rehabilitation proposed for all weather
5. Length of Road	: 23.9 km
6. Standard of Pavement	: Gravel
7. Construction Period	: 270 Days
9. Design speed	: 20 Km/hr
10. Maximum Grade	: 12%

11. Minimum radius of Horizontal curve	: 10m
12. Major Settlements:	
12.1 Major Settlements	: Uttarpani, Dharmasala tole, Marga, Sukeahal, Thalthale, Panitar, Pipledada and Sambu gaun
12.2 Municipality /VDCs along the Road	: Dhankuta Municipality, Chungbang, Belhara, Khoku, Ankhisalla and Chhintang
12.3 Total no. of Households	: 2718 HHs
12.4 Total Population of ZOI area	: 15,974
12.5 Population served by the total road	: 31,731
13. Cross Section	
13.1 Right of way	: 10m
13.2 Formation Width	: 5 m
13.3 Carriageway width	: 3.0 m
13.4 Side drain Width	: 0.40 m
13.5 Shoulder width	: 1.0m (Including Drain)
13.6 Lane	: Single
14. Approximate Volume of works	
14. 1 Earth work in cutting	: 79,919.40 m^3
14. 2 Earth work in filling	: 34,762.95 m^3
14. 3 Excavation for foundation structure	: 16,286 m^3
14. 4 Dry masonry structures	
(i) PCC causeway (nos.)	: 73
14. 5 Pipe Culverts (Road crossing)	: 13 nos.
14. 6 Slab Culvert	: 2m span (2nos.) and 5m span (4 nos.)
14. 7 Retaining structures	
(i) Gabion Wall	: 7,696 m^3
(ii) Dry Wall	: 2,185 m^3
14. 8 Gravel (Cum)	
(i) Sub-Base	: 13,203.75 Cum
(ii) Base	: 9,485.00
15. Total Employment generation	: 194,542 Person days
18.1. Skilled	: 155,634
18.2. Unskilled	: 38,908
16. Sub-project cost	
19.1 Total Cost	: NRs. 129,694,881.00
19.2Cost per km	: NRs. 5,156,854.00

2.1 Relevancy of the Proposal

10. The sub-project area has high potential for the production of orange, vegetables and ginger cultivation. It helps to connectivity to the other parts of the country, all weather serviceability, safety after upgrading the road in gravel standard. The proposed road will enhance access of the rural people to market and social services and will significantly uplift their socio-economic status and sustainable livelihood. Better access in turn will also doors to new development opportunities. This road corridor is highly prioritized road as per DTMP in Dhankuta.

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

2.2 Construction Approach and Activities

12. The construction will be based on contractor modality and Labour-based, Environment-friendly and Participatory (LEP) approach as far as possible. The important features of the LEP approach are (i) phased construction with balanced cut and fill; (ii) manual work and use of hand tools and small equipment rather than heavy machinery; (iii) bio-engineering for slope stabilization; (iv) avoid blasting; (v) use soft engineering structures; and (vi) use of contractors only in the works that cannot be done through manual labor. Machine Intensive Road Construction Approach will be used in works that cannot be done manually through road building groups. In such works, the construction will be carried by using the equipment and machineries but it will be used in such a way to ensure the minimum environmental damage. Activities included during the road construction are: Site clearance, Pavement work, Structures (Toe wall, retaining wall etc.), Earthwork, Bioengineering, Gravelling, Cross drainage works and Side drain works.

2.3 Proposed Schedule for Implementation of Sub-project

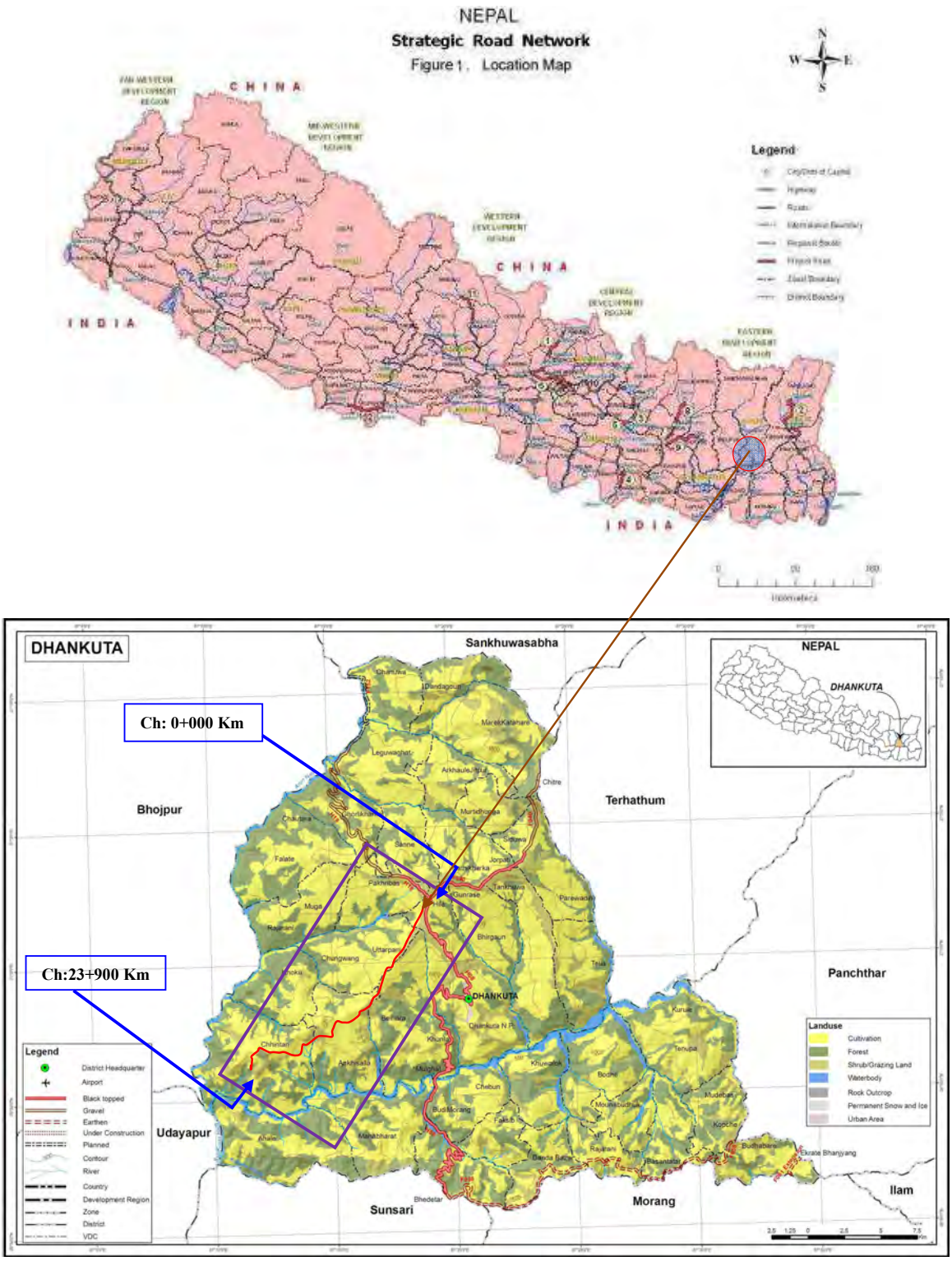
13. Following table shows the proposed implementation schedule for Hille-Utterpani-Chhingtang road sub-project:

Table 2.1: Sub-project implementation schedule

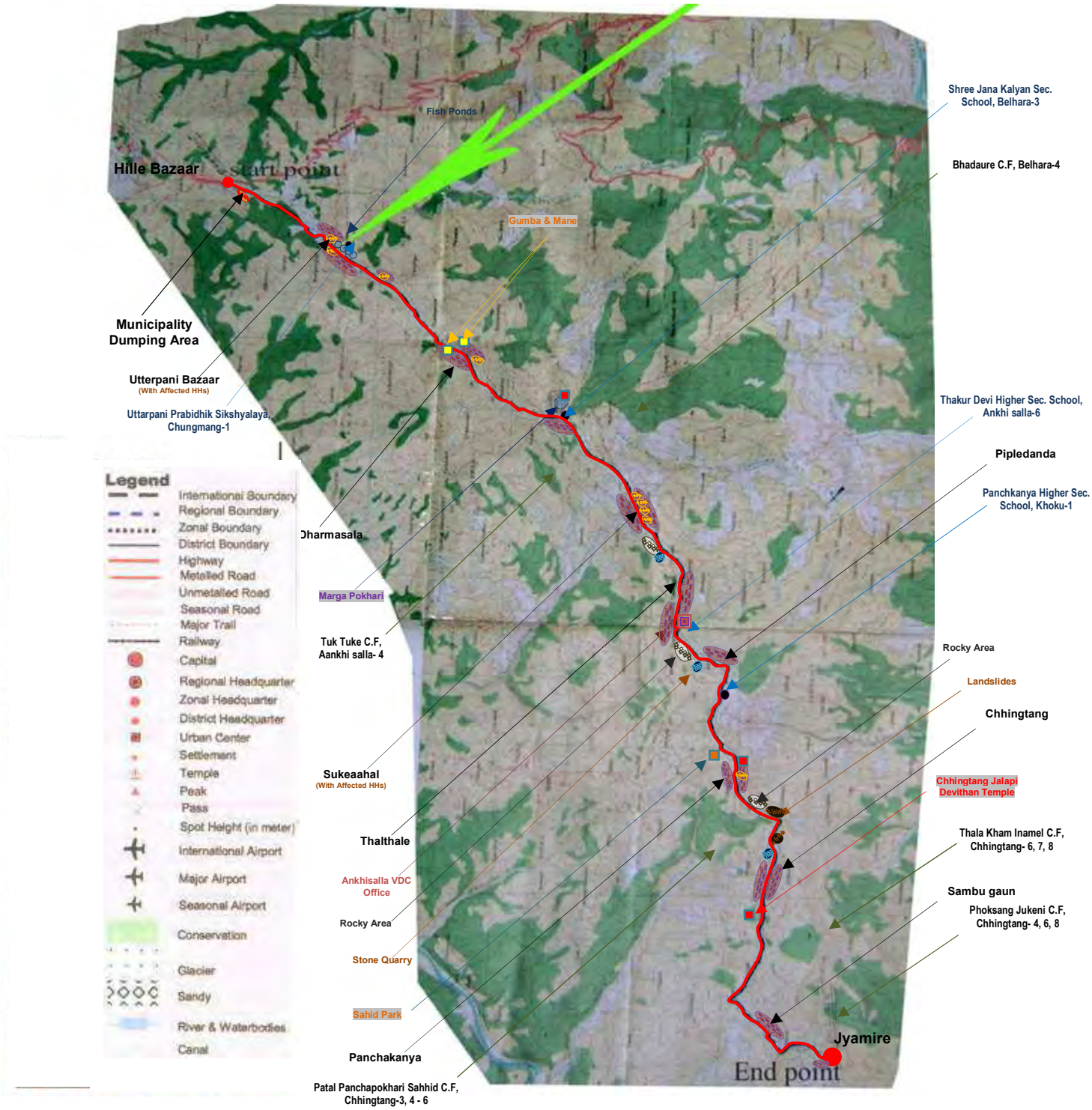
S.N	Activity	2009				2010				2011			
		I	II	III	IV	I	II	III	IV	I	II	III	IV
1	**Detailed survey, design and estimate**												
2	**Preparation of Resettlement Plan**												
2.1	Life skill and income generation training												
3	**Environment Assessment and implementation**												
3.1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

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

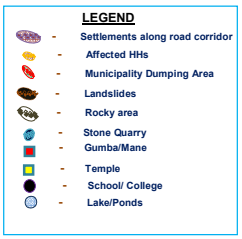
Location Map



Location Map of Dhankuta District showing the proposed road alignment of Hille-Utterpani-Chhingtang Road Sub-project



Topo Map showing the proposed alignment with existing Condition and other infrastructures within Hille-Utterpani-Chhingtang Road



CHAPTER – 3

REVIEW OF RELEVANT ACTS, REGULATIONS AND GUIDELINES

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

Table 3.1: Review of Environmental Acts, Regulations and Guidelines

S.N.	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), GoN	The EPR and its schedules clearly provide various step-wise requirements to be followed while conducting the IEE study. It also obliges the Proponent to timely consult and inform the public on the contents of the proposal and IEE study.
4	Forest Act, 2049 BS (1993 AD) (amendment, 2007), GoN	Requires decision makers to take account of all forest values, including environmental services and biodiversity, not just the production of timber and other commodities. It includes several provisions to ensure development, conservation, management, and sustainable use of forest resources based on approved work plan.
5	Forest Rules, 2051 BS (1995 AD), GoN	Elaborates legal measures for the conservation of forests and wildlife. Expenses incurred for cutting trees and transportation shall be borne by proponent.
6	*Batabaraniya Nirdesika* (Nepal; MLD), 2057, GoN	The directive is focused in the practical implementation of small rural infrastructures through the minimization of environmental impacts. This directive includes the simple methods of environmental management in the different phases of the project cycle.
7	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
8	Land Acquisition Act, 2034 BS (1977 AD) and Land Acquisition Rules, 2026 BS (1969 AD), GoN	Specifies procedural matters on land acquisition and compensation
9	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.
10	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.
11	RRRSDP Environmental Assessment & Review Procedures (EARP), 2007, GoN	For preparation of environmental assessments of future subprojects under Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP), this EARP includes: i) The process to be adopted while preparing environmental reports, ii) the potential environmental impacts that could result from undertaking the Project based on the Initial Environmental Examinations (IEEs) of sample core subprojects; iii) the proposed mitigation measures to avoid the identified impacts; iv) institutional capacity assessment and strengthening arrangements; v) legal framework for environmental assessment, domestic and the Asian Development Bank (ADB) environmental assessment and review procedures; and finally vi) the approaches to be adopted during implementation of the Project in order to ensure that environmental aspects are dealt with in a comprehensive manner.

S.N.	Environmental Acts, Regulations and Guidelines	Description of Requirements
12	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
13	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
14	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
15	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.
16	The Interim Constitution of Nepal, 2063 (2007).	Has provision of right regarding environment - Every person shall have the right to live in clean environment.
17	The Labor Act, 2048 BS (1992 AD)	Regulates the working environment and deals with occupational health and safety.

CHAPTER- 4

EXISTING ENVIRONMENTAL CONDITION

4.1 Physical Environment

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

4.1.1 Topography

17. The road alignment lies in Middle Mountain. The proposed road alignment passes through different valley ridges, moderate hill slopes and cultivated terrains of the Midhills in eastern Nepal. It starts from Hille Bazaar of Dhankuta Municipality at altitude of 1,918 m (maximum) a.m.s.l and passes through Kagune at altitude of 1000m (minimum) amsl, which ends at Jyamire, ward no. 6 of Chhingtang VDC at altitude of 1053m amsl.

4.1.2 Geology and soil type

18. Geographically the proposed road falls under the Lesser Himalayas, which is the range of rock composition of low to medium grade meta-sedimentary rocks. The road corridor comprises rocks such as quartzite and schists. No fragile and landslide prone sensitive areas are found along the alignment.

19. In general, soil type along the alignment can be classified as alluvial, residual and clay mixed sandy soil. The details are presented in the **Appendix-XIII**.

Table 4.1 Geological features along the road alignment

Chainage	Location	Terrain slope	State of Land dry /wet	Land Use Pattern	Geological Problem
0+000- 0+300 Km	Municipality Dumping Site	Moderate	Moist	Barren	-
1+170-1+550 Km	Utterpani	Flat	Dry	Barren + cultivated	-
4+850 - 7+150 km	Marga	Moderate	Dry	Cultivated + barren	Gully/ Soil erosion, Sediment deposit in Marga pokhari
8+950- 13+800 km	Ankhi salla	Moderate	Moist	Cultivated	Soil erosion
13+800-17+100km	Khoku	Moderate	Moist	Cultivated	Soil erosion
17+500 -19+550km	Panchkanya	Ridge	Dry	Cultivated	-
19+850- 21+800 km	Chhingtang	Moderate	Moist	Cultivated+Forest	Minor Scale landslide

Source: Field Survey, November, 2009

4.1.3 Soil Erosion and Sedimentation

21. The road alignment passes through hilly region. The stability of slopes along the road corridor depends upon slope angle, the material constituting the slope, rock discontinuities and hydrological condition. The proposed alignment does not pass through major landslides or erosion prone area. But, there are some minor scale landslides at Ch:19+800km (15x8m) in Mugliling kholsi and at Ch: 20+500km (20x7m) near Chhingtang devisthan along the road alignment. However, few small-scale soil erosion at road turings, sediment deposit and gully erosion near Marga pokhari were observed.

4.1.4 Climate

22. The climate of the sub-project site is warm temperate in nature at lower altitudes and cool temperate further north, which is characterized by cold, dry winter, warm and humid rainy seasons. Generally, rainy season starts from June and ends in September. The meteorological record shows unevenly distributed monsoon rain with the total annual average rainfall of 1,615 mm. The maximum temperature of the area rises to as much as nearly 32° C during summer. The minimum goes down to 5° C in winter (Source: District Profile of Dhankuta, 2058).

4.1.5 Hydrology and Drainage System

23. There are various seasonal and perennial streams along the road alignment namely Pani khola, Thaunda kholsa (Ch:1+400 - 3+000), Karfok khola, Bhadaure kholsi (Ch: 5+000 - 8+950), Khoku kholsi, Karki kholsi, Chongrang khola, Shreemana kholsi(Ch: 13+800 – 17+500) , Lodhia khola, Gara khola Mugliling khola (Ch: 18+600 - 21+550) etc.

4.1.6 Land use

20. Land use along road alignment mainly passes through ridge with flat and moderate slope. Overall landuse pattern and its zone of influence classify primarily, cultivated, forest, barren land and built up area. Details of land use pattern have been summarized in **Table 4.2** below:

Table 4.2: Summary of land use pattern along the road alignment

Type of Land	Chainage		Length (m)	Existing Width (m)	Additional Width (m)	Existing Area (ha.)	Additional Area (ha)
	From	To					
Agricultural land	2+300	4+100	1800	4.1	0.9	0.738	0.162
	4+700	6+200	1500	3.9	1.1	0.585	0.165
	6+450	7+250	800	4.6	0.4	0.368	0.032
	7+500	8+300	800	3.9	1.1	0.312	0.088
	9+600	10+500	900	3.3	1.7	0.297	0.153
	12+250	12+750	500	3.6	1.4	0.18	0.07
	13+800	14+200	400	3.5	1.5	0.14	0.06
	15+000	17+450	2450	3.4	1.6	0.833	0.392
	19+900	20+500	600	3.2	1.8	0.192	0.108
	20+700	23+900	3200	3.0	2.0	0.96	0.64
		Sub Total				**4.605**	**1.87**
Barren land	0+150	2+300	2150	4.4	0.6	0.946	0.129
	10+500	11+300	700	3.4	1.6	0.238	0.112
	12+750	13+750	1050	3.7	1.3	0.3885	0.1365
	17+450	18+010	560	3.4	1.6	0.1904	0.0896
		Sub Total				**1.7629**	**0.4671**
Forest	4+500	4+700	200	3.5	1.5	0.07	0.03
	6+200	6+450	250	4.3	0.7	0.1075	0.0175
	8+400	9+600	1200	3.7	1.3	0.444	0.156
	20+500	20+700	200	3.1	1.9	0.062	0.038
		Sub Total				**0.6835**	**0.2415**
Built up area (Public Land+ settlement)	0+000	0+150	150	5	0	**0.075**	**0**
	4+100	4+500	400	3.8	1.2	**0.152**	**0.048**
	7+250	7+500	250	4.6	0.4	**0.115**	**0.01**
	8+300	8+400	100	3.9	1.1	**0.039**	**0.011**
	10+500	10+600	100	3.4	1.6	**0.034**	**0.016**
	11+300	12+250	950	3.3	1.7	**0.3135**	**0.1615**
	14+200	15+000	800	3.7	1.3	**0.296**	**0.104**
	18+010	19+900	1890	3.3	1.7	**0.6237**	**0.3213**
		Sub Total	**23900**			**1.6482**	**0.6718**
		Total				**8.6996**	**3.2504**

Source: Field Survey, November, 2009

4.1.7 Air, Noise and Water Quality

24. The air quality observed was good and expected to be within national ambient air quality standards of Nepal. The proposed road alignment does not have any sources of noise nuisance. Although, noise and dust emission during vehicular movement in the existing road is a natural phenomenon and it is more significant during dry and festival season. Some educational and offices close to road alignment have noise disturbance in some extent during transportation services. Likewise, water quality seems to be good. There is no defecation problem around the drinking water sources along the road alignment. However, during the monsoon season the water may be slightly polluted.

4.1.8 Existing Road Condition

25. The proposed road starts from Hille Bazaar, through Chungbang, Belhara, Ankhisalla, Khoku and ends to Jyamire of Chinntang VDC. Hille bazaar is 13Km distant from Dhankuta municipality and situated in Dharan-Dhankuta-Hille- Basantapur Highway. There are many existing horizontal curves, and a few hairpin bends. The gradient is quite moderate. The road width in average is 3.8m; gradients of roads are generally around 8-10 % and at some critical places more than 12%. There are some sharp bending curves and box cutting areas in two places along the road alignment. Major portion of the road passes along the south and south-west facing slope. There is a holy buddist shrine Dharmasala Gumba which is situated in Belhara VDC. The Famous temple of Chhintang Jalapi Devi also falls within Chinntang VDC and lies beyond the RoW of the proposed road.

26. The proposed road is already in operation with frequent movement of vehicles of tractors and mini trucks. However, the ending point of the road at Jyamire, Chhintang VDC has existing trail road link to Bhojpur district, which could be develop as important road network in near future. It connects several VDCs of lower belts near arun river valley to the national highway and could facilitate as easy access to other parts of the country. There is no bridge in this road section.

27. Although the proposed road for the western remote areas of the district is linked with Dharan-Dhankuta-Hille-Basantapur road, it cannot be smoothly operated during rainy season. After the completion of the proposed road, it will provide accessibility to district headquarter-Dhankuta including other market centres.

4.1.9 Existing Traffic Situation

28. There is no regular service of buses plying on the road. In rainy season, the number of vehicles operating in this road reduces due to slippery and poor road condition. Vehicle used for transportation of vegetables always operate in the road except in heavy rainfall days.

4.2 Biological Environment

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

4.2.1 Vegetation

30. The dominant tree and fodder species reported in the road alignment are *Alnus nepalensis* (Uttis), *Dendrocalamus strictus* (Bans), *Schima wallichii* (Chilaune), *Pinus roxburghii* (Salla), and *Castanopsis indica* (Katus). Other species found are *Ficus semicordata* (Khaniyu), *Ficus bengalensis* (Bar), *Prunus cerasoides* (Painyu), *Ficus religiosa* (Pipal), *Bahunia purpurea* (Tanki), *Albizia labbeck* (Siris), *Thysanolaena maxima* (Amliso), *Sauravia nepauensis* (Gogan), *Woodfodia fruticosa* (Dhangeri). Detailed of trees cutting from community forest and private forest during road construction are given in **Appendix-XXII**.

Forest

31. In total 0.24 ha forest areas will be lost due to the construction of this road. Total number of trees to be removed is 1028 from private land. However, no trees will be removed from these forests during road construction. **Table 4.3** shows the community forest lies within ZoI of the subproject area.

Table 4.3: Community Forests along ZoI OF the subproject

S. N	Name of CF/ Location	Chainage	Main Species	Remarks
1	Bhadaure CF, Belhara-4	Ch:8+ 950	Uttis, Chilaune, Laliguras, Patale katus, Ghangaru, Angeri, Mauwa	Natural + Manmade forest
2	Tuk Tuke CF, Akhisalla-4	Ch: 10+500	Sallo dominant	Manmade forest
3	National forest(Chhingtang Devi mandir premises), Chhingtang-2	Ch:20+750	Uttis, Chilaune, Uttis, Simal, Jhullo, Painate, Newarpate, Lampate, Asuro, Khirro, Mauwa, Ritta, Lahare kapra, khari, Madane	Natural and religious forest
4	Patal Panchpokhari Sahid CF, Chhingtang-3,4-6	Ch: 21+400	Uttis, Chilaune, Dhale katus, Mauwa, Ghangaru	Natural + Manmade forest
5	Thala Kham Inamel CF, Chhingtang-6,7,8	CH:22+500	Sakhuwa(Sal), Chilaune, Malati,Dhayero,Uttis	Natural forest
6	Phoksang Jukeni CF, Chhingtang-4,6,8	Ch: 23+250	Sakhuwa, Saj, Khair, Chilaune, Malati, Dhayero, Banmara	Natural + Manmade forest (Recently Established)

Source: Field Survey, November 2009

Trees on private land

32. Local people have planted trees in some patches of their private land. The main tree species is Uttis. They don't have registered as a private forest in DFO.

Religious forest

33. There is religious forest at Chhingtang Jalapi Devisthan adjoining to the road alignment.

4.2.2 Wildlife

34. *Panthera pardus* (Leopard), *Hystix indica* (Porcupine), *Canis aureus* (Jackal), *Macaca mulatta* (Monkey), *Sus scrofa* (Bandel), *Felis chaus* (Jungle Cat), *Martes flavigula* (Malsanpro), *Ratufa spp.(*Lokharke), Fyauro (*Vulpes Montana)* are the wild animals reported in the forests of proposed road area. Similarly, bird species *Lophura lencomelana* (Kalij pheasant), *Columba livia* (Pigeon), *Corvus splendens* (Crow), *Passer domesticus* (Sparrow), *Streptopelia spp.* (Dhukur), *Gallus gallus* (Jungle fowl), and *Psittacula kramen* (Parrot) are noticed during field visit. The road does not fall under any National Park, buffer zone and protected area.

4.2.3 Aquatic life

35. Aquatic species found in water bodies i.e. pond, streams and kholsi. Mainly Bhyaguto (Rana tigrina), Paha and Gangata are found.

4.2.4 Endangered and protected species

36. Faunal species: Among the fauna present in the forest area along the road alignment, Leopard (*Panthera pardus*) is listed in CITES Appendix I, Jackal (*Canis aureus*) is listed in CITES Appendix-III, Lokharke*(Ratufa spp.*) is listed in CITES Appendix II. Floral species: Sal (*Shorea robusta*) is listed as protected tree species under the forest Act 1993 which is categorized into timber trees banned for felling, transportation and export for commercial purposes.

4.3 Socio-economic and Cultural Environment

4.3.1 Population, Household and Ethnicity

37. The alignment covers five VDCs namely: Chungmang, Belhara, Ankhisalla, Khoku and Chhingtang. Major settlements within ZoI of the project are Utterpani, Dharmasala, Marga, Suke aahal, Thalthale, Pipledanda, Panchakanya, Devithan and Sambu gaun. Total population of the concerned VDCs is 15974 persons in 2718 households and average family size of 5.9. Major ethnic groups are Rai, Chhetri, Brahamin, Newar, Magar, Tamang and Dalit as given in **Table 4.5**.

Table 4.4: Demographic Features with Population Distribution along the road alignment

S.N	Influenced VDCs/MC	Total HHs	Population distribution by Sex			Population distribution by Percentage		
			Male	Female	Total	Male%	Female%	Total%
1	Chungbang	698	1913	1846	3759	50.89	49.11	100
2	Belhara	304	862	824	1686	51.13	48.87	100
3	Aankhisalla	508	1331	1287	2618	50.84	49.16	100
4	Khoku	420	1490	1476	2966	50.20	49.80	100
5	Chhintang	788	2569	2376	4945	51.97	48.03	100
Total		**2718**	**8165**	**7809**	**15974**	**51.11**	**48.89**	**100**

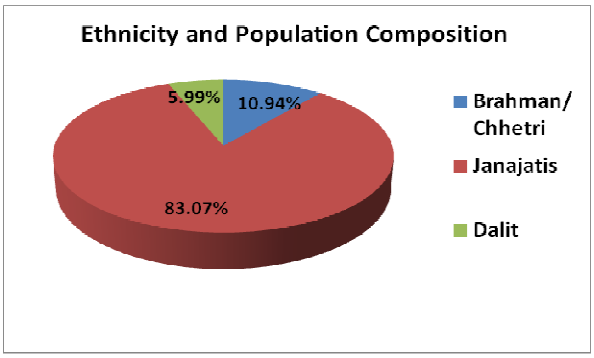
Source: Field /ZoI HH survey of RRRSDP, 2009

Table 4.5: Ethnicity and Population Composition

S N	Influenced VDCs/MC	Population distribution by caste and ethnicity			
		Brahman/ Chhetri	Janajatis	Dalit	Total
1	Chungbang	600	2996	163	3759
2	Belhara	823	575	288	1686
3	Aankhisalla	186	2393	39	2618
4	Khoku	52	2817	97	2966
5	Chhintang	86	4489	370	4945
Total		**1747**	**13270**	**957**	**15974**
Percentage		**10.94**	**83.07**	**5.99**	**100.00**

Source: Field Survey, November, 2009

Chart-1: Distribution of population by caste and ethnicity



(Distribution of population by caste and ethnicity)

4.3.2 Main occupation

38. The main occupations of all people residing within the ZoI of the proposed road alignment is agriculture and bussiness. Most of the households (HHs) are involved in agriculture and livestock (78%) along with other occupation. However, farming is not enough for subsistence due to small landhoding size and lack of irrigation and market facilities. Therefore, people are carrying out other economic activities like labour and porters (14%), working in service/employees (6%), and business (2%). Details of occupation of the people according to the settlements are shown in **Appendix-XII a.**

4.3.3 Market Centres and Business Facilities

39. There are grocery shops and tea stalls available in the almost all settlements. Mainly Utterpani, Thalthale, Suke Aahal and Panchakanya have some hotels. Necessity of sewerage/drainage system is felt in these places. Other smaller market centres with tea stalls and daily commodities are at Dharmasala, Marga, Pipledanda, Sambu gaun and Jyamire.

4.3.4 Public Services

40. Details about public services and infrastructures according to the settlements are shown in **Appendix-XIIb.**

Education

41. The proposed sub-project area consists of nine educational institutions ranging from primary level to higher secondary level. Secondary and higher secondary schools are found in majority of the settlements. Pravidhik Shikshalaya (Technical school) at Chungmang-1and two higher secondary schools viz Panchkanya Higher Secondary School, Khoku-1 and Adarsha Higher Secondary School, Chhingtang-9 are situated nearby road alignment. During the field study, it was known that local people have realized the importance of education in their life and most of them send their children to school. However, literacy rate of female enrollment in schools is more encouraging than that of male students.

Health Facility

42. In health sector, there are altogether two health posts/sub healthposts in the settlement along road alignment. For serious health problem, people go to district hospital in Dhankuta, B.P.Memorial hospital, Dharan or Kathmandu.

Communication

43. Regarding communication, all of the settlements have telephone facilities mostly with CDMA connection. Mobile phones are in use more and more. Two post offices have been serving the local people from all settlements.

Transportation facilities

44. The main means of transportation in the area are mini truck/pick-up, tippers which generally carry vegetables, fruits and other local products from the area. Some grocery shops still uses porters for the transportation of daily goods from the nearest market centres, Hille and Dhankuta. However, opening of existing road before some years ago has provided better accessibility to rural people for the supply of daily commodities and selling of agricultural products. Jyamire, the end point of this road has been also linked with Bhojpur through foot trail.

Electricity

45. Almost all settlements in ZoI are connected with national grid transmission line. There are no promotion of alternative energy facilties ie. Solar, biogas within the ZoI of the road sub-project.

Irrigation

46. No irrigation facility has been observed in ZoI of the sub-project area.

Water Supply

47. Generally, Drinking water supply facility is available to all settlements. Water from spring sources is conveyed by pipes to the public taps through gravity flow. Mostly, taps are located in common places to serve households as much as possible.

Other Infrastructures

Table 4.6: Infrastructure Facilities in the Project Area

Type of Public Service and Infrastructure	Chainage/ Location	Distance from the Road CL	Remarks
Drinking water pipelines	Pipledanda (Ch: 15+500Km) and Dadagaun (Ch:18+000Km)	Along the road alignmnt	Affected during road construction
Municipality Dumping Site	Ch: 0+300 km	Adjacent	Not affected
Dharmasala Gumba /Buddist shrine	Ch: 0+400 km	Adjacent	Not affected
MargaPokhari	Ch: 7+000 km	Adjacent	Affected due to uncontrolled drainage water
Office Building and 3 nos. of *Chautara*	Ch:9+550-10+500km	Within Formation width	Bhayanjang, Suke Aahal
VDC Office Building (Destroyed)	Ch: 12+650 km	Within Formation width	Thalthale
Jalaseg English Boarding School, Utterpani, Chungmang -1	2+400Km	Within Formation width	Compound wall is affected
Shree Janakalyan Scondary School, Marga, Belhara-3	7+000 Km	Within Formation width	Compound wall is affected
Panchkanya Higher Secondary School, Khoku-1	9+250Km	Within Formation width	Compound wall is affected

Source: Field Survey, November, 2009

Health and Sanitation

48. Major health problems associated with local people are gastric, diarrhoea, respiratory diseases, water borne diseases, gaeneco related diseases, skin, malnutrition, typhoid, worm etc. Sanitation awareness among local people is increasing and many of them have toilets in their home, but there is no public sewerage system.

Industries

49. Cottage and other industries are not well developed within the ZoI. There are some rice and flour mill in some settlements. Many people have skills of weaving bamboo baskets; woolen cloths etc. and these skills can be commercialized to increase ther income.

Financial Institutions

50. There are few saving and credit cooperatives found in settlements within ZoI of project concerned VDCs.

Community Development Facilities/Organizations

51. There are various community user structures within ZoI of the project of which *Gumba* of Buddist community is located within RoW in Dharmasala settlement, Chungmang-2. Several community based organizations, Satsanga Building, youth clubs, women's group, NGOs and water/forest users groups are active in ZoI of the sub-project.

4.3.5 Local Economy

52. The economy of the area is predominantly agriculture based. Local people are gradually attracted towards cultivation of cash crops such as Orange, vegetables, ginger, rudrakshya, tea etc. Selling of orange and citrus fruit to the market has been main source of income for local farmers. About 78 percent populations are engaged in agricultural activities for their daily needs. With growing closeness to Dharan-Dhankuta-Hille-Basantapur Highway with regular transportation facility, cultivation of fruits and vegetables in a commercial manner seems to have gained momentum. Diversity in employment pattern has been observed more. Local people have increasingly been engaged in business activities at urban market centers ie. Dharan, Itahari, Biratnagar etc. Many People seasonally migrate to different parts of India and even further abroad to earn money for better livelihood.

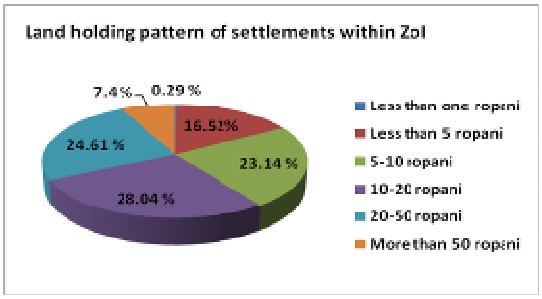
4.3.6 Agriculture pattern

53. Major cash crops that are grown are orange, mustard, vegetables, alainchi, amliso, ginger etc. The area has appropriate climate and fertile soil for farming of citrus type of fruits such as orange, lemon, *nibuwa* etc.

4.3.7 Land holding pattern

54. Land holding pattern within the ZoI of the road demonstrates that very few 0.29% HHs have land less than one ropani of land where as 28.04% HHs have 10 to 20 ropani land. While 16.52 % HHs have less than 5 ropani land, 23.14% HHs have 5-10 ropani, 24.61 % HHs have 20 – 50 ropani land and 7.4 % HHs have more than 50 ropani. Details about land holding pattern are given in **Appendix-XI c**.

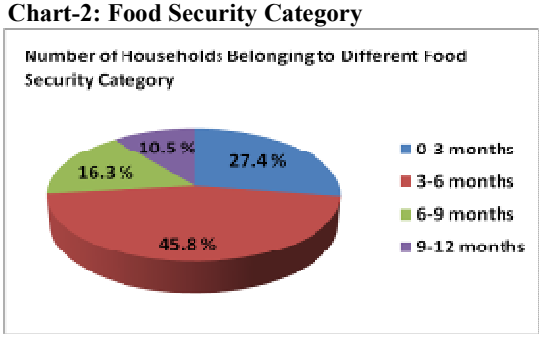
Chart-1: Landholding pattern settlements



4.3.8 Food Security

55. The food sufficiency shows maximum number of households (45.8%) have food sufficient for three-six months period. About 10.5% households have enough food for 9-12 months, 16.3 % households hav food sufficiency for 6-9 months, But only 27.4 % households have food sufficiency for less than three months. This shows the existing poverty condition within the ZoI of the sub-project area (see in **Appendix-XI d).**

Chart-2: Food Security Category



4.3.9 Livestock

56. Cow and buffalo farming for dairy and goat farming for meat production is seldom seen. The motorable road will increase such activities in future.

4.3.10 Industry

57. Some local people are engaged in weaving of bamboo products, making of furniture and tailoring. The area has the potentiality of agro-based industries such as tea, allinchi; ginger processing, orange juice and candy production as well as furniture and handicraft products.

4.3.11 Trade and Commerce

58. Salt, sugar, packed / fast food items, spices, and clothes etc.are some of daily important commodities. Similarly, major items of export are orange, amliso, alainchi, vegetables, fruits, timber and bamboo products etc. whereas cereal crops such as rice, maize are both export and import items.

4.3.12 Settlement Pattern

59. Most of the settlements within ZoI of the project are of scattered type. Houses are mostly one or two storied thatch roofed and CGI sheet roofed ones.

4.3.13 Migration pattern

60. Few permanent migration takes place annually towards Dharan and various parts of eastern India to work as a labourer. Most of the yong generation also frequently go abroad.

4.3.14 Potential Development area

61. Many of the places, areas and settlements within ZoI of the project have the potentialities in various sectors. The area near Pravidhik Shikshyalaya is already potential for tea plantation and fish farming. Sambu gaun and Khoku are also famous for huge exportation of orange, tomato ginger. Other significant areas of unique geographic and geological value passing the road alignment is old copper mine at Gurase, Chhingtang-3. These sectors and their potentialities have been mentioned in **Table 4.7**.

Table 4.7: Development Potentialities in Various Sectors

S.N.	Sector	Devlopment potentiality
1	Agriculture	Orange, tea, ginger, tomato, alaichi, amliso (broom grass), potato, vegetable farming, timber (uttis) production, dairy production within the Whole ZoI
2	Tourism Promotion	Chhintang Jalapa Devi temple) for sight-seeing
3	Small and Cottage Industry	Orange juice, Bamboo products, furniture, dairy industry
4	Trade and business	Development several rural market centres at various places along the road alignment and main market centres at Hille, Uttarpani, Dharmasala, Marga pokhari, Suke Aahal, Thalthale, Pipledanda, Panchakanya, Devithan, Sambugaun.

Source: Field Survey, November, 2009

4.3.15 Tourism related services

62. Eight numbers of local hotel and lodges are in operation at Utterpani, Thalthale, Panchakanya and Chhingtang Devisthan. Since the ZoI of the sub-project and its surrounding area has potentiality of tourism promotion, more lodge, restaurant and resorts are expected to be established. People may engage themselves in various kinds of tourism related activities such as guide, cook, porter, promotion of local handicrafts and other local products. Religous tourism may be increased in the coming days with the upgradation of the road.

4.3.16 Religious, Cultural and Historical Sites

63. The historical and religious sites within ZoI of the proposed project area as given in **Appendix-XV.** There is Chautaras, Cremation ground within RoW of the road in some places. Among which Marga pokhari of Belhara VDC-3 and famous Chhingtang Jalapi Devi Temple of Chhingtang VDC-2 could be developed as historical and touristic centres after the upgrading of the road.

64. Dharmasala gumba, Shiva temple and Martyrs Park are adjacent to road alignment butare not affected by road construction. Several fairs and worships like Teej, Budha Jayanti, Shivaratri, Durga puja are held on religious festivals within ZoI of the sub-project. Religious faith of most of the people within ZoI of the project is Hinduism followed by Buddhism. Main festivals observed by local people are Dashain, Tihar, Maghe/Saune Sakranti, Ubauli, Lhosar etc.

CHAPTER- 5

PROJECT ALTERNATIVES

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

5.1 No Action Option

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

5.2 Proposal Alternatives

67. Construction of other supporting roads could be the options for achieving the transportation and access. Considering other project alternatives, the proposed road project can be the best option to serve the home-to-home services. This is existing road. This road will help to connect Dhankuta-Hille feeder road. This road helps to reduce travl time and cost of local people to access other part of the country.

5.3 Alternative Alignment

68. The alignment of the Hille-Utterpani-Chhingtang road is an existing motor able earthen road. This road is in operation as a fair weathered road and since this is the existing road and proposed for the rehabilitation, requirement to acquire land and cutting trees will be minimum than in new alignment opening. Hence, new alternative alignment is not studied and the proposed road can be the best option.

5.4 Alternative Design and Construction Approach

69. The road has been designed considering the contractor modality and RBG. The construction work will not be carried by only using the labours but equipment and machineries will also be used where manual work is not possible.

5.5 Alternative Schedule and Process

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

5. 6 Alternative Resources

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

CHAPTER – 6

IDENTIFICATION & EVALUATION OF IMPACTS, BENEFIT AUGMENTATION AND MITIGATION MEASURES/ENHANCEMENT MEASURES

72. The identification and assessment of impacts has been carried out by considering the proposed proposal activities examined in terms of its current condition and likely impacts during construction and subsequent operation phases. Most of the identified impacts have been quantified to the extent possible. The impacts have been predicted in terms of their nature, magnitude, extent and duration.

6.1 Beneficial Impacts and Benefit Augmentation Measures

6.1.1 Construction Stage

Employment Generation and Increase in Income

73. Impacts: A major direct beneficial impacts of the road is the creation of employment opportunity to the local community, which will minimize seasonal out-migration. Total employment during construction of this road alignment is 194542 person days in which 38908 person days as skilled and 155634 person days as unskilled The amount of money earned by the wages will directly enhance the operation of various economic activities and enterprise development in the area. There will be positive impacts creating income-generating activities with other economic activities in a chain manner. This is one of the direct and significant impacts of the sub-project but short-term and local in nature.

74. Measures: Priority for employment will be given to local poor, dalit, vulnerable groups and women. They will be given training to do the job. Proponent will implement skill training, awareness, and income generation programs encouraging them to utilize their money earned through wage.

Skill Enhancement

75. Impacts: The construction of road will enhance the skills of the people in construction. Furthermore, the project will also organize training on road construction and maintenance to the Road Building Groups (RBG), Social mobilizers and supervisors. Enhancing the technical skills of local people create future employment opportunities. This impact is indirect, medium, local and long-term in nature.

76. Measures: RBG members will be given on the job training during road construction, for works like masonry, gabion wires, construction of dry and foundation walls, slope cutting and stabilization as well as bio-engineering works.

Enterprise Development and Business Promotion

77. Impacts: Different types of commercial activities will increase good purchasing power of workers. Many local and outside people may operate small shops and restaurants for their daily needs of different types of food, beverage and other daily necessary items. Various farm based enterprises including wide range of agricultural and livestock products will be increased due to increased demand during construction period. This impact is also direct, low, local and short terms in nature.

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

Community Empowerment and Ownership

79. Impacts: Various road construction coordination committees and RBGs will be constituted in order to proceed and implement the road construction activities to build and safeguard community infrastructures resulting in community empowerment and feeling of ownership among them. This impact is also indirect, low, local and short terms in nature.

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

Women and Indigenous People Empowerment

81. Impacts: Women and indigenous people in particular may be benefited more from improved access to the market centers and various service providing agencies such as health centers, banks, training institutions, women development office etc. Frequency of visit to such agencies will increase awareness level and empower the women and indigenous people. Thus, the project will have indirect, significant, local and long-term impact in ZoI.

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

6.1.2 Operation Stage

Improvement in accessibility and saving of time and transportation cost

83. Impacts: Once the sub-project is completed, the people living within the road corridor will have easy access to market centres of Hille, Seduwa, Dhankuta etc. and will enhance the transaction of goods and services. People from concerned VDCs will be benefited due to fast mobility and safe access to market places after reconstruction of this road. It takes two and half-hour walking distance from Chhingtang and Khoku to reach Hille Bazaar, the nearest road head. At present the road is partially well accessible by recently carried out maintenace work upto Panchakanya. Furthermore, with the entire upgradement of road will increase more vehicle movement and less time to reach the destination. The efficiency of road trips in specific time will greatly enhance the socio-economic condition of the sub-project area. This is the direct, most significant, regional impacts and will have long-term benefits.

84. Measures; Regular transportaton services will be improved for the increased income from the farm products and maintainance of existing local trails will be done.

Increase in Trade, Commerce and Development of Market centers

85. Impact: There is a possibility of increased economic opportunities and significant growth and extension of the minor local marketsin Uttarpani, Dharmasala, Marga pokhari, Suke Aahal, Thalthale, Pipledanda,Panchakanya, Devithan, Sambugaun. The selling goods of farm and livestock products mainly increased in the settlements along the road corridor like Utterpani, Panchkanya, Chhingtang, Sambugaun, Khoku settlements, which are potential areas for the production of vegetables, fruits and cash crops such as ginger, alainchi, orange, amliso etc. This will support the economy of rural area.The impact will be indirect, low, local and long term in nature.

86. Measures: DDC/VDCs shall manage planned growth with required infrastructure facilities for in the market areas.

Appreciation of Land Value

87. Impacts: The construction of road leads to appreciation of land values particularly near the market and settlement areas due to the availability of reliable transportation facilities. There will be rapid increase in the commercial production of agricultural crops due to road accessibility, which is also a major factor to raise the land value. Mainly the land value will increase in Uttarpani, Marga pokhari and Devithan. This activity would likely uplift the economic condition of the local people. The impact is indirect, medium, local and long term in nature.

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

Enhancement of Community Development Services

89. Impacts: There will be improvement in social service such as education, health, government offices, saving and credits with more frequent visit of extension workers, longer stay of professionals such as teacher, doctors to their rural duty areas. Similarly, enhanced income level will encourage local people to spend more on health and sanitation, development of education facilities by employing qualified and professional teachers and upgrading the existing health posts. Production of educated manpower will also help to increase employment oppertunity in government/non- government services. This is direct, significant, local and long-term impact of the proposed project.

90. Measures: The access will be kept maintained by generating awareness and enhancing community development activities to promote linkage of social infrastructure services.

6.2 Adverse Impacts and Mitigation Measures

6.2.1 Construction Stage

91. Following impacts on physical, biological, socio-economic and cultural resources of the road area and respective mitigation measures are also suggested.

Physical Impacts

Change in Land Use

92. Impacts: Changes of land use due to the construction of road are mainly conversion of agriculture and barren land as well as nominal forest into built up area. Cultivated land (1.87ha) of the local people will be permanently lost during road construction. Similarly, 0.47 ha of barren land and 0.24 ha of forest and 0.67 ha of built up area will be permanently lost due to road construction work. The changes in land use will have impact on loss of cultivated land, which will directly reduce the agricultural production. Similarly, there will also some

change in land use due to expansion of roadside settlements like tea shops, temporary shops and labor camps etc. The impact from changes in land use will be high, direct, local and long term in nature.

93. Measures: Plantation of trees, improving agricultural extension services, applying additional protective measures that the remaining land will not be lost due to erosion and temporary vegetation clearance on work site and material storage yards shall be revegetated after the completion of road construction. During re-vegetation, local species identified during the field study will be emphasized.

Change in Air Quality, Water and Noise Pollution

94. Impacts: During the construction of the road, there is a strong possibility of dust emission affecting the local people and workers, agricultural crops, markets, schools and health posts at places where contractor may use heavy equipment during surfacing works, it might cause dust nuisance. Impact on air quality will be direct, low, local and short term in nature. The sub-project area at present does not experience high levels of noise. However, during construction, the increased construction activities may increase the noise level to some extent. The impact of road construction on the noise level will be direct, low, local, reversible and short term in nature. The water quality data within the sub-project area is not available. Nevertheless, the quality of water in the water bodies appears to be fairly good, as is proven by the fact that they are widely utilized for household use and drinking for cattle. If adequate care is not taken during construction, the water bodies are likely to be affected due to the disposal of excavated materials and disposal wastes. However, since the construction will follow the green road concept appropriate consideration will be taken to dispose excavated material. The impact will be direct, low, local, short term and reversible in nature. Plantation of local tree species (Masala, Dhupi, Siris, Painyu, Tanki) in about 3500 numbers along RoW on both sides of the road which act as noise and dust barrier.

95. Measures: The mitigation measures include use of face mask by the workers during the time of high dust generation; frequent sprinkling water during surface of the road by contractor; use of ear muffles to protect from noise pollution during rock breaking and quarrying and avoiding the disposal of excavated materials in the water bodies.

Operation of Quarries and borrow pits

96. Impacts: Potential adverse impacts are accelerated land erosion, landslides, disturbance in natural drainage patterns, water logging, water pollution, decline in aesthetic value. The likely impact from the operation of quarry sites will be direct, low in magnitude, local nature and short term in duration.

97. Measures: The mitigation measures will be quarry and borrow operation plan 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 (toe wall, retaining wall) and bioengineering measures (Grass plantation, Shrub/Tree plantation, Brush layering) after the extraction is complete.

98. Recommended quarry sites are given in **Table 6.1**.

Table 6.1: Recommended Quarry sites

S.N.	Chainages	Name of VDC	Places of recommended quarry sites
1.	Ch: 8+950 –10+700 km	Ankhi salla	Stone quarry are available at rocky areas
2.	Ch: 10+750 – 10+800 km	Ankhi salla	Stone quarry
3.	Ch: 11+000-11+350 km	Ankhi salla	Stone quarry
4.	Ch: 12+605 – 12+640 km	Ankhi salla	Stone quarry
5.	Ch: 13+800 –17+100Km	Khoku	Gravel/rock could be extracted
6.	Ch: 17+ 325– 17+465 km	Khoku	Gravel/rock could be extracted
7.	Ch: 17+500 –19+550	Panchkanya	Stone and boulders could be collected by rock cutting.

Source:Field Survey, November, 2009

Spoil Disposal

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

100. Measures: Spoil will be safely disposed and managed at designated site with minimum environmental damage. Engineer will give approval for disposal site of spoil. Balanced cut and fill and re-use of excavated materials will be given emphasis. Spoil will be used to reclaim land or eroded areas. Disposal site will be provided with proper drainage, vegetation and adequate protection against erosion. Potential safe spoil management areas are given in Table 6.2.

Table 6.2 Safe Spoil Disposal Site

S.N.	Chainage	Location	Remarks
1.	0+300 km	Municipality Dumping site Area	Spoil / Wastage disposal
2.	1+570 km	Utterpani Area	Spoil disposal
3.	5+500 km	Dharnasala Area	Spoil disposal
4.	7+300 km	Marga pokhari Area	Spoil disposal
5.	8+800km	Chhedi Area	Spoil disposal
6.	10+900km	Eklebar Area	Spoil disposal
7.	13+400km	Pantara Area	Spoil disposal
8.	15+300km	Piple bar Area	Spoil disposal
9.	16+500km	Danda gaun Area	Spoil disposal
10.	18+200km	Panchakanya Area	Spoil disposal
11.	20+400km	Devithan Area	Spoil disposal
12.	22+050km	Shambu gaun Area	Spoil disposal
13.	23+500km	Jyamire Area	Spoil disposal

Source:Field Survey, November, 2009

Water/Drainage Management

101. Impacts: The concentrated water from the road outlet causes erosion and landslide eventually affecting the stability of the road itself. Roads usually generate large volumes of concentrated surface runoff. As part of road construction, side and crossdrains will also be constructed. The impact will be indirect, medium, site specific and medium term.

102. 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.

103. Details about necessary structures required to mitigate the water induced adverse impacts are as given in **Appendix-XVII and Appendix-XVIII**.

Slope Instability

104. Impacts: Removal of vegetation and open cuts with exposed soil to rain may cause soil erosion as well as landslide. Major instability areas along the road alignment are Ch. 4+850 - 7+150 km, 8+950 - 13+800 km, 13+800 -17+100km, 19+850 - 21+800 km. The likely impact of slope instability and soil erosion is direct, medium, site specific and mid-term nature.

105. Measures: Cut slope will be maintained depending upon the soil type; use of Bio-engineering techniques (Grass plantation, Brush layering, Palisades, Shrub/Tree plantation, Bamboo plantation, live check dams etc.); no construction work during rainy season; and use of soft engineering structures (dry wall, toe wall, riprap drain, check dams etc.) before disposing spoil.

106. Recommended engineering structures necessary at various chainages for slope stabilization have been given in **Appendix-XVI**.

Construction Equipment Vehicles

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

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

Location of Camp Sites, Storage Depots

107. Impacts: The siting of labor camp/ storage depts by contractors for carrying out contractor-based works may cause encroachment of forest, agriculture land, alteration of drainage, disposal of solid waste, and waste water etc. which may cause degradation in the environment. During the construction a large number of workers may required. It cannot be fulfilled only from local labour and additional workers from outside the area should be supplied. So, such workforce camp required are listed in Table 6.3.

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

- The location of campsites, storage depots will be kept on unproductive/ barren land away from forest area as far as possible.
- Camp Site will be provided with pit latrine and first aid facility. Soak Pit will be provided for solid waste and waste water management.
- Fuel and chemical storage areas will be on paved surface with surrounding catch drain to protect soil from leakage
- Compensation for using private farm or land for storage or camp.
- All fuel loading, unloading, storage areas will be spill proof, leakage proof and carried out on paved areas.

Table 0.3 Suitable Locations for Workforce Camp

Chainage	Location	Description	Suitable For
6+000	Chyan Danda	Right side of road at open private land	Workforce camp, stockpiling of construction materials
10+500	Suke Aahal	Right side of road at open space	Workforce camp, stockpiling of construction materials
16+450	Karki Kholsi	Left side of road at open space	Workforce camp, stockpiling of construction materials
21+550	Gara Khola	Left side of road at open space	Workforce camp, stockpiling of construction materials

Source:Field Survey, November, 2009

Biological Impacts

Loss or Degradation of Forests and Vegetation

110. Impacts: Total of 0.24 ha of forest area will be affected due to road construction work and 1028 numbers of trees (including fodder species) of various species will be removed during road construction from private land. The impacts on vegetation/forest resources have been considered to be high in magnitude, site specific in extent and long term in duration, whereas loss of tree patches will be moderate, local and long term in magnitude, extent and duration respectively.

111. Measures: The loss of trees can not be minimized; however, it can be compensated by replantation. Following the 'Work Procedure for Providing the Forest Land for Other Use, 2063' of Government of Nepal (cabinet decision of 10.11.2063 B.S.), Proponent will manage a nursery to grow tree sapling and plant them with in 1:1 ratio in private land for each cleared trees and

Impact on wildlife loss or degradation of habitat and poaching

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

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

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

117. Impacts: There will be no impact on flora and fauna (listed in CITES and IUCN category) as these are not reported in the proposed sub-project area.

Socio-economic Impacts

Loss or Degradation of Farm Land and Productivity

118. Impacts: There will be permanent loss of 1.87 ha of cultivated land due to road rehabilitation. This will lead to annual loss of food grain production among the families losing lands to the project. Dust settling on crop and vegetation will also affect production. This impact is expected to be high in magnitude, local in extent and of long term in duration.

119. Measures: Minimize acquisition of productive land; compensate for loss of property; compensate for loss of standing crops and temporary use of agriculture land; plant trees along both sides of the road to act as dust and noise barrier.

Loss of private properties

120. Impacts: The loss of private properties in proposed road alignment in the settlement areas will affect 20 houses (ch 2+850, 2+960, 2+970, 3+030, 3+740, 4+220, 4+230, 4+240, 9+860, 9+870, 9+900, 9+940, 9+950, 11+250, 18+000, 18+250, 18+260, 18+320, 19+770 and 19+780). During the construction phase, the people of

such settlements suffer by their property losses and damage by road construction works in some extent. The impact will be direct, site specific, short term and medium in magnitude. The location and detail of these are presented in Table 6.4

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

Impact on Community infrastructures

122. Impacts and Measures: The community infrastructure that requires reconstruction / rehabilitation during construction works, and the mitigation measures are as presented in following Table 6.5.

Table 6.4: Impact on Community Infrastructure and Mitigation Measures

Infrastructure	Location/ Chainage	Impact	Mitigation Measure
Drinking water pipelines	Pipledanda (15+500Km) and Dadagaun (18+000Km)	damage	Restoration of affected drinking water pipelines.
MargaPokhari	7+000 km	Access drainage water may damage	Proper drainage system will be constructed
Office Building and 3 nos. of *Chautara and* boundary wall.	9+550-10+500km	Affect	Restoration of office buildings
VDC Office Building	12+650 km	Affect	Restoration of office building
Jalaseg English Boarding School, Utterpani, Chungmang -1	2+400Km	Affect	Reinstate of affected compound wall. For control of dust nuisance, sprinkling of water will be designed, Information signboard will be placed (Such as School area, Speed limit), and use of horns should be restricted.
Shree Janakalyan Scondary School, Marga, Belhara-3	7+000 Km	Dust and noise pollution	Reinstate of affected compound wall. For control of dust nuisance, sprinkling of water will be designed,
Panchkanya Higher Secondary School, Khoku-1	9+250Km	Affect	Reinstate of affected compound wall. For control of dust nuisance, sprinkling of water will be designed. Information signboard will be placed (Such as School area, Speed limit), and Use of horns should be restricted.

Source:Field Survey, November, 2009

Impacts on cultural, religious and archeological sites

127. Impact: There are Dharmasala Gumba in Chungmang, Durga Bhawani and Shree Durga Panchayan Mandir in Belhara and Panchakanya Mandir and Jalapi Devisthan temple in Chhingtang VDC are situated nearby road alignment and boundary wall of Sahid Park at Panchakanya within the formation width of the the road alignment. There are Bar and Pipal (*Ficus religiosa*) tree at Ch: 10+500 within the formation width. Therefore, they will be affected due to the road construction . This impact is expected to be of low in magnitude, local in extent and of short term in duration. There will be likely no impact on local culture and tradition during construction stage.

128. Measures: Mitigation measures for this impact are:

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

Decline in Aesthetic Value

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

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

Impacts on occupational health and safety

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

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

6.2.2 Operation stage

Physical Environment

Impact due to air, water and noise pollution

129. Impacts: During operation period, the number of vehicles will ply along the road and will emit gaseous pollutants, which will increase the pollution level of ambient air along the road corridor. At the same time, increase in air pollution is likely from the dusts emitted from the road surface due to movement of vehicles. This will cause adverse health impact to the people living in the road vicinity. The surface water may be polluted by road runoff containing oil, grease, lubricants and other chemical spills and it may cause water pollution. The spoil and other construction material and wastes into water bodies during maintenance may also degrade water quality. These water resources of the proposed road alignment will impact low, local and short term. Noise level during the operation period will increase due to the movement of vehicles and other activities. As the road is of district road category and the vehicular movement is not expected to be very high. However, due to low traffic volume, the impact due to noise pollution will be direct, low, local and long term. The impact of this kind will be direct, low, local and long term.

130. Measures: Plantation of trees on both sides of road as far as possible; restrict horn near forest, health posts, schools and settlements; provide speed limit for vehicle at sensitive areas.

Road Slope Stability and Management

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

- Pani khola, Thaunda kholsa (Ch:1+400 - 3+000), Karfok khola, Bhadaure kholsi (Ch: 5+000 - 8+950), Khoku kholsi, Karki kholsi, Chongrang khola, Shreemana kholsi(Ch: 13+800 – 17+500) , Lodhia khola, Gara khola Mugliling khola (Ch: 18+600 - 21+550)
.

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

132. 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.

Biological Environment

Depletion of Forest Resources

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

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

Disturbance to the Wildlife and Illegal Poaching

135. 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. There may occur illegal poaching during operation period by the people from market areas due to easy accessibility. Wildlife and birds will be disturbed due to the vehicle movement. The impact will be indirect, low, local and long term in nature.

136. 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.

Socio-economic and Cultural Impacts

New Settlement and Market Center Development

139. Impacts: Expansion of settlement area and market can be observed at Uttarpani, Dharmasala, Margapokhari, Panchakanya, Devithan, Sambugaun. 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 medium term in nature.

140. 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 behavior

141. 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 for long term.

14250. Measures: The mitigation measures recommended will be facilitating awareness to the communities about negative social behavior like gambling, excess use of alcohol. Support awareness raising programs and strengthen communities against such nuisances.

Road safety Issues

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

144. Measures: The mitigation measures adopted will be:

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

Chapter- 7

2. ENVIRONMENTAL MANAGEMENT PLAN

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

7.1 Institutions and Their Roles

Table 7.1: Institution and their roles

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 (MoLD)	It is concerned line ministry, executive agency and concerned agency as per EPA/EPR. Environment Management Section is responsible to look into safeguard matters for the ministry.	▪ To review IEE ToR and Report, and give approval. ▪ Coordinate with project on safeguard issues ▪ Conduct environmental monitoring from central level.	Executing Agency
Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR)	Department under MoLD responsible to execute infrastructure projects under MoLD. Provides back-up support to DDCs in technical matters through DTO.	RRRSDP is being executed under overall coordination and supervision of the Department for the Ministry. It is also supporting DDCs through DTOs to implement the project.	Executing Agency
RRRSDP- Project Coordination Unit	Project specific unit.	Technical Unit to support and coordinate all activities for implementation of RRRSDP. Review, comment, and forward IEE ToR and Report for review to ADB and for approval to MoLD	First Class Officer / DDG of DoLIDAR has been heading the PCU.
District Development Committee / District Technical Office	DDC/DTO is Project implementing Agency.	▪ Prepare IEE ToR and submit for approval to PCU/MoLD ▪ Conduct IEE Study, Public Consultation, and prepare IEE Report ▪ Receive comments from PCU/ADB/MoLD and modify accordingly. Get final approval from MoLD. ▪ Conduct environmental safeguard monitoring ▪ Reporting	District Technical Officer is the Project Manager
District Project Office	Project implementation office working directly under DDC/DTO.	Responsible for overall activities related to implementation of the works at field level.	Implementing Agency
Central Implementation Support Consultant (CISC)	Support consultants at central level	Technical and management support to PCU	Consultant
District Implementation Support Team (DIST)	Support consultants at district level	Technical and management support to DDC/DTO	Consultant

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

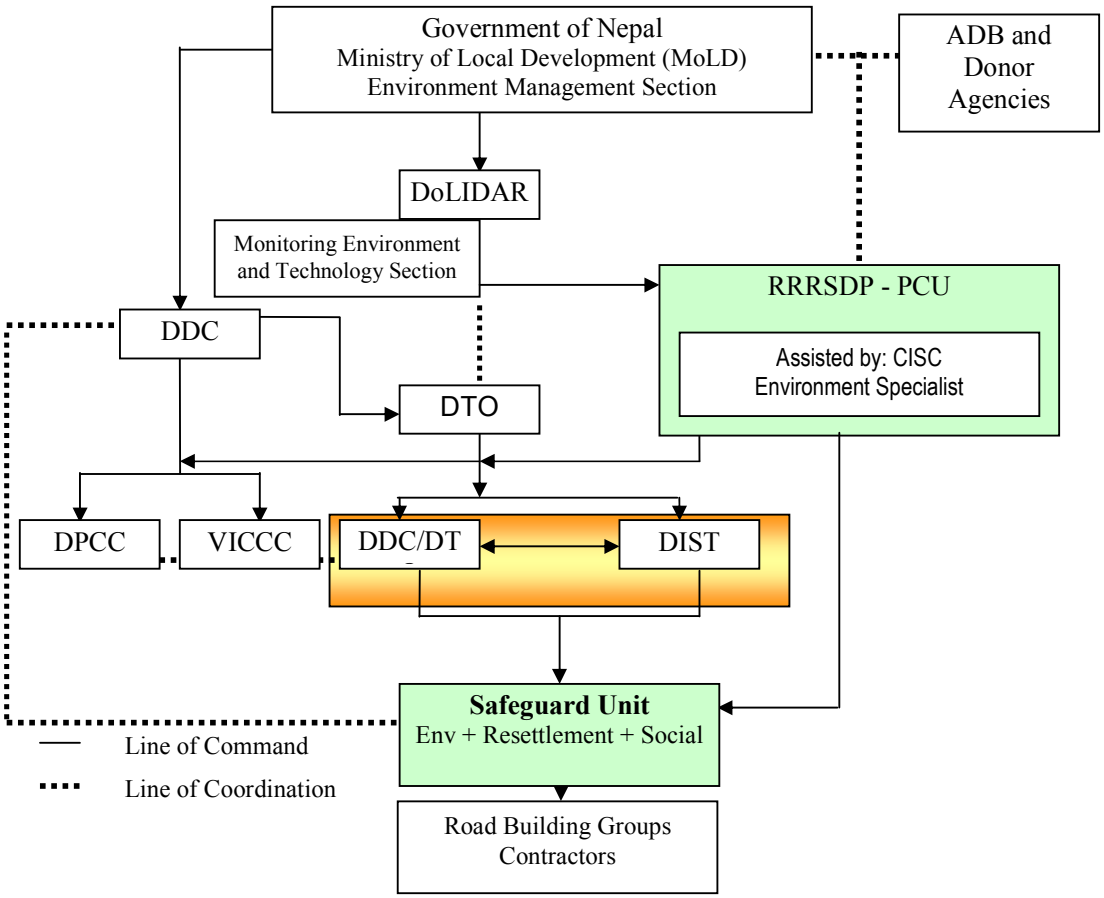
7.2. Reporting and Documentation

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

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

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

Fig. 7.1: Environmental Management Organization Structure



7.3. Benefit Augumentation and Mitigation Measures Implementation Strategy

150. 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.

Table 7.2: Likely Beneficial Impacts and Proposed Enhancement Measures

Activity	Effect	Related Beneficial Impacts	Type of Impact(*)				Benefit Augmentation Measures	Responsible Agencies	
			Nature	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	Involve local people to extent possible to implement manual works through labour-based approach (Skilled-38,908 person days & Unskilled-155,634 person days)	DDC/DTO/DIST	DPCC / VICCC / CISC
Construction of road	Skill Enhancement	Increase in income generating activities, employment opportunities	IN	M	L	LT	Priority to Affected Peoples (APs) and vulnerable groups, job training on various constructions works.	DPO/DIST	DDC/DTO / CISC
Construction of road	Enterprise Development and Business Promotion	Enhancement in local economy	D	L	L	ST	Provide support to local entrepreneurs, promotion of cooperatives and linkage with financial institutions.	DDC/DTO	DIST/ CISC
Construction coordination committee and RBG program	Community Empowerment and Ownership	Increase in income and ownership.	IN	L	L	ST	Provide skill trainings	DPO/DIST	DDC/DTO / CISC
Construction of road	Women and Indigenous People Empowerment	Empower the women and indigenous people	IN	H	L	LT	Priority to women, dalit and vulnerable workers. At least 50% workers will be women.	DDC/DTO	DIST/VICCC
Operation Stage									
Operation of Road	Improvement in accessibility and saving time and transportation cost	Saving in travel time and travel cost	D	H	R	LT	Proper maintenance (regular, emergency) , continuation of bioengineering	DTO	DDC / DoLIDAR
Operation of Road	Increase in Trade, Commerce and Development of Market centers	Shifts towards improved and commercial agriculture	IN	L	L	LT	Manage planned growth with required infrastructure facilities in the market areas. Agriculture extension services, market linkages and networking for better market price.	Local farmers	DDC, VDC
Operation of Road	Enhancement of Community Development Services	Ease of access to social service and raise in quality service	D	H	L	LT	Keep road maintained to ensure access facility that will attract development of other social services facilities	Local people, DDC, VDC	DDC, VDC
Operation of Road	Appreciation of Land Value	Improvement in local economic condition	IN	M	L	LT	Land development & management, observe that RoW is not encroached. Locals will be made aware on this fact so that they can rip its benefit.	DDC/DPO	DDC/VDC

Table 7.3: Likely Adverse Impacts and Proposed Mitigation Measures

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact (*)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
Construction Stage										
Physical Environment										
Construction of Road, site clearance	Change in land use.1.87 ha. of cultivated land, 0.47ha. of barren land, 0.24ha. of forest and 0.67 ha. of built up area will be lost	Loss of agricultural land, production, loss of property	D	H	L	LT	IR	Avoid fertile land, forest, settlement areas etc. Civil structures with bio-engineering application (Such as Grass plantation, Tree/Shrub plantation, Brush layering, Palisades, Bamboo plantation, Live checkdam construction etc.) shall be used to stabilize the slopes. Drainage management (Catch drain, rip-rap drain, checkdam etc.)	DDC/DTO	DIST
Construction works, operation of construction vehicles, material hauling and unloading etc	Dust from exposed surface, from construction equipments and vehicles	Air pollution, public health risks	D	L	L	ST	Re	Use of face mask while working on dust prone areas, covering of dust sources. Plantation of local tree species (Masala, Dhupi, Siris, Painyu, Tanki) in about 3500 numbers along RoW on both sides of the road which act as noise and dust barrier.	DDC/DTO / RBGs	DIST
	Increase in level of noise around school, health posts, forest areas	Noise pollution, disturbance and annoyance.	D	L	L	ST	Re	Restrict horn near school, health posts etc.	DDC/DTO / Contractor	DIST
Slope cutting, spoil and waste disposal during road construction	Increase in sediment level, spills and leakage of oils and chemicals to water bodies	Water pollution and impact on users	D	L	L	ST	Re	Proper spoil management, and prevention of leakage and spills of construction chemicals, restriction in urination and defecation in open areas	DIST / BGs	DTO / CISC
Operation of quarry sites and stockpiles of material	River bank cutting and erosion, change in river regime, instability, land slide	Damage to farmland, water pollution etc.	D	L	L	ST	Re	Proper selection and management of quarry sites, rehabilitation of quarry sites after completion of work. Bolders/ Aggregates: Ch: 8+950 –10+700 km, Ch: 10+750 – 10+800 km, Ch: 11+000-11+350 km, Ch: 12+605 – 12+640 km, Ch: 13+800 –17+100Km, Ch: 17+ 325– 17+465 km, Ch: 17+500 –19+550 km	DDC/DTO/ Contractor/ RBGs	CISC/DIST/ VICCC
Site Clearance,exavation	Slope Instability: Ch. 4+850 - 7+150 km, 8+950 - 13+800 km, 13+800 -17+100km, 19+850 - 21+800 km	Slope instability and erosion	D	M	SS	MT	Re	Civil structures with bio-engineering application (Such as Grass plantation, Tree/Shrub plantation, Brush layering, Palisades, Bamboo plantation, Live checkdam construction etc.) shall be used to stabilize the slopes. Drainage management (Catch drain, rip-rap drain, checkdam etc.)	DDC/DTO	DIST

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact (*)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
Construction Stage										
Physical Environment										
Construction of road	Location of Camp Sites, Storage Depots(Ch: 6+000, 19+500, 16+950, 21+550km)	Encroachment of forest, agriculture land, solid waste,and waste water may cause pollution	D	M	SS	ST	Re	Locate camp site away from productive land and forest area, pay compensation to land owner of camp area; proper storage of chemical and materials; provision of drinking water facilities, first aid and pit latrine; soak pit for solid and waste water.	DPO assisted by DIST/ Contractor	DIST/VICCC
Construction of Road, earth excavation	Spoil Disposal and imposed weight of spoil on fragile slopes	Gully erosion, landslide, disruption of road, damage to farmland, water pollution etc.	D	M	SS	ST	Re	Proper site selection and management of spoil at designated areas approved by Engineer; provision of proper drainages, toe walls; Proposed spoil disposal site is Ch: 0+300, 1+180, 9+500 and 13+000. 3	DDC/DTO	DIST/VICCC/ VDC
Construction of Road	Water Management, generation of large volume of surface runoff	Erosion, landslide, damage to farmland	IN	M	SS	MT	IR	Proper drainage structures and proper spoil disposal, Avoid blockage or diversion of natural channels due to construction of road and disposal of spoils.	DDC/DTO	DIST
Operation of heavy equipments	Crusher Plants	Dust and Noise pollution and health risks to workers	D	H	SS	ST	Re	River bed material will be used from Mai khola, so there is no need of crusher plant	DPO assisted by DIST/ Contractor	DIST/CISC/ PCU
Operation of construction equipments	Construction machineries and tools (Rollers, tippers, spreader, water tanker etc.)	Air pollution due to emission of smoke, increase in vibration and noise pollution	D	H	SS	ST	Re	Equipment/vehicles deployed for construction activities shall be regularly maintained. All the vehicles deployed for material movement shall be spill proof to the extent possible	DPO assisted by DIST/ Contractor	DIST/CISC/ PCU
Biological Environment										
Clearance of vegetation necessary for road formation	Loss or Degradation of Forests and Vegetation (0.24 Ha, and 1028 nos tree)	Loss of green cover; loss of environmental benefits from vegetation, disturbance in ecological function (dust and noise absorbance, aesthetic value etc	D	H	L	LT	Re	Cutting of tree only in formation width, compensatory plantation of local species of tree at 1:1 in private land.	DDC/DTO/ DFO	DFO/CFUGs/ DIST
Construction activity	Impact on Wildlife Due To Loss of Habitat and Poaching	Pressure on forest resulting in forest degradation; habitat degradation	IN	L	L	ST	Re	Work only in day time, do not disturb wildlife, aware workers	Local Contractors if establish labour camps	DTO / DIST/ CFUGs

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact (*)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
Construction Stage										
Socio-Economic Environment										
Acquisition of land and property for maintaining road width	Loss of Private Properties (ch 2+850, 2+960, 2+970, 3+030, 3+740, 4+220, 4+230, 4+240, 9+860, 9+870, 9+900, 9+940, 9+950, 11+250, 18+000, 18+250, 18+260, 18+320, 19+770 and 19+780)	Loss of private land.	D	M	SS	ST	IR	Compensation and resettlement to the owner as described in resettlement plan	DDC/DTO	CFC / DIST
Demolition of structures along road alignment	Impact on Community Infrastructure	Loss of services provided by them	D	M	SS	ST	Re	Restoration and relocation of affected infrastructures: Drinking water pipelines (Ch:15+500 and Ch:18+000); MargaPokhari (Ch: 7+000); Office Building and 3 nos. of Chautara (Ch:9+550-10+500); VDC Office Building (Ch: 12+650); Schools (Ch. 2+400, 7+000 , 9+250)	DDC/DTO	PCU DIST/CISC/ VICCC/VDC
Construction of Road	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
Construction of Road	Decrease in aesthetic value	Disturbances in working areas and scar on topography	D	L	L	ST	Re	Cover the road alignment by planting tree on both sides; manage working areas.	DPO in assistance by DIST / Contractors	PCU / CISC / Users Committee / VDC
Acquisition of land for maintaining road width	Loss or Degradation of Farm Land and Productivity	Reduced production, hardship, food shortage	D	H	L	LT	IR	Minimize productive land acquisition through alignment selection	DDC/DTO	CFCii DIST/VICCC
Operation Stage										
Physical Environment										
Operation of vehicles	Air, water and noise pollution effects, particularly near sensitive spots(School, healthpost)	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
Quarrying, operation of construction equipments	Road Slope Stability and Management	Slides and slope failure, Disturbance to traffic flow, pollution of water bodies, impacts on agriculture land, loss of vegetation.	D	M	L	LT	Re	Regular maintenance of slope protection structures, Selection of healthy upland farming techniques	DDC/DTO/ VDC	DoLIDAR , DFO, DWSSC

Activity	Potential Negative Effects	Related Adverse Impacts	Type of Impact (*)					Mitigation Measures	Responsibility for Mitigation Measure	
			Nat	Mag	Ext	Dur	Rev		Responsible Executing Agency	Relevant Supporting Agency
Opration Stage										
Biological Environment										
Road operation	Depletion of Forest Resources	Loss of timber, forest resources and benefits	IN	M	L	LT	IR	Enforcement of law, vigilance and monitoring, participation of community	DFO/ CFUGs/VDCs	CDO / CBOs, NGOs
Road operation	Disturbance to wildlife and Illegal Poaching	Collision of wildlife with vehicles, disturbance in their normal activities	IN	L	L	LT	Re	Warning traffic signal, Awareness training to driver to limit speed and horn use	DTO/ CFUGs	DDC/CDO / DFO
Road operation	Impact on aquatic life	Loss of aquatic life; degrade water quality of water bodies at Margapokhari	IN	L	L	ST	Re	Awareness programmes shall be organized to educate local people	VDC/ CFUGs	DDC/CDO
Socio-Economic Environment										
Operation of Road	New Settlement and Market Center Development	Encroachment of RoW, increased accidents, delay in traffic movement, depletion of local resources, water pollution	D	M	L	MT	IR	Awareness program, enforcement of law, planning of land development, plantation of trees.	DDC/DTO	CDO / VICCC
Operation of Road	Change in Social behavior	Social and cultural conflicts	IN	M	L	LT	Re	Awareness, Enforcement of law and order, Provision of training for skill	DTO	DDC/DoLIDAR
Operation of Road	Impact Road Safety	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

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

Table 7.4: Cost Estimate for Environmental Enhancement and Mitigation Measures

S.N.	Environmental Protection Measures	Estimated Budget (NRs.)	Remarks
1. Benefits Augmentation Measures			
1.1	Training to DDC/DTO/ DDC/DTO/ DIST by CISC to conduct monitoring and reporting	50,000.00	
1.2	Training to Naike of RBGs	50,000.00	
1.3	Enhancement in Technical Skills for income generation	50,000.00	
	Sub-total (1)	150,000.00	
2.1	Bio-engineering / Road side plantation	3,777,520.00	
2.2	Insurance	400,000.00	
2.3	Information Signboard	50,000.00	
2.4	Resettlement cost (Compensation/ reconstruction for public and private properties, Income generation and Livelihood improvement programme for affected families)	8,960,092.00	
2.5	Restoration or relocation of affected infrastructures, spoils disposal site management and rehabilitation, reinstate of quarry etc.	500,000.00	
2.7	Compensatory plantation Re-plantation / Re-forestation	240,000.00	
2.8	Social Action Plan.	1,050,000.00	
2.9	Occupational health and safety; First aid boxes, campsite sanitation; solid waste management	500,000.00	
	Sub-total (2)	**15,477,612.00**	
	Total (1 + 2)	**15,627,612.00**	

7.5. Implementation of Mitigation Measures

152. The mitigation measures will be integrated into project design. 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.

153. 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

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

7.6.1 Monitoring Responsibility

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

156. According to EPR, 1997, the MLD/DoLIDAR is responsible for monitoring and evaluation of the impact of the implementation of the project. The MLD/DoLIDAR checks whether the DDC/DTO is carrying out monitoring activities as per the IEE, and if the prescribed mitigation measures are being implemented. Total cost estimated for central level environmental monitoring is NRs. 100,000.

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

158. The sub-project level monitoring team should submit its report to RRRSDP district management, which should forward a copy to the RRRSDP-PCU. Total cost of environmental monitoring (field visits, observation, review of reports and report preparation) is estimated NRs.200, 000.00 as given in **Table 7.4**.

Table 7.5: Environmental Monitoring Cost

S. N.	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
6	Cost for Monitoring by MoLD/DoLIDAR		LS		100,000.00
	TOTAL				**200,000.00**

159. Thus, total environmental monitoring and management cost is NRs. 15,827,612.00

7.6.2 Types of Monitoring and Monitoring Parameters

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

161. Environmental Monitoring for this sub project are:

a. **Compliance Monitoring** - It verifies whether contract environmental clauses and the mitigation measures are properly implemented in the field. The frame work for compliance monitoring is given in the **Table 7.6.**

b. **Impact Monitoring** - It confirms whether the environmental mitigation measures specified in the project design and contract are correctly formulated. The frame work for impact monitoring is given in the **Table 7.7.**

Table 7.6: Compliance Monitoring for Hille – Utterpani - Chhingtang Road Construction Works

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

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

Table 7.7: Impact / Effect Monitoring for Hille – Utterpani - Chhingtang Road Construction Works

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

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

CHAPTER – 8

8. CONCLUSION AND RECOMMENDATION

8.1 Conclusion

162. The IEE study of the proposed Hille-Utterpani-Chhingtang road Subproject does not pass through any environmentally sensitive area, and have minimal adverse impact associated with loss of forest and agricultural land. Most of the adverse impacts predicted are of low significance and short term as well as reversible. The 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, minimized, or compensated.

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

8.2 Recommendation

164. The road alignment minimizes the acquisition of valuable agricultural and forest land. However, some private houses and possibly some agricultural land will have to be acquired for construction of the proposed road. A Resettlement Plan is prepared to ensure that the persons affected by these losses are properly compensated. The proposed road sub-project is recommended for implementation with incorporation of mitigation measures and environmental management plan.

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Appendix- I

Letter of Approval from MoLD and Terms of Reference (ToR)

नेपाल सरकार

स्थानीय विकास मन्त्रालय

(वातावरण व्यवस्थापन शाखा)

फोन नं. ५५४८५१४
फ्याक्स नं. ५५४८५१४
Web: www.mld.gov.np

पत्र संख्या ०६५/०६६
चलानी नं. २८३.

मिति:- २०६६/३/१०

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

श्री स्थानीय पूर्वाधार विकास तथा कृषि सडक विभाग,
जावलाखेल, ललितपुर ।

उपर्युक्त विषयमा ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना अन्तर्गत धनकुटा जिल्ला विकास समितिको कार्यालयबाट निम्नानुसारका सडकहरुको प्रारम्भिक वातवरणीय परीक्षण (IEE) को कार्यसूची (TOR) तयार गरी त्यहाँ विभाग मार्फत वातारण संरक्षण नियमावली, २०५४ अनुसार स्वीकृतिको लागि यस मन्त्रालयमा पेश भएकोमा नेपाल सरकारको मिति २०६६।३।९ को निर्णय(सचिवस्तर) अनुसार स्वीकृत भएको कार्यसूची २/२ थान यसै पत्रसाथ पठाईएको व्यहोरा अनुरोध छ ।

निम्न

१. हिले-उत्तरपानी-छिन्ताङ सडक ।
२. राजारानी-६नं.बुधवारे सडक ।
३. त्रिशुले-हात्तीखर्क-अ.जितपुर सडक ।

(डण्डुराज घिमिरे)
उप-सचिव

Terms of Reference (ToR)

Government of Nepal

Ministry of Local Development

Department of Local Infrastructure Development Agricultural Roads

Rural Rehabilitation Reconstruction Sector Development Project Co-ordination Unit

Terms of Reference

for

Initial Environmental Examination

of

Hille- Uttarpani- Chhintang Road (25.2 Km)

Proponent:

District Development Committee

District Technical Office Dhankuta

Tele phone No. – 977- 026-520920

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Submitted by:

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June 2009

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East Consult Pvt. Ltd. JV with B.N., SITARA and PARD Consult Pvt. Ltd. * 3RP

Acronyms

ADB	Asian Development Bank
amsl	Above mean sea level
DDC	District Development Committee
DFID	Department for International Development
DISST	District Implementation Support Team
DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DoR	Department of Road
DTO	District Technical Office
EIA	Environmental Impact Assessment
EMP	Environmental Monitoring Plan
EPA	Environmental Protection Act
EPR	Environmental Protection Rules
GESU	Geo-Environmental and Social Unit
GEU	Geo Environmental Unit
GoN	Government of Nepal
IEE	Initial Environmental Examination
Km	Kilometer
m	meter
MLD	Ministry of Local Development
MOEST	Ministry of Environment, Science and Technology
MoPPW	Ministry of Physical Planning and Works
OFID	OPEC Fund for International Development
REA	Rapid Environmental Assessment
RRRSDP	Rural Reconstruction and Rehabilitation Sector Development Project
SDC	Swiss Agency for Development and Cooperation
ToR	Terms of Reference
VDC	Village Development Committee
ZoI	Zone of Influence

TERMS OF REFERENCE FOR INITIAL ENVIRONMENTAL EXAMINATION (IEE) OF HILE-UTTARPANI-CHHINTANG SUBPROJECT ROAD

RURAL RECONSTRUCTION AND REHABILITATION SECTOR DEVELOPMENT PROJECT, DHANKUTA

1.0 NAME AND ADDRESS OF THE PROPONENT

1. The District Development Committee (DDC)/District Technical Office (DTO), Dhankuta is the executing organization at the district level and the proponent of the Initial Environmental Examination (IEE) study for the rehabilitation of Hile-Uttarpani-Chhintang Road. The Ministry of Local Development (MLD) is the concerned authority for the approval of IEE study report.

1.1 ADDRESS OF THE PROPONENT:

1. District Development Committee (DDC)
District Technical Office (DTO)
Dhankuta
Telephone No. :977-026-520920
Fax No. 977-026-521481

2.0 INTRODUCTION

2.1 GENERAL INTRODUCTION

1. The Rural Reconstruction and Rehabilitation Sector Development Project (RRRSDP) covers 20 districts spread over the country, which focuses on immediate post conflict development priorities for accelerated poverty reduction and inclusive development, thereby enhancing the effectiveness and efficiency of the delivery of public services, and improving access of rural people to economic opportunities and social services.

4. The focus project 20 districts are Panchthar, Ilam, Jhapa, Morang, Sunsari, Dhankuta, Sankhuwasabha, Dolakha, Sindhupalchowk, Kavrepalanchowk, Lalitpur, Bhaktapur, Kathmandu, Dhawalagiri, Manang, Mustang, Parbat, Rolpa, Rukum and Dadeldhura, not yet covered by major donor funded rural road infrastructure projects. The project is expected to complete by 31 December 2011.

5. The RRRSDP program is financed by the Government of Nepal (GoN), Asian Development Bank (ADB), Department for International Development (DFID), OPEC Fund for International Development (OFID) and Swiss Agency for Development and Cooperation (SDC) to improve the connectivity, enhance economic and employment opportunities, increase access to market and social services of rural communities. The project components include (i) improved rural roads; (ii) developed and improved community-based supplementary rural infrastructures; (iii) enhanced equity, employment and income opportunities for the poor and disadvantaged; (iv) strengthened institutional capacity of the Ministry of Local Development (MLD), the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR), and District Development Committees (DDCs) of project districts; and (v) improved project

management.The coordinating government department is the Department for Local Infrastructure Development and Agricultural Roads (DoLIDAR) under the Ministry of Local Development (MLD).

6. The DDC is the Project Implementing Agencies at the district level. The DTO of each respective DDC is responsible for technical and Project management matters in the district. The DTO will be supported by the DIST.

7. East Consult Pvt. Ltd Joint Venture with B.N., SITARA and PARD Consult Pvt. Ltd is District Implementation Support Team (DIST) for RRRSDP and have the responsibility of providing technical assistance in this Dhankuta District.

8. Hille-Uttarpani-Chhintang Road (25.2 Km) in Dhankuta subproject is a high priority rural road in Dhankuta District and is proposed for upgrading under RRRSDP. An IEE of the proposed road is necessary in order to assess the environmental consequences and suggest appropriate, practical and site specific mitigation and enhancement measures. Therefore, terms of reference (ToR) is prepared to conduct an IEE study of Hille-Uttarpani-Chhintang sub project road in Dhankuta District. The Ministry of Local Development (MoLD) is the concerned authority for the approval of the IEE study report.

2.2 SALIENT FEATURE OF THE PROJECT

Salient Feature of the Project	
Project	Upgrading of Hille-Uttarpani-Chhintang Road
Development Region	Eastern
District	Dhankuta
VDCs	Chhungbang, Belhara, Ankhisalla, Khoku and Chintang
Total Length	25.2 Km
Road Standard	District Road
Existing Width	2.70 m to 5.00 m
Formation Width	7.5m
Carriage Way	4m
Right of Way Width	10m
Surface Type	Graveled
Type of Work	Upgrading

2.3 BRIEF DESCRIPTION OF THE SUBPROJECT AREA

9. Dhankuta is the headquarter of the eastern development region and is located in the middle hills of the Koshi Zone of eastern development region. This lies between latitude 26 53' to 27 08' north and longitude 87 8' to 87 33' east. The total area of the district is 887.7sq km. The district lies in between Tehrathum and Panchthar in the east, Bhojpur in the west, Sankhuwasabha in the north and Morang and Sunsari in the south. Most of the parts of the district lies in the middle hills and very small parts (about 0.10%) lies in Siwalic region. So most of the parts of the district are sloppy pakho with very considerable parts (about 3.5%) of flat land. The elevation of the district range from 120m to 2702 m from amsl (above mean sea level). The climatic condition of Dhankuta district is Sub-Tropical and Monsoon.

10. The District comprises of two constituencies, 35 VDC and a Municipality grouped into 11 Ilakas for development process. Dhankuta Municipality is accessible by a blacktop road i.e. Dharan-Dhankuta-Hile-Basantapur Road. About 108 km of earthen roads are constructed in the

District which is in poor conditions. There are only three existing road, one of them is Hile-[illegible] (seasonal earthen road) and another is Bhedetar-Rajarani (earthen road) and the [illegible] one is Mughat (Chengchengbari)-Okwatar-Ghoretar feeder road. The Village trails, because of their high gradient, can't be upgraded to motor able track. Insufficiency of good drinking water system and irrigation facility is the major problem of this district. As 67.67% of the population of the district depends upon agriculture, the role of road is crucial factor for increasing the economical condition of the peoples. The existing condition of road network in the district is not satisfactory.

[illegible] The proposed Hille-Uttarpani-Chhintang Road lies in the south-western part of Dhankuta District. The proposed road starts from Hille bazaar at ward no. 1 of Dhankuta Municipality which is located 13 km away from Dhankuta Municipality have passes through various major settlements are Hille bazaar, Uttarpani, Marga of Belhara, Dharmasala of Chungbang, [illegible], Thathale and panitar of Ankhisalla VDC and ends at Jyamire of Chhintang VDC. This road has a greater scope and is very advantageous to the people of this region including Hille base and remote areas of Dhankuta district zone. After successfully completion of this subproject will have wider scope on overall development of the Dhankuta District.

[illegible] The highest altitude of this alignment is 1850m and falls within the lowest altitude of [illegible]. The alignment passes mainly through settlement area (~33%), cultivated/Agriculture and [illegible], forest land (~07%) and other land (~ 04%).

[illegible] The forest of the subproject road vicinity is sparse with dominant species such as Saila (*Pinus roxbergi*) Uttis (*Alnus nepalensis*), chilaune (*Schima wallichii*), Katus, Mahuwa, Pipal (*Ficus religiosa*) Bar (*Ficus religiosa*) ,Bans (*Bambusa*) Amba (*Psidium guajava*) Naspati (*Pyrus communis*) Guras (*Rhododendron*) Ainselu (*Rubus ellipticus*). Fox (*Vulpes spp.*), Monkey (*Macaca mulatta*), Syal (*Canis auricus*), Ban biralo (*chaus*), Muso (*Rattus rattus*) and other common wild animals and different common birds such as Kalij (*Lophura leucomelana*), Suga (*Pericula cyanocephala*), Kag (*Corvus splensens*), Parewa (*Columba livia*) and Chil (*Hieraetus spp.*) reported in the forest of the proposed road area. Along the road alignment there are no any wildlife threats, no major landslides and other environmental hazards.

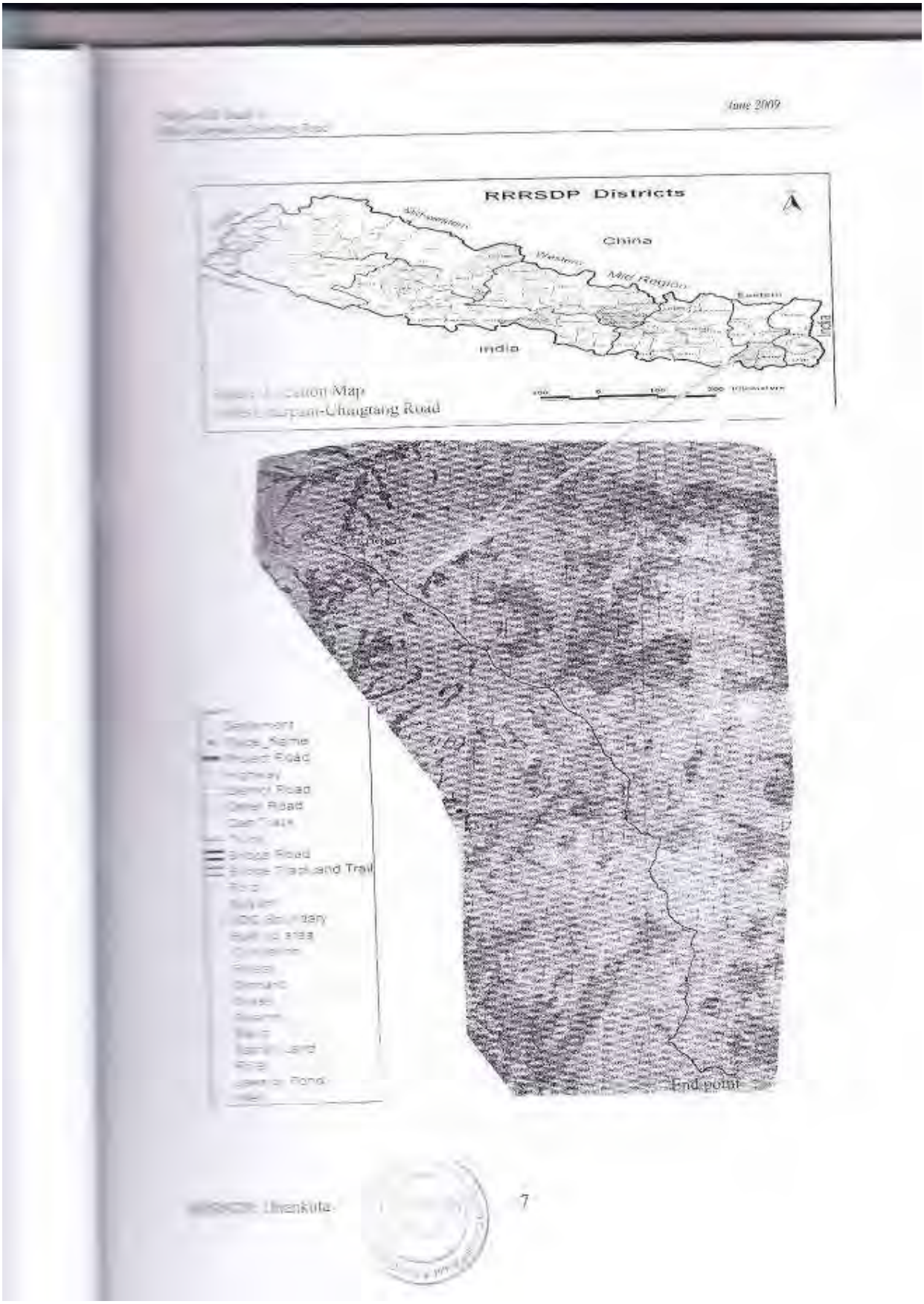
[illegible] It is found that about 64 no. of houses and 16 business stall shall be affected and need to be some partially and fully resettled. The houses are made of RCC structures, wooden houses and thatched houses were found.

[illegible] The people in this sub-project area are having many types of transportation problems due to the steep topography. Local people have no access to the market centres of the district to fulfil their daily needs. Hence, the locally produced materials are getting low prices than it may fetch. Other development facilities are also far from the reach of people because it is very difficult to create a system like water supply, electricity, bio-gas plant and telephone without a road corridor.

[illegible] The rehabilitation of this road will mainly enhance the transportation of agro products such as fruits and vegetables and other crops specially mango, leechi, banana, tomato, green vegetables(sag), ginger etc. from remote areas of proposed road and other areas. Furthermore, during road construction, use of local labour will generate immediate employment to local people and minimize migration to other urban areas (national and international) for search of work. There is a famous temple of Chhintang Devi near the road alignment of Chhintang VDC. Therefore, there will increase income from pilgrims and tourists as well due to better access. Consequently, local people will get long-term benefit which will enhance their physical and

within the road corridor area/immediate zone of influence(ZOI) and of Dhankuta District

The location and alignment of the road is given in Figure below


June 2009
RRRSDP Districts
China
Mid Region
India
End point

2.4 OBJECTIVES

[illegible] The main objectives of the TOR is to guide the preparation of the subsequent IEE study, to produce a comprehensive and coherent IEE report as per Environment Protection Act 1997 (EPA'97) and Environment Protection Rules 1997 (EPR'97) and Amendment 1999. Other specific objectives of the studies are to collect baseline data on physical, biological, chemical and socio-economic and cultural resources; and to identify positive and negative impacts on social and environmental aspects of the project area such as:

- 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,
- to recommend practical and site specific environmental mitigation and enhancement measures, prepare and implement environmental monitoring plan for the sub-project,
- to make sure that IEE is sufficient for the proposed road sub-project, and
- to provide information on the general environmental setting of the sub-project area as baseline data.

2.5 RELEVANCY OF THE SUB-PROJECT

[illegible] The proposed road upgrading with gravel standard has several benefits from the project to the people living in the vicinity of the project area in terms of easy access, saving of time on travel, easy transportation facilities for people and agricultural products (tomato, green vegetables, maize, millets, tea, alainchi, ginger, amliso, oragne, leechi etc.) of village to the nearby markets (Hile, Dhankuta etc). It creates social and employment securities to the local beneficiaries during the construction stage of the Project. Therefore, the construction and rehabilitation of the proposed road is necessary to uplift social and economical status of the sub-people through the easy and safe access of the transportation facilities.

[illegible] An IEE of the proposed road is necessary in order to assess the environmental consequences of the proposed rural road construction activities and suggest appropriate, practical and site specific mitigation and enhancement measures. Since this is a district road, an IEE is a legal requirement according to Environmental Protection Act, 1997 (EPR, 1997) and Environmental Protection Rules, 1997 (EPR, 1997). Preparation of IEE report by concerned District Development Committee (DDC) and approval by the Ministry of Local Development (MLD) according to Nepali legal provision is considered sufficient by the ADB. However, rapid environmental assessment (REA) checklist will also be considered during IEE report preparation based on ADB Environmental Guideline.

2.6 PROCEDURES TO BE ADOPTED WHILE PREPARING THE REPORT

[illegible] The approach, methodology and procedure shall be preparing one comprehensive and coherent IEE report. The report shall be as per the EPA, 1997 and EPR, 1997.

2.7 DESK STUDY

[illegible] The following steps will be followed during the desk review:

- Collection and review of secondary sources of information from various sources like detailed project report, different environmental guidelines, published data of the related field etc.
- 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

[redacted] PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

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

[redacted] Publication of notice - A public notice of 15 days will be published in a national level [redacted] newspaper seeking written opinion from concerned VDCs, DDC, school, health posts and [redacted] local organizations. A copy of the public notice will be affixed in the above mentioned [redacted]s and deed of enquiry (muchulka) will be collected.

- [redacted]commendation letter from concerned VDCs and/or municipality will also be obtained.
- [redacted] team will also carryout interaction with local communities and related stakeholders [redacted] will also collect the public concerns and suggestions.
- [redacted] IEE report will be sent to concerned VDCs for information disclosure.
- [redacted] approved IEE report will be made accessible to interested parties and general public [redacted]ough information center of DDC and websites of ADB, DoLIDAR and RRRSDP.

[redacted] FIELD STUDY

[redacted] The field visit will be conducted to collect baseline information on socio-economic, [redacted] & physical and biological environmental issues of the project. The baseline data shall be [redacted], but not limited to the following:

[redacted] and Economic [redacted]ment	Information on social and Economic features of the project area including population, ethnicity, employment facilities, and educational status, and health and sanitation conditions shall be presented. Report of settlement pattern, migration, religion, and religious land holdings and crop production. Existing infrastructure and development activities in the project area and documentation of the families likely to be directly affected by the project shall be given. An estimation of the approximate area disturbed/acquired for the road will be made.
[redacted] and Physical [redacted]ment	Description of cultural sites and issues. Meteorological (climate, temperature) data of the nearest weather station, land use and utilization pattern data of the project area and the Districts shall be studied.

Environment Vegetation type in the project area and particularly along the alignment, their distribution as well as occurrence of threatened and government protected plant species, plants with medicinal and cultural value shall be recorded. The study shall also calculate and document plant species likely to be felled.

Documentation on wildlife shall include lists of wild mammals, birds reported and observed in the project area. Sensitive habitat and areas of great ecological importance on wildlife are also to be noted.

The collected raw baseline data shall be verified by citing standard references and analysed before accessing impacts on them.

REPORT PREPARATION

An IEE reports as per GoN format shall be prepared in accordance with the contents in Schedule-5 of the EPR'97. Final report shall be prepared after incorporating the comments on the draft report.

REVIEW OF ACTS, POLICIES, RULES, REGULATIONS AND GUIDELINES

The IEE report shall be reviewed with the following legislative provisions and guidelines:

- Public Road Act, 1974
- Land Acquisition Act, 1978
- Labour Act, 1991
- Water Resources Act, 1992
- Forest Policy, 1993
- National EIA Guidelines, 1993
- Forest Act, 1993 and its Rules, 1995
- EIA Guidelines for Forestry Sector, 1995
- Environmental Assessment Guidelines, ADB, 2003
- Environmental Policy of the ADB, 2002
- DFID/RAP Initial Environmental Examination Guideline (Draft), 2001
- RRSDP Environmental Assessment & Review Procedures (EARP) Guidelines, 2007
- APPROACH for the Development of Agricultural and Rural Roads, 1999 (DoLIDAR)
- Environmental Management Guidelines, GEU/ DoR, 1997
- Environmental Protection Act, 1997
- Environmental Protection Rule, 1997 (Amendment, 1999)
- Batabaraniya Nirdesika (Nepal; MoLD), 2057
- Aquatic Animals Protection Act, 1961 and first amendment, 1998
- Local Self-Governance Act, 1998 and its Rules, 2000
- Policy Document of DoR on Environmental Assessment in the Strategic Road Network, 2000
- Nepal Road Statistics, 2002
- Road Board Act,2002
- Reference Manual for Environmental and Social Aspects of Integrated Road Development; MoPPWD/DoR, HMGN, 2003

East Consult Pvt. Ltd. JV with B.N., SITARA and PARD Consult PVT. LTD. 3RP

- Guide to Road Slope Protection Works, DoR, 2003
- Guideline for Road Corridor and Alignment Selection,RAP, 2002
- Interim Constitution, 2007
- Three Years Interim Development Plan, GoN, 2007
- The Tenth Fiver Year Plan, 2002-2007

5.0 ALTERNATIVES FOR THE IMPLEMENTATION OF THE PROPOSAL

29. 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.

30. 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 REQUIRED TIME, BUDGET AND STUDY TEAM FOR PREPARING THE REPORT

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

6.1 TIME SCHEDULE

32. 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:

PROPOSED WORK SCHEDULE FOR CONDUCTING IEE STUDY

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

ESTIMATED BUDGET AND STUDY TEAM

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

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

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

ENVIRONMENTAL BASELINE

This will describe environmental setting of the project location and surrounding areas and will contain information on relevant bio-physical, socio-economic and cultural factors and features. The updated, processed and analyzed information and data on each of the relevant physical, biological, 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

[illegible] 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.

8.2 IDENTIFICATION, PREDICTION AND EVALUATION OF IMPACT

[illegible] The identification and prediction of impacts shall be carried out by considering the proposed project actions/activities in terms of rehabilitation and construction of the road project. The impacts of the activities shall be on physical, biological, socio-economic and cultural resources in a defined zone of influence.

[illegible] The impacts will be quantify with 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.

8.2 PHYSICAL IMPACTS

[illegible] The impacts/issues and concerns generally related to the cultural and physical environment typically include, but are not necessary limited to:

8.2.1 CONSTRUCTION STAGE

[illegible] The following impacts/issues will be taken into account during the construction stage:

Beneficial Impacts

- Landslide stabilization/Clearance of land slides
- Maintain water drainage system

Adverse Impacts

- Change in land use and likely loss of farm and forest lands;
- Change in air quality due to dust and exhaust emission, change in water quality due to sedimentation, and increase noise level due to use of heavy equipments;
- Management of solid wastes disposal generated by the construction workers;
- Stock piling of construction materials;
- Operation of quarries and borrow pits;
- Drainage alternation and associated erosion and sediment.
- Road safety measures;
- Slope instability.

8.2.2 OPERATION AND MAINTENANCE STAGE

[illegible] The following impacts/issues will be taken into account during operation and maintenance stage:

Beneficial Impacts

- Increase in efficiency of vehicles
- Drainage management
- Embankment Slope Protection
- Road slope stability and management

Adverse Impacts

- Increase noise level and air pollution
- Water may be polluted due to the leakage of fuel and lubricants from vehicles
- Road accident

8.2 BIOLOGICAL IMPACTS

[illegible] The impacts/issues and concerns generally related to ecological/biological environment typically include, but are not necessary limited to the following:

8.2.1 CONSTRUCTION STAGE

Beneficial Impacts

- Roads side plantation if required
- Application of Bio-engineering tools

Adverse Impacts

- Possible extraction of firewood and timber;
- Possible impact on biodiversity

8.2.2 OPERATION AND MAINTENANCE STAGE

Beneficial Impacts

- Protection of trees along the road
- Application of Bio-engineering tools

Adverse Impacts

- Possible extraction of firewood and timber;
- Possible impact on biodiversity especially rare or endangered species
- Disturbance to wild life movement and possible hunting and poaching
- Impact on aquatic environment

8.3 SOCIAL AND ECONOMIC

[illegible] The impacts/issues and concerns generally related to socio-economic typically include, but are not necessary limited to the following:

CONSTRUCTION STAGE

Beneficial Impacts

- Employment generation
- Enterprise Development and Commercialization
- Skill enhancement

Adverse Impacts

- Relocation of Existing Infrastructures
- Loss of agricultural products;
- Population displacement, if any;
- Land acquisition and compensation;
- Effect or pressure on social service facilities such as drinking water, school, health post etc.
- Effect on irrigation schemes;
- Availability of local construction workers, employment opportunities,
- Occupational health and safety (including awareness issues on dust)
- Dispute in selecting construction works (conflict of local people hiring local labors)

OPERATION AND MAINTENANCE STAGE

Beneficial Impacts

- Employment generation to local people;
- Positive increase in agro based economic activities
- Improved access
- Enhancement of Social Services
- Rise of land value

Adverse Impacts

- Population pressure and urbanization
- Social conflicts

SOCIAL AND CULTURAL RESOURCES

The following impacts/issues will be taken into account during the construction, operation and maintenance stages:

Beneficial Impacts

- Development project areas as tourist places
- Increase pilgrims
- Protection of public important places;

Adverse Impacts

- Impact on cultural, religious and historical sites

9.5 CHEMICAL

[illegible] The following impacts/issues will be taken into account during the construction, operation and maintenance stages:

- Dust hazard affect air, water and land pollution.
- Use of fuel, lubricants, oil, acids and other chemicals for construction (vehicle, plants and equipment) and their storage

9.6 ENHANCEMENT ISSUES

- Road side landscape development
- Road side amenities

10.0 BENEFIT AUGUMENTATION/MITIGATION MEASURES

[illegible] 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

[illegible] 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

[illegible] The 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 of the sub-project
- Relevancy of the Proposal
- Project description
- Existing condition
- Identification of Impacts and Benefit Augumentation/Mitigation Measures
- Environmental Management Plan
- Conclusions and recommendations

Salient Features of the Project

Introduction: This section should describe the project in simple terms and concisely, without missing relevant points but avoiding unnecessary details. The project description should include 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

Public Consultation and Information Disclosure

Review of Relevant Acts, Regulations and Guidelines: During the study relevant national legislations and guidelines should be reviewed and their salient features should be mentioned in this section. Similarly related institutions should be consulted.

Existing Environmental condition: Baseline information on the existing physical, biological as well as socio-economic and cultural resources of the proposed sub-projects is identified here.

Environmental features such as sensitive areas, population and settlements, forests should be shown in a map.

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

1. Project alternative
2. Alternative routes
3. Alternative design and construction approach
4. Alternative schedule and process
5. Alternate resources
6. Any other alternatives

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:

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

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

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.

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

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

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

Annex

- ToR of IEE
- Rapid Environmental Assessment (REA) Checklist
- Abstract of cost
- RRRSDP environmental checklist
- Public notice
- Deed of inquiry (*muchulka*)
- List of persons contacted
- Raised issues during public consultation
- Recommendation letters from the concerned VDCs or Municipality
- 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

References

DoR, 2003. Reference Manual for Environmental and Social Aspects of Integrated Road Development, Ministry of Physical Planning and Works, Department of Roads, Kathmandu.

Ministry of Population and Environment, 1997. Environmental Protection Act, 1997 and Environment Protection Rules, 1997. (Amendment, 1999).

NCE, 2003. Environmental Assessment Guidelines

DDC Dhankuta, 2058, District Profile of Dhankuta.

Department of Roads, 2000. Policy Document, Environmental Assessment in the Road Sector of Nepal. Geo-Environment Unit, Ministry of Physical Planning and Works, Nepal.

Appendix – 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 / RRRSDP

Name of the sub Project: Hile – Utterpani-Chhingtang Rural Road

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

SCREENING QUESTIONS	Yes	No	REMARKS
▪ Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		✓	Thaunda Kholsa at(Ch 1+400-3+000), Karfok Khola at Ch 5+000-6+700, Lodhia River at Ch 14+600-18+600
▪ Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		√	At specific sites only
▪ Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	√		At construction sites only
▪ Noise and vibration due to blasting and other civil works?	✓		• Noise due to civil works
▪ Dislocation or involuntary resettlement of people		✓	
▪ Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?	✓		During construction at the settlement areas along the road sides e.g. Ch:0+000-0+150km,2+050-3+100, 4+105-4+800, 7+2500-7+500,8+300-8+400,11+300-12+250,14+200-15+000,18+010-19+900,20+100-20+500,23+000-23+500 etc.
▪ Hazardous driving conditions where construction interferes with pre-existing roads?		✓	
▪ Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	✓		There would be influx of labourers from outside during the construction period.
▪ Creation of temporary breeding habitats for mosquito vectors of disease?	✓		
▪ Dislocation and compulsory resettlement of people living in right-of-way?	✓		About 20 no. of houses shall be affected
▪ Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	✓		Mitigation measures should be adopted.
▪ Increased noise and air pollution resulting from traffic volume?	✓		Mitigation measures should be adopted.
▪ Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	✓		At Marga Pokhari (Ch: 6+700-7+150 only at rainy season), Thaunda Kholsa at(Ch 1+400-3+000), Karfok Khola at Ch 5+000-6+700, Lodhia River at Ch 14+600-18+600km.

Source: field survey, November, 2009

Appendix - III: Abstract of Cost

Rural Reconstruction and Rehabilitation Sector Development Programme
Hille – Utterpani - Chhingtang Road Sub Project, Dhankuta

S.N	Description	Units	Quantity	Rate	Amount(NRs.)	Remarks
1.0	**Earthwork in Excavation**					
1.1	Hard Soil	Cum	84071.15	106.61	8,962,824.82	
1.2	Medium Rock(Boulder Mix Soil)	Cum	9890.15	710.70	7,028,926.41	
1.3	Rock	Cum	4945.36	3020.48	14,937,365.50	
2.0	**Earthwork in Fill**	Cum	1993.75	44.42	88,562.38	
3.0	**Lined Side Drain(1:4CSM)**					
	Cement Stone Masonary(1:4)	Cum	1974.87	4341.53	8,573,957.35	
	Sub Surface Drain	Cum	1026.80	106.61	109,467.15	
4.0	**Toe and Check Wall**	Cum	3925.00	4341.53	17,040,505.25	
5.0	**Pipe Culvert**					
	Dia.300mm	Nos	3.00	115925.26	347,775.78	
	Dia.600mm	Nos	5.00	125026.42	625,132.12	
	Dia.900mm	Nos	3.00	137097.99	411,293.96	
6.0	**Slab Culvert**					
	Span-2.00m	Nos	2.00	485003.59	970,007.17	
	Span-5.00m	Nos	4.00	592965.36	2,371,861.46	
7.0	**CauseWays:**					
	RCC Causeway					
	a) Short Span-6.00M	Nos	21.00	205499.49	4,315,489.21	
8.0	**Retaining/Breast Wall:**					
	a)RRM with Dry stone masonary	Rm	100.00	10586.43	1,058,642.52	
	b)Cement Stone Masonary	Rm	220.00	14814.50	3,259,190.38	
	c)Gabion Wall					
	I)Supplying and Weaving of Gabion Box(2*1*1)	Nos	2800.00	4081.93	11,429,404.00	
	Packing of Stone In Gabion Box	Cum	5600.00	1548.82	8,673,392.00	
9.0	**Road Pavement Work**					
	a)Sub-Grade Work (20cm Thick)	Sqm	125750.00	62.10	7,809,075.00	
	b)Sub-Base Work (15cm Thick)	Cum	13203.75	1894.79	25,018,333.46	
10.0	**Others**					
	a) Site Clearance	Sqm	40050.00	71.07	2,846,353.50	
	b)Cutting Trees					
	girth 30-60cm	Nos	400.00	53.30	21,320.00	
	girth 61-90cm	Nos	80.00	71.07	5,685.60	
	girth 91-180cm	Nos	48.00	266.57	12,795.36	
					125,917,360.38	
	Bio Engineering Works				**3,777,520.81**	
	Total Cost				**129,694,881.19**	
	Cost Per KM				**5,156,854.12**	

Appendix – IV: RRRSDP Environmental Checklist

A. GENERAL SOCIO-ECONOMIC SITUATION OF THE INFLUENCE AREA

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

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

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

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						
K						

3. Existing services and infrastructures

S. N.	Service/Infrastructure Category	Settlement Code									
		A	B	C	D	E	F	G	H	I	J
1	EDUCATION										
1.1	Campus (no.) Students (no.)										
1.2	High School (no.) Students (no.)										
1.3	Primary School (no.) Students (no.)										
2	HEALTH										
2.1	Hospital /health centre (no.) Capacity (beds)										
2.2	Health Post (no.) Sub-Health Post (no.)										
3	COMMUNICATION										
3.1	Telephone/fax										
3.2	Mobile/CDMA										
3.3	Post Office										
4	ELECTRICITY SUPPLY (no. of Hhs)										
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										
5	BUSINESS & COMMERCE										
5.1	Hotels & Lodges (no.)										

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

4. Land holding pattern

Land holding Pattern (ropani)	Settlement (HH No.)										Remarks
	A	B	C	D	E	F	G	H	I	J	
Landless											
less than 1											
1 to 5											
5 to 10											
10 to 20											
20-50											
> 50											

5. Food grain availability (HH no.)

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

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

S. No.	Type of Agriculture Production	Settlements									
		A	B	C	D	E	F	G	H	I	J
1.0	CEREALS										
1.1	Rice										
1.2	Wheat										
1.3	Maize										
1.4	Millet										
1.5	Junelo										
1.6	Phaper										
1.7	Others (list)										
2.0	CASH CROPS										
2.1	Oil Seeds										
2.2	Beans/Dal										
2.3	Tobacco										
2.4	Potato										
2.5	Vegetables										
2.6	Fruits										
2.7	Tea/Coffee										
2.8	Amliso										
2.9	Sericulture										
2.10	Others (list)										
3.0	LIVESTOCK & FISHERIES										
3.1	Cattle (cows & buffaloes)										
3.2	Horses, Mules										
3.3	Yak										
3.4	Goat										
3.5	Sheep										
3.6	Rabbit										
3.7	Pig										
3.8	Fisheries										
3.9	Poultry										
3.10	Bee-keeping										
3.11	Others										

7. Migration for employment

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

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

8. **Name of settlement:** **Address:**

A. Seasonal migration in search of work

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

B. Dominant off-farm occupation in the settlement in descending order
1.....
2.....
3.....

C. DEVELOPMENT POTENTIAL OF THE INFLUENCE AREA

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

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

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

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

D. Historic and Cultural Resources

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

E. Name of Existing Community Organisation

F. Trading pattern - Imported items and Exported Items

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

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

Appendix - V:
Public Notice

स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
जिल्ला प्राविधिक कार्यालय
ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना
जिल्ला आयोजना कार्यालय
धनकुटा

प्रारम्भिक वातावरणीय परीक्षण(IEE) संवन्धी राय सुझावका लागि
सार्वजनिक सूचना

(सूचना प्रकाशित मिति: २०६६।३।१७)

ग्रामिण पुनर्निमाण तथा पुनर्स्थापना आयोजना (RRRSDP) अन्तर्गत एशियाली विकास बैंक, डिफिड तथा स्वीस सरकार विकास नियोगको अनुदान सहयोग तथा ओफिडको ऋण सहयोग तथा नेपाल सरकार, जिल्ला विकास समिति र लाभग्राही समेतको लगानीमा स्तरोन्नती गर्नका लागि प्रस्ताव गरिएको हिले उत्तरपानी छिन्ताङ सडक उप आयोजना, राजारानी ६ न.बुधवारे सडक उप आयोजना र त्रिशुले हातिखर्क अ.जितपुर सडक उप आयोजनाको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन कार्यान्वयन गर्ने क्षिलक्षिलामा वातावरणीय संरक्षण नियमावली, २०५४ (पहिलो संशोधन २०५५ समेत) को नियम ७२(२) अनुसार यो सार्वजनिक सूचना प्रकाशित गरिएको छ ।

प्रस्तावकको नाम: **जिल्ला विकास समितिको कार्यालय/जिल्ला प्राविधिक कार्यालय,धनकुटा ।**

प्रस्तावित सडक उप आयोजनाहरुको विवरण :-

क.सं.	सडकको नाम	प्रभाव पार्ने गा.वि.स. तथा न.पा.हरु	प्रस्तावको विवरण	लम्बाइ
१	हिले उत्तरपानी छिन्ताङ सडक उप आयोजना	ध.न.पा.,बेलहरा, चुङमाङ,खोकु, आखिसल्ला, छिन्ताङ	यो उप आयोजना धनकुटा नगरपालिका वडा नं. १ को हिले बजारबाट शुरु भै छिन्ताङ - ६ मा गई टुङ्गिन्छ । यो सडकमा उत्तरपानी,धर्मशाला,मार्गा,सुके आहाल, बलथले,पानीटार,पिप्लेडाडा,पञ्चकन्या,ज्यामिरे आदी बजार वस्तीहरु पर्दछन ।	२५.१५० कि.मि
२	राजारानी छ नं.बुधवारे सडक उप आयोजना	राजारानी,वसन्तटार, मुढेतास, राजारानी	यो उप आयोजना राजारानी गा.वि.स.को राजारानी बजारबाट शुरु भै छ नं. बुधवारे गा.वि.स.को वार्ड नं.४ को छ नं. बुधवारे बजारमा गइ टुङ्गिन्छ । यो सडकमा पाटीबजार,राजारानी,सम्मेवा ,डाडागाउ, चारुगाउ,लाफाचोक,लाप्से,सौर्य,सानेमोक्तारा,बुधवारे आदी बजार वस्तीहरु पर्दछन ।	२३.१०० कि.मि
३	त्रिशुले हातिखर्क अ.जितपुर सडक उप आयोजना	ध.न.पा.,हातिखर्क, मुर्तिङ्गा, अ.जितपुर	यो उप आयोजना धनकुटा नगरपालिकाको त्रिशुलेबाट शुरु भै अ. जितपुर गा.वि.स.को वार्ड नं. ५ को जितपुर बजारमा गई टुङ्गिन्छ । यो सडकमा त्रिशुले,फलाटे,धुलपुजा,डाडागाउ, पचमी, मगरगाउ,मादीबुङ,चर्चरे,कटहरे,अर्खौले,याङपाङ,जीतपुर आदी बजार वस्तीहरु पर्दछन	१७.४०० कि.मि

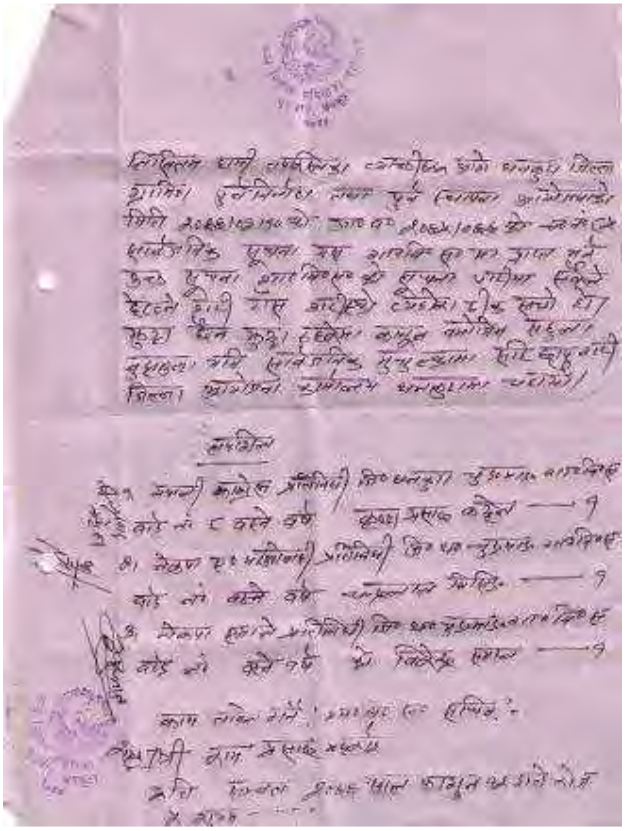
उक्त प्रस्तावको कार्यान्वयनबाट वातावरणमा पर्न सक्ने प्रभावका बारेमा सम्बन्धित गा.वि.स.,विद्यालय,स्वास्थ्य चौकी,वन उपभोक्ता समिति तथा अन्य सरोकारवाला व्यक्ति वा संस्थाले यो सूचना प्रकाशित भएको मितिले १५(पन्ध्र) दिन भित्र निम्न ठेगानामा आफ्नो राय सुझाव पठाई सहयोग गरी दिनु हुन अनुरोध छ ।

राय सुझाव पठाउने ठेगाना:-

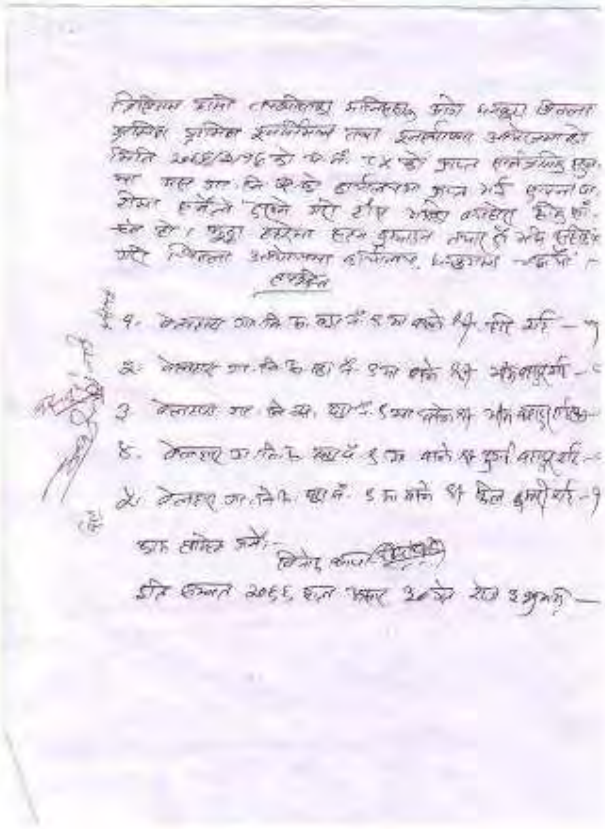
जिल्ला विकास समितिको कार्यालय,धनकुटा फोन नं.०२६-५२०१२५ फ्याक्स ०२६-५२०१२४	जिल्ला प्राविधिक कार्यालय,धनकुटा फोन नं.०२६-५२०९२० फ्याक्स ०२६-५२१४८१	जिल्ला आयोजना कार्यालय,धनकुटा फोन नं.०२६-५२१४८१ फ्याक्स ०२६-५२१४८१

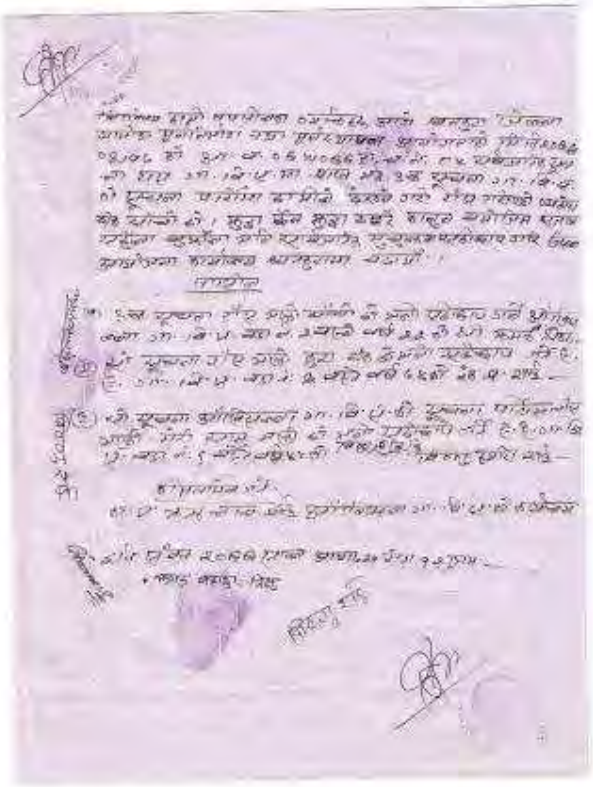
आयोजना प्रमुख

Appendix - VI:
Deed of enquiry (*muchulka*)

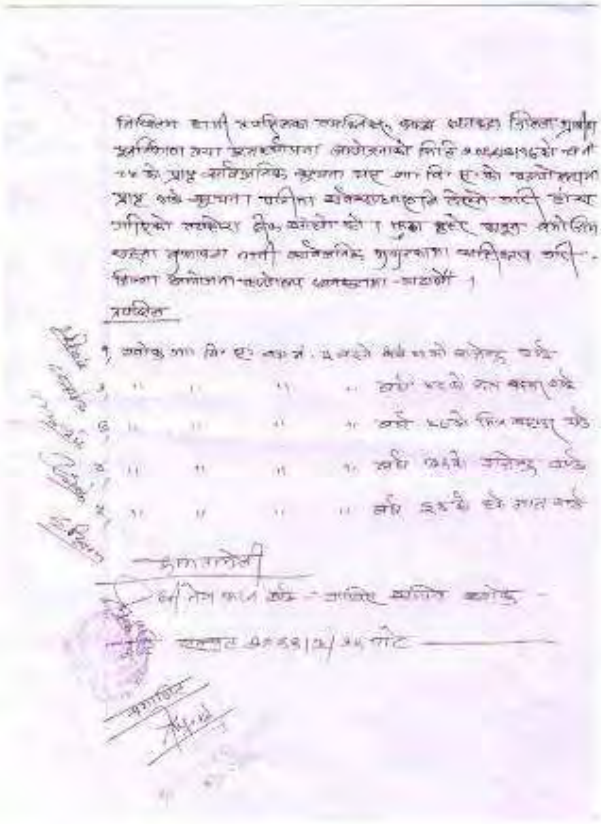


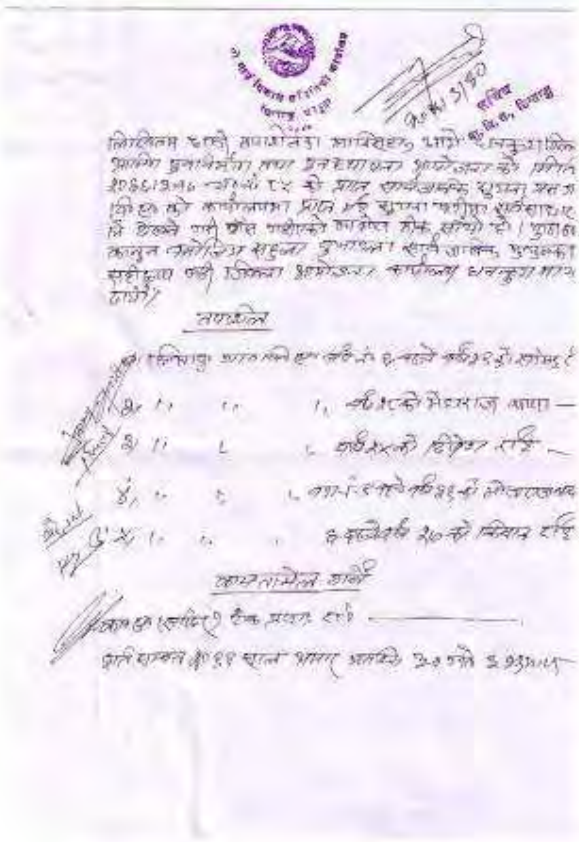
Deed of enquiry (*muchulka*)





Deed of enquiry (*muchulka*)





Appendix - VII:
IEE related supporting Documents and Letters

ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना

जिल्ला आयोजना कार्यालय

धनकुटा

कोशी अञ्चल, नेपाल

मिति २०६४/१२/१७

विषयः- सूचना टांस गरी जानकारी पठाई दिने बारे ।

इस्तुत विषयमा यस कार्यालयबाट मिति २०६४/१२/१७ गते प्रकाशित प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावका लागि सार्वजनिक सूचना १ प्रति यसै पत्रबाट संलग्न राखि पठाइएको छ,तपाईको सूचना पाटीमा टांस गरी सो को जानकारी यस कार्यालयमा पठाई दिनु हुन अनुरोध छ

पुष्करप्रसाद पोखरेल
आयोजना प्रमुख

ग्रामिण पुनर्निर्माण तथा पुनर्स्थापना आयोजना

जिल्ला आयोजना कार्यालय

धनकुटा

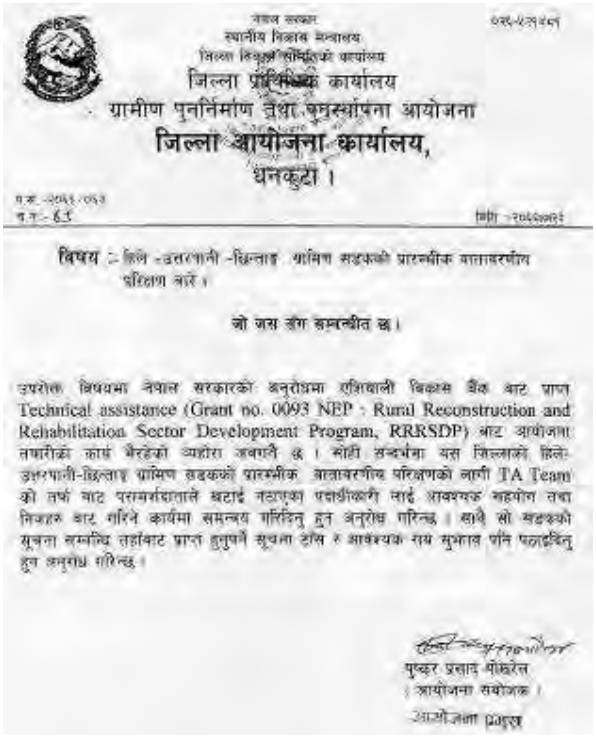
कोशी अञ्चल, नेपाल

मिति २०६४/१२/१७

विषयः- सूचना टांस गरी जानकारी पठाई दिने बारे ।

प्रस्तुत विषयमा यस कार्यालयबाट मिति २०६४/१२/१७ गते प्रकाशित प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावका लागि सार्वजनिक सूचना १ प्रति यसै पत्रबाट संलग्न राखि पठाइएको छ,तपाईको सूचना पाटीमा टांस गरी सो को जानकारी यस कार्यालयमा पठाई दिनु हुन अनुरोध छ

पुष्करप्रसाद पोखरेल



नेपाल सरकार

स्थानीय विकास मन्त्रालय

जिल्ला विकास समितिको कार्यालय

जिल्ला प्राविधिक कार्यालय

ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना

जिल्ला आयोजना कार्यालय,

धनकुटा ।

विषय :- जिले -उत्तरपानी -छिन्ताङ ग्रामिण सडकको प्रारम्भीक वातावरणीय परिक्षण बारे ।

जो जस लेग सम्बन्धीत छ ।

उपरोक्त विषयमा नेपाल सरकारको अनुरोधमा एशियाली विकास बैंक बाट प्राप्त Technical assistance (Grant no. 0093 NEP : Rural Reconstruction and Rehabilitation Sector Development Program, RRRSDP) बाट आयोजना तयारीको कार्य भैरहेको व्यहोरा जनाउने छ । सोही सन्दर्भमा यस जिल्लाको जिले-उत्तरपानी-छिन्ताङ ग्रामिण सडकको प्रारम्भीक वातावरणीय परिक्षणको लागी TA Team को तर्फ बाट परामर्शदाताले खटाई नठाएको पदाधीकारी लाई आवश्यक सहयोग तथा निजहरु बाट गरिने कार्यमा समन्वय गरिदिनु हुन अनुरोध गरिन्छ । साथै सो सडकको सूचना सम्बन्धि तहबाट प्राप्त हुनुपर्ने सूचना टांस र आवश्यक राय सुझाव पनि पठाइदिनु हुन अनुरोध गरिन्छ ।

पुष्कर प्रसाद पोखरेल
(आयोजना समन्वयक)
आयोजना प्रमुख

नेपाल सरकार

स्थानीय विकास मन्त्रालय

जिल्ला विकास समितिको कार्यालय

धनकुटा

मिति २०६४/१२/२८

पत्र संख्या :-

चलानी नम्बर :- 2336

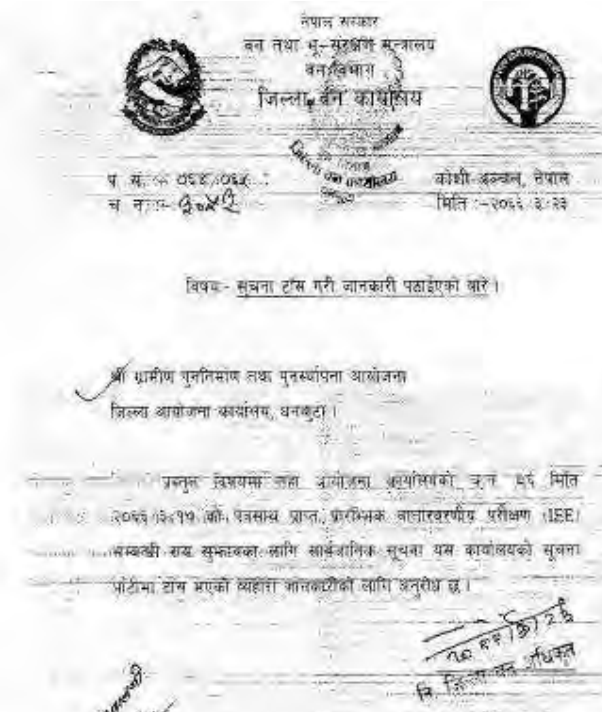
विषय:- सूचना टांस गरिएको ।

श्री जिल्ला आयोजना कार्यालय, धनकुटा

उपरोक्त विषयमा ताहाँ कार्यालयको प.सं. ..... मिति ..... गतेको पत्र साथ प्राप्त भएको ..... सूचना थोन .....) यस कार्यालयको सूचना पाटीमा टांस गरिएको व्यहोरा जानकारीको लागि अनुरोध छ ।

सुब्बा

IEE related supporting Documents and Letters



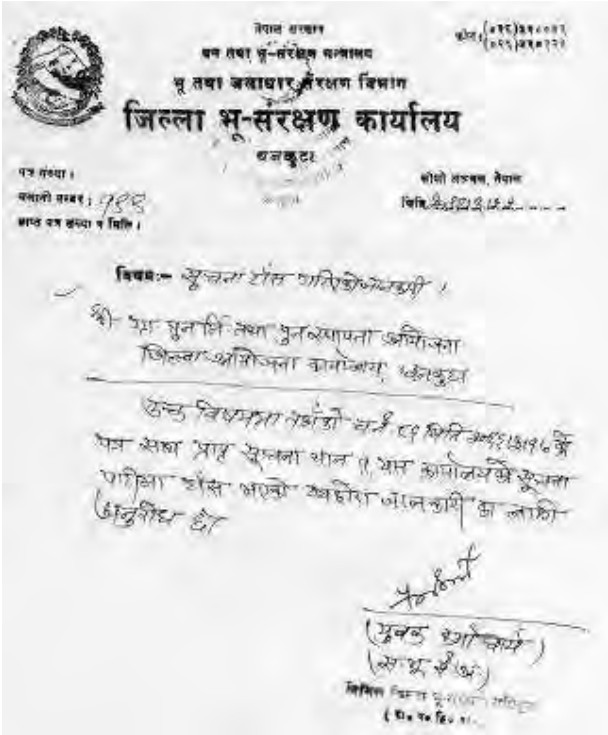
नेपाल सरकार
वन तथा भू-संरक्षण मन्त्रालय
वन विभाग
जिल्ला वन कार्यालय
धनकुटा

कोशी अञ्चल, नेपाल
मिति :-२०६६/३/२३

विषय- सूचना टाँस गरी जानकारी पठाईएको बारे ।

श्री ग्रामीण पुनर्निर्माण तथा पुनर्स्थापना आयोजना
जिल्ला आयोजना कार्यालय, धनकुटा ।

प्रस्तुत विषयमा तहा आयोजना कार्यालयको पत्र मिति २०६६/३/१४ को पत्रसाथ प्राप्त प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धी राय सुझावका लागि सार्वजनिक सूचना यस कार्यालयको सूचना पाटीमा टाँस भएको व्यहोरा जानकारीको लागि अनुरोध छ ।



नेपाल सरकार
वन तथा भू-संरक्षण मन्त्रालय
भू तथा जलाधार संरक्षण विभाग
जिल्ला भू-संरक्षण कार्यालय
धनकुटा

कोशी अञ्चल, नेपाल

विषयः- सूचना टाँस गरिएको बारे ।

श्री ग्रा. पुनर्निर्माण तथा पुनर्स्थापना आयोजना
जिल्ला आयोजना कार्यालय, धनकुटा

उक्त विषयमा तहाँको मिति ०६६/३/१४ के पत्र साथ प्राप्त सूचना यस कार्यालयको सूचना पाटीमा टाँस भएको व्यहोरा जानकारीका लागि अनुरोध छ ।

श्री वार्ड विकास समितिको कार्यालय
धनकुटा

विषयः- सूचना टाँसको जानकारी बारे ।

श्री जिल्ला आयोजना कार्यालय
धनकुटा ।

नेपाल सरकार
भौतिक योजना तथा निर्माण मन्त्रालय
खानेपानी तथा ढल निकासा विभाग
क्षेत्रीय अनुगमन तथा सुपरिवेक्षण कार्यालय
धनकुटा

कोशी अञ्चल, नेपाल

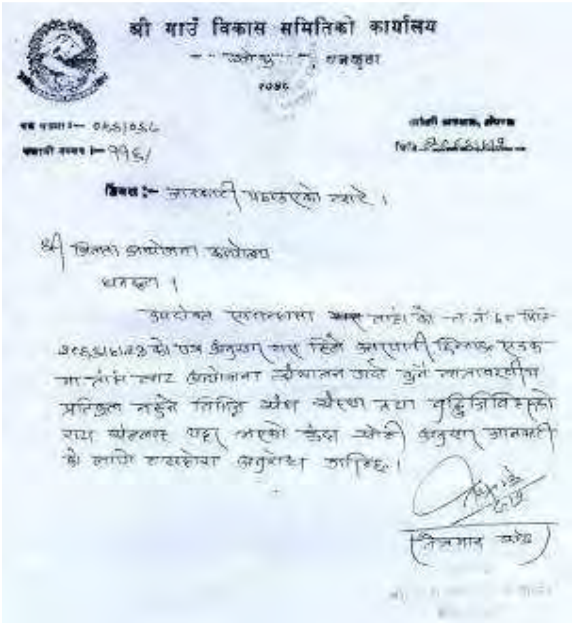
विषयः- जानकारी पठाएको बारे ।

श्री जिल्ला आयोजना कार्यालय, धनकुटा ।

प्रस्तुत विषयमा तपाँहा कार्यालयको मिति ०६६/३/१६ का प्राप्त पत्र साथ सीमित सूचना टाँस कार्यालयको सूचना पाटीमा टाँस गरिएको जानकारीका लागि ।

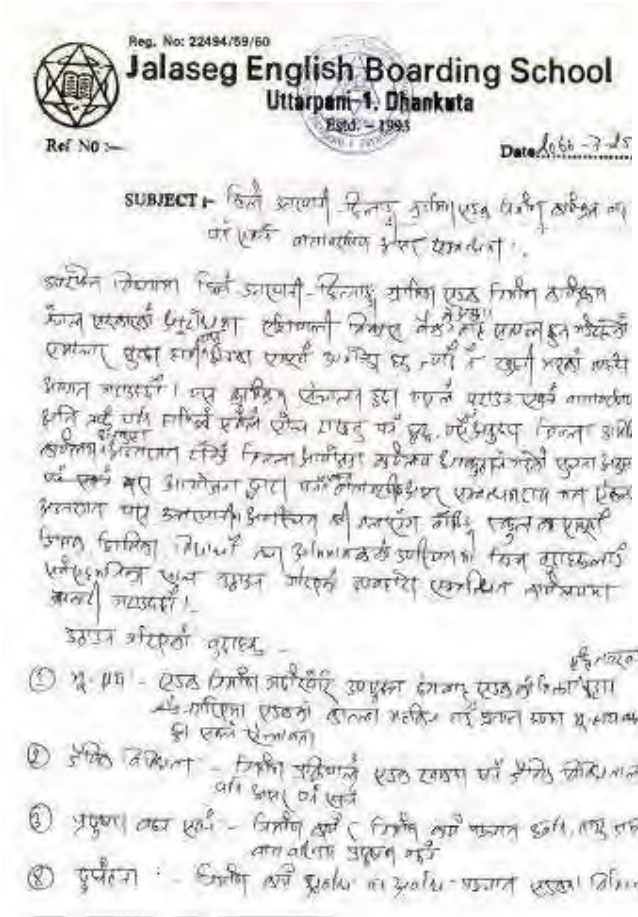
रामशीष यादव

IEE related supporting Documents and Letters


श्री गाउँ विकास समितिको कार्यालय

श्री जनकल्याण माध्यमिक विद्यालय

Shree Janakalyan Secondary School


Reg. No: 22494/59/60

Jalaseg English Boarding School

Uttarpani-1, Dhankuta

Estd. - 1993

Reg. No: 22494/59/60

Jalaseg English Boarding School

Uttarpani-1, Dhankuta

Estd. - 1993

IEE related supporting Documents and Letters

गाउँ विकास समितिको कार्यालय

गाउँ विकास समितिको कार्यालय
Office of the Village Development Comitee
बेलहारा, धनकुटा (Belhara, Dhankuta)
(Koshi Zone, Nepal)

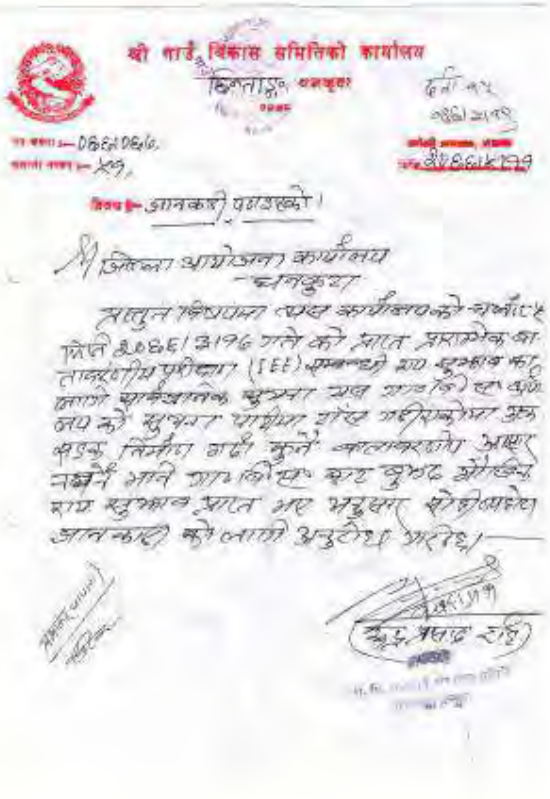
विषय:- प्रारम्भिक वातावरणीय परीक्षण (IEE) सम्बन्धमा ।

श्री जिल्ला प्राविधिक कार्यालय,
धनकुटा ।

उपरोक्त सम्बन्धमा यस बेलहारा गाविसको उक्त नं. १ हुदै जिन्ताङ गाविससम्म पुग्ने जिर्ले उपरपानी जिन्ताङ सडक उप आयोजना संचालन सम्बन्धी डामिल पुनर्निर्माण तथा पुनर्स्थापना आयोजना, जिल्ला आयोजना कार्यालय, धनकुटाले जारी गरेको प्रारम्भिक वातावरणीय परीक्षण सम्बन्धमा यो गाविसको तर्फबाट राय सुझाव उपलब्ध गराउनु पर्दा उक्त आयोजना संचालन गर्दा यस क्षेत्रमा कुनै प्रकारको वातावरणीय असर, प्रभाव नपर्ने व्यहोराको राय सुझाव प्रेषित गरिएको व्यहोरा अनुरोध गरिन्छ ।

विनोद कुमार थापा
सचिव अध्यक्ष

श्री गाउँ विकास समितिको कार्यालय



श्री गाउँ विकास समितिको कार्यालय
जिन्ताङ, धनकुटा

Appendix- VIII:
Name of the Organizations
(Notice pasted and deed of inquiry obtained)

S. N	Name or Organization	Address	Remarks
1	Uttarpani Bazaar	Uttarpani	
2	Dharmasala Bazaar	Uttarpani	
3	Chungbang VDC buiding	Chungbang	
4	Bharatee secondary school	Chungbang	
5	Marga Bazar	Belhara	
6	Belhara VDC building	Belhara	
7	Marga higher secondary school	Belhara	
8	Thalthale Bazaar	Aakhisalla-6	
9	VDC building	Aakhisalla	
10	Tampu devi secondary school	Aakhisalla-1	
11	Mambhing gaun		
12	Panchakrishna secondary school	Khoku-1	
13	Piple danda	Khoku-1	
14	VDC building	Khoku-5	
15	Panchakanya Bazaar	Chhintang-2	
16	Devithan Bazaar	Chhintang-2	
17	VDC building	Chhintang-6	
18	Jyamire Bazaar	Chhintang-6	

Source: Field Survey, 2009

Appendix - IX:
List of persons consulted

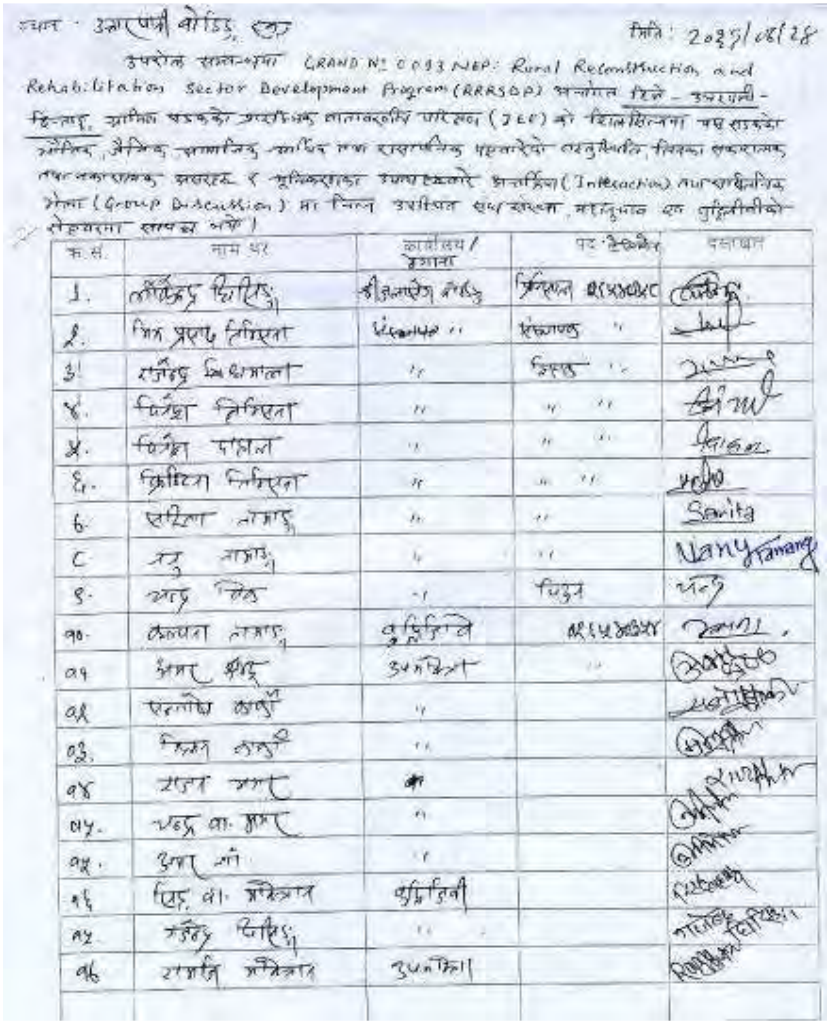
Name	Designation	Address
Mr. Singha Bdr. Moktang	Farmer	Utterpani, Chungmang-1
Mrs. Phul Maya Tamang	VICC-Member	Utterpani, Chungmang-1
Mr. Ramesh Ramtel	Headmaster	Shree Chaurasi Devi Pri.School, Chungmang-1
Mr. Bhim pd. Subedi	Headmaster	Jana Kalyan Sec. School, Belara-3
Mr. Amar Raj Khanal	Teacher	- " - - " -
Mr. Jeevan Kr. Rai	- " -	- " - - " -
Mr. Chiranjivi Dhahal	- " -	- " - - " -
Mr. Ghyanu Rai	- " -	- " - - " -
Ms. Gita Paudel	Chairman/ Student	Eco- children Club, - " - - " -
Mr. Ishori Pd. Subedi	Chairman	Bhadaure C.F, Belhara-4
Mr. Bal Bdr Rai	Project affected person	Chhingtang-6
Ms. Tulasa Bhattarai	ANM, Ilaka Health Post	Thalthale-6
Mr. Bir Bdr Rai	Project affected person	Panchakanya-1
Mr.Yachya Bd. Rai	- " -	Panchakanya-1
Mr. Dhruba Thapa	Teacher/ Owner	Chhingtang Guest house, Panchakanya-2
Mr. Nar Bdr. Rai	- " -	Chhingtang-1
Mr. Kamal Mangati	- " -	Chhingtang-1
Mr. Dagendra Rai	Teacher	Piple Danda, Khoku-1
Mr. Shamser Man Rai	Teacher/ Pracharya	Khoku-5
Mr. Hang Bir Rai	Teacher	Khoku-1
Mr. Jahi Miya Manshuri	Seasonal worker/ Immigrant (Khoku-1)	Amuwa, Jhitkaiya, Kaliya
Mr. Som Nath Khadka	CUFFAG/ Solve Nepal	Chhangtang-9
Mr. Biswas Shrestha	CUFFAG/ Solve Nepal	Tallo Copche
Mr. Dhan Kr. Rai	Politician (Area Incharge-Maoist)	Sambu gaun, Chhingtang-6
Mr. Mani Kr. Rai	Farmer	Chhingtang-6
Mr. Nanda Pd. Rai	Social Worker/ Politician(DCM)	Chhingtang-9
Mr. Yogendra Rai	Project affected person	Chhingtang-2
Mr. Netra Pd. Rai	Former Chairman/ Member	Shree Chhingtang Jalapi Devi Conservation Committee
Mr. Kumar Mangati	Farmer	Jyamire, Chhingtang-8
Mr. Damber Gurung	VDC Secretary	Chungmang
Mr. Binod Kr. Thapa	- " -	Belhara
Mr. Dil Ser Rai	- " -	Ankhisalla
Mr. Netra Man Rai	- " -	Khoku
Mr. Rudra Pd. Rai	- " -	Chhingtang

Source: Field Survey, 2009

Appendix - Xa:
Summary of Focus Group Discussion / Public Consensus

Date	Location	No. of Participants		Issues and Suggestions of the meeting
		Male	Female	
2066/07/24 B.S.	Utterpani Boarding School, Uttarpani, Chungwang VDC	15	4	• Proper techniques must be used to control soil erosion and weak embankment. • Construction should be carried out with minimum impacts omitted on Biodiversity. • Noise and air pollution during and after the construction are inevitable. • Special measures should be taken to protect the accident victims, if any. • To minimize the adverse effect on students in school, close to road special measures should be adopted.
2066/07/24 B.S.	Shree Janakalyan higher secondary school, Marga	12	3	• Storm water drainage need to be properly controlled to save school building and librarybooks. • Soil deposit in Marga Pokhari should be cleaned appropriately. • To protect school playground area compound wall and fencing should be provided. • Cultural heritage site of Marga Pokhari and Durga Panchayan temple must be preserved. • Children club sould be supported for the motivation and awareness campaign.
2066/07/26 B.S.	Ankhisalla Health Post, Ankhisalla VDC	3	3	• Spoil should be disposed properly to save farmland and water bodies. • Safety measure signs should be kept in the healthpost area and other appropriate sites. • Local people should be protected from air pollution. • Road safety measures should be taken for accidents.
2066/07/25 B.S.	Chhingtang VDC Office, Chhingtang	21	3	• Awareness campaigns are essential for local people. • Community infrastructures should be protected and restored, if damaged. e.g. Satsanga Building at Sambugaun and Panchakanya Higher Seconary School, Khoku-1 (supporting compound wall and pillars). • Air and noise pollution in the Panchakanya school premises to be minimized(Speed breaker and signboard). • Locally available people to be employed.
2066/07/25 B.S.	Jyamire Settlement, Chhingtang VDC	9	2	• Local people should be given priority in employment opportunities and training for income generating activities. • Supplementary infrastructure such as drinking water supply and irrigation schemes should be supported. • Training programmes must be conducted for poorer and marzionalized people for better living.

Appendix - Xb:
Meeting minutes with local people

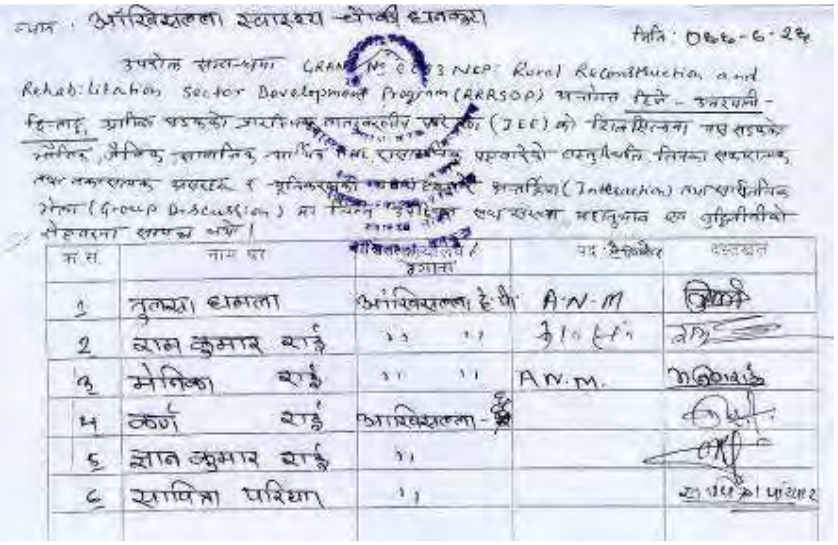


स्थान : उत्तरपुरी वोडिङ, काठ

मिति : 2075/08/28

उपरोक्त सम्बन्धमा GRAND No. 0093 NEP: Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) अन्तर्गत रिने - उत्तरपुरी - हिलाङ, आयोजना सडकको आर्थिक वातावरणीय परिक्षण (IEE) को सिलसिलामा यस सडकको आर्थिक, सामाजिक, वातावरणीय तथा सांस्कृतिक पक्षहरुको अवस्थिति, विकास सम्भावना तथा नकारात्मक असरहरु र भूमिकरणका उपायहरुको अन्तर्क्रिया (Interaction) सम्बन्धीत समूह छलफल (Group Discussion) मा निम्न उपस्थित व्यक्तिहरु, महानुभाव एवं गुहिनीहरुको सहभागिता रहेको थियो ।

क्र.सं.	नाम थर	कार्यालय / ठेगाना	पद	दस्तखत
1.	[illegible]	[illegible]	[illegible]	[illegible]
2.	मित्र प्रसाद तिमिल्सिना	[illegible]	[illegible]	[illegible]
3.	राजेन्द्र [illegible]	"	[illegible]	[illegible]
4.	[illegible] तिमिल्सिना	"	"	[illegible]
5.	[illegible] पाहाल	"	"	[illegible]
6.	[illegible] तिमिल्सिना	"	"	[illegible]
7.	सरिता लामाङ	"	"	Sanita
8.	[illegible] लामाङ	"	"	Nany Lamang
9.	[illegible] [illegible]	"	[illegible]	[illegible]
10.	[illegible] लामाङ	गुहिनी	[illegible]	[illegible]
11	[illegible] [illegible]	उपस्थित	"	[illegible]
12	[illegible] [illegible]	"		[illegible]
13.	[illegible] [illegible]	"		[illegible]
14	[illegible] [illegible]	"		[illegible]
15.	[illegible] [illegible]	"		[illegible]
16	[illegible] [illegible]	"		[illegible]
17.	[illegible] [illegible]	"		[illegible]
18	[illegible] [illegible]	उपस्थित		[illegible]



स्थान : आँखिझरना स्वास्थ्य चौकी हलकुरा

मिति : 0066-6-28

उपरोक्त सम्बन्धमा GRAND No. 0093 NEP: Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) अन्तर्गत रिने - उत्तरपुरी - हिलाङ, आयोजना सडकको आर्थिक वातावरणीय परिक्षण (IEE) को सिलसिलामा यस सडकको आर्थिक, सामाजिक, वातावरणीय तथा सांस्कृतिक पक्षहरुको अवस्थिति, विकास सम्भावना तथा नकारात्मक असरहरु र भूमिकरणका उपायहरुको अन्तर्क्रिया (Interaction) सम्बन्धीत समूह छलफल (Group Discussion) मा निम्न उपस्थित व्यक्तिहरु, महानुभाव एवं गुहिनीहरुको सहभागिता रहेको थियो ।

क्र.सं.	नाम थर	कार्यालय / ठेगाना	पद	दस्तखत
1	तुलसा हलाला	आँखिझरना हे.पो.	A.N.M	[illegible]
2	राम कुमार राई	" "	[illegible]	[illegible]
3	मेनिका राई	" "	A.N.M.	[illegible]
4	कर्ण राई	आँखिझरना - [illegible]		[illegible]
5	ज्ञान कुमार राई	"		[illegible]
6	रापिता परियार	"		[illegible]

Meeting minutes with local people

स्थान : श्री० जनकल्याण मा०वि० (मार्ग) धनकुटा मिति : 2073/08/28

उपरोक्त सम्बन्धमा GRAND No 0093 NEP: Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) मर्फत हिले - धनकुटा - दिलाराम, आँखा सडकको आर्थिक लाभान्वित परिक्षण (IEE) को शिलसिलामा यस सडकको भौतिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक पक्षहरुको अवस्थिति, तिनका सकारात्मक तथा नकारात्मक असरहरु र न्यूनिकरणका उपायहरुबारे अन्तर्क्रिया (Interaction) तथा सार्वजनिक भेला (Group Discussion) मा चिन्ता उपस्थित सर्वसंमत, सहानुभाव र पुष्टिलीबारे छलफल भयो।

क.सं.	नाम थर	कार्यालय/ठेगाना	पद	दस्तखत
१.	श्री भीम प्रसाद सुवेदी	श्री जनकल्याण मा०वि०	V.H.	
२.	श्री प्रीतम कुमार राई	" धनकुटा-१	शिक्षक	
३.	श्री चित्रबहादुर दाहाल	" धनकुटा-१	0266-29335	
४.	श्री ज्ञानराज खतवाल	" धनकुटा-१	"	
५.	श्री हरिनारायण थापा	" धनकुटा-१	"	
६.	श्री चन्द्रना चामजाई	" धनकुटा-८	"	
७.	श्री लोकनाथ दाहाल	" धनकुटा-१	"	
८.	श्री गंगाराम राई	" दिलाराम-४	"	
९.	श्री लोकनाथ गहतराज	" धनकुटा-२	"	
१०.	श्री राम बा० शाह	" धनकुटा-१	"	
११.	श्री भीम बा० खतवाल	" धनकुटा-२	"	
१२.	श्री माधव प्र० खतवाल	" धनकुटा-२	"	
१३.	श्री उपेन्द्र बान्तेल	" धनकुटा-६	"	
१४.	श्री कविता सुवेदी	" धनकुटा-४	"	
१५.	श्री मनु विश्वकर्मा	" धनकुटा-७	"	

स्थान : ज्योतिपुर दिलाराम-६ (धनकुटा) मिति : 2073/06/27

उपरोक्त सम्बन्धमा GRAND No 0093 NEP: Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) मर्फत हिले - धनकुटा - दिलाराम, आँखा सडकको आर्थिक लाभान्वित परिक्षण (IEE) को शिलसिलामा यस सडकको भौतिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक पक्षहरुको अवस्थिति, तिनका सकारात्मक तथा नकारात्मक असरहरु र न्यूनिकरणका उपायहरुबारे अन्तर्क्रिया (Interaction) तथा सार्वजनिक भेला (Group Discussion) मा चिन्ता उपस्थित सर्वसंमत, सहानुभाव र पुष्टिलीबारे छलफल भयो।

क.सं	नाम थर	कार्यालय/ठेगाना	पद	दस्तखत
१	कुमार गैरागी	दिलाराम - ६	0266-35035C	
२	दिलकुमार लम्सेल	दिलाराम - ८	"	
३	राम ब. "	दिलाराम - ६	"	
४	प्रेम ब. विश्वकर्मा	" "	"	
५	शिला लम्सेल	" "	"	
६	भिम ब. विश्वकर्मा	" "	"	
७	निर्मल प्रेम पी	" "	"	
८	दिक्षा रानी	" "	"	
९	विष्णु ब. रानी	दिलाराम - ८	"	
१०	चन्द्र लम्सेल	दिलाराम - ६	"	
११	विमल आइदाली	दिलाराम - ६	"	

Meeting minutes with local people

स्थान : हिलिंगाडु गा०वि० का धनकुटा

मिति: २०६६।६।२६

उपरोक्त सम्बन्धमा GRAND No 0093 NEP: Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP) अन्तर्गत पिने - बुजरुनी - हिलिंगाडु, ग्रामिण सडकको प्रारम्भिक वातावरणीय परिक्षण (IEE) को शिलशिलामा यस सडकको भौतिक, जैविक, सामाजिक, आर्थिक तथा सांस्कृतिक पक्षहरुको वस्तुस्थिति, विकास सम्बन्धी तथा नकारात्मक असरहरु र भूमिकराका व्यक्तिहरुसँग अन्तर्क्रिया (Interaction) तथा सामूहिक छलफल (Group Discussion) मा निम्न उपस्थित व्यक्तिहरु, बालुवाट का पुष्टिनीको सहभागिता भयो।

क्र.सं	नाम थर	कार्यालय / ठेगाना	पद / हैसियत	दस्तखत
01	श्री हरि प्रसाद राई	हिलिंगाडु - 6	बुद्धिजीवी	
02	श्री निर बहादुर राई	हिलिंगाडु - ५	" "	
03	श्री रतन बहादुर राई	" ५	वि०व्य०स० अ०	
04	श्री दुर्ग बहादुर राई	" ५	" "	
05	श्री रूप लाल राई	" ६	नि०जि०वि०स०	
06	श्री धसमीता राई	" ६	" "	
07	श्री चित्र बहादुर राई	" ६	" "	
08	श्री ललित कुमार राई	" ६	" "	
09	श्री टिका राम राई	" ६	" "	
10.	श्री मिना कुमारी राई	" ६	" "	मिना
11.	श्री चित्र प्रसाद राई	" ६	" "	चित्र राई
12.	श्री राम कुमारी राई	" ६	" "	राम कुमारी
13.	श्री शिर बहादुर राई	" ६	" "	शिर
14.	श्री पंच बहादुर वि०क	" ६	" "	पंच
15	श्री दिनेश राज शर्मा	" ५	शिक्षक, प्रा०वि० धनकुटा	
16	श्री हस्त राई	- ७	" "	
17	श्री अविर मान राई	" ६	" "	अविरमान
18	श्री राम बहादुर राई	" ५	" "	राम
19.	श्री तिर्थ भक्त राई	" ७	नि०कृषक समूह	
20.	श्री लक्ष्मण गाउले	शिक्षक हिलिंगाडु मा०वि०		
21.	श्री कमल लम्जेल	हिलिंगाडु - ६	बुद्धिजीवी	
22	श्री साने भान्छाघरे	" ६	"	साने
23	श्री इन्द्र प्रसाद राई	" ५	कार्यालय का० रुपादेवी	
24	श्री रूप प्रसाद राई	" ५	गा०वि० स० सचिव	

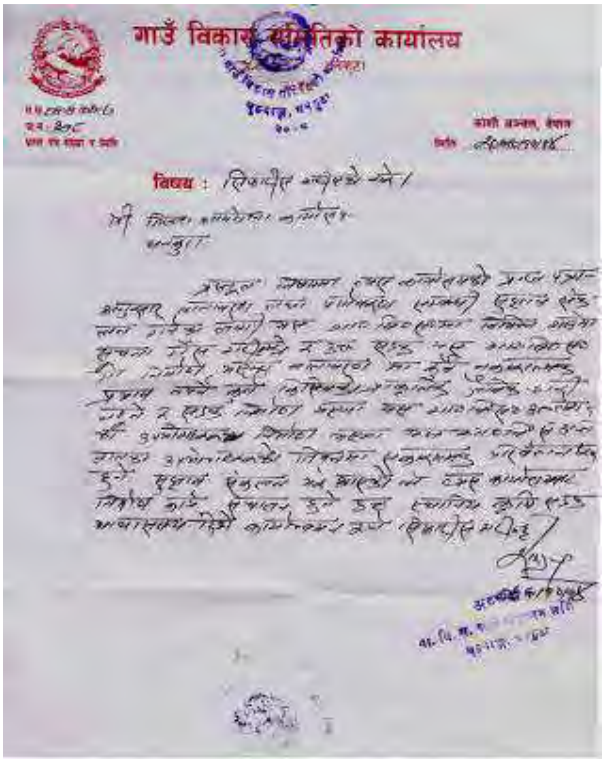
Appendix - XI:
Recommendation Letters from Concerned Municipality and VDCs

धनकुटा नगरपालिका कार्यालय

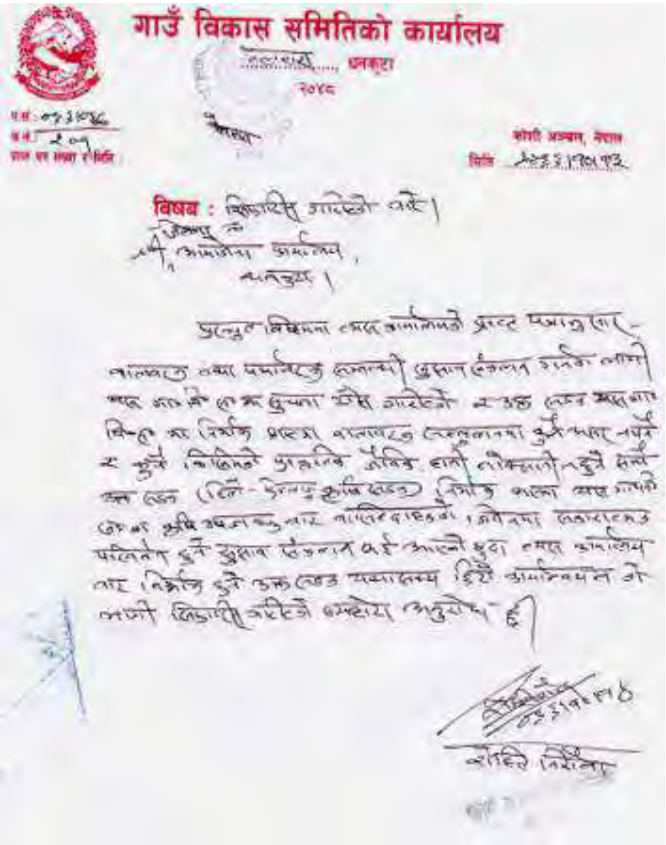
जिल्ला: धनकुटा

विषयः- सिफारिस गरिएको बारे ।

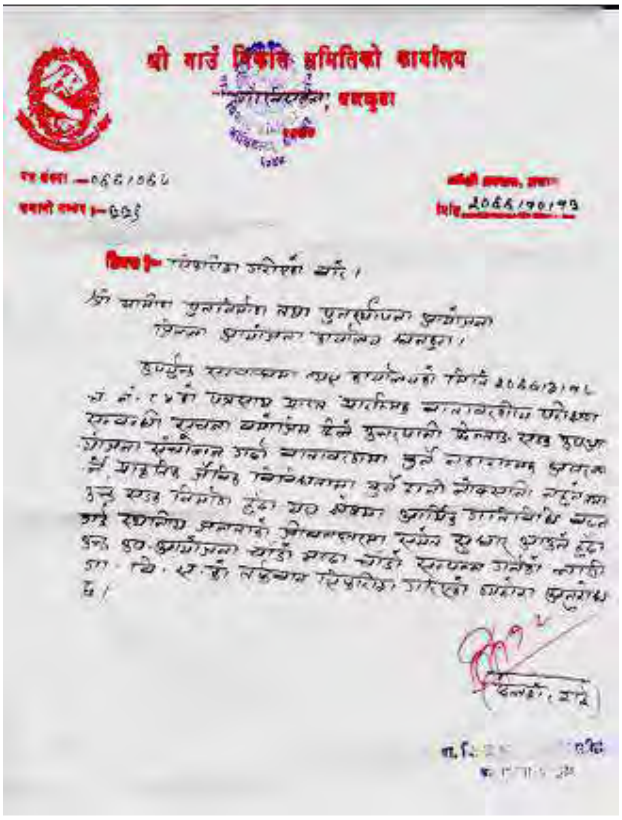
कार्यकारी अधिकृत



गाउँ विकास समितिको कार्यालय



गाउँ विकास समितिको कार्यालय



श्री गाउँ विकास समितिको कार्यालय

Recommendation Letters

श्री गाउँ विकास समितिको कार्यालय

[illegible] धनकुटा

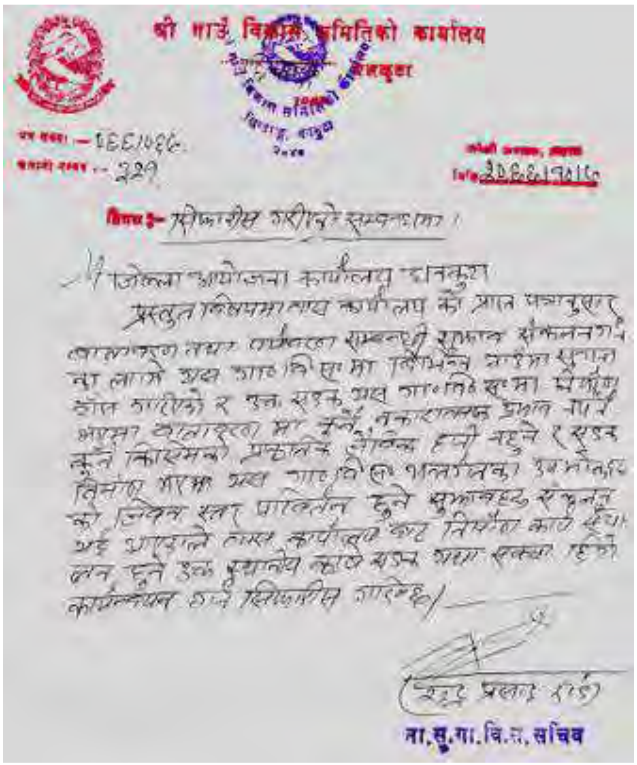
[illegible]

विषय :- सिफारिस गरिएको बारे ।

श्री जिल्ला आयोजना कार्यालय
धनकुटा ।

उपरोक्त सम्बन्धमा हिले खिन्ताङ्ग सडक निर्माण गर्ने सिलसिलामा यस गा.वि.स. भएर जाने भएको मा वातावरणीय असर प्रतिकूल हुँने तर्फले भएको ईका अयामाक्य चौडा भन्दा चौडा निर्माण प्रारम्भ गर्ने कोशिश अनुरोध गरिएछ ।

[illegible]
अध्यक्ष
गा.वि.स. [illegible]
धनकुटा



श्री गाउँ विकास समितिको कार्यालय

धनकुटा

[illegible] — IEE/[illegible]
[illegible] — 329

विषय :- सिफारिस गरीएको सम्बन्धमा ।

जिल्ला आयोजना कार्यालय धनकुटा

प्रस्तुत विषयमा यस कार्यालय को प्राप्त पत्रानुसार [illegible] तथा [illegible] सम्बन्धी [illegible] [illegible] लागि यस गा.वि.स. मा विभिन्न [illegible] [illegible] र उक्त सडक यस गा.वि.स. मा [illegible] [illegible] मा कुनै [illegible] प्रकारले [illegible] हुने र सडक निर्माण गरेमा यस गा.वि.स. भौतिक [illegible] को जिवन स्तर परिवर्तन हुने सुझावहरु रहेकोले यस आयोजनाले यस कार्यालय बाट निर्माण कार्य [illegible] हुने उक्त सुझावहरु कार्य सम्पन्न [illegible] कार्यान्वयन गर्न सिफारिस गरिएछ ।

[illegible]
सचिव
गा.वि.स. सचिव

Appendix - XII

XII a. Distribution of population by major occupation
XII b. Summary of public services & infrastructures
XII c. Land holding pattern of settlements within ZoI
XII d. Number of households belonging to different food security category

XIIa. Distribution of Households by Major Occupation

S.N	Settlement Name	VDC	Number of HH in (in percentage)			
			Agriculture & Livestock	Labour & Porter	Business/ Commerce	Employees
1.	Uttarpani, Dharmasala	Chungbang	77.76	9.82	1.7	10.72
2.	Utarpani, Dharmasala, Marga	Belhara	79.98	12.92	1.7	5.4
3.	Thalthale, Marga pokhari, Sukeaahal	Ankhisalla	76.3	13.12	5.78	4.8
4.	Pipal danda	Khoku	78.17	16.76	0.6	4.47
5.	Panchakanya, Devithan, Samgaun, Jyamire	Chhintang	79.52	17.18	0.9	2.4
		Average(%)	**78**	**14**	**2**	**6**

Source: Field survey, 2009 and District Profile 2066

XII b. Summary of public services and infrastructures

S.N	Service/Infrastructure Category	Settlement Code										
		A	B	C	D	E	F	G	H	I		Others
1	**EDUCATION**											
1.1	Campus (no.)/Higher secondary	-	-	1	-	1	1	-	-	- 1		
1.2	High School (no.)/ Lower secondary	-	-	1	-	1	1	-		1		
1.3	Primary School (no.)	1	1	1	1	1	1	1	1	1		
2	**HEALTH**											
2.1	Hospital/health centre (no.) Capacity (beds)	-	-	-								
2.2	Health Post (no.) Sub-Health Post (no.)	-	-	-	-1	1-	-	-1	-	- 1		
3	**COMMUNICATION**											
3.1	Telephone/fax	√	√	√	√	√	√	√	√	√		
3.2	Mobile/CDMA	√	√	√	√	√	√	√	√	√		
3.3	Post Office	-	-√	-	-	-√	-	-	-	- √		
4	**ELECTRICITY SUPPLY**											
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	-	-	-	-	-	-	-	-	-		
5	**BUSINESS & COMMERCE**											
5.1	Hotels & Lodges (no.)	5	5	2	4	10	2	4	3	3		
5.2	Restaurant & Tea Stall (no)	2	2	1	5	2	2	3	2	2		
5.3	Grocery Shops (no.)											
5.4	Other Shops (no.) (e.g. stationery, medicine, tailoring, etc.)	6	4	1	1	10	2	4	1	4		

S.N	Service/Infrastructure Category	Settlement Code										
		A	B	C	D	E	F	G	H	I		Others
6	**DRINKING WATER SUPPLY SCHEMES**											
6.1	Gravity-Flow Scheme (capacity)	-	-	-	-	-	-	-	-	-		
6.2	Tube-wells (no.)	-	-	-	-	-	-	-	-	-		
6.3	Spring/Dug-wells (no.)											
7	**IRRIGATION SCHEMES**											
7.1	Surface Irrigation(ha)	-	-	-	-	-	-	-	-	-		
7.2	Groundwater (ha.)	-	-	-	-	-	-	-	-	-		
8	**OTHER INFRASTRUCTURES**											
8.1	Micro-hydro scheme (no. & capacity.....kw)	-	-	-	-	-	-	-	-	-		
8.2	Water Mill (no.)											
8.3	Suspension Bridges (no.)											
8.4	Wooden Bridges (no.)	-	1	1	1	1	1	-	-	-		
8.5	Other Bridges (specify)	-	-	-	-	-	-	-	-	-		
9	**INDUSTRY**											
9.1	Weaving Industry (no.)	-	-	-	-	-	-	-	-	-		
9.2	Rice & flour Mills (no.)	-1	-	1-	-	-1	-	-1	-1	-1	-	
9.3	Other Industries (specify)	-	-	-	-	-	-	-	-	-		
10	**FINANCIAL INSTITUTIONS**											
10.1	Bank (no.)	-	-	-	-	-	-	-	-	-		
10.2	Cooperative	-	1		1				1	-		
11	**COMMUNITY USE**											
11.1	Ghat (no.)	-	-	-	-	-		-	-	-		
11.2	Hatia/Bazaar (no.)	-	1	1	1	1	1	1	1	1		
11.3	Playground (no.)	1	1	1	1	1	1	1	1	1		
11.4	Community Centre (no.)	1	1	1	2	1	1	1	1	2		
11.5	Others (specify)	-	-	-	-	-	-	-	-	-		

Source: Field survey, July 2009

*Note: A. Uttarpani B. Dharmasala C. Marga D.Sukeaahal E.Thalthale F.Pipledanda G. Panchakanya H. Devithan I.Sambugaun

XII c. Land holding pattern of settlements within ZoI

S. N	Influenced VDCs	Distribution of HHs by land holdings						Total
		Less than one ropani	Less than 5 ropani	5-10 ropani	10-20 ropani	20-50 ropani	More than 50 ropani	
1	Chungbang	4	62	125	184	253	70	698
2	Belhara	3	72	62	69	76	22	304
3	Aankhisalla	1	78	126	162	108	33	508
4	Khoku	0	65	106	125	89	35	420
5	Chhintang	0	172	210	222	143	41	788
	Total	**8**	**449**	**629**	**762**	**669**	**201**	**2718**

Source: Field survey / ZoI HH survey of RRRSDP, 2009

XII d. Number of Households Belonging to Different Food Security Category

S.N	Settlement Name	Distribution of HHs by food sufficiency level				Total HHs
		0-3 months	3-6 months	6-9 months	9-12 months	
1	Uttarpani, Dharmasala (Chungbang VDC)	148	253	154	143	698
2	Utarpani, Dharmasala, Marga (Belhara VDC)	131	103	42	28	304
3	Thalthale, Marga pokhari, Sukeaahal (Ankhisalla VDC)	204	211	59	34	508
4	Pipal Danda (Khoku VDC)	116	209	60	35	420
5	Panchakanya, Devithan, Sambugaun, Jyamire (Chhintang VDC)	146	469	127	46	788
	Total	**745**	**1245**	**442**	**286**	**2718**
	Percentage (%)	**27.4**	**45.8**	**16.3**	**10.5**	**100**

Source: Field survey / ZoI HH survey of RRRSDP, 2009

Appendix - XIII:

Topography, Elevation and Soil type along the road alignment

S.N	Chainage		Length(m)	Elevation(m)	Aspect	Soil type
	From	To				
1.0	0+000.00	0+200.00	200.00	1870	South	OS
2.0	0+200.00	0+350.00	150.00	1867	South	OS
3.0	0+350.00	0+500.00	150.00	1862	South	OS
4.0	0+500.00	0+750.00	250.00	1860	South	OS,HS
5.0	0+750.00	0+880.00	130.00	1845	South	OS
6.0	0+880.00	1+450.00	570.00	1823	South	OS
7.0	1+450.00	1+566.00	116.00	1798	South	OS
8.0	1+566.00	1+936.00	370.00	1785	South	OS
9.0	1+936.00	2+150.00	214.00	1778	South	OS
10.0	2+150.00	2+425.00	275.00	1772	South	OS
11.0	2+425.00	2+750.00	325.00	1742	South	OS
12.0	2+750.00	3+000.00	250.00	1718	South	OS
13.0	3+000.00	3+450.00	450.00	1702	South	OS,HS
14.0	3+450.00	3+700.00	250.00	1686	South	OS
15.0	3+700.00	4+300.00	600.00	1678	South	OS
16.0	4+300.00	4+500.00	200.00	1645	South	OS
17.0	4+500.00	4+750.00	250.00	1632	South	OS
18.0	4+750.00	5+000.00	250.00	1603	South	OS
19.0	5+000.00	5+050.00	50.00	1597	South	OS
20.0	5+050.00	6+050.00	1000.00	1566	South,west	OS,HS
21.0	6+050.00	6+170.00	120.00	1536	South,west	OS,HS
22.0	6+170.00	6+400.00	230.00	1511	South,west	OS,HS
23.0	6+400.00	6+550.00	150.00	1483	South,west	OS
24.0	6+550.00	6+850.00	300.00	1476	South,west	OS
25.0	6+850.00	7+100.00	250.00	1442	South,west	OS
26.0	7+100.00	7+250.00	150.00	1409	South,west	OS,HS
27.0	7+250.00	7+550.00	300.00	1389	South,west	OS
28.0	7+550.00	7+750.00	200.00	1368	South,east	OS
29.0	7+750.00	8+150.00	400.00	1355	South,east	OS
30.0	8+150.00	8+350.00	200.00	1328	South,east	OS
31.0	8+350.00	8+570.00	220.00	1304	South,east	OS
32.0	8+570.00	8+950.00	380.00	1267	South,west	OS
33.0	8+950.00	9+100.00	150.00	1245	South,west	OS
34.0	9+100.00	9+350.00	250.00	1205	South,west	OS
35.0	9+350.00	9+650.00	300.00	1196	South,west	OS,HS,HR
36.0	9+650.00	9+900.00	250.00	1186	South,west	OS,HS
37.0	9+900.00	10+200.00	300.00	1176	South,west	OS,HS,HR
38.0	10+200.00	10+690.00	490.00	1175	South,west	OS,HS,HR
39.0	10+690.00	10+750.00	60.00	1183	South,west	OS,HS,HR
40.0	10+750.00	10+800.00	50.00	1195	South,west	OS,HS,HR
41.0	10+800.00	11+000.00	200.00	1502	South,west	OS,HS,HR
42.0	11+000.00	11+354.00	354.00	1511	South,west	OS,HS,HR

S.N	Chainage		Length(m)	Elevation(m)	Aspect	Soil type
	From	To				
43.0	11+354.00	11+376.00	22.00	1526	South,west	OS,HS
44.0	11+376.00	11+430.00	54.00	1545	South,west	OS,HS
45.0	11+430.00	11+565.00	135.00	1532	South,west	OS,HS
46.0	11+565.00	11+620.00	55.00	1524	South,west	OS,HS
47.0	11+620.00	11+685.00	65.00	1502	South,west	OS
48.0	11+685.00	11+750.00	65.00	1425	South,west	OS
49.0	11+750.00	11+897.00	147.00	1436	South,west	OS,HS,OR
50.0	11+897.00	12+015.00	118.00	1438	South,west	OS,HS,OR
51.0	12+015.00	12+145.00	130.00	1435	South,west	OS,HS,OR
52.0	12+145.00	12+182.00	37.00	1433	South,west	OS,HS,OR
53.0	12+182.00	12+241.00	59.00	1430	South,west	OS,HS,OR
54.0	12+241.00	12+345.00	104.00	1425	South,west	OS,HS
55.0	12+345.00	12+395.00	50.00	1423	South,west	OS,HS,OR
56.0	12+395.00	12+460.00	65.00	1422	South,west	OS,HS
57.0	12+460.00	12+495.00	35.00	1421	South,west	OS,HS,OR
58.0	12+495.00	12+545.00	50.00	1417	South,west	OS,HS
59.0	12+545.00	12+605.00	60.00	1413	South,west	OS,HS,HR
60.0	12+605.00	12+630.00	25.00	1415	South,west	OS,HS
61.0	12+630.00	12+725.00	95.00	1416	South,west	OS,HS,HR
62.0	12+725.00	12+835.00	110.00	1417	South,west	OS,HS
63.0	12+835.00	12+895.00	60.00	1420	South,east	OS,HS
64.0	12+895.00	13+097.00	202.00	1414	South,east	OS,HS
65.0	13+097.00	13+205.00	108.00	1419	South,east	OS,HS
66.0	13+205.00	13+270.00	65.00	1419	South,east	OS,HS
67.0	13+270.00	13+315.00	45.00	1419	South,east	OS,HS,OR
68.0	13+315.00	13+410.00	95.00	1418	South,east	OS,HS
69.0	13+410.00	13+475.00	65.00	1421	South,east	OS,HS,OR
70.0	13+475.00	13+490.00	15.00	1422	South,east	OS,HS,OR
71.0	13+490.00	13+525.00	35.00	1424	South,east	OS,HS,OR
72.0	13+525.00	13+590.00	65.00	1426	South,east	OS,HS,OR
73.0	13+590.00	13+840.00	250.00	1418	South,east	OS,HS,OR
74.0	13+840.00	13+995.00	155.00	1417	South,east	OS,HS,OR
75.0	13+995.00	14+085.00	90.00	1417	South,east	OS,HS,OR
76.0	14+085.00	14+220.00	135.00	1415	South,east	OS,HS,OR
77.0	14+220.00	14+280.00	60.00	1411	South,east	OS,HS,OR
78.0	14+280.00	14+420.00	140.00	1409	South,east	OS,HS
79.0	14+420.00	14+530.00	110.00	1407	South,west	OS,HS
80.0	14+530.00	14+600.00	70.00	1400	South,west	OS,HS
81.0	14+600.00	14+800.00	200.00	1391	South,west	OS,HS
82.0	14+800.00	14+890.00	90.00	1387	South,west	OS,HS
83.0	14+890.00	14+920.00	30.00	1384	South,west	OS,HS,OR
84.0	14+920.00	15+000.00	80.00	1374	South,west	OS,HS

S.N	Chainage		Length(m)	Elevation(m)	Aspect	Soil type
	From	To				
85.0	15+000.00	15+135.00	135.00	1366	South,west	OS,HS
86.0	15+135.00	15+215.00	80.00	1362	South,west	OS
87.0	15+215.00	15+267.00	52.00	1359	South,west	OS,HS,OR
88.0	15+267.00	15+350.00	83.00	1356	South,west	OS,HS,OR
89.0	15+350.00	15+430.00	80.00	1355	South,west	OS,HS,OR
90.0	15+430.00	15+480.00	50.00	1354	South,west	OS,HS
91.0	15+480.00	15+540.00	60.00	1354	South,west	OS,HS,OR
92.0	15+540.00	15+615.00	75.00	1352	South,west	OS,HS,OR,MR,HR
93.0	15+615.00	15+840.00	225.00	1336	South,west	OS,HS,OR,MR
94.0	15+840.00	16+000.00	160.00	1325	South,west	OS,HS,OR,MR,HR
95.0	16+000.00	16+225.00	225.00	1314	South,west	OS,HS,OR,MR
96.0	16+225.00	16+300.00	75.00	1315	South,west	OS,HS,OR,MR,HR
97.0	16+300.00	16+430.00	130.00	1314	South,west	OS,HS,OR,MR
98.0	16+430.00	16+520.00	90.00	1311	South,west	OS,HS
99.0	16+520.00	16+790.00	270.00	1306	South,west	OS,HS
100.0	16+790.00	17+050.00	260.00	1293	South,west	OS,HS,OR
101.0	17+050.00	17+200.00	150.00	1281	South,west	OS,HS,OR
102.0	17+200.00	17+325.00	125.00	1276	South,west	OS,HS,OR,MR
103.0	17+325.00	17+465.00	140.00	1265	South,west	OS,HS,OR,MR
104.0	17+465.00	17+560.00	95.00	1254	South,west	OS,HS,OR,MR
105.0	17+560.00	17+700.00	140.00	1235	South,west	OS,HS,OR,MR
106.0	17+700.00	17+860.00	160.00	1223	South	OS,HS,,MR
107.0	17+860.00	18+170.00	310.00	1208	South	OS,HS,,MR
108.0	18+170.00	18+420.00	250.00	1197	South	OS,HS
109.0	18+420.00	18+750.00	330.00	1174	South	OS,HS
110.0	18+750.00	19+140.00	390.00	1138	South	OS,HS
111.0	19+140.00	19+440.00	300.00	1117	South	OS,HS,OR
112.0	19+440.00	19+610.00	170.00	1103	South	OS,HS,OR
113.0	19+610.00	19+750.00	140.00	1089	South	OS,HS,OR,HR
114.0	19+750.00	19+915.00	165.00	1094	South	OS,HS
115.0	19+915.00	20+110.00	195.00	1103	South	OS,HS,OR
116.0	20+110.00	20+365.00	255.00	1111	South,west	OS,HS,OR
117.0	20+365.00	20+480.00	115.00	1109	South,west	OS,HS,OR
118.0	20+480.00	20+550.00	70.00	1109	South,west	OS,HS
119.0	20+550.00	20+675.00	125.00	1117	South,west	OS,HS,OR,HR
120.0	20+675.00	20+785.00	110.00	1116	South,west	OS,HS,OR,HR
121.0	20+785.00	20+905.00	120.00	1112	South,west	OS,HS,OR,HR
122.0	20+905.00	21+215.00	310.00	1128	South,west	OS,HS,OR
123.0	21+215.00	21+370.00	155.00	1122	South,west	OS,HS
124.0	21+370.00	21+550.00	180.00	1132	South,west	OS,HS,OR
125.0	21+550.00	21+700.00	150.00	1137	South,west	OS,HS,OR
126.0	21+700.00	21+880.00	180.00	1139	South,west	OS,HS,OR

S.N	Chainage		Length(m)	Elevation(m)	Aspect	Soil type
	From	To				
127.0	21+880.00	22+050.00	170.00	1132	South,west	OS,HS,OR
128.0	22+050.00	22+260.00	210.00	1126	South,east	OS,HS,OR
129.0	22+260.00	22+370.00	110.00	1121	South,east	OS,HS,OR
130.0	22+370.00	22+670.00	300.00	1101	South,east	OS,HS
131.0	22+670.00	22+940.00	270.00	1087	South,east	OS,HS,OR
132.0	22+940.00	23+090.00	150.00	1088	South,east	OS,HS
133.0	23+090.00	23+195.00	105.00	1092	South,east	OS,HS,OR
134.0	23+195.00	23+385.00	190.00	1084	South,east	OS,HS
135.0	23+385.00	23+565.00	180.00	1071	South,east	OS,HS,OR
136.0	23+565.00	23+670.00	105.00	1055	South,east	OS,HS
137.0	23+670.00	23+871.00	201.00	1053	South,east	OS,HS,OR

Source: Detailed Design, 2009

* Codes:
OR – Ordinary Rock OS – Ordinary Soil
MR –Medium Rock HS – Hard Soil
HR – Hard Rock

Appendix - XIV:
Summary of Land use pattern along the road alignment

S. N.	Chainage		Effecting VDC / Municipality	Settlement	Profile	Alignment Condition	Land Use Pattern
	From	To					
1	0+000	1+000	Hille Municipality	West part of Hille	Descending	Valley	Barren/
2	1+000	2+300	Chumbang/Belhara	Uttarpani	Descending	Valley	Barren/
3	2+300	2+600	Chumbang/Belhara	Uttarpani	Ascending	Valley	Cultivated Land
4	2+600	3+000	Chumbang/Belhara	Uttarpani	Descending	Valley	Cultivated Land
5	3+000	4+500	Chumbang/Belhara	Dharmasala	Ascending	Valley	Cultivated Land
6	4+500	4+700	Chumbang/Belhara	Dharmasala	Ascending	Valley	Forest
7	4+700	5+500	Chumbang/Belhara	Dharmasala	Descending	Valley	Cultivated Land
8	5+500	6+500	Chumbang/Belhara	Dharmasala	Descending	Valley	Forest/ Cultivated Land
9	6+500	7+200	Chumbang/Belhara	Dharmasala	Descending	Valley	Cultivated Land
10	7+200	7+300	Chumbang/Belhara/ Aakhisalla	Marga	Descending	Valley	Cultivated Land
11	7+300	8+300	Aakhisalla	-	Descending	Valley	Forest/ Cultivated Land
12	8+300	8+400	Aakhisalla	Chedi	Descending	Valley	Cultivated Land
13	8+400	9+000	Aakhisalla	-	Descending	Valley	Forest/Cultivated Land
14	9+000	9+800	Aakhisalla	-	Descending	Valley	Cultivated Land
15	9+800	10+000	Aakhisalla	Sukehal	Descending	Valley	Cultivated Land
16	10+000	10+900	Aakhisalla	-	Ascending	Valley	Cultivated Land
17	10+900	11+200	Aakhisalla	Thalthale	Descending	Valley	Cultivated Land
18	11+200	11+450	Aakhisalla	Thalthale	Ascending	Valley	Forest/ Cultivated Land
19	11+450	12+100	Aakhisalla	Thalthale	Descending	ridge	Forest/ Cultivated Land
20	12+100	12+900	Aakhisalla	-	Descending	Valley	Forest/ Cultivated Land

S.N.	Chainage		Effecting VDC / Municipality	Settlement	Profile	Alignment Condition	Land Use Pattern
	From	To					
21	12+900	13+500	Aakhisalla	-	Descending	Valley	Forest/ Cultivated Land
22	13+500	14+000	Aakhisalla	-	Descending	Valley	Forest/ Cultivated Land
23	14+000	14+300	Khoku	Piple Danda	Descending	ridge	Cultivated Land
24	14+300	15+000	Khoku	-	Descending	Valley	Forest/ Cultivated Land
25	15+000	16+100	Chhintang	-	Descending	Valley	Forest/ Cultivated Land
26	16+100	16+350	Chhintang	-	Ascending	Valley	Forest/ Cultivated Land
27	16+350	17+000	Chhintang	-	Descending	Valley	Forest/ Cultivated Land
28	17+000	18+000	Chhintang	-	Descending	Valley	Forest/ Cultivated Land
29	18+000	18+200	Chhintang	Panchakanya	Descending	ridge	Cultivated Land
30	18+200	19+000	Chhintang	Panchakanya	Descending	Valley	Cultivated Land
31	19+000	20+000	Chhintang	Chhintang	Descending	Valley	Cultivated Land
32	20+000	20+500	Chhintang	Chhintang	Ascending	Valley	Cultivated Land
33	20+500	20+700	Chhintang	Chhintang	Descending	Valley	Cultivated Land
34	20+700	21+200	Chhintang	Chhintang	Ascending	Valley	Cultivated Land
35	21+200	21+300	Chhintang	Chhintang	Descending	Valley	Cultivated Land
36	21+300	21+800	Chhintang	Chhintang	Ascending	Valley	Cultivated Land
37	21+800	22+800	Chhintang	Chhintang	Descending	Valley	Cultivated Land
38	22+800	23+700	Chhintang	Chhintang	Descending	Valley	Cultivated Land
39	23+700	23+900	Chhintang	Jyamire	Descending	ridge	Cultivated Land

Source: Field Survey, 2009

Appendix - XV:
Religious Sites and their Details along the Road Alignment

S.N	Descriptions	Distance from road alignment	Impact type and level
1	Saraswoti Temple (Uttarpani)	50m	No impact
2	Durga Bhagawati Temple	15m	No impact
3	Dharmasala Gumba	Within Row	Might be affected
4	Marga Temple	70m	No impact
5	Saraswoti Temple (Suke aahal)	40m	No impact
6	Shiva Temple	Within Row	Might be affected
7	Pipal Tree, Martyrs statue (Panchakanya)	Within RoW	Might be affected
8	Panchkanya Temple	8m	NO impact
9	Chhintang Jalapi Devi Temple	6m	No impact

Source: Field Survey, 2009

Appendix - XVI: Structures for Slope Stabilization

Appendix - XVI a: Recommended dry wall structures at various places

S.N	Chainage		Length	Height	Area(m^2)	Remarks
	From	To				
1.0	0+720.00	0+730.00	10.00	2.00	20.00	Toe Wall
2.0	3+470.00	3+485.00	15.00	2.00	30.00	Toe Wall
3.0	3+590.00	3+605.00	15.00	2.00	30.00	Retaining Wall
4.0	3+830.00	3+840.00	10.00	2.00	20.00	Toe Wall
5.0	4+505.00	4+520.00	15.00	2.00	30.00	Toe Wall
6.0	4+730.00	4+745.00	15.00	2.00	30.00	Toe Wall
7.0	4+840.00	4+850.00	10.00	2.00	20.00	Toe Wall
8.0	6+475.00	6+480.00	15.00	1.50	22.50	Toe Wall
9.0	6+510.00	6+520.00	10.00	1.50	15.00	Toe Wall
10.0	6+740.00	6+755.00	15.00	2.00	30.00	Toe Wall
11.0	7+010.00	7+020.00	10.00	1.50	15.00	Toe Wall
12.0	7+320.00	7+328.00	8.00	1.00	8.00	Retaining Wall
13.0	7+510.00	7+515.00	5.00	2.00	10.00	Toe Wall
14.0	7+683.00	7+690.00	7.00	2.00	14.00	Toe Wall
15.0	8+225.00	8+230.00	5.00	1.50	7.50	Toe Wall
16.0	8+475.00	8+482.00	7.00	2.50	17.50	Toe Wall
17.0	8+915.00	8+925.00	10.00	2.50	25.00	Toe Wall
18.0	9+014.00	9+018.00	4.00	2.00	8.00	Toe Wall
19.0	9+166.00	9+171.00	5.00	1.50	7.50	Retaining Wall
20.0	9+175.00	9+182.00	7.00	2.00	14.00	Toe Wall
21.0	9+215.00	9+225.00	10.00	2.00	20.00	Toe Wall
22.0	9+295.00	9+305.00	10.00	2.00	20.00	Toe Wall
23.0	9+355.00	9+365.00	10.00	2.00	20.00	Toe Wall
24.0	9+375.00	9+380.00	5.00	2.00	10.00	Toe Wall
25.0	9+565.00	9+570.00	5.00	2.00	10.00	Toe Wall
26.0	9+655.00	9+660.00	5.00	2.00	10.00	Retaining Wall
27.0	10+230.00	10+235.00	5.00	1.50	7.50	Retaining Wall
28.0	10+775.00	10+785.00	10.00	2.50	25.00	Retaining Wall
29.0	11+290.00	11+300.00	12.00	2.00	24.00	Toe Wall
30.0	11+762.00	11+767.00	15.00	5.00	75.00	Retaining Wall
31.0	12+003.00	12+013.00	10.00	2.00	20.00	Retaining Wall
32.0	12+135.00	12+150.00	15.00	2.50	37.50	Retaining Wall
33.0	12+420.00	12+430.00	10.00	1.50	15.00	Retaining Wall
34.0	12+565.00	12+577.00	12.00	2.50	30.00	Retaining Wall
35.0	12+630.00	12+638.00	8.00	2.00	16.00	Retaining Wall
36.0	13+000.00	13+010.00	10.00	2.00	20.00	Retaining Wall
37.0	15+415.00	15+421.00	6.00	2.00	12.00	Retaining Wall
38.0	16+095.00	16+105.00	10.00	2.00	20.00	Toe Wall
39.0	16+275.00	16+285.00	10.00	2.00	20.00	Retaining Wall
40.0	17+030.00	17+042.00	12.00	2.00	24.00	Retaining Wall

S.N	Chainage		Length	Height	Area(m^2)	Remarks
	From	To				
41.0	17+140.00	17+155.00	15.00	2.00	30.00	Retaining Wall
42.0	17+260.00	17+272.00	12.00	2.00	24.00	Retaining Wall
43.0	17+420.00	17+435.00	15.00	2.00	30.00	Retaining Wall
44.0	18+075.00	18+090.00	15.00	2.00	30.00	Retaining Wall
45.0	18+610.00	18+615.00	5.00	1.00	5.00	Retaining Wall
46.0	18+740.00	18+760.00	20.00	2.00	40.00	Retaining Wall
47.0	19+040.00	19+060.00	20.00	1.50	30.00	Retaining Wall
48.0	19+120.00	19+145.00	25.00	1.50	37.50	Retaining Wall
49.0	19+480.00	19+490.00	10.00	2.00	20.00	Retaining Wall
50.0	19+495.00	19+505.00	10.00	2.00	20.00	Retaining Wall
51.0	19+960.00	19+690.00	25.00	2.00	50.00	Retaining Wall
52.0	20+000.00	2+040.00	40.00	3.00	120.00	Retaining Wall
53.0	20+460.00	20+480.00	20.00	2.00	40.00	Retaining Wall
54.0	21+277.00	21+287.00	10.00	2.00	20.00	Retaining Wall
55.0	21+965.00	21+975.00	10.00	3.00	30.00	Retaining Wall
56.0	22+010.00	22+030.00	20.00	3.00	60.00	Retaining Wall

Source: Detailed Design, 2009

Appendix - XVIb:

Recommended Gabion wall structures at various places

S.N	Chainage		Length	Height	Area(m^2)	Remarks
	From	To				
1.0	0+385.00	0+400.00	15.00	4.00	60.00	Retaining Wall
2.0	0+440.00	0+470.00	30.00	3.00	90.00	Breast Wall
3.0	0+545.00	0+560.00	15.00	3.00	45.00	Retaining Wall
4.0	0+765.00	0+777.00	12.00	3.00	36.00	Retaining Wall
5.0	0+840.00	0+850.00	10.00	2.00	20.00	Retaining Wall (after existing hume pipe)
6.0	1+070.00	1+080.00	10.00	3.00	30.00	Retaining Wall
7.0	1+310.00	1+322.00	12.00	2.00	24.00	Retaining Wall
8.0	1+410.00	1+420.00	10.00	2.00	20.00	Retaining Wall
9.0	1+450.00	1+462.00	12.00	2.00	24.00	Retaining Wall
10.0	1+460.00	1+470.00	10.00	2.00	20.00	Retaining Wall
11.0	1+520.00	1+535.00	15.00	4.00	60.00	Retaining Wall
12.0	1+615.00	1+621.00	6.00	3.00	18.00	Toe Wall
13.0	1+990.00	2+000.00	10.00	2.00	20.00	Retaining Wall
14.0	2+348.00	2+354.00	6.00	1.00	6.00	Retaining Wall
15.0	3+115.00	3+127.00	12.00	2.00	24.00	Toe Wall
16.0	4+770.00	4+785.00	15.00	2.00	30.00	Retaining Wall
17.0	5+070.00	5+090.00	20.00	2.00	40.00	Toe Wall
18.0	5+185.00	5+205.00	20.00	2.00	40.00	Retaining Wall
19.0	5+386.00	5+400.00	14.00	3.00	42.00	Breast Wall
20.0	5+915.00	5+930.00	15.00	3.00	45.00	Breast Wall
21.0	6+010.00	6+020.00	10.00	5.00	50.00	Retaining Wall
22.0	6+125.00	6+135.00	10.00	3.00	30.00	Retaining Wall
23.0	6+160.00	6+170.00	10.00	3.00	30.00	Retaining Wall
24.0	6+210.00	6+230.00	20.00	3.00	60.00	Retaining Wall
25.0	6+283.00	6+297.00	14.00	3.00	42.00	Retaining Wall
26.0	6+320.00	6+328.00	8.00	3.00	24.00	Retaining Wall
27.0	6+648.00	6+656.00	8.00	4.00	32.00	Retaining Wall
28.0	6+880.00	6+895.00	15.00	3.00	45.00	Retaining Wall
29.0	6+920.00	6+935.00	15.00	2.00	30.00	Toe Wall
30.0	7+105.00	7+125.00	20.00	3.00	60.00	Toe Wall
31.0	7+155.00	7+175.00	20.00	3.00	60.00	Toe Wall
32.0	7+200.00	7+215.00	15.00	3.00	45.00	Retaining Wall
33.0	7+220.00	7+228.00	8.00	3.00	24.00	Retaining Wall
34.0	7+240.00	7+250.00	10.00	3.00	30.00	Breast Wall
35.0	7+240.00	7+255.00	15.00	3.00	45.00	Retaining Wall
36.0	7+260.00	7+270.00	10.00	3.00	30.00	Retaining Wall
37.0	7+535.00	7+545.00	10.00	3.00	30.00	Kholsi
38.0	7+555.00	7+570.00	15.00	4.00	60.00	Retaining Wall

S.N	Chainage		Length	Height	Area(m^2)	Remarks
	From	To				
39.0	7+580.00	7+590.00	10.00	3.00	30.00	Toe Wall
40.0	7+665.00	7+672.00	7.00	3.00	21.00	Retaining Wall
41.0	7+755.00	7+790.00	35.00	3.00	105.00	Retaining Wall
42.0	7+760.00	7+795.00	35.00	3.00	105.00	Breast Wall
43.0	7+805.00	7+825.00	20.00	4.00	80.00	Retaining Wall
44.0	7+835.00	7+850.00	15.00	3.00	45.00	Toe Wall
45.0	7+905.00	7+912.00	7.00	2.00	14.00	Toe Wall
46.0	7+988.00	7+995.00	7.00	2.00	14.00	Toe Wall
47.0	8+010.00	8+018.00	8.00	3.00	24.00	Toe Wall
48.0	8+025.00	8+037.00	12.00	3.00	36.00	Toe Wall
49.0	8+050.00	8+060.00	10.00	5.00	50.00	Retaining Wall
50.0	8+060.00	8+075.00	15.00	6.00	90.00	Retaining Wall
51.0	8+105.00	8+117.00	12.00	3.00	36.00	Retaining Wall
52.0	8+140.00	8+160.00	20.00	3.00	60.00	Retaining Wall
53.0	8+190.00	8+205.00	15.00	3.00	45.00	Retaining Wall
54.0	8+255.00	8+270.00	15.00	3.00	45.00	Toe Wall
55.0	8+325.00	8+347.00	22.00	5.00	110.00	Retaining Wall
56.0	8+323.00	8+330.00	7.00	3.00	21.00	Toe Wall
57.0	8+340.00	8+350.00	10.00	4.00	40.00	Toe Wall
58.0	8+390.00	8+400.00	10.00	4.00	40.00	Retaining Wall
59.0	8+390.00	8+400.00	10.00	3.00	30.00	Check Dam
60.0	8+430.00	8+440.00	10.00	3.00	30.00	Retaining Wall
61.0	8+430.00	8+437.00	7.00	3.00	21.00	Retaining Wall
62.0	8+439.00	8+446.00	7.00	3.00	21.00	Retaining Wall
63.0	8+490.00	8+502.00	12.00	4.00	48.00	Retaining Wall
64.0	8+570.00	8+580.00	10.00	3.00	30.00	Retaining Wall
65.0	8+690.00	8+697.00	7.00	2.00	14.00	Retaining Wall
66.0	8+725.00	8+737.00	12.00	4.00	48.00	Toe Wall
67.0	8+790.00	8+798.00	8.00	3.00	24.00	Toe Wall
68.0	8+940.00	8+947.00	7.00	3.00	21.00	Toe Wall
69.0	9+095.00	9+100.00	5.00	2.00	10.00	Retaining Wall
70.0	9+155.00	9+162.00	7.00	2.00	14.00	Retaining Wall
71.0	9+270.00	9+282.00	12.00	4.00	48.00	Retaining Wall
72.0	9+435.00	9+447.00	12.00	3.00	36.00	Retaining Wall
73.0	9+502.00	9+515.00	13.00	2.00	26.00	Retaining Wall
74.0	9+535.00	9+550.00	15.00	3.00	45.00	Toe Wall
75.0	9+668.00	9+698.00	30.00	3.00	90.00	Retaining Wall
76.0	7+785.00	7+815.00	30.00	3.00	90.00	Retaining Wall
77.0	9+860.00	9+890.00	30.00	3.00	90.00	Retaining Wall
78.0	9+910.00	9+930.00	20.00	4.00	80.00	Retaining Wall
79.0	9+985.00	9+995.00	10.00	6.00	60.00	Retaining Wall
80.0	9+985.00	10+000.00	15.00	3.00	45.00	Check Dam

S.N	Chainage		Length	Height	Area(m^2)	Remarks
	From	To				
81.0	10+080.00	10+100.00	20.00	3.00	60.00	Retaining Wall
82.0	10+150.00	10+180.00	30.00	3.00	90.00	Toe Wall
83.0	10+215.00	10+225.00	10.00	3.00	30.00	Toe Wall
84.0	10+260.00	10+280.00	20.00	3.00	60.00	Retaining Wall
85.0	10+343.00	10+355.00	12.00	3.00	36.00	Toe Wall
86.0	10+395.00	10+405.00	10.00	2.00	20.00	Toe Wall
87.0	10+475.00	10+490.00	15.00	3.00	45.00	Retaining Wall
88.0	10+495.00	10+508.00	13.00	3.00	39.00	Retaining Wall
89.0	10+510.00	10+525.00	15.00	3.00	45.00	Retaining Wall(loop)
90.0	10+630.00	10+640.00	10.00	2.00	20.00	Retaining Wall
91.0	10+755.00	10+760.00	10.00	3.00	30.00	Retaining Wall
92.0	11+000.00	11+020.00	20.00	4.00	80.00	Retaining Wall
93.0	11+090.00	11+100.00	10.00	2.00	20.00	Retaining Wall
94.0	11+160.00	11+175.00	15.00	3.00	45.00	Retaining Wall
95.0	11+232.00	11+252.00	20.00	3.00	60.00	Retaining Wall
96.0	11+314.00	11+329.00	15.00	3.00	45.00	Toe Wall
97.0	11+360.00	11+375.00	15.00	2.00	30.00	Breast Wall
98.0	11+442.00	11+455.00	13.00	3.00	39.00	Retaining Wall
99.0	11+564.00	11+590.00	26.00	3.00	78.00	Retaining Wall
100.0	11+590.00	11+600.00	10.00	4.00	40.00	Retaining Wall
101.0	11+632.00	11+644.00	12.00	3.00	36.00	Retaining Wall
102.0	11+820.00	11+850.00	30.00	4.00	120.00	Retaining Wall
103.0	11+860.00	11+872.00	12.00	3.00	36.00	Retaining Wall
104.0	11+948.00	11+960.00	12.00	4.00	48.00	Retaining Wall
105.0	12+045.00	12+060.00	15.00	2.00	30.00	Toe Wall
106.0	12+270.00	12+285.00	15.00	4.00	60.00	Retaining Wall
107.0	12+275.00	12+280.00	5.00	1.00	5.00	Retaining Wall
108.0	12+300.00	12+310.00	10.00	4.00	40.00	Retaining Wall
109.0	12+300.00	12+310.00	10.00	1.00	10.00	Retaining Wall
110.0	12+450.00	12+470.00	20.00	3.00	60.00	Retaining Wall
111.0	12+490.00	12+500.00	10.00	2.00	20.00	Retaining Wall
112.0	12+495.00	12+500.00	5.00	1.00	5.00	Retaining Wall
113.0	12+610.00	12+620.00	10.00	4.00	40.00	Retaining Wall
114.0	12+660.00	12+674.00	14.00	3.00	42.00	Retaining Wall
115.0	12+690.00	12+698.00	8.00	3.00	24.00	Retaining Wall
116.0	13+070.00	13+080.00	10.00	2.00	20.00	Retaining Wall
117.0	13+130.00	13+140.00	10.00	2.00	20.00	Retaining Wall
118.0	13+340.00	13+350.00	10.00	3.00	30.00	Retaining Wall
119.0	13+440.00	13+455.00	15.00	3.00	45.00	Retaining Wall
120.0	13+575.00	13+590.00	15.00	4.00	60.00	Retaining Wall
121.0	13+640.00	13+650.00	10.00	3.00	30.00	Retaining Wall
122.0	13+745.00	13+755.00	10.00	3.00	30.00	Retaining Wall

S.N	Chainage		Length	Height	Area(m^2)	Remarks
	From	To				
123.0	13+830.00	13+850.00	20.00	1.00	20.00	Toe Wall
124.0	13+990.00	14+000.00	10.00	3.00	30.00	Retaining Wall
125.0	14+050.00	14+060.00	10.00	3.00	30.00	Toe Wall
126.0	14+155.00	14+167.00	12.00	3.00	36.00	Retaining Wall
127.0	14+295.00	14+310.00	15.00	3.00	45.00	Toe Wall
128.0	14+450.00	14+460.00	10.00	3.00	30.00	Retaining Wall
129.0	14+800.00	14+875.00	15.00	4.00	60.00	Retaining Wall
130.0	14+860.00	14+875.00	15.00	2.00	30.00	Check Dam
131.0	14+890.00	14+905.00	15.00	5.00	75.00	Retaining Wall
132.0	14+975.00	14+990.00	15.00	3.00	45.00	Retaining Wall
133.0	15+030.00	15+090.00	10.00	3.00	30.00	Retaining Wall
134.0	15+130.00	15+140.00	10.00	3.00	30.00	Retaining Wall
135.0	15+130.00	15+140.00	10.00	2.00	20.00	Check Dam
136.0	15+240.00	15+265.00	12.00	3.00	36.00	Retaining Wall
137.0	15+265.00	15+280.00	15.00	3.00	45.00	Retaining Wall
138.0	15+265.00	15+280.00	10.00	1.00	10.00	Retaining Wall
139.0	15+265.00	15+280.00	10.00	2.00	20.00	Check Dam
140.0	15+335.00	15+345.00	10.00	3.00	30.00	Retaining Wall
141.0	15+540.00	15+555.00	15.00	2.00	30.00	Retaining Wall
142.0	15+570.00	15+580.00	10.00	3.00	30.00	Retaining Wall
143.0	15+570.00	15+580.00	10.00	3.00	30.00	Check Dam
144.0	15+920.00	15+930.00	10.00	3.00	30.00	Retaining Wall
145.0	15+970.00	15+985.00	12.00	2.00	24.00	Check Dam
146.0	15+970.00	15+985.00	10.00	1.00	10.00	Retaining Wall
147.0	15+970.00	15+980.00	10.00	3.00	30.00	Retaining Wall
148.0	15+980.00	15+990.00	10.00	3.00	30.00	Retaining Wall
149.0	16+020.00	16+030.00	10.00	2.00	20.00	Retaining Wall
150.0	16+060.00	16+070.00	10.00	3.00	30.00	Retaining Wall
151.0	16+150.00	16+160.00	10.00	2.00	20.00	Retaining Wall
152.0	16+215.00	16+225.00	10.00	2.00	20.00	Retaining Wall
153.0	16+300.00	16+315.00	15.00	3.00	45.00	Toe Wall
154.0	16+340.00	16+352.00	12.00	3.00	36.00	Toe Wall
155.0	16+510.00	16+520.00	10.00	2.00	20.00	Toe Wall
156.0	16+670.00	16+675.00	15.00	3.00	45.00	Retaining Wall
157.0	16+770.00	16+785.00	15.00	3.00	45.00	Toe Wall
158.0	17+080.00	17+115.00	35.00	4.00	140.00	Retaining Wall
159.0	17+530.00	17+565.00	35.00	3.00	105.00	Retaining Wall
160.0	17+585.00	17+610.00	25.00	3.00	75.00	Retaining Wall
161.0	17+660.00	17+680.00	20.00	4.00	80.00	Retaining Wall
162.0	17+685.00	17+715.00	30.00	4.00	120.00	Retaining Wall
163.0	17+810.00	17+820.00	10.00	3.00	30.00	Retaining Wall
164.0	17+844.00	17+850.00	6.00	3.00	18.00	Retaining Wall

S.N	Chainage		Length	Height	Area(m^2)	Remarks
	From	To				
165.0	17+864.00	17+900.00	35.00	4.00	140.00	Retaining Wall
166.0	17+960.00	17+980.00	20.00	3.00	60.00	Retaining Wall
167.0	18+020.00	18+035.00	15.00	3.00	45.00	Retaining Wall
168.0	18+095.00	18+110.00	15.00	4.00	60.00	Retaining Wall
169.0	18+095.00	18+125.00	30.00	4.00	120.00	Retaining Wall
170.0	18+150.00	18+170.00	20.00	3.00	60.00	Retaining Wall
171.0	18+170.00	18+200.00	30.00	4.00	120.00	Retaining Wall
172.0	18+150.00	18+200.00	50.00	5.00	250.00	Retaining Wall
173.0	18+200.00	18+250.00	40.00	5.00	200.00	Retaining Wall
174.0	18+285.00	18+310.00	25.00	3.00	75.00	Retaining Wall
175.0	18+375.00	18+435.00	60.00	3.00	180.00	Retaining Wall
176.0	18+435.00	18+475.00	40.00	3.00	120.00	Retaining Wall
177.0	18+580.00	18+595.00	15.00	3.00	45.00	Retaining Wall
178.0	18+700.00	18+720.00	20.00	2.00	40.00	Retaining Wall
179.0	18+820.00	18+835.00	15.00	2.00	30.00	Retaining Wall
180.0	18+835.00	18+850.00	15.00	2.00	30.00	Toe Wall
181.0	18+936.00	18+948.00	12.00	3.00	36.00	Check Dam
182.0	18+920.00	18+948.00	28.00	4.00	112.00	Retaining Wall
183.0	19+210.00	19+228.00	18.00	4.00	72.00	Retaining Wall
184.0	19+220.00	19+230.00	10.00	3.00	30.00	Check Dam
185.0	19+430.00	19+450.00	20.00	3.00	60.00	Retaining Wall
186.0	19+640.00	19+655.00	15.00	3.00	45.00	Retaining Wall
187.0	19+640.00	19+650.00	10.00	2.00	20.00	Check Dam
188.0	19+640.00	19+650.00	10.00	1.00	10.00	Retaining Wall
189.0	19+670.00	19+685.00	15.00	2.00	30.00	Retaining Wall
190.0	19+710.00	19+730.00	20.00	3.00	60.00	Retaining Wall
191.0	19+770.00	19+775.00	20.00	6.00	120.00	Retaining Wall
192.0	20+105.00	20+115.00	6.00	3.00	18.00	Retaining Wall
193.0	20+225.00	20+240.00	15.00	2.00	30.00	Retaining Wall
194.0	20+280.00	20+290.00	10.00	3.00	30.00	Retaining Wall
195.0	20+410.00	20+430.00	20.00	3.00	60.00	Retaining Wall
196.0	20+540.00	20+550.00	2.00	2.00	4.00	Retaining Wall
197.0	20+730.00	20+740.00	10.00	2.00	20.00	Retaining Wall
198.0	20+810.00	20+820.00	10.00	2.00	20.00	Check Dam
199.0	20+850.00	20+860.00	10.00	3.00	30.00	Retaining Wall
200.0	20+985.00	20+995.00	10.00	2.00	20.00	Retaining Wall
201.0	21+040.00	21+050.00	10.00	2.00	20.00	Retaining Wall
202.0	21+207.00	21+237.00	30.00	4.00	120.00	Retaining Wall
203.0	21+380.00	21+395.00	15.00	3.00	45.00	Retaining Wall
204.0	21+405.00	21+425.00	20.00	3.00	60.00	Retaining Wall
205.0	21+470.00	21+480.00	10.00	2.00	20.00	Retaining Wall
206.0	21+690.00	21+710.00	20.00	4.00	80.00	Retaining Wall

S.N	Chainage		Length	Height	Area(m^2)	Remarks
	From	To				
207.0	21+690.00	21+710.00	10.00	2.00	20.00	Check Dam
208.0	21+935.00	21+955.00	20.00	3.00	60.00	Retaining Wall
209.0	22+140.00	22+150.00	10.00	4.00	40.00	Retaining Wall
210.0	22+160.00	22+185.00	25.00	4.00	100.00	Retaining Wall
211.0	22+300.00	22+315.00	15.00	4.00	60.00	Retaining Wall
212.0	22+355.00	22+385.00	30.00	3.00	90.00	Retaining Wall
213.0	22+470.00	22+490.00	20.00	3.00	60.00	Retaining Wall
214.0	22+530.00	22+550.00	20.00	3.00	60.00	Retaining Wall
215.0	22+970.00	22+980.00	10.00	3.00	30.00	Retaining Wall
216.0	23+005.00	23+030.00	25.00	3.00	75.00	Retaining Wall
217.0	23+100.00	23+120.00	20.00	4.00	80.00	Retaining Wall
218.0	23+165.00	23+185.00	20.00	3.00	60.00	Retaining Wall
219.0	23+225.00	23+250.00	25.00	3.00	75.00	Retaining Wall
220.0	23+485.00	23+525.00	40.00	3.00	120.00	Retaining Wall
221.0	23+640.00	23+680.00	40.00	2.00	80.00	Retaining Wall
222.0	23+720.00	23+740.00	20.00	4.00	80.00	Retaining Wall

Source: Detailed Design , 2009

Appendix- XVII:
Purposed Pipe culvert for Water Management

S.N	Chainage	300 mm	600 mm	900 mm	1200 mm
1	0+650	-	-	√	-
2	2+228	-	-	√	-
3	2+910	-	√	-	-
4	3+305	-	√	-	-
5	3+737	-	√	-	-
6	4+315	-	-	√	
7	4+325	-	√	-	-
8	4+960	-	√	-	-
9	5+550	-	√	-	-
10	6+070	-	-	√	-
11	7+255	-	-	√	-
12	16+020	-	-	√	-
13	20+415	-	√	-	-

Source: Detailed Design, 2009

Appendix - XVIII:

Purposed Causeway for Water Management

S.N	Chainage		Length	Thickness	Remarks
	From	To			
1.0	0+385.00	0+400.00	15.00	0.20	PCC Causeway
2.0	0+545.00	0+560.00	15.00	0.20	PCC Causeway
3.0	1+070.00	1+080.00	10.00	0.20	PCC Causeway
4.0	1+310.00	1+322.00	12.00	0.20	PCC Causeway
5.0	1+940.00	1+950.00	10.00	0.20	PCC Causeway
6.0	2+345.00	2+355.00	10.00	0.20	PCC Causeway
7.0	3+600.00	3+610.00	10.00	0.20	PCC Causeway
8.0	3+750.00	3+760.00	10.00	0.20	PCC Causeway
9.0	4+430.00	4+440.00	10.00	0.20	PCC Causeway
10.0	4+635.00	4+650.00	15.00	0.20	PCC Causeway
11.0	4+770.00	4+785.00	15.00	0.20	PCC Causeway
12.0	5+080.00	5+095.00	15.00	0.20	PCC Causeway
13.0	5+386.00	5+400.00	14.00	0.20	PCC Causeway
14.0	5+750.00	5+765.00	15.00	0.20	PCC Causeway
15.0	6+010.00	6+025.00	15.00	0.20	PCC Causeway
16.0	6+320.00	6+330.00	10.00	0.20	PCC Causeway
17.0	6+398.00	6+410.00	12.00	0.20	PCC Causeway
18.0	6+645.00	6+660.00	15.00	0.20	PCC Causeway
19.0	6+880.00	6+895.00	15.00	0.20	PCC Causeway
20.0	7+200.00	7+215.00	15.00	0.20	PCC Causeway
21.0	7+530.00	7+545.00	15.00	0.20	PCC Causeway
22.0	7+905.00	7+917.00	12.00	0.20	PCC Causeway
23.0	8+192.00	8+205.00	13.00	0.20	PCC Causeway
24.0	8+385.00	8+400.00	15.00	0.20	PCC Causeway
25.0	8+570.00	8+580.00	10.00	0.20	PCC Causeway
26.0	8+690.00	8+698.00	8.00	0.20	PCC Causeway
27.0	9+090.00	9+105.00	15.00	0.20	PCC Causeway
28.0	9+155.00	9+162.00	7.00	0.20	PCC Causeway
29.0	9+270.00	9+280.00	10.00	0.20	PCC Causeway
30.0	9+435.00	9+445.00	10.00	0.20	PCC Causeway
31.0	9+800.00	9+810.00	10.00	0.20	PCC Causeway
32.0	9+985.00	10+000.00	15.00	0.20	PCC Causeway
33.0	10+475.00	10+490.00	15.00	0.20	PCC Causeway
34.0	10+630.00	10+640.00	10.00	0.20	PCC Causeway
35.0	10+755.00	10+765.00	10.00	0.20	PCC Causeway
36.0	11+080.00	11+095.00	15.00	0.20	PCC Causeway
37.0	11+160.00	11+167.00	7.00	0.20	PCC Causeway
38.0	11+683.00	11+700.00	15.00	0.20	PCC Causeway
39.0	12+270.00	12+285.00	15.00	0.20	PCC Causeway
40.0	12+300.00	12+315.00	15.00	0.20	PCC Causeway
41.0	12+450.00	12+470.00	15.00	0.20	PCC Causeway
42.0	12+490.00	12+500.00	10.00	0.20	PCC Causeway
43.0	12+610.00	12+620.00	10.00	0.20	PCC Causeway
44.0	12+660.00	12+674.00	10.00	0.20	PCC Causeway

S.N	Chainage		Length	Thickness	Remarks
	From	To			
45.0	12+690.00	12+698.00	8.00	0.20	PCC Causeway
46.0	13+130.00	13+140.00	10.00	0.20	PCC Causeway
47.0	13+340.00	13+350.00	10.00	0.20	PCC Causeway
48.0	13+440.00	13+455.00	10.00	0.20	PCC Causeway
49.0	13+830.00	13+850.00	8.00	0.20	PCC Causeway
50.0	13+990.00	14+000.00	8.00	0.20	Stone Causeway
51.0	14+155.00	14+167.00	10.00	0.20	PCC Causeway
52.0	14+450.00	14+460.00	10.00	0.20	PCC Causeway
53.0	14+800.00	14+875.00	12.00	0.20	PCC Causeway
54.0	14+975.00	14+990.00	12.00	0.20	PCC Causeway
55.0	15+030.00	15+040.00	8.00	0.20	PCC Causeway
56.0	15+130.00	15+140.00	8.00	0.20	PCC Causeway
57.0	15+265.00	15+280.00	12.00	0.30	RCC Causeway
58.0	15+570.00	15+580.00	10.00	0.20	PCC Causeway
59.0	15+920.00	15+930.00	12.00	0.30	RCC Causeway
60.0	16+215.00	16+225.00	12.00	0.20	PCC Causeway
61.0	18+820.00	18+835.00	10.00	0.20	PCC Causeway
62.0	18+920.00	18+948.00	12.00	0.20	PCC Causeway
63.0	19+210.00	19+228.00	12.00	0.20	PCC Causeway
64.0	19+640.00	19+655.00	10.00	0.20	PCC Causeway
65.0	19+710.00	19+730.00	12.00	0.20	PCC Causeway
66.0	20+105.00	20+115.00	10.00	0.20	PCC Causeway
67.0	20+730.00	20+740.00	10	0.20	PCC Causeway
68.0	20+810.00	20+820.00	10	0.20	PCC Causeway
69.0	21+690.00	21+710.00	15	0.20	PCC Causeway
70.0	21+790.00	21+800.00	10	0.20	PCC Causeway
71.0	22+470.00	22+490.00	15	0.20	PCC Causeway
72.0	22+830.00	22+860.00	10	0.20	PCC Causeway
73.0	23+485.00	23+525.00	12	0.20	PCC Causeway

Source: Detailed Design, 2009

Appendix - XIX:

Resettlement Cost and list of Affected infrastructues

Appendix - XIXa: Summary of Cost for RP

	Item	Unit	Total loss	Amount(NRs)	Remarks
1.	**DIRECT COSTS**				
1.1	Compensation for private land	(sqm)	11730.61	863127.54	Without Voluntarly
A	Donated Land	(sqm)	22488.45	0.00	Cost for donated land is NRs.1551349.07
B	Absentees' Land (Reserve Fund)	(sqm)	50813.53	1482788.54	Reserve Fund for absentee HHs (110)
1.2	Compensation for structures	Nos.	20	4022784.55	
1.3	Dismantling Costs for Structure	(sqm)		152695.35	
1.4	Cost for Private Trees	Nos.	1035	185186.31	Harvesting and Transportation cost for 210 fodder and wooden trees and 9 shurb of Bamboo (825Ghana)
	Sub-Total			**6706582.29**	
2.	**INDIRECT COSTS**				
2.1	Movement Allowance	LS:	6 HHs	18000.00	
2.2	Rental Stipend	LS:	6 HHs	36000.00	
2.3	Deed Transfer Assistance	LS:	315 HHs	315000.00	Including NRs.150000.00 Transportation cost for deed transfer process
2.5	Official Deed Transfer fees	LS	682 plots	300000.00	
2.6	Appreciation Program for APs	LS:		200000.00	
	Sub Total			**869000.00**	
3	Livelihood Enhancement Skills Training (LEST)	**LS:**		**1277200.00**	For APs
	Total			2146200.00	
4	Contingency (5%)			**107310.00**	heading (2+3)
	Grand Total NRs.			**8960092.29**	

Appendix - XIXb: List of affected houses and infrastructures along the Road Alignment

S. N.	Chainage		Name of House owner	Settlement	Ward	VDC	Distance from Center Level	Material Used for Construction	Type of Structure
	From	To							
1	2+850	2+870	Mohan Sherestha	Uttarpani Bazzar	1	Chunhang	3	Mud Floor CGI Wall & CGI Roof	Residential
2	2+960	2+970	Harka Bahadur Ghising	Uttarpani	1	Chunhang	2.25	Mud Floor CGI Wall & CGI Roof	Residential
3	2+970	2+980	Harka Bahadur Ghising	Uttarpani	1	Chunhang	2.3	Mud Floor,Timber wall ,CGI Sheet roof	Residence Building
4	3+030	3+045	Phulmaya Tamang	Uttarpani	1	Chunhang	2.4	Masonry wall	Residential
5	3+740	3+750	Lal Bahadur Khanal	Nigale	9	Belhara	2.35	PCC Floor,mud masonary Wall & CGI Sheet roof	Residential building
6	4+220	4+230	Meherman Moktang	Dharmasala	1	Belhara	2.25		Residential
7	4+230	4+240	Saraswati Tamang	Dharmasala	1	Belhara	2.3	Masonry wall	Residential Building
8	4+240	4+250	Chhatra Bdr Adhikari	Dharmasala	1	Belhara	2.4	PCC Floor,Mud Masonry Wall & CGI Sheet	Residential building
9	9+860	9+870	Surendra Rai	Suke Aahal	4	Akhisalla	2.75	Mud masonary wall , Mud Floor	Residential
10	9+870	9+880	Surendra Rai	Suke Aahal	4	Akhisalla	2.75	Mud masonary wall , Mud Floor	Residence Building/shop
11	9+900	9+910	Surendra Rai	Suke Aahal	4	Akhisalla	2.5		Residential
12	9+940	9+950	Lok Bahadur Rai	Suke Aahal	4	Akhisalla	2.75	Mud floor, Kar wall, CGI roof	Residence Building
13	9+950	9+960	Gunu Devi Rai	Suke Aahal	4	Akhisalla	3.25	Mud Floor,Timber wall ,CGI Sheet roof	Residence Building/shop
14	11+250	11+260	Man Maya Jarga (Magar)	Thalthale	4	Akhisalla		Mud Floor & Mud Wall	Residential Building
15	18+000	18+010	Dik Bdr Rai	Panchakanya	1	Chhingtang	3.2	Mud Floor,Timber wall ,CGI Sheet roof	Residential
16	18+250	18+260	Birkha Bahadur Rai	Panchakanya	1	Chhingtang	1.75	Mud Floor,Mud Wall & khar Roof	Residential Building
17	18+260	18+270	NA	Panchakanya	1	Chhingtang	1.75	PCC Floor,masonary Wall	Residential
18	18+320	18+340	Sagar Rai	Panchakanya	2	Chhingtang	1.75	PCC Floor,masonary Wall	Residential
19	19+770	19+780	Bhakta Bdr. Rai	Debithan	2	Chhingtang	1.75	PCC Floor,Masonary Wall & CGI Sheet roof	Residence Building

Source: Detailed Design 2009

Appendix - XIXc: Details of affected private and public structures

HH No :Absentee	Structure No: 1	Chainage: From 2+850 to 2+870				
		Distance from centre line of road: 3.0 m				
		Address of structure : Uttarpani Bazzar, Chungmang VDC, Ward no. 1				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per sq.ft	Total
		Ground floor	88.15	88.15	310.12	27338.7
		First	88.15	88.15	310.12	27338.7
		Second				
		Veranda/Basking				
		Shed				
		Wall	242.2	242.19	109.88	26611.88
		Other				
		Total				81289.27

Name of Owner: Mohan Shrestha	Type of structure: Residential house
Address: Uttarpani Bazzar, Chungmang VDC-1	Materials used in wall : Dry wall
Citizenship No:	Materials used in roof: CGI
Name of Father:	Materials used in storey: Mud masonary
Map/Sheet No: Plot No:1155 land Ownership Certificate: df]7 g+=	Present use: Residential Construction Year: 20 yrs.

HH No : 1	Structure No: 2	Chainage: From 2+960 to 2+970				
		Distance from centre line of road: 2.25 m				
		Address of structure : Uttarpani Bazzar, Chungmang VDC-1				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per sq. ft	Total
		Ground floor	290.63	186.00	778.84	144864.72
		First	290.63	186.00	778.84	144864.72
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				289729.44

Name of Owner: Harka Bdr Ghising	Type of structure: Residential house
Address: Uttarpani Bazzar, Chungmang VDC-1	Materials used in wall : Timber
Citizenship No: 2996	Materials used in roof: CGI
Name of Father:Chan Bdr Ghising	Materials used in storey: Mud masonary
Map/Sheet No:172-0384 Plot No:1053 land Ownership Certificate: df]7 g+= !%(#	Present use: Residential Construction Year: 20 yrs.

HH No : 1	Structure No: 3	Chainage: From 2+970 to 2+980				
		Distance from centre line of road: 2.3 m				
		Address of structure : Uttarpani Bazzar, Chungmang VDC-1				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq. ft)	Total
		Ground floor	726.56	310.00	864.78	268080.59
		First	726.56	310.00	864.78	268080.59
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				536161.19

Name of Owner: Harka Bdr Ghising	Type of structure: Residential house
Address: Uttarpani Bazzar, Chungmang VDC-1	Materials used in wall : Mud masonary
Citizenship No: 2996	Materials used in roof: CGI
Name of Father:Chan Bdr Ghising	Materials used in storey: PCC floor
Map/Sheet No:172-0384 Plot No:1053	Present use: Residential
land Ownership Certificate: df]7 g+= !%(#	Construction Year: 20 yrs.

HH No : Abs	Structure No: 4	Chainage: From 3+030 to 3+045				
		Distance from centre line of road: 2.4 m				
		Address of structure : Uttarpani Bazzar, Chungmang VDC-1				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq. ft)	Total
		Ground floor				
		First				
		Second				
		Veranda/Basking				
		Shed				
		Wall	58.13	58.13	422.43	24553.97
		Other				
		Total				24553.97

Name of Owner: Phool Maya Tamang	Type of structure: Wall
Address: Uttarpani Bazzar, Chungmang VDC-1	Materials used in wall : masonary
Citizenship No:	Materials used in roof:
Name of Father:	Materials used in storey:
Map/Sheet No: Plot No:1438	Present use:
land Ownership Certificate: df]7 g+=	Construction Year: 10 yrs.

HH No : 48	Structure No: 5	Chainage: From 3+70 to 3+750				
		Distance from centre line of road: 2.35 m				
		Address of structure : Belhara VDC-2				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)m	Total
		Ground floor	678.13	121.1	2066.23	250208.55
		First	678.13	121.1	2066.23	250208.55
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				500417.11

Name of Owner: Lal Bd. Khanal Address: Belhara VDC-2 Negale Citizenship No: 22126 Name of Father: Tej Bdr Damai Map/Sheet No: 172-0384 Plot No:1734 land Ownership Certificate: df]7 g+=	Type of structure: Residential House Materials used in wall : Mud masonary Materials used in roof: CGI Sheet Materials used in storey: PCC Floor Present use: Residential House Construction Year: 13 yrs.

	Structure No: 6	Chainage: From 4+220to 4+230				
		Distance from centre line of road: 2.25 m				
		Address of structure : Belahara 1, Dharmasala				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)	Total
		Ground floor	982.75	312.7	271.7	266975.61
		First	982.75	312.7	147.7	145204.54
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				412180.15

Name of Owner: Mehar Man Moktan Address: Belahara 1, Dharmasala Citizenship No: 3391 Name of Father: Bag Dal Moktan Map/Sheet No: 172-0434 Plot No:1703 land Ownership Certificate: df]7 g+=	Type of structure: Residential/ shop Materials used in wall : Mud masonary Materials used in roof: Materials used in storey: Mud Floor Present use: Residential/ Shop Construction Year: 18 yrs.

HH No : Abs	Structure No: 7	Chainage: From 4+230 to 4+240				
		Distance from centre line of road: 2.4 m				
		Address of structure : Belahara 1, Dharmasala				
		Storey	Total Area (sq.ft.)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)	Total
		Ground floor				
		First				
		Second				
		Veranda/Basking	180.83	180.83	145.18	26253.90
		Shed				
		Wall				
		Other				
		Total				26253.90

Name of Owner: Saraswoti Tamang Address: Belahara 1, Dharmasala Citizenship No: Name of Father: Map/Sheet No: Plot No:1524 land Ownership Certificate: df]7 g+=	Type of structure: Residential building Materials used in wall : Materials used in roof: CGI Materials used in storey: Mud floor Present use: Resident Construction Year: 15 yrs.

HH No : 74	Structure No: 8	Chainage: From 4+240 to 4+250				
		Distance from centre line of road: 2.5 m				
		Address of structure : Belahara 1, Dharmasala				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq. ft)	Total
		Ground floor				
		First				
		Second				
		Veranda/Basking	145.53	145.53	498.46	72539.72
		Shed				
		Wall				
		Other				
		Total				72539.72

Name of Owner: Chhatra Bdr Adhikari Address: Belahara 1, Dharmasala Citizenship No: 20440 Name of Father: Kul Man Adhikari Map/Sheet No: 172-0424 Plot No:1517 land Ownership Certificate: df]7 g+=	Type of structure: Residential House Materials used in wall : Timber Materials used in roof: CGI Materials used in storey: Mud Floor Present use: Resident/ Shop Construction Year: 15 yrs.

HH No : Abs	Structure No: 9	Chainage: From 9+860 to 9+870				
		Distance from centre line of road: 2.75 m				
		Address of structure : Aankhisalla 4, Suke aahal				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)	Total
		Ground floor	329.38	219.58	221.63	48666.58
		First	329.38	219.58	284.24	62414.24
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				111080.82

Name of Owner: Surendra Rai Address: Aankhisalla 4, Suke aahal Citizenship No: Name of Father: Map/Sheet No: Plot No:385 land Ownership Certificate: df]7 g+=	Type of structure: Building Materials used in wall : Khar Materials used in roof: Khar Materials used in storey: Timber Present use: Resident Construction Year: 8 yrs.

HH No : Abs	Structure No: 10	Chainage: From 9+870 to 9+880				
		Distance from centre line of road: 2.75 m				
		Address of structure : Aankhisalla 4, Suke aahal				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)	Total
		Ground floor	329.38	219.59	284.24	62414.24
		First				
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				62414.24

Name of Owner: Surendra Rai Address: Aankhisalla 4, Suke aahal Citizenship No: Name of Father: Map/Sheet No: Plot No:385 land Ownership Certificate: df]7 g+=	Type of structure: Residential Building Materials used in wall : Mud Materials used in roof: Khar Materials used in storey: Mud Floor Present use: Resident Construction Year: 8 yrs.

HH No : Abs	Structure No:11	Chainage: From 3+030 to 3+045				
		Distance from centre line of road: 2.5 m				
		Address of structure : Aankhisalla 4, Suke aahal				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)	Total
		Ground floor	377.82	134.33	564.95	75890.09
		First	377.82	134.33	836.65	112387.45
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				188277.54

Name of Owner: Surendra Rai Address: Aankhisalla 4, Suke aahal Citizenship No: Name of Father: Map/Sheet No: Plot No:385 land Ownership Certificate: df]7 g+=	Type of structure: Residential Building Materials used in wall : masonary Materials used in roof: CGI Materials used in storey: PCC floor Present use: Resident Construction Year: 10 yrs.

HH No : 105	Structure No: 12	Chainage: From 9+940 to 9+950				
		Distance from centre line of road: 2.75 m				
		Address of structure : Aankhisalla 4, Suke Aahal				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)	Total
		Ground floor	602.78	188.37	1101.91	207565.12
		First	602.78	188.37	1101.91	207565.12
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				415129.87

Name of Owner: Lok Bdr Rai Address: Aankhisalla 4, Suke Aahal Citizenship No: 1413 Name of Father: Brisha Dhoj Rai Map/Sheet No: 172-0502 Plot No:381 land Ownership Certificate: df]7 g+=	Type of structure: Residential Building Materials used in wall : masonary Materials used in roof: CGI Materials used in storey: PCC floor Present use: Resident Construction Year: 25 yrs.

HH No : 104	Structure No: 13	Chainage: From 9+950 to 9+960				
		Distance from centre line of road: 3.25 m				
		Address of structure : Aankhisalla 4, Suke Aahal				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)	Total
		Ground floor	340.03	130.78	492.68	64433.52
		First				
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				64433.52

Name of Owner: Gunu Devi Rai Address: Aankhisalla 4, Suke Aahal Citizenship No: 1267 Name of Father: Kul Bdr Rai Map/Sheet No: 172-0502 Plot No:470 land Ownership Certificate: df]7 g+=	Type of structure: Residential Bulding Materials used in wall : Mud/ Khar Materials used in roof: Khar Materials used in storey: Mud Floor Present use: Resident Construction Year: 10 yrs.

HH No : 107	Structure No: 14	Chainage: From 11+250 to 11+260				
		Distance from centre line of road: 3.2 m				
		Address of structure : Aankhisalla 4, Thalthale				
		Storey	Total Area (sq.m)	Area of land to be acquired (sq.m)	Rate per sq. m	Total
		Ground floor	685.66	263.72	492.68	129927.67
		First				
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				129927.67

Name of Owner: Mana Maya Garga Magar Address: Aankhisalla 4, Thalthale Citizenship No: 2632 Name of Father: Dal Bdr Jarga Magar Map/Sheet No:172-0541 Plot No: 518 land Ownership Certificate: df]7 g+=	Type of structure: Residential Building Materials used in wall : Mud Materials used in roof: Khar Materials used in storey: Mud Floor Present use: Resident Construction Year: 12 yrs.

HH No : Abs	Structure No: 15	Chainage: From 18+000 to 18+010				
		Distance from centre line of road: 3.2 m				
		Address of structure : Chhintang 1, Panchakanya				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq. ft)	Total
		Ground floor	592.01	272.33	622.28	169463.40
		First				
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				169463.40

Name of Owner: Dik Bdr Rai Address: Chhintang 1, Panchakanya Citizenship No: Name of Father: Map/Sheet No: Plot No:705 land Ownership Certificate: df]7 g+=	Type of structure: Residential Building Materials used in wall : Stone masonary Materials used in roof: CGI Materials used in storey: Mud Floor Present use: Resident Construction Year: 7 yrs.

HH No : 130	Structure No: 16	Chainage: From 18+250 to 18+260				
		Distance from centre line of road: 1.75 m				
		Address of structure : Chhintang 1, Panchakanya				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq. ft)	Total
		Ground floor	301.38	188.36	303.188	57111.06
		First				
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				57111.06

Name of Owner: Birkha Bdr Rai Address: Chhintang 1, Panchakanya Citizenship No: 64 Name of Father: Man Bdr Rai Map/Sheet No: 172-0578 Plot No:733 land Ownership Certificate: df]7 g+= @!	Type of structure: Residential Building Materials used in wall : Timber Materials used in roof: CGI Materials used in storey: Mud Floor Present use: Resident Construction Year: 9 yrs.

HH No : 147	Structure No: 18	Chainage: From 18+320 to 18+340				
		Distance from centre line of road: 1.75 m				
		Address of structure : Chhintang 2, Panchakanya				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)	Total
		Ground floor	726.56	290.63	526.74	153083.63
		First	726.56	290.63	810.68	235603.97
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				388687.60

Name of Owner: Sagar Rai Address: Chhintang 2, Panchakanya Citizenship No: 168/2078 Name of Father: Chet Bdr Rai Map/Sheet No: 172-0578 Plot No:559 land Ownership Certificate: df]7 g+= @*	Type of structure: Residential Building Materials used in wall : CGI Materials used in roof: CGI Materials used in storey: PCC Floor Present use: Resident/ shop Construction Year: 12 yrs.

HH No : Abs	Structure No: 17	Chainage: From 18+260 to 18+270				
		Distance from centre line of road: 1.75 m				
		Address of structure : Chhintang 1, Panchakanya				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq. ft)	Total
		Ground floor	269.097	269.097	85.271	22946.41
		First				
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				22946.41

Name of Owner: Aailaini Address: Chhintang 1, Panchakanya Citizenship No: Name of Father: Map/Sheet No: 172-0539 Plot No: Aailani Not Given By Amin land Ownership Certificate: df]7 g+=	Type of structure: Residential Building Materials used in wall : Mud Materials used in roof: Khar Materials used in storey: Mud Floor Present use: Resident Construction Year: 7 yrs.

HH No : 178	Structure No: 19	Chainage: From 19+770 to 19+780				
		Distance from centre line of road: 1 m				
		Address of structure : Chhintang 2, Devisthan				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq. ft)	Total
		Ground floor	212.91	212.91	189.49	40344.87
		First	212.91	212.91	189.49	40344.87
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				80689.74

Name of Owner: Bhakta Bdr Rai Address: Chhintang 2, Devisthan Citizenship No: 791/285 Name of Father: Bir Bdr Rai Map/Sheet No: 172-0578 Plot No: 519 land Ownership Certificate: df]7 g+=	Type of structure: Residential buliding Materials used in wall : Bamboo Materials used in roof: Khar Materials used in storey: Mud Floor Present use: Resident Construction Year: 15 yrs.

HH No : Abs	Structure No: 20	Chainage: From 19+780 to 19+790				
		Distance from centre line of road: 1.75 m				
		Address of structure : Chhintang 2, Devisthan				
		Storey	Total Area (sq.ft)	Area of land to be acquired (sq.ft)	Rate per (sq.ft)m	Total
		Ground floor	558.11	390.62	215.37	84126.64
		First	558.11	390.62	781.76	305371.06
		Second				
		Veranda/Basking				
		Shed				
		Wall				
		Other				
		Total				389497.70

Name of Owner: Desh Kumari Rai Address: Chhintang 2, Devisthan Citizenship No: Name of Father: Map/Sheet No: Plot No:1010 land Ownership Certificate: df]7 g+=	Type of structure: Residential Building Materials used in wall : Mud masonary Materials used in roof: CGI Materials used in storey: Mud Floor Present use: Resident Construction Year: 10 yrs.

Appendix - XIXd: List of affected trees in the road alignment

S.N.	CHainage Chainage		Name of Owner	Location	Details of lost trees				
	From	To			Species	Nos. of Trees	Girth (m)	Hight (m)	Volume (Cum)
1	0+400	0+400	Usha Thapa	Phanduwa	Utis	1	0.25	5	0.01
2	0+800	0+800	Gita Devi	Chunbang-1	Dhuppi	1	0.75	5	0.09
3	2+750	2+750	Shree Bdr Tamang	Chunbang-1	Utis	1	0.8	3	0.06
4	3+210	3+210	Pabitra Devi	Chunbang-1	Chilaune	1	2.40	15	2.70
5	3+230	3+230	Aait Singh Ghising	Chunbang-1	Chilaune	1	1.40	15	0.92
6	3+300	3+300	Rabi Singh Shrestha	Chunbang-1	Chilaune	1	0.90	10	0.25
7	4+500	4+500	Briksha Bdr Darmali	Nigale-9	Khirro	1	1.20	2	0.09
8	4+500	4+500	Briksha Bdr Darmali	Nigale-9	Khirro	1	1.20	3	0.14
9	4+950	4+950	Purna Bdr Magar	Nigale-9	Utis	2	0.6	3	0.03
10	4+980	4+980	Purna Bdr Magar	Nigale-9	Utis	1	0.60	3	0.03
11	5+100	5+100	Purna Bdr Magar	Nigale-9	Utis	1	0.30	5	0.01
12	5+500	5+500	Chahak Bdr Newar	Nigale-9	Utis	1	0.90	3	0.08
13	5+800	5+800	Pahal Bdr Shrestha	Chunbang-7	Utis	1	1.20	5	0.23
14	5+810	5+810	Bhim Kumar Shrestha	Chunbang-7	Utis	1	1.20	5	0.23
15	6+300	6+300	Purna Bdr BK	Chunbang-7	Utis	1	0.60	5	0.06
16	6+600	6+600	Purna Bdr BK	Chunbang-7	Utis	1	0.60	5	0.06
17	7+600	7+600	Tulasi Pokharel	Aakhisalla-4	Chilaune	1	1.20	5	0.23
18	7+610	7+610	Tulasi Pokharel	Aakhisalla-4	Chilaune	1	0.60	17	0.19
19	7+650	7+650	Tulasi Pokharel	Aakhisalla-4	Chilaune	1	1.20	17	0.77
20	8+460	8+460	Chandra Man Rana Magar	Aakhisalla-4	Utis	1	0.60	10	0.11
21	8+500	8+500	Udak Bdr Magar	Belhara-8	bamboo	25			0.00
22	8+520	8+520	Udak Bdr Magar	Belhara-8	Khirro	1	0.60	7	0.08
23	10+000	10+000	Guna Devi Rai	Aakhisalla-4	Khari	1	0.40	3	0.02
24	10+050	10+050	Chakra Bdr Rai	Aakhisalla-4	Khirro	1	1.20	5	0.23
25	10+060	10+060	Ser Bdr Thapa	Aakhisalla-6	Khirro	3	0.60	3	0.03
26	10+070	10+070	Sher Bdr Thapa	Aakhisalla-6	Bar-pipal	2	3.10	15	4.50
27	10+080	10+080	Sher Bdr Thapa	Aakhisalla-6	Khari	1	1.20	7	0.32
28	10+300	10+300	Nar Bdr Neupane	Aakhisalla-6	Utis	2	0.40	5	0.03
29	11+000	11+000	Dhan Kumari Rai	Aakhisalla-6	Bar-pipal	2	2.70	10	2.28
30	11+010	11+010	Dhan Kumari Rai	Aakhisalla-6	Khari	1	0.80	5	0.10
31	11+050	11+050	Lakh Bdr Rai	Aakhisalla-6	bamboo	50			0.00
32	11+070	11+070	Lakh Bdr Rai	Aakhisalla-6	bamboo	100			0.00
33	11+500	11+500	Govind Bdr Rai	Aakhisalla-7	Khirro	1	1.20	10	0.45
34	11+900	11+900	Govind Bdr Rai	Aakhisalla-8	Utis	1	0.30	5	0.01

S.N.	CHainage Chainage		Name of Owner	Location	Details of lost trees				
	From	To			Species	Nos. of Trees	Girth (m)	Hight (m)	Volume (Cum)
35	11+500	11+500	Govind Bdr Rai	Aakhisalla-9	Utis	1	1.20	10	0.45
36	11+900	11+900	Govind Bdr Rai	Aakhisalla-8	Utis	10	0.30	5	0.01
37	12+100	12+100	Netra Man Rai	Aakhisalla-8	Patmero	1	0.30	4	0.01
38	12+200	12+200	Laxmi Rai	Aakhisalla-8	Chilaune	1	0.30	4	0.01
39	12+300	12+300	Kholsi	Aakhisalla-8	Khanar	1	0.80	4	0.08
40	12+600	12+600	Jang Bdr Rai	Aakhisalla-8	Khanar	1	1.00	4	0.13
41	16+950	16+950	Aash Bdr Limbu	Chhintang-1	Bar	1	2.50	10	1.95
42	18+200	18+200	Mani Kumar Rai	Chhintang-1	Barpiple	2	3.00	10	2.81
43	19+700	19+700	Surya Kumar Rai	Chhintang-1	Dhupi	1	0.75	6	0.11
44	19+800	19+800	Bahadur Khici	Chhintang-1	Siris	2	0.45	5	0.03
45	19+900	19+900	Bahadur Khici	Chhintang-3	Dadube	1	0.75	5	0.09
46	20+000	20+000	Bahadur Khici	Chhintang-3	Tanki	2	0.75	5	0.09
47	20+100	20+100	Bahadur Khici	Chhintang-3	Utis	1	0.75	5	0.09
48	20+100	20+100	Bahadur Khici	Chhintang-3	Tanki	2	0.45	5	0.03
49	20+100	20+100	Bahadur Khici	Chhintang-3	Khaneu	2	0.45	5	0.03
50	20+100	20+100	Bahadur Khici	Chhintang-3	Tanki	4	0.45	5	0.03
51	20+250	20+250	Lakh Bdr Rai	Chhintang-3	Chilaune	2	0.45	5	0.03
52	20+200	20+200	Lakh Bdr Rai	Chhintang-3	Tanki	2	0.75	5	0.09
53	20+210	20+210	Lakh Bdr Rai	Chhintang-3	Siris	1	0.75	5	0.09
54	20+250	20+250	Lakh Bdr Rai	Chhintang-3	Chilaune	1	0.75	5	0.09
55	20+350	20+350	Lakh Bdr Rai	Chhintang-3	bamboo	50			0.00
56	20+450	20+470	Krishna Bdr Rai	Chhintang-6	Utis	5	0.45	5	0.03
57	20+500	20+500	Krishna Bdr Rai	Chhintang-6	Utis	5	0.75	5	0.09
58	20+548	20+548	Krishna Bdr Rai	Chhintang-6	Siris	1	2.70	18	4.10
59	20+580	20+580	Mal Sen Teli Rai	Chhintang-6	Utis	1	0.45	5	0.03
60	20+620	20+620	Bhim Bdr Rai	Chhintang-6	Chilaune	1	0.75	8	0.14
61	20+640	20+640	Bhim Bdr Rai	Chhintang-6	Utis	1	0.45	4	0.03
62	20+660	20+660	Bhim Bdr Rai	Chhintang-6	Utis	1	0.45	5	0.03
63	20+700	20+700	Lakh Bdr Kshetri	Chhintang-6	Utis	15	0.45	5	0.03
64	20+700	20+700	Lakh Bdr Kshetri	Chhintang-6	Utis	1	0.45	5	0.03
65	20+780	20+780	Dil Maya Rai	Chhintang-6	Utis	10	0.45	6	0.04
66	20+800	20+800	Dil Maya Rai	Chhintang-6	Utis	1	0.45	10	0.06
67	20+900	20+900	Bhageswar Rai	Chhintang-6	Utis	1	0.75	5	0.09
68	20+950	20+950	Hark Bir Rai	Chhintang-6	Utis	1	0.75	10	0.18
69	21+950	21+950	Kuberdhoj Rai	Chhintang-6	Siris	1	1.10	6	0.23
70	20+420	20+420	Krishna Bdr Rai	Chhintang-6	Siris	1	1.10	8	0.30
71	20+465	20+465	Krishna Bdr Rai	Chhintang-6	Tanki	1	1.10	5	0.19

S.N.	CHainage Chainage		Name of Owner	Location	Details of lost trees				
	From	To			Species	Nos. of Trees	Girth (m)	Hight (m)	Volume (Cum)
72	20+450	20+450	Krishna Bdr Rai	Chhintang-6	Tanki	1	2.70	15	3.42
73	20+450	20+450	Krishna Bdr Rai	Chhintang-6	Kavro	1	0.45	5	0.03
74	20+470	20+470	Krishna Bdr Rai	Chhintang-6	Utis	1	0.45	8	0.05
75	21+477	21+477	Bhim Kurmar Rai	Chhintang-6	Utis	1	0.45	5	0.03
76	21+485	21+485	Bhim Kurmar Rai	Chhintang-6	Masala	1	0.75	8	0.14
77	21+490	21+490	Bhim Kurmar Rai	Chhintang-6	Tanki	1	0.45	8	0.05
78	21+495	21+495	Bhim Kurmar Rai	Chhintang-6	Khaniyu	1	2.70	12	2.73
79	21+500	21+500	Bhim Kurmar Rai	Chhintang-6	Khaniyu	1	2.70	10	2.28
80	21+510	21+510	Keshab Man	Chhintang-6	Sidhure	1	1.20	6	0.27
81	21+510	21+510	Keshab Man	Chhintang-6	Lavour	1	1.20	8	0.36
82	21+510	21+510	Keshab Man	Chhintang-6	Tanki	1	1.20	5	0.23
83	21+520	21+520	Keshab Man	Chhintang-6	Khirro	1	1.20	10	0.45
84	21+530	21+530	Keshab Man	Chhintang-6	Khaniyu	1	1.20	10	0.45
85	21+540	21+540	Keshab Man	Chhintang-6	Tanki	1	0.90	8	0.20
86	21+550	21+550	Keshab Man	Chhintang-6	Khaniyu	1	2.70	15	3.42
87	21+560	21+560	Keshab Man	Chhintang-6	Khaniyu	1	2.70	15	3.42
88	21+560	21+560	Keshab Man	Chhintang-6	Tanki	1	0.30	4	0.01
89	21+590	21+590	Keshab Man	Chhintang-6	Khaniyu	1	2.70	15	3.42
90	21+580	21+580	Keshab Man	Chhintang-6	Tanki	1	0.30	8	0.02
91	21+560	21+560	Keshab Man	Chhintang-6	bamboo	200			0.00
92	21+590	21+590	Keshab Man	Chhintang-6	Tanki	1	0.75	6	0.11
93	21+950	22+000	Gopal Salten Rai	Chhintang-6	bamboo	100			0.00
94	22+450	22+450	Santa Kumari Rai	Chhintang-6	Khaniyu	1	1.20	12	0.54
95	22+050	22+050	Krishna Bdr Rai	Chhintang-6	Tanki	1	0.60	5	0.06
96	22+530	22+530	Ram Bdr Rai	Chhintang-6	Tanki	1	0.60	5	0.06
97	22+510	22+510	Ram Bdr Rai	Chhintang-6	Patta	1	0.20	5	0.01
98	22+530	22+530	Ram Bdr Rai	Chhintang-6	Khaniyu	1	1.20	15	0.68
99	22+540	22+540	Ram Bdr Rai	Chhintang-6	Khaniyu	1	2.70	10	2.28
100	22+550	22+550	Ram Bdr Rai	Chhintang-6	Khaniyu	1	1.20	10	0.45
101	22+600	22+600	Buta Man Rai	Chhintang-6	Khaniyu	1	2.70	15	3.42
102	22+610	22+610	Buta Man Rai	Chhintang-6	Tanki	1	0.45	2	0.01
103	22+615	22+615	Buta Man Rai	Chhintang-6	Tanki	1	0.45	4	0.03
104	22+700	22+700	Bal Dhoj Rai	Chhintang-6	Kutmero	1	1.20	7	0.32
105	22+720	22+720	Bal Dhoj Rai	Chhintang-6	Kutmero	1	2.70	10	2.28
106	22+500	22+500	Ram Bdr Rai	Chhintang-6	Dudelo	1	0.30	4	0.01
107	22+680	22+680	Bal Dhoj Rai	Chhintang-6	Dudelo	1	0.30	4	0.01
108	22+680	22+680	Bal Dhoj Rai	Chhintang-6	Patmero	1	0.60	10	0.11

S.N.	CHainage Chainage		Name of Owner	Location	Details of lost trees				
	From	To			Species	Nos. of Trees	Girth (m)	Hight (m)	Volume (Cum)
109	22+850	22+850	Chitra Bdr Rai	Chhintang-6	Khaneu	2	0.90	5	0.13
110	22+900	22+900	Chitra Bdr Rai	Chhintang-6	Dudelo	1	0.60	5	0.06
111	22+900	22+900	Chitra Bdr Rai	Chhintang-6	Tanki	5	0.60	5	0.06
112	22+900	22+900	Chitra Bdr Rai	Chhintang-6	Tanki	1	0.30	3	0.01
113	23+950	23+950	Kamal Dhoj Rai	Chhintang-6	Tanki	1	0.30	4	0.01
114	23+960	23+960	Kamal Dhoj Rai	Chhintang-6	Sirish	1	2.70	20	4.56
115	22+970	22+970	Purna Bdr Rai	Chhintang-6	Siris	1	1.20	10	0.45
116	23+000	23+000	Bir Bdr Rai	Chhintang-6	bamboo	100			0.00
117	21+570	21+570	Chandra Bdr Rai	Chhintang-6	Khari	1	1.00	15	0.47
118	21+650	21+650	Jit Parti Rai	Chhintang-6	Patmero	1	1.00	10	0.31
119	21+650	21+650	Jit Parti Rai	Chhintang-6	Patmero	1	0.75	7	0.12
120	21+800	21+800	Raj Kumar Rai	Chhintang-6	Tanki	1	0.30	5	0.01
121	21+810	21+810	Raj Kumar Rai	Chhintang-6	Sidure	1	0.45	5	0.03
122	22+100	22+100	Krishna Bdr Rai	Chhintang-6	Tanki	1	0.60	5	0.06
123	22+110	22+110	Krishna Bdr Rai	Chhintang-6	Tanki	1	0.45	5	0.03
124	22+115	22+115	Krishna Bdr Rai	Chhintang-6	Tanki	1	0.40	4	0.02
125	22+120	22+120	Krishna Bdr Rai	Chhintang-6	Sirish	1	0.30	8	0.02
126	22+160	22+160	Ganj Bdr Rai	Chhintang-6	Chilaune	1	0.50	10	0.08
127	22+300	22+300	Tirth Bdr Rai	Chhintang-6	Utis	1	0.50	10	0.08
128	22+400	22+400	Santa Rai	Chhintang-6	Badahar	1	0.25	7	0.01
129	22+460	22+460	Santa Rai	Chhintang-6	Chilaune	1	0.40	7	0.04
130	22+460	22+460	Santa Rai	Chhintang-6	Chilaune	1	0.40	5	0.03
131	22+550	22+550	Buta Man Rai	Chhintang-6	Kharri	1	0.40	10	0.05
132	22+770	22+770	Bal Dhoj Rai	Chhintang-6	Tanki	1	0.40	7	0.04
133	22+900	22+900	Karm Dhoj Rai	Chhintang-6	Tanki	1	0.30	7	0.02
134	22+950	22+950	Karm Dhoj Rai	Chhintang-6	Sidure	1	0.40	5	0.03
135	22+960	22+960	Karm Dhoj Rai	Chhintang-6	Dudhelo	1	0.60	5	0.06
136	22+900	22+900	Karm Dhoj Rai	Chhintang-6	Dudhelo	1	0.30	5	0.01
137	22+900	22+900	Karm Dhoj Rai	Chhintang-6	Dudhelo	1	0.40	5	0.03
138	22+900	22+900	Karm Dhoj Rai	Chhintang-6	Dudhelo	1	0.45	5	0.03
139	22+900	22+900	Karm Dhoj Rai	Chhintang-6	Dudhelo	1	0.45	5	0.03
140	22+900	22+900	Karm Dhoj Rai	Chhintang-6	Tanki	1	0.40	5	0.03
141	23+950	23+950	Krishna Maya Rai	Chhintang-6	Tanki	1	0.30	5	0.01
142	23+960	23+960	Krishna Maya Rai	Chhintang-6	Badahar	1	0.80	10	0.20
143	22+970	22+970	Purna Bdr Rai	Chhintang-6	Katmero	1	0.90	7	0.18

S.N.	CHainage Chainage		Name of Owner	Location	Details of lost trees				
	From	To			Species	Nos. of Trees	Girth (m)	Hight (m)	Volume (Cum)
144	22+350	22+350	Laxmi Prasad Rai	Chhintang-6	Utis	1	0.40	10	0.05
145	22+450	22+450	Santa Rai	Chhintang-6	Tanki	1	0.40	5	0.03
146	22+450	22+450	Santa Rai	Chhintang-6	Tanki	1	0.40	4	0.02
147	22+550	22+550	Buta Man Rai	Chhintang-6	Katmero	1	0.60	10	0.11
148	22+950	22+950	Karm Dhoj Rai	Chhintang-6	Simle	1	0.40	11	0.06
149	22+960	22+960	Purna Prasad Rai	Chhintang-6	Siris	1	0.50	11	0.09
150	22+970	22+970	Purna Prasad Rai	Chhintang-6	bamboo	150	0	0	0.00
151	22+810	22+810	Purna Prasad Rai	Chhintang-6	bamboo	50	0	0	0.00
					Total	**1028**			

Appendix - XX: Photographs
Photograph – I

PHOTO NO. 1

Starting Point of the Hille-Utterpani Chhingtang Rural Road at Hille Bazaar.

PHOTO NO. 2

End Point of the Hille-Utterpani Chhingtang Rural Road at Jyamire, Chhingtang-8.

PHOTO NO. 3

Road Alignment passes nearby Municipality Dumping site at Chainage 0+300m

PHOTO NO. 4

Farmers will be more benefited to supply their agricultural products by the easy vehicular facility.

PHOTO NO. 5

The proposed road at Lisimbu Chowk, Chungmang-1 need to be widen by partially demolish of two houses.

PHOTO NO. 6

The narrow road at Thalthale, Ankhi Salla-6 need to accuire the building, which was affected during

Photograph – II

PHOTO NO. 7

The premises of Shree Jana Kalyan High School, Marga, Belhara-3 was dewatered due to uncontrolled drain.

PHOTO NO. 8

Uncontrolled drainage at Marga, Belhara-3 was protected by the initiative of Shree Jana Kalyan High.

PHOTO NO. 9

Bar-Pipal Chautari and Dudahang Pri. School seems to be partially affected by the proposed road construction at Suke Aahal, Ankhi Salla-4.

PHOTO NO. 10

Natural lovers will visit historically importance Marga Pokhari after the upgrading of proposed Hille-Utterpani-Chhingtang road.

PHOTO NO. 11

Interaction Meeting/ Group discussion was also held at Shree Jana Kalyan High School, Marga, Belhara-3.

PHOTO NO. 12

Group Discussion meeting was conducted at Chhingtang VDC hall with local people and VDC staffs.