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Attachment

Transport Infrastructure Map 1: 100,000; District Transport Plan, Okhaldhunga District

FOREWORD

APPROVAL SHEETS

DISTRICT ROADS COORDINATION COMMITTEE

1	Mr. Prem Narayan Premi	: DDC Chairperson	: Chairperson
2	Mr. Harka Bahadur Rai	: DDC Vice-Chairperson	: Member
3	Mr. Chandra Bahadur Karki	: DDC Member	: Member
4	Mr. Ramhari Karki	: DDC Member	: Member
5	Mr. Mugadhan Rai	: DDC Member	: Member
6	Ms. Krishna Kumari Karki	: DDC Member	: Member
7	Mr. Ram Chandra Magar	: VDC Chairperson	: Member
8	Mr. Om Dayal	: Representative from ethnic minority	: Member
9	Mr. Pradip Sunwar	: VDC Chairperson	: Member
10	Mr. Jaya Bahadur Shrestha	: VDC Chairperson	: Member
11	Mr. Ashok Kumar Karki	: VDC Chairperson	: Member
12	Mr. Krishna Kumar Rai	: DDC Member	: Member
13	Mr. Bhaikaji Shrestha	: Representative from FNCCI, Okhaldhunga	: Member
14	Mr. Rudra Shrestha	: DDC Engineer/DRSP	: Member
15	Mr. Yagya Bahadur Khatri	: Act. Local Development Officer	: Member Secretary

DISTRICT TECHNICAL TEAM

1	Mr. Rudra Shrestha	: DDC Engineer/DRSP
2	Mr. Baijanath Yadav	: DDC Overseer/DRSP

ABBREVIATIONS AND ACRONYMS

APP	Agricultural Perspective Plan
CBS	Central Bureau of Statistics
DDC	District Development Committee
DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DoR	Department of Roads
DRCC	District Road Coordination Committee
DRF	District Road Fund
DRSP	District Roads Support Programme
DTMP	District Transport Master Plan
DTPP	District Transport Perspective Plan
FfW	Food for Work
FNCCI	Federation of Nepalese Chamber of Commerce and Industry
FY	Fiscal Year
HMG	His Majesty's Government
IEE	Initial Environmental Examination
km ²	Square Kilometre
LDO	Local Development Officer
LGP	Local Governance Programme
LRCC	Local Road Coordination Committee
MoLD	Ministry of Local Development
MP	Member of Parliament
Msl	Metres above sea Level
NGO	Non Government Organisation
NPC	National Planning Commission
NRS	Nepalese Rupees
PSU	Programme Support Unit
RCIW	Rural Community Infrastructure Works
SDC	Swiss Agency for Development and Cooperation
STOL	Short Take-Off and Landing
UGs	Users' Groups
VDC	Village Development Committee
YPO	Yearly Plan of Operation

1. INTRODUCTION

1.1 Background

Okhaldhunga district is situated between the districts of Udayapur (in the south) and Solukhumbu (in the north) in the Sagarmatha zone of the Eastern Development Region of Nepal (See Map 1). Okhaldhunga acts as the gateway from the Terai to the Solukhumbu district in the north.

Okhaldhunga is mostly rural. It is one of the 24 least populated districts in the country and has an average population density of about 130 people per square kilometre.

Okhaldhunga is the district headquarter, and is the largest urban centre in the district with a population of 2,290. The annual population growth rate is 1.3%. According to District Development Committee (DDC) Okhaldhunga, the average literacy rate of the district is about 40% and only 24 % female are literate.

The distribution of the land resource base in Okhaldhunga shows that the district has a total land area of 1076.4 sq. km. Out of this 48.6 % of the land area is agricultural, followed by forest/scrub land, which accounts for 43.2 %.

Distribution of Land Resource

Land Use	Area (sq. km.)	Area (%)
Agricultural Land	522.9	48.6
Forest/Scrub	465.2	43.2
Grass Land	65.2	6.1
Others	23.1	2.1
Total	1076.4	100

Source: Digitised Data, DRSP, May 2001.

TABLE 1.1

The main feeder road, under construction, in the district is Katari-Okhaldhunga Road, which is about 88 km long. It provides access from Katari to the district headquarter at Okhaldhunga. Katari is the regional/urban market centre closest to Okhaldhunga and is in the plain of Udayapur district. A section of this road - Katari to Ghurmi -at the bank of Sun Koshi River is already open to traffic. The Sun Koshi River acts as a border between Udayapur and Okhaldhunga. The remainder of the road to Okhaldhunga is under construction by the Royal Nepal Army. The section between Ghurmi to Manebhanjyang is already motorable but not open to public traffic. At the moment, it takes about a day walk to reach the road head at the Sun Koshi River from Okhaldhunga. The Asian Development Bank is funding the construction of a 58 km road from Okhaldhunga to Phaplu. This road will also pass through Salleri, headquarter of the Solukhumbu District. Roads from the district headquarter (Okhaldhunga Bazaar) are currently being constructed to main market centres of the district like Rampur, Rumjatar and Nisankhe under training road construction of DRSP, DDC, HMG/N and agricultural road programme of HMG/N respectively.

The DDC of Okhaldhunga has given a high priority to prepare the District Transport Master Plan and the District Transport Perspective Plan (DTMP/DTPP). The district has realised that with better access to areas with resource potentials, the social and economic development of the district will be enhanced.

During the Programme Orientation and Vision Sharing Workshop in December 1999, Okhaldhunga with five other districts in the Central Region were selected for support through the District Roads Support Programme (DRSP). This support takes the form of capacity building, planning, implementation and maintenance of district roads. The programme is a joint venture

between Swiss Agency for Development and Cooperation (SDC), His Majesty's Government of Nepal (HMG/N) and the participating district.

1.2 Objectives and Rationale of the DTMP/DTPP

One of the main reasons for slow development of social and economic structures in Okhaldhunga district has been the lack of an adequate transport infrastructure.

The DTMP and the DTPP has two objectives. Firstly to facilitate access to areas with resource potentials and secondly to guide the spatial arrangement of rural settlements, market and service centres of the district. This can be done by developing a sustainable road network that reduces the aggregate transportation cost and minimises the environmental impact.

The DTMP will provide the basis from which planning and implementation for construction of new district roads in Okhaldhunga will take place. This will extend over a five-year period starting from the fiscal year of 2001/2002 to 2005/2006. The plan recommends construction of roads that have high priority in the district. This includes roads, which link the district to strategic road networks in the country. The DTPP however reflects the plan of the district over the next 20 years. Both the DTMP and the DTPP also provide HMG and donors a rational basis on which to decide on future investments that will go towards improving the district transport situation.

The implementation of the DTMP / DTPP will also minimise the current ad-hoc practice of investing in roads based only on short-term considerations on the basis of the political contingency. Due to the high demand for rural roads and a shortage of funds for construction and rehabilitation it is imperative that proposed roads are prioritised according to rational criteria.

1.3 Methodology

The different phases and procedures in preparing the DTMP and the DTPP are explained in Volume I "Methodology". This describes in detail the individual steps of the planning cycle and provides the basis for prioritising and making decisions. The methodology is an integral part of the Okhaldhunga DTMP/DTPP. The methodology, including and the scoring system were approved by the DRCC of the Okhaldhunga district during the district consultation in September 2000.

Chronology of events in the course of the DTMP/DTPP development has been summarised in Table 1.2.

Chronologies of Events in DTMP/DTPP Development

Date	Achievement	Participants/ Ownership	Remarks
September 1999	Formation of District Road Coordination Committee (DRCC)	DDC Okhaldhunga DRSP/PSU	Workshop in Okhaldhunga
November 1999	District Technical Team hired (1 engineer and 2 overseers)	DDC Okhaldhunga	
December 1999	Okhaldhunga District agreed to participate in the District Road Support Programme	DDC Chairman DDC LDO DoLIDAR SDC DRSP/PSU	DRSP Programme Orientation and Vision Sharing Workshop in Kathmandu
January 2000	Status and analysis of the strategic road network and the district road network	District Technical Team DRSP/PSU	Collection of primary and secondary data in the district and with concerned HMG departments
February 2000	Preliminary selection of road corridors for DTMP considerations.	DRCC DRSP/PSU	Workshop in Okhaldhunga
April to October 2000	Collection of data and analysis of individual road corridors. <ul style="list-style-type: none"> • Demography • Agriculture • Economic structure and central services • Trade flow • District Priority • Construction Costs • Environment • Social 	DDC/DRCC District Technical Team DRSP/PSU	Data collection in Okhaldhunga and Kathmandu
September 2000	Scoring system developed and approved. Criteria for prioritisation finalised.	DRCC DRSP/PSU	Workshop in Okhaldhunga
December 2000	Analysis of expected funds available for road construction and maintenance work for the next five years.	PSU	Consultation meetings with HMG Departments and potential donor agencies
December 2000	Regional synchronisation of DTMP roads in consultation with the neighbouring district and HMG stakeholder	Members of: NPC DoR DoLIDAR SDC DRSP/PSU	One day workshop in Kathmandu
December 2000	DTMP roads prioritised.	DDC/DRCC	Workshop in Kathmandu
January 2001	Draft DTMP approved by the DDC	DDC/DRCC	DRCC Meeting in Okhaldhunga
January 2001	DTMP findings and guidelines for DTPP data collection presented to the VDC's	All VDC Chairman of the district Ilaka Members DDC/DRCC DRSP/PSU	Workshop in Okhaldhunga
February 2001	Proposal collected from the VDC's for the DTPP in the VDC's.	VDC Chairman VDC Vice Chairman Ilaka Members	Consultation meetings in the VDCs

Date	Achievement	Participants/ Ownership	Remarks
February 2002	Draft of DTMP and DTPP approved by the District Council.	DDC DRSP/PSU	District Council Meeting in Okhaldhunga
March 2002	Final editing of approved DTMP/DTPP		DRSP/PSU
	Endorsement by NPC Endorsement by MoLD		

TABLE 1.2

2. DISTRICT INVENTORY/ DISTRICT PROFILE ANALYSIS

The chapter provides an overview of Okhaldhunga District. Emphasis has been given to issues related to transport development planning.

2.1 Physical and Meteorological Characteristics

2.1.1 Location

The district of Okhaldhunga lies between the northern latitudes of 27°6' and 27°32' and between the eastern longitudes of 86°10' and 86°41'. It is approximately 144 km. east of Kathmandu, 128 km. north of Rajbiraj, its zonal headquarter, and 112 km. south of Mount Everest. The district was established during 1961 when the boundaries of the districts were re-defined and is also sometimes known as the 'district of a hundreds martyrs'.

2.1.2 Geo-Physical Aspects

Okhaldhunga lies between the Mahabharat Lekh and the lesser Himalayas between the altitudes of 390m (Jortighat) and 3,627m. (Lamche) mean above sea level (msl). Topographically the district is made up of undulating terrain, tars, lowland areas and riverbanks. 20 percent of the district lies in high altitude and the remaining 56% and 15% are located in the middle and low altitudes respectively. Accordingly there are agro-climatic variations throughout the district.

Three perennial rivers border the district - the Likhu to the west, the Sunkoshi to the south and the Dudhkoshi to the east.

2.1.3 Political Division of the District

The district is divided into two electoral constituencies, which divides the north from the south. There are 56 Village Development Committees (VDCs) distributed in 11 Ilakas.

2.1.4 Climate

Due to the difference in altitude the climate varies from sub-tropical to cold temperate. The southern parts of the Sunkoshi and the Dudhkosi riverbanks in the Toksel, Harkapur, and Sisneri VDCs have tropical climates. Other hill areas have temperate climates. Some of the high altitude areas like Necha, Lamje etc. have cold temperate climates with snowfall during the winter season. The average temperature of the district is 1.4° C in the winter and 24.3°C in the summer. The average annual rainfall is 1650 mm.

2.2 Economic Activities

Agriculture is the major source of income and employment in the district. This alone provides employment for over 95 % of the district population. According to statistical figures of 1987, 96% of the population is involved - directly or indirectly - with agriculture; 0.2 % are involved in business and trade; 1.8 % are dependent on service; and only 0.1 % are engaged in industry.

Porters carry commodities from Katari (Udayapur district) to southern and eastern parts of the district, Jiri (Dolakha district) and Manthali (Ramechhap district) to western areas of the district.

The economy of the district is supported by earnings from three sources; firstly from seasonal migration to cities in the *Terai* and other Indian cities; secondly from formal sector employment like teaching and the civil service; and finally from informal sector employment like agricultural labour, porters etc.

2.3 Demographic and Social Characteristics

2.3.1 Demography

According to the latest population census of 1991, the total population of the district was 139,457 - with 67,951 men and 71,506 women. There are about 26,363 households and settlements randomly scattered in settlements throughout the district. The average household size is 5.3 and the average population density is 130 inhabitants per sq. km. (Table 2.1).

Demographic Characteristics of the District

Characteristics	1981 census	1991 census
Total population:	137,640	139,457
Male	67,653	67,951
Female	69,987	71,506
Economically active population	75,254	68,594
Male	40,341	32,592
Female	34,913	36,002
Total households	24,009	26,362
Average household size	5.7	5.3
Population density per Sq.Km	128.2	129.9

Source: Record on Nepalese Development: Nepal District Profile, 1999

TABLE 2.1

A review of the population in the district suggests that the density of the population is lower in the northern areas in comparison to the southern areas of the district. This is reflected in the figures of the individual road corridors. (Annex 3.1, Vol. III)

The economically active population of the district is engaged in agriculture or work as wage workers outside the district. Small percentage of population serves in the British and Indian army.

2.3.2 Social Issues

The low economic activity in the district is reflected by a high percentage of the population living below the subsistence level. 65% of the population live below the poverty line. 25% of the population have enough food for less than 9 months (poor households), and 40% have enough food for even less than 3 months (ultra-poor households). In order to survive, female members of the poor and ultra-poor search for work as daily wage workers and as porters within the district. Male members have to search for income outside the district in Udayapur, Kathmandu or India.

2.3.3 Health Aspects

The hospital is located next to Okhaldhunga and is run by the United Mission to Nepal. In addition, there are 45 sub-health posts, 9 health posts, 2 health centres and 1 ayurvedic hospital in the district. But most of the village level health posts and sub-health posts are not functioning properly mainly because of lack of technical staff and required tools and medicines. The health posts and the hospital are used only in serious cases and people still consult traditional healers throughout the district.

2.3.4 Religious Activities

Famous religious spots like Kakani, Kuntadevi, and Tinkanya are located in the district. Kakani is about 30 km. west of the district headquarter. Thousands of pilgrims travel to Kakani for religious purposes.

2.4 Service Centres and Services

2.4.1 Overview

Okhaldhunga is a hilly district with plain valleys. There are various settlements in the district but the distribution and the population varies in each VDC. Most of the flat, plain areas and riverbanks have dense settlement. This is due to land use patterns, agricultural production, infrastructure development and socio-economic factors.

The economy of the district is supported by 'haat' bazaar. This is a traditional periodic market that gives people the opportunity to sell farm products and buy different goods imported from the *Terai*. There are more than a dozen 'haat' bazaars within the district. These bazaars take place during different days of a week. Okhaldhunga has its 'haat' bazaar on Saturdays and Wednesdays; the market centres at Manebhanjyang and Rampur have their 'haat' bazaars on Thursdays, while Sisneri and Khijiphalate have their 'haat' bazaars on Wednesdays.

The main service centres provide economic facilities and public and private services to the population of the district. They have been identified based on the criteria outlined in Volume I, Chapter 3.7.3.

The estimated population of Okhaldhunga bazaar for the year 2000 is 2,290. Most of the government offices and schools are located here as well as the hospital. As a result the majority of the district's population visit Okhaldhunga for official as well as for private reasons. Okhaldhunga is also the main service centre where commodities are exported and imported to different VDCs. Other market centres are scattered over the district.

The population distribution at service centres indicates that the bigger centres are Okhaldhunga Rumjatar, Khijiphalate, Rampur, Nisankhe and Sangutar (Table 2.2). Rumjatar is three hours walking distance from Okhaldhunga and has a STOL airport that has daily flights to Kathmandu and four flights a week to Biratnagar. In the western region of the district the main market centres are Rampur, Khiji Phalate, Chisapani Kos Bhanjyang and Sangutar. Rumjatar, Khani Bhanjyang and Nisankhe provide services to the eastern region, while Mane Bhanjyang and Dhadkhola serve the southern area of the district.

Main Service Centres

Main Service Centres	Population (2000)
Okhaldhunga	2,290
Khani Bhanjyang	270
Nisankhe	312
Rumjatar	2,638
Rampur	340
Khijiphalate	366
Sangutar	307
Chisapani Koshhaat	42
Sisneri (Dhadkhola)	64

Source: Annex 3.3.1

TABLE 2.2

Okhaldhunga and Rumjatar bazaar each have 150 telephone lines. There are also eleven VHF-village telecommunication services in the district. This is far below the public demand required in the district. The only alternative to telecommunication service is the postal service. There is a district post office at the district headquarter, 11 Ilaka post offices and 44 sub-district post offices scattered over the district.

There are only a few industrial activities within the district. Existing cottage industries are woodcarving, carpentry, brick making, flour and rice mills and knitting. These industries are concentrated in the main market centres of Okhaldhunga and Rumjatar.

2.4.2 Description of Main Service Centres

Okhaldhunga

Okhaldhunga is the district headquarter and is located on the Katari-Okhaldhunga-Salleri road (under construction). During the year 2000 its population was 2,290. Most of the government and non-government offices of the district are located here. It also has the UMN hospital, the largest health service centre of the district.

Khani Bhanjyang

The Khanibhanjyang bazar is a junction of Pokhare, Diyale and Kuibhir VDCs. This is a regional market/service centre located in the eastern part of the district next to the Khotang and Solukhumbu districts. It's population stands at 270 and it has a health post, agricultural service centre, public telephone etc.

Nisankhe

Located at Thulachhap VDC, Nishankhe is a trading centre of Thulachhap, Bhadaure, Taluwa and Moli VDCs. This is another regional service centre for people living in the eastern part of the district. It has the potential to become a regional administrative centre for the district. It has agricultural and livestock service centres.

Rumjatar

This is the second largest market centre of the district and is Okhaldhunga's main gateway to Kathmandu and Biratnagar. This market/service centre also has the airport for the district. The market has offices and services like the district health centre, agricultural and livestock service centres, telecommunication and range post.

Rampur

Rampur is 16.5 km. from the district headquarter and is situated in Baruneshwar VDC. The market is well known in the district for agricultural export particularly, rice and the cereals. The centre has telephone, health and education offices.

Khijiphalate

Khijiphalate is the local market centre for the northwest region of the district. It has agricultural and livestock service centres, a post office, schools, public telephones etc.

Sangutar

Sangutar is the traditional market centre for the adjoining district of Ramechhap with a population of 302. It is located on the banks of the Likhu Khola, which flows along the border of Ramechhap and Okhaldhunga. Sangutar provides services to the population of Ramechhap and to western parts of Okhaldhunga. It has different services and facilities like telephones, co-operatives, a health post, a police station, various tea stalls, a school, campus and shops selling groceries, clothes, medicines and hardware etc.

Chisapani Koshhaat

Chisapani Koshhaat is a small market centre situated on the proposed Rampur-Sangutar road. This is a local trading centre for Katunje and Mulkharka VDCs. It has some tea stalls.

Sisnery (Dhadkhola)

Sisnery is on the Okhaldhunga-Katari main trail. It is a trading centre for food grain and holds haat bazaars every Wednesday.

2.5 Existing Transport Situation

2.5.1 Accessibility

Among the hilly districts of eastern Nepal, the district of Okhaldhunga lags far behind in terms of transportation and communication infrastructure. There is no existence of any road connection but only a limited number of main trails exists (refer to Table 2.3).

The Katari-Okhaldhunga-Salleri road is the main road that is currently being constructed in the districts of Okhaldhunga and Solukhumbu (refer to Map 3). Katari is the urban/regional-trading centre for the districts of Okhaldhunga, Solukhumbu, Sindhuli and Ramechhap. It has access to the East-West Highway by an all weather gravel road. The Katari-Okhaldhunga earth road is expected to open after a year. This will have a significant impact on the socio-economic situation of Okhaldhunga and other adjacent districts.

Inventory of Rural Transport Linkages (Existing Transport linkages)

Name of Transport Linkage	Category	Total Length Constructed (km.)
Katari-Okhaldhunga-Phaplu	Under construction	146.0
Okhaldhunga - Bamti	Major Trail	45.1
Okhaldhunga - Sangutar	"	38.1
Udayapur - Okhaldhunga	"	22.24
Okhaldhunga - Nisankhe-Rabuwa	"	20.6
Rumjatar - Nisankhe	"	8.0
Mamkha - Patle-Bhusinga	"	46.4
Okhaldhunga-Rumjatar-Khanibhanjyang	"	18.9
Rabuwa Bazar-Khanibhanjyang	"	9.1
Okhaldhunga-Chisapani	"	18.1
Nisankhe-Toksel	"	21.5
Sanguatar-Sindhuli	"	16.55

Source: Annex 3.01

TABLE 2.3

The socio-economic activities still depend on trail-based transport and communication systems that consist of mule trails and main trails. Main trails provide access to a substantial region of the district and serve a larger number of pedestrians and porters. These trails are all weather and are often used by mules to transport goods.

The Sunkoshi and Dudhkosi rivers form a natural border to the south and east of the districts. There are only a few suspension bridges.

2.6 Agricultural Profile

Agriculture is the main source of income and about 95% of the population depends on it for their livelihood.

With the land use analysis (See Map 6) the existing land resource base in the district has been broadly divided into cultivated land, forest/scrub, grassland, and others. Distribution of the land resources indicates that cultivated land covers 48.6% or 522.9 sq. km., followed by forest that covers 43.2% or 465.3 sq. km. and grassland, which covers 6.1%. The total district area is 1076.5 sq. km.

The overall agricultural production pattern of the district is characterised by a high subsistence production and a moderate surplus production.

2.7 Industrial Profile

There are only a few industrial activities in the district. Some of the more common types of rural industries are bamboo craft, clay pots, rice and flourmills, *Radi/Pakhi*, *Dhaka* weaving etc. Products from the cottage industries fulfill local market demands. *Radis* from the Rumjatar area are well known in the country and are exported - sometimes even overseas. The Gurung communities in Rumjatar, Bilandu, Rawadulu and Gannangtar are particularly involved in the production of *Radi*, as this is a part of their traditional occupation. Another export from the district is Nepali paper from the Lokta plant (*Daphne spp*). Paper industries are particularly concentrated in Bhusinga, Patle, Jantarkhani and Rawadulu VDCs. In the western part of the district rope spinning from Hattibar (*Agave spp*) is one of the important sources of off-farm income. There is a 125-KW hydropower plant at Thotne Khola near Rumjatar that supplies electricity to Okhaldhunga, Rumjatar and Barnalu VDCs.

2.8 Trends and Dynamics Observed

The main trends observed are related to the demographic dynamics in the district. As in many southern districts of the country, in-migration from the hill districts has stabilised and the present in/out-migration situation in the district has balanced. This may be because of the pressure on land during the 80's increased the land prices in the *Terai* making it difficult for the people from the hill districts to settle there. However, temporary and or seasonal migration for off-farm employment in the city areas of *Terai* and even India and abroad is increased over the past decade. Another important change observed in the district is in the use of industrial products particularly ready-made clothes, shoes etc. have significantly increased even in the remote areas, which has particularly influenced the traditional occupation of Damain(Tailors), Kami(Blacksmith) and Sharki (Cobblers). In addition, the increased use of ready-made product has serious impact of traditional cottage industries and some of the traditional cottage industries like *Khandi* making are on the verge of extinction.

2.9 District Priorities

During the workshop in February 2000 in Okhaldhunga, the District Roads Coordination Committee (DRCC) and the District Development Council (DDC) recommended seven road corridors in order to prepare the District Transport Master Plan (DTMP). This was based on the general assessment of the district related to market centres, trade flows, agriculture, demography, development of potential areas and other related aspects and the assessment of collected data (See Methodology Vol. I, Section 3.7). During December 2000 regional synchronisation workshop in Kathmandu, the priorities of the district were also confirmed and included in the DTMP. Most of the proposed roads connect the district headquarter to major market centres scattered over the district (See Table 2.4).

Based on the initial assessment of data collected, the DRCC meeting proposed to include the following roads for study in the DTMP (refer to Map no.4):

Roads Proposed for DTMP

Name of Road	Total Road Length	
	Road Reference Number ¹	Proposed (Km)
Okhaldhunga - Rampur	12A009R	16.52
Okhaldhunga - Rumjatar	12A015R	9.86
Okhaldhunga - Nisankhe	12A019A	13.25
Okhaldhunga-Sisneri-Toksel	Dropped due to serious environmental impact	
Rampur - Khijiphalate - Banti	12A010R	37.1
Rampur - Phediguth - Sangutar	12A008R	50.52
Rumjatar - Khani Bhanjyang	12A016R	21.42

Source: Annex 3.01

TABLE 2.4

Based on the general assessment of the proposed road corridor a brief description of each proposed road linkage has been outlined below.

Okhaldhunga-Rampur Road

The Okhaldhunga-Rampur road links the district headquarter to a fertile valley in Rampur called Rampurphat. The road is about 17 km long. It was initially proposed and surveyed as an agricultural road by DoLIDAR. It will also link up Rampur bazaar, which is located in the middle of the Okhaldhunga district. Rampur is one of the largest agricultural producing areas in the district.

Okhaldhunga-Rumjatar Road

The proposed Okhaldhunga-Rumjatar road links the district headquarter at Okhaldhunga with the airport at Rumjatar. The road is about 10 km long and acts as a transportation link for air passengers traveling to and from Rumjatar airport.

Okhaldhunga-Nisankhe Road

The Okhaldhunga-Nisankhe road provides access from the district headquarter to the market centre at Nisankhe. This road meets the Katari-Okhaldhunga road at Gorumare Bhanjyang, which is on the Okhaldhunga-Katari road. The road is about 13 km in length and links the district headquarter to major agricultural producing areas and market centres located in the eastern region of the district.

Okhaldhunga-Sisneri-Toksel Road

This road runs almost parallel to the existing Okhaldhunga-Katari feeder road and joins Okhaldhunga to Betini, Madhavpur and Toksel VDCs in the southern part of the district. The road was dropped from DTMP due to serious environmental impact in Initial Environmental Examination (IEE) (See details in Section 3.8).

Rampur-Khiji-Banti Road

The Rampur-Khijiphalate-Banti road provides access from Rampur, which is surrounded by a fertile agricultural resource base, to Bimire, a small market located next to the Likhu Khola. This river is located on the boundary of Okhaldhunga and Ramechhap districts. This road however can

¹ Road reference number is based on 'Approach for Development of Agricultural and Rural Roads' DoLIDAR /DOC/01

only be constructed after the construction of the Okhaldhunga-Rampur road. The length of this road is about 37 km.

Rampur-Sangutar Road

The Rampur Sangutar road provides access from Rampur to the market centre at Sangutar, which is located on the border of Ramechhap district. The road passes close by the market centre at Kosh Bhanjyang. The proposed road is the major trail from Okhaldhunga to Kathmandu. It divides the district into two halves - northern and southern. This road is about 50 km long.

Rumjatar-Khani Bhanjyang Road

The proposed Rumjatar-Khani Bhanjyang road provides access from Rumjatar to the market centre at Khani Bhanjyang. The length of this road is 21 km.

This road is to be constructed after the completion of the Okhaldhunga-Rumjatar road. It will serve the eastern region of Okhaldhunga and a few VDCs of Khotang district.

3. INDICATORS FOR DISTRICT TRANSPORT PLANNING

As mentioned in the Methodology (Volume I), the indicators for district transport planning reflects the existing situation of a road corridor that falls within its area of influence. The selected road corridors for Okhaldhunga district have been compiled in Table 2.4. The individual road corridors were ranked according to the approved scoring system.

3.1 Demography

Based on the Methodology (Vol. I, Chapter 3.7.1), population along the different road corridors have been divided into two categories: population located in the inner and outer zones of influence.

The inner zone of influence (IZI) comprises of the total area located left and right of the road corridor within 5 km from the road. The outer zone of Influence (OZI) consists of the area between 5 and 15 km. The zones of influence are reflected in thematic Map no. 5.

The scoring of the individual road corridor has been compiled in Table 3.1 and the most important/extreme linkages related to population are described below:

Score of Proposed Roads Based on Demographic Characteristics

Road Corridor	Length (km)	Total Population in the Inner Zone of Influence (IZI)	Total Population in the Outer Zone of Influence (OZI)	IZI (Pop /km)	OZI (Pop/ Km)	Scoring		Total Score IZI+OZI (10)	Transformed score (10)
						IZI (6)	OZI (4)		
Okhaldhunga- Rampur	16.5	5,998	0	363	0	1.1	0.0	1.1	0.9
Okhaldhunga- Rumjatar	9.9	6,653	0	675	0	2.2	0.0	2.2	1.8
Okhaldhunga- Nishangkhe	13.3	15,965	697	1205	53	6.0	0.9	6.9	9.6
Rampur-Khiji-Bamti	37.1	23,477	6,198	633	167	1.9	2.9	4.8	6.1
Rampur-Sangutar	50.5	32,486	3,135	643	62	2.0	1.1	3.1	3.3
Rumjatar Khanibhanjyang	21.4	17,279	4,852	807	227	3.2	4.0	7.2	10.0

Source: Annex 3.1

TABLE 3.1

The **Rumjatar-Khani Bhanjyang** road is the continuation of the road corridor from Okhaldhunga to Rumjatar. This road corridor receives a maximum score of 10. This is because of the average population in the inner zone and outer zone of influence, and the average length of the road. This road corridor also serves a considerable number of people.

Although the **Okhaldhunga-Nisankhe** road linkage will serve the largest population in the inner zone of influence per km of road, it ranks only second with a score of 9.6. It serves a population of 15,965. It is the most densely populated road corridor in the district, however it only serves the smallest population in the outer zone of influence.

The **Rampur-Khiji-Bamti** ranks third followed by the **Rampur-Sangutar** road. Both linkages are located in the mid-hill area. Roads start from the market centre at Rampur and provide services to the population located west of Rampur. The roads provide access to a considerable population in the immediate zone of influence.

The **Okhaldhunga-Rampur** road serves the smallest population in the immediate zone of influence and does not serve population in the outer zone of influence. Consequently this road has received the minimum score.

3.2 Agricultural Resources / Potentials

The agro-climatic variations encourage farming of different cash crops that have high value and export potentials like large cardamom, ginger, orange etc. However the agricultural production system is subsistence in nature and market integration is very limited.

3.2.1 Irrigation Facilities in the District

A review of irrigation facilities in the district indicates that only 7 % of the total cultivated land is under a perennial irrigation system. Without irrigation facilities it is impossible to accelerate agricultural production.

Irrigation Status of the District

Description	Area (ha)
Total cultivated land	23,870
□ Area under permanent irrigation systems	
Government level	1,299
Public level	510
□ Area under partial irrigation systems	4,796
□ Rain fed	17,265

Source: District Agricultural Development Office, Okhaldhunga

TABLE 3.2

Maize- Millet is the main crop of Bari land, which covers the main area of cultivated land. The cropping pattern on irrigated khet land is paddy-wheat, paddy-maize, and paddy-paddy. Mono cropping with paddy is the most common practice on rain-fed Khet land.

3.2.2 Status of Agriculture

Considering agro-climatic variations and present practice of growing different agricultural crops, there are many niches of developing agricultural production pocket areas in the district. Bigutar VDC located west of the Okhaldhunga-Salleri road is known for its production of citrus and temperate fruits (See Map no. 2). It supplies fruits to the district headquarter at Okhaldhunga. VDCs located south of the proposed Rumjatar-Khani Bhanjyang road are also known for their production of citrus fruits. The area north of the proposed Rampur-Khiji-Bamti road is known for its production of potato. Although there is large-scale production in this area, farmers are still not getting reasonable benefit from potato farming. This is because the area lacks a road transportation network that makes it possible for the farmers to transport their production to the market centre. They have to carry their products, which lead to an increase in the transport cost and a reduction in the farm-gate price.

The Ubu, Waksa and Moli VDCs along the Dudh Koshi river basin are traditionally known for goat raising and export a significant number of goats to the Terai via Toksel Ghaat. Northern parts of the district like the Jantarkhani, Patele, Bhusinga and Rawadulu VDCs have temperate forests rich with a variety of herbs and non-timber forest products like Lokta, Allo etc. Linking these agro-producing potential areas to a transport network may lead to a reduction in the transport cost of products and inputs. This will lead to a reduction of the farm gate price and will favour production.

Potential pocket areas for the production of different crops are given in the Table below.

Agricultural Production Potential Areas in the District

Crops	Potential pocket areas
Citrus fruits	Rumjatar, Thulachap, Manebhanjyang, Moli, Gamangtar, Mamkha, Pokhare, Katunje
Temperate fruits	Patle, Jantarkhani, Bigutar, Khijiphalate, Shreechaur, Ragadeep
Cereal crops	Baruneshwar, Harkapur, Kuntadevi, Prapcha, Serna, Kuivir, Taluwa, Jyamire, Rumjatar, Bagutar, Madhavpur, Thakle, Toksel, Phulbari
Vegetable production	Okhaldhunga, Bigutar, Salleri, Barnalu, Harkapur
Vegetable seed production	Barnalu, Salleri, Bigutar

Source: District Agricultural Development Office, Okhaldhunga

TABLE 3.3

3.2.3 Agricultural Production and Potential

The production system in the district is subsistence in nature with low levels of input and output. Rice, maize, millet, wheat and potato are the major subsistence crops. The average area, production and productivity of different crops, fruits and vegetables are given in Table 3.4

Areas, Production and Productivity of Major Crops, Vegetables and Fruits (1999/2000)

SN	Type of crop	Area (ha)	Production (Mt)	Productivity (Mt/ha)
1	Cereal crops	26,670	42,198	1.58
2	Pulse crops	260	225.67	0.87
3	Oil seed crops	155	88.35	0.57
4	Potato	2,385	16,228	6.80
5	Tobacco	10	12	1.20
6	Sugarcane	5	40	8.00
7	Spices	59	233	4.00
8	Orange (<i>Junar</i>)	75	399	9.50
9	Mandarin/orange (<i>Suntala</i>)	180	927	9.00
10	Lime/Lemon	55	132	4.00
11	Other fruits ²	295	1,900	10.50
12	Vegetables	410	2,870	7.00

Source: District Agricultural Development Office, Okhaldhunga (2000)

TABLE 3.4

Although there are favourable agro-climatic conditions in the district and high cropping intensity (area of temporary crops divided by arable land), farmers' income is still low. This is due to the low percentage of land available for cultivation and the lack of a road transport in the district.

The scoring related to agricultural resources and potentials was carried out. It was based on the area of cultivated land located in the inner and outer zone of influence of the different road corridors. As defined the agricultural area within 5 km of both sides of the road corridor is within the IZI and the area between 5 and 15 km belongs to the OZI.

The scoring of the individual road corridors is in Table 3.5 and the most important linkages related to agriculture have been described below:

The **Okhaldhunga-Nisankhe** road has maximum priority from the agricultural perspective. This is because a large area of cultivated land falls within its inner zone of influence. This road has been

² Mango, Apple, Pear, Plum, Peach etc

assigned a maximum score of 15 followed by the **Rampur-Khiji-Bamti** linkage, which has a score of 6.8.

The **Rumjatar-Khani Bhanjyang** road corridor is third highest with a score of 4.7. This is because a large area of land falls in the IZI.

The **Okhaldhunga-Rampur** road corridor receives the least importance because of the minimal area of cultivated land in its inner zone. In spite of this, it is still important as it provides access to other agricultural resource bases located in the catchment area of other roads like the Okhaldhunga-Toksel, Rampur-Sangutar and Rampur-Khiji Bamti roads.

Score of Proposed Roads Based on Agricultural Resource Base

Name of Road	Length of Roads (Km)	Cultivated land area in IZI, ha/km	Cultivated land area in OZI, ha/km	Score		Total Score (15)	Transformed Score (15)
				IZI (10)	OZI (5)		
Okhaldhunga-Rampur	16.5	112.47	0.0	2.9	0.0	2.9	2.0
Okhaldhunga- Rumjatar	9.9	170.60	0.0	4.4	0.0	4.4	3.1
Okhaldhunga-Nishankhe	13.3	379.41	7.2	10.0	0.1	10.1	15.0
Rampur-Sangutar	37.1	176.82	20.7	4.6	0.3	4.9	4.2
Rampur-Khiji-Bamti	50.5	232.69	5.7	6.1	0.1	6.2	6.8
Rumjatar-Khani Bhanjyang	21.4	6.85	314.8	0.2	5.0	5.2	4.7

Source: Annex.3.2

TABLE 3.5

3.2.4 Agriculture Development Prospect

A review of the Land Use clearly shows that constructing three roads starting from Okhaldhunga to Rampur, Rumjatar and Nisankhe will provide access to areas that have an agriculture resource base and potential. An improved district road network will allow products to be transported more economically to the southern regional centres.

Investing in the three roads starting from Okhaldhunga will improve services providing credit and agricultural inputs such as seeds and fertilisers. In addition to this it will provide market access for agricultural products and also give economic access to different services. The reduction in transport costs from the farms to the road will lead to a substantial increase in farmers' income from cash crops and a gradual change from traditional subsistence farming to cash crop production.

There are opportunities in the district to transform the subsistence level agriculture production level to a more market oriented, high-input, high-output one. Diversifying and intensifying existing cropping patterns can do this. The district has a variety of climatic zones from a warm sub-tropical climate along the river basin to temperate and cold in the high altitude zones. Due to differences in the climate and great heterogeneity in the potential pocket areas (Table 3.3) there are opportunities to grow both temperate as well as tropical crops.

The mid-altitude zones of the district are suited for orange and mandarin production. There are patches of land along the river stream with moist conditions that are suitable for growing cardamom. This means that if enough investments are made on the required transport network, Okhaldhunga like other hill districts of eastern Nepal can also be developed as a cardamom exporting district. Fulbari, Bilandu, Shreechaur, Baruneshwar, Barnalu, Kuntadevi VDCs have a different climatic niche that is also suitable for growing cardamom.

The major citrus growing areas that have a high potential for expansion are Rumjatar, Thulachap, Manebhanjyang, Moli, Gamangtar, Mamkha, Pokhare, Katunje VDCs etc. Other VDC's close to the district headquarter and along the Katari-Okhaldhunga road have the potential to produce fresh vegetables, both seasonal and off-seasonal.

The northern regions of the district that share a common border with Solukhumbu district are suitable for temperate fruits like pear, peach, plum etc. This includes VDCs like Patle, Jantakhani, Bigutar, Khijiphalate, Prapcha, Serna and Kuibhir. They also have high value forest products like Chiraito (*Swertia chirayita*), Allo/Himalayan nettle (*Girardinia spp*), Jatamasi (*Nardostaxys grandiflora*) etc. that have high export prospects.

In the large forest areas of the western part of the district different types of medical herbs are available. After the construction of the Rampur-Khiji-Bamti road, these could be a source of income for the district as they could be processed to produce medicine.

3.3 Economic Structure and Service Centres

The analysis of service centres and settlements indicates how important the transportation networks are for future development (the importance of market exchange goods is determined by the geographical conditions and agricultural potential of the area). This section analyses the economic facilities and governmental services. It also prioritizes road corridors based on the scalogramme analysis of the service centres.

3.3.1 Distribution of Service Centres

Lack of accessibility has resulted in markets and service systems in the district, which are not well developed or articulated. In addition to Okhaldhunga, there are about ten small permanent service centres scattered around the district. They are Rumjatar, Khani Bhanjyang, Nisankhe, Khijiphalate etc (See Map 2). The airport at Rumjatar has provided an opportunity to export oranges.

3.3.2 Industry and Commerce

The main rural industries in the districts are bamboo craft, clay pots, rice and flour-mills, *Radi/Pakhi*, *Dhaka* weaving etc. Products from the cottage industries are for the local markets demand. *Radi* from Rumjatar areas are well known in the country and are exported overseas. The Gurung communities in the Rumjatar area traditionally are involved in this business. Nepali paper (*Lokta*) is another important product of the district.

3.3.3 Major Service Centres and their Functional Characteristics

The questionnaire for the study of service centres has divided the service/infrastructure category into nine categories. These have been classified into two facilities: Economic and Government. Economic facilities are occupational structure, industry, business and commerce, offices whereas government facilities are health, education, drinking water supply, communication and electricity.

During the field survey information was collected about economic facilities and governmental services located at market centres and in their catchment area. The functional characteristics of market centres were also assessed using the scalogramme analysis and scores were assigned.

The scores of the service centres depends on the weight assigned to each of the facilities and services. A scalogramme analysis was done to identify the importance of each market centre. The detailed functional characteristic of each market centre, has been given in Annex-3.3.1.

To prepare the unweighted centrality analysis, each of the nine categories grouped under economic and government facilities were assigned a score ranging from 0 to 4. Based on these scores a suitable number was assigned to each of the facilities. To prepare the weighted centrality analysis, the scores of each service identified in the unweighted centrality analysis are multiplied by the

weight assigned to the nine different services. The outcome of the weighted centrality analysis has been given in Annex 3.3.4.

The economic and social activities are concentrated in the main service centres. These are Okhaldhunga (the district headquarter), Rumjatar, Khani Bhanjyang Nisankhe, Rampur, Sangutar, Khijiphalate and Chisapani Koshhaat (See Map 2). Other market centres are Manebhanjyang and Dhadhkhola. These service centres are located along traditional main trade routes, or on planned district roads.

A review of the functions and services in the service centres and in their catchment area was carried out based on the information collected during the field survey (Annex.3.3). The data indicates that Okhaldhunga provides the maximum number of economic facilities and government services to the district population. As a result **Okhaldhunga** receives the highest score of 98.1 out of 100 followed by **Sangutar** with a score of 90.6, **Rumjatar** with 88.1 and **Khijiphalate** with 61.9. These service centres are located in the western region of the district. The other centres scored from between 48.1 to 59.4.

Score of Proposed Roads Based on Services Provided by Existing Service Centres

Road Corridor	Market Centres	Weightage	Total Weightage	Length of the Road (km.)	Total Marks per km. road	Total Score (10)	Transformed Score (10)
Okhaldhunga-Rampur	Okhaldhunga Rampur	98.1 48.1	146.3	16.5	8.9	3.7	3.7
Okhaldhunga-Rumjatar	Okhaldhunga Rumjatar	98.1 88.1	186.3	9.9	18.9	10.0	10.0
Okhaldhunga-Nishangkhe	Okhaldhunga Nishangkhe	98.1 59.4	157.5	13.3	11.9	5.6	5.6
Rampur-Khijiphalate-Banti	Rampur Khijiphalate	48.1 61.9	110.0	37.1	3.0	0.0	0.4
Rampur-Phediguth-Sangutar	Rampur Sangutar Koshhaat	48.1 90.6 48.8	187.5	50.5	3.7	0.5	0.5
Rumjatar-Khanibhanjyang	Rumjatar KhaniBhanjyang	88.1 56.9	145.0	21.4	6.8	2.4	2.4

Source: Annex 3.3

TABLE 3.6

Three roads starts from Okhaldhunga: Okhaldhunga-Rumjatar, Okhaldhunga-Nisankhe and Okhaldhunga-Rampur. Due to the location of the major service centres on these roads, their scores are higher. Their scores range from 10 to 3.7.

The **Okhaldhunga-Rumjatar** road has a maximum score of 10 for several reasons. Firstly, two bigger market centres are located on this road and secondly, the length of this road is short at 9.9km. Since the final score is obtained by dividing the total score by the length of the road, there is a chance that shorter roads with bigger market centres will have higher scores. The **Okhaldhunga-Nisankhe** road, which has a score of 5.6, is of second highest importance from the perspective of market/service centres development.

3.4 Trade Flow/Predicted Changes

Most of the commodities like kerosene, salt, cloth, and rice are carried to Okhaldhunga from Toksel, a market centre located south of Okhaldhunga district. The market centre at Sangutar serves the western region of the district. The area in the north-west is served by the market centre at Banti.

The trade flow within Okhaldhunga is reflected in Map no. 7. In common with existing tendencies of the mid-hills and inner Terai districts, the import of goods from the southern districts far exceeds the export.

Based on Vol. I, in order to estimate average transport rate per ton per km of distance, the total transport cost was divided by the length of the road and average volume of commodities transported along the roads starting from origin to destination. This was done in order to compare the transport costs saving of different corridors after the construction of road. This indicator was assigned a total score of 15.

Along the proposed **Okhaldhunga-Rampur** road corridor, porters transport all goods. Rampur, which is located at the middle point of Okhaldhunga, provides services to a substantial number of people in the district. Due to a high trade volume of 442 ton/year, the total transportation costs per year along this corridor are the highest. As a result it receives the maximum score of 15.

The existing trade volume on the **Okhaldhunga-Rumjatar** road is 146 ton/year, a relatively low figure. The average transport cost is the most at Rs. 396/ton/km in comparison to other proposed roads. This is due to the commercialisation of trade along this road. The proposed corridor receives the score of 7.6.

Scores of Proposed Roads Based on Volume of Trade Flow

Name of Road	Length km	Trade volume by Transport mode (Ton/Year)						Total Trade volume t/year	Avg. Transp. Cost Rs/t/km	Total Transp. cost Rs/km/y	Total Score (15)	Trans-formed Score (15)
		Porter	Mule/horse	Truck	Tractor	Bus	Tyre gada					
Okhaldhunga-Rampur	16.5	442						442	189	83,538	15.0	15.0
Okhaldhunga-Rumjatar	9.9	146						146	396	57,816	7.6	7.6
Okhaldhunga-Nisankhe	13.3	170						170	189	32,130	0.2	0.2
Rampur-Khiji Phalate-Bamti	37.1	136	9					145	217	31,465	0.0	0.2
Rampur-Katunje-Sangutar	50.5	255						255	189	48,195	4.8	4.8
Rumjatar-Khani Bhanjyang	21.4	170						170	189	32,130	0.2	0.2

Source: Annex 3.4

TABLE 3.7

Rampur-Sangutar has the second highest trade flow at 255 ton/year in comparison to other roads. In spite of its trade flow, its score is only 4.8. This is because the length of the road is relatively longer i.e. 50.5 km.

3.5 Development Potential

Other resources and activities along the individual road corridors, which are beyond the agricultural sector, are described and rated as development potentials.

There are few areas that have distinct development potentials. However, the survey carried out with the district representatives identified the potentials in the respective road corridors that have a high significance.

Table 3.8 is a summary of certain trends, potentials and other considerations that have been discussed in the previous chapters.

Scores of Proposed Roads Based on Development Potentials

Road corridor	Total Weightage	Total Score (5)	Transformed Score (5)
Okhaldhunga-Rampur	4.2	2.5	2.5
Okhaldhunga-Rumjatar	3.3	0.0	1.2
Okhaldhunga-Nisankhe	4.3	2.8	2.8
Rampur-Khijiphalate-Bamti	5.1	5.0	5.0
Rampur-Sangutar	5.1	5.0	5.0
Rumjatar-Khani Bhanjyang	3.8	1.4	1.4

Source: Annex 3.5

TABLE 3.8

Along the Rampur-Khijiphalate-Bamti connection the only development potential areas identified were potato farming and non-timber forest products.

There are development potentials in livestock farming and agricultural development on the Okhaldhunga-Rumjatar, Okhaldhunga-Nisankhe, and Okhaldhunga-Rampur roads.

3.6 District Priorities

A preliminary selection of road corridors was made based on the preliminary survey data and recommendations made by the DRCC and also on the recommendations made during VDC level and Ilaka level workshops in February 2000 in Okhaldhunga. A consensus was reached about the priorities during a first workshop in Kathmandu in the December 2000. These priorities were ranked between 0 and 5 and a list was finalised (See Table 3.9).

The district clearly prioritised the four main road linkages of Okhaldhunga-Rumjatar, Okhaldhunga-Nisankhe, Okhaldhunga-Rampur and Rampur-Sangutar

Scores of Proposed Roads Based on District Priorities

Road Corridors	Total Marks given	Total Score (5)	Transformed Score (5)
Okhaldhunga-Rampur	3.5	3.0	3.0
Okhaldhunga-Rumjatar	4.5	5.0	5.0
Okhaldhunga-Nisankhe	3.5	3.0	3.0
Rampur-Khijipjalate-Bamti	3.0	2.0	2.0
Rampur-Sangutar	3.5	3.0	3.0
Rumjatar-Khani Bhanjyang	2.0	0.0	1.3

Source: Annex 3.6

TABLE 3.9

3.7 Tentative Construction Costs of Proposed Roads

The initial estimate covers the cost for the construction of new roads. It includes the cost of labour, local construction materials, imported materials and transportation costs for earthwork, construction of retaining structures and minor water management structures. The rating is done based on construction costs. The road linkage with the lowest cost i.e. the cheapest gets the highest score.

The highest ranked road link is Okhaldhunga-Rumjatar. The proposed road alignment follows a gradual decent from Okhaldhunga and finally transverses the points of Rumjatar. This road costs the least and gets the highest score. On the other hand Rampur -Khijiphalate - Bimire, which has the highest cost, scores the lowest (Table 3.10)

The road alignments that follow a ridge cost less in comparison to the valley alignments. This is because of more retaining structures and water management works are needed.

The following table presents an initial cost estimate and engineering rating.

Summary of Initial Cost and Engineering Rating of Proposed Roads

Name of Road	Length km	Total Cost (NRs.000)	Cost per km (NRs.000)	Engineering Rating	
				Scores (20)	Transformed score (20)
Okhaldhunga-Rampur	16.5	20,167	1,220	18.7	18.7
Okhaldhunga-Rumjatar	9.9	11,142	1,130	20.0	20.0
Okhaldhunga-Nisankhe	13.3	20,374	1,540	13.9	13.9
Rampur-Khijiphalate-Bimire	37.1	92,008	2,480	0.0	7.1
Rampur-Sangutar	50.5	92,452	1,830	9.6	9.6
Rumjatar-Khani Bhanjyang	21.4	31,901	1,490	14.7	14.7

*Note: - Engineering Score = (Maximum-X)*20 / (Maximum-Minimum)*

Lowest is the best

Source: Annex 3.7

TABLE 3.10

3.8 Environmental Issues / Predicted Impacts

An assessment of the potential environmental impact along the proposed road corridors was made during the walkover survey carried out by the District Technical Team. Descriptions of the road link, water bodies, topography, geology, vegetation, socio-economic, etc. have also been described. The significance of negative environmental impacts was also taken into consideration and rated in Table 3.11

The following summary describes the environmental aspects of the individual road links.

a) Okhaldhunga - Rampur

The proposed alignment passes through settlement areas, thin private and community forests, grazing lands and agricultural fields. The alignment has been selected so that the road passes through minimum forestland and rich agricultural fields. There is a major active landslide at north of the Lipe khola at Ch 4+350. However, this does not pose a threat to the road other than during the monsoon when there might be flash floods. Major rivers along the alignment

are the Lipe khola and Jhagarpur khola - these rivers are seasonal. There are minimum impacts on the environment from construction of the road.

b) Okhaldhunga - Rumjatar

The proposed alignment passes through thin forests, settlement areas and barren lands. Though technically feasible, the existing trail at Rumjatar will need to be avoided as houses are situated very close to the track. There are no landslides or major waterways along the proposed alignment. This road construction would result in very little environmental damages.

c) Okhaldhunga - Nisankhe

Apart from the initial 2 km section of road, which passes through thin community forest, few environmental issues need to be addressed. There are four streams along the alignment; the Dhungeni khola, Jamdar khola, Andheri khola and Masar khola, which are spring-fed, can be made motorable by providing causeways.

d) Rampur - Khijiphalate - Bimire

The proposed alignment passes through agricultural fields, community forests and settlement areas. In the high altitude forest, you can find species of trees such as khasru and gurans and wild animals such as tigers and leopards. There are no landslides where the alignment needs to pass, but there is a cliff at Bhitri that needs to be avoided. This will increase the length of the road. The Molung khola and Elon khola are perennial rivers and major bridges will be needed - even during the dry season. Kopche khola is another river, which is spring fed and can be forded during the dry season.

e) Rampur - Sangutar

This proposed road is 50 km long and connects Rampur to Sangutar (which is on the border of Ramechhap district). The road climbs from an altitude of 550 m at Rampur to an altitude of 2000 m at Bhotechaur forest area. Community and national forests fall along this alignment. In the high altitude national forests, you can find tree species such as khasru and wild animals such as tigers and leopards. The fertile areas along the alignment are Rampurphat and Sangutar. Perennial rivers like the Molung khola and the Solun khola are not fordable. However minor rivers like Kakani khola, Bilandu khola and Niure khola are fordable during the dry season.

f) Rumjatar - Khani Bhanjyang

The proposed road link is 21km long. It intersects the Okhaldhunga-Rumjatar road at Sanetar. Major rivers along the alignment are the Thotne khola and Kharte khola, while the minor ones are the Thati khola, Khahare khola, Serne khola, Ganda khola and Khani khola. All the rivers are perennial and spring fed. There is a major active landslide in the Bhusune area on the banks of the Kharte khola so the alignment needs to be carefully selected. There are community forests in four different areas of the alignment. The dominant species are chilaune, uttis and salla. About 0.5 km of the alignment passes through agricultural fields at Sanetar VDC. Settlement areas along the 21 km of road length are Mankha, Pakhe, Ratmate and Khasibhanjyang.

g) Okhaldhunga - Sisneri - Toksel

The proposed road runs almost parallel to the existing Okhaldhunga - Katari feeder road and connects Okhaldhunga to Betini, Madhavpur and Toksel VDCs in the southern part of the district. IEE was also carried out during the walk over survey to find out its possible environmental impact along its alignment. A serious environmental impact was forecasted during the walk over survey hence this corridor is dropped from the consideration. Therefore, this corridor does not appear in the environmental rating table 3.11.

In conclusion, the initial environmental walk over survey shows that there could be significant environmental effects along some of the road corridors (See Table 3.11). However none of the roads included in the DTMP selection needed major environmental measures. The Toksel (Ghurmi)- Okhaldhunga road has been dropped from the DTMP due to foreseeable environmental impacts along the proposed route. However certain areas could be served by roads following alternative routes and could be a part of the DTPP.

Summary of Environmental Rating of Proposed Roads

Name of Road	Length km.	Environmental Rating					Transformed Score (10)
		Min.	Sign.	Serious	Scores	Scores (10)	
Okhaldhunga-Rampur	16.5	37	0	0	10	10.0	10.0
Okhaldhunga-Rumjatar	9.9	34	3	0	7	0.0	2.9
Okhaldhunga-Nisankhe	13.3	37	0	0	10	10.0	10.0
Rampur-Khijphalate-Bimire	37.1	35	2	0	8	3.3	3.3
Rampur-Sangutar	50.5	34	3	0	7	0.0	2.9
Rumjatar-Khani Bhanjyang	21.4	34	3	0	7	0.0	2.9

Source: Annex 3.8

Note: Environmental Score = $(X - \text{Minimum}) * 10 / (\text{Maximum} - \text{Minimum})$

Highest is the best

Environmental Rating:-

If the Value on "Min." column > 27 = < 37: **Minimum Environmental Impact**

If the Value on " Sign." column > 10: **Significant Negative Environmental Impact**

If the Value on "Serious" column > 0: **Serious Negative Environmental Impact**

TABLE 3.11

3.9 Social Issues

The burning issue is "how can we in a best way help to reduce poverty through district transport operation". In order to do this we need to identify the poor and the ultra poor people in the road corridor. Transportation alone cannot reduce poverty. We should always keep in mind that direct as well as indirect approaches can reduce poverty. There is a need to implement social interventions to reduce poverty. As a result DRSP is implementing social interventions program beyond the physical construction of roads, especially income generating and non-income generating program with close cooperation with LRUC, LRCC, and implementing by CBOs.

The social and poverty data analysis shows that Okhaldhunga district has the highest rate of poor and ultra poor households. An improved transport infrastructure is expected to enhance economic growth through better access to areas with resource potentials. This results in better opportunities for the poorest social strata in the district as well. Therefore by using this indicator, road corridors that have the highest number of people living in poverty will get top priority. In order to identify households in the road corridors living below the poverty line, a food sufficiency survey was conducted by DDC. The results are presented in Table 3.12.

Potentials for social transformations have studied only in Okhaldhunga - Rampur road. A strong recommendation is that during the construction work, people from the poorest population strata and particularly women are employed so that they can benefit from road construction and maintenance. The increased economic activity might lead to new enterprises, which will provide more job opportunities.

The population along the road corridors is divided into three social strata - the ultra-poor, the poor and those living above the existence level. Ultra-poor households are defined as having less than three months food sufficiency; poor households have less than nine months food sufficiency. Households with more food sufficiency are considered to be living above the existence level. These are the indicators used to evaluate the poor population per road kilometre in the IZI and OZI.

The Okhaldhunga-Nisankhe corridor has the largest number of people living in poverty. This is followed by the road links of Rumjatar- Khani Bhanjyang, Bhimsthan-Bahuntipung and Okhaldhungamadi-Bhimstan.

Population under Poverty in the Influence Area of the Proposed Road

Road Corridor	Length (km)	Pop. in IZI	Pop. in OZI	Total Pop.in IZI & OZI	Ultra poor Pop. of IZI	Ultra poor Pop. of OZI	Total UP Pop. of IZI & OZI	Poor Pop. of IZI	Poor Pop. of OZI	Total Poor Pop. of IZI & OZI	Pop. per Km of road length		Score (10)			Transf-ormed Score (10)
											UP	P	UP (6)	P (4)	Total Score (10)	
Okhaldhunga - Rampur	16.5	5,998	0	5,998	2,884	0	2,884	2,364	0	2,364	175	143	1.0	0.6	1.6	0.9
Okhaldhunga - Rumjatar	9.9	6,653	0	6,653	2,724	0	2,724	2,890	0	2,890	275	292	3.6	1.3	4.9	3.9
Okhaldhunga - Nishangkhe	13.3	15,965	697	16,662	4,388	133	4,521	7,705	299	8,004	340	602	6.0	4.0	10.0	10.0
Rampur - Khijiphalate - Bamti	37.1	23,477	6,198	29,675	6,590	1,620	8,210	12,243	2,767	15,010	221	405	1.7	2.3	4.0	2.8
Rampur - Sangutar	50.5	32,486	3,135	35,621	9,558	943	10,501	16,685	1,624	18,309	208	363	1.2	1.9	3.1	1.8
Rumjatar - Khanibhanjyang	21.4	17,279	4,852	22,131	6,222	222	6,444	8,537	324	8,861	301	414	4.6	2.4	7.0	6.4

Source: Annex 3.9

TABLE 3.12

3.10 Aggregation of Scores from all Nine scoring Indicators

Prioritisation based on the total scoring has been compiled in Table 3.13. The rating of the individual indicators is explained in the respective chapters. The overall finding of the scoring exercise is, that roads located in the inner plain areas receive a higher priority over roads located in the hills. The construction cost of roads in the inner plain is lower and less environmental mitigation measures have to be considered.

Prioritisation of Individual Road Corridors

Name of Road	Parameters Used for the Prioritisation of Road Corridors and their Corresponding Scores										
	Demography (10)	Agriculture (15)	Service Centres (10)	Trade flow (15)	Dev. Pot. (5)	District Priority (5)	Const. Cost (20)	Environment. (10)	Social Aspects (10)	Total Score (100)	Rank
Okhaldhunga- Rampur	0.9	2.0	3.7	15.0	2.5	3.0	18.7	10.0	0.9	56.7	II
Okhaldhunga- Rumjatar	1.8	3.1	10.0	7.6	1.2	5.0	20.0	2.9	3.9	55.5	III
Okhaldhunga- Nishankhe	9.6	15.0	5.6	0.2	2.8	3.0	14.0	10.0	10.0	70.2	I
Okhaldhunga-Sisneri-Toksel	Dropped Due to Serious Environment Impact										
Rampur-Khiji- Bamti	6.1	6.8	0.4	0.2	5.0	2.0	7.1	3.3	2.8	31.1	VI
Rampur - Sangutar	3.3	4.2	0.5	4.8	5.0	3.0	9.6	2.9	1.8	35.1	V
Rumjatar-Khanibhanjyang	10.0	4.7	2.4	0.2	1.4	1.3	14.7	2.9	6.4	44.0	IV

Source: Annex 3.10

TABLE 3.13

The findings of the scoring system indicate that the three roads starting from Okhaldhunga (the district headquarter) to Rampur, Rumjatar and Nishankhe have top priorities for construction. These roads, which provide access to the western and eastern sub-regions of the district, had higher score in comparison to the other roads. Their scores ranged from 55.5 to 70.2.

The Okhaldhunga-Nishankhe road has a maximum score of 70.2. This road is recommended for construction for several reasons. Firstly, it will open up large agricultural producing areas in the south-east region. Secondly, it will reduce the cost of transporting agricultural exports to the district headquarter and to Katari via the Okhaldhunga-Katari road. It will also promote the export of orange from producing pockets that have surplus production. Furthermore this road will serve a large number of the middle-east region of the district and will promote the growth of the market centre at Nishankhe. This road has the potential to extend to the district headquarter of Khotang. The road is currently under construction with funds from DoLIDAR.

The Okhaldhunga-Rumjatar road links three VDCs in the district - Okhaldhunga, Barnalu and Rumjatar. These are all well known for oranges. The District Soil Conservation Office, Okhaldhunga, as a major trail, initially started construction of this road link. The DDC has now undertaken the construction of this road. From the construction cost aspect, this road is the most cost effective amongst other DTMP roads. This road will provide access from the airport to the district headquarter. This will further enhance citrus export and cottage industries.

The Okhaldhunga-Rampur road provides access from Okhaldhunga to Rampur. Although Rampur is a small market centre with only few economic and public service activities, the proposed link is important for several reasons. Firstly, from the agricultural perspective this road provides access to fertile land in the hinterland of Rampur along the banks of the Molung River - one of the major rivers in the district. Rampur also exports agro-products to both the district headquarter and the Solukhumbu district. In addition to this, the Okhaldhunga-Rampur road links the western and south-western parts of the district to the district headquarter. After the construction of the proposed road it could be extended to market centres such as Bamti and Sangutar, which are next to the western border of Okhaldhunga. This can be done through the construction of the Rampur-Bamti and Rampur-Sangutar roads. Secondly the Okhaldhunga-Rampur Road provides services to a large section of the district and is the main district road for central parts of Okhaldhunga. Moreover, the proposed road has maximum trade flow in and out of the district, which further justifies the importance of this road in the district. This road will also serve as a link road to the proposed hydropower station at the Molung River and Kakani, an important religious spot in the district.

The remaining three roads Rampur-Sangutar, Rumjatar-Khani Bhanjyang, Rampur-Khiji-Bamti have a lower priority. Their scores range from 33.7 to 44. The construction of these roads can only begin after

the construction of the Okhaldhunga-Rampur and Okhaldhunga-Rumjatar road. The Rampur-Khiji-Bamti Road will promote the export of cash crops like potato and herbs e.g. Chiraito. It passes through undulating geographical terrain, which may demand higher construction cost per unit length. At present the Rampur-Sangutar route has relatively lower trade flow. However, out of these three roads Rampur-Sangutar road has the highest regional importance as this road provides benefits to people from both Okhaldhunga and Ramechhap.

4. FUNDING SOURCES FOR THE DTMP IMPLEMENTATION

4.1 Potential Funding Sources

Based on a review for funds allocation in the past, the following funding agencies are expected to continue funding the construction of the district roads identified for implementation by the DTMP in Okhaldhunga. Since likely financial resources are the basis for the implementation plan of DTMP, cost for future roads (new construction), periodic and routine maintenance of existing roads and maintenance works after the construction of roads in the district are considered while preparing the implementation plan of the DTMP.

a) DoLIDAR

Under the Agricultural Perspective Plan (1995/2015), during the FY 58/59, DoLIDAR has allocated Rs 4 million to the agricultural road sector. Based on past experience this amount is expected to increase by at least 15% annually.

b) DDC Fund

Discussions with DDC Chairman and other officials at the district have indicated that DDC funds are generated from the royalty obtained from public resources like forest, land tax etc. DDC's internal fund is assumed to increase by 10% annually. Out of the total DDC internal fund, 25% is expected to be allocated to district roads.

c) HMG/N Block Grant

MoLD is allocating a DDC block grant to the district for general development activities (development grant) and for the road sector (rural road grant). The Okhaldhunga district is expected to reserve 25 % of the block grant amounting to 1 million every year for the construction of district roads. The DTMP assumes that the block grant will continue to be allocated over the coming years.

d) VDC Contribution

VDCs receive a block grant of Rs 500,000 each year for the development of their VDCs. 25 % of this block grant is for human resources management and the remaining 75 % is for infrastructure development. Out of the total budget VDC's are expected to give 40% for infrastructure development. This is for the construction of roads that passes through their VDCs. This contribution is not expected to increase over the next five years.

e) Constituency Development Fund

At present each MP receives Rs. 1 million as a block grant for their constituency. Okhaldhunga has two constituencies. It is expected that 10% of this grant will be allocated to the transport sector.

f) DoR/MoLD

The DoR/MoLD provides a special grant for village road development. This is Rs 1.18 million in the FY 58/59 and is expected to increase annually by 20%.

g) DRSP

The budget allocated by the DRSP for the implementation of the DTMP is about Rs.10.05 million. This is for the build-up phase of the project until March 2002. It may increase by 15% for the next five years.

The district will have to use this DTMP report in order to mobilise the funds needed to construct the roads.

h) Local /Community Contribution

Although, quantification of community contribution for the implementation of DTMP is not done at this stage, it is expected that the district will seek community contribution in terms of cash or

labour during the construction and or maintenance of the road. For construction projects this is not usually a very significant source of funding but it could be an important resource for the maintenance of roads by the local communities in partnership with the DDCs and VDCs.

4.2 Budget Forecast for DTMP Implementation

Based on the sources identified in the previous section a tentative budget forecast has been compiled in Table 4.1

Budget Forecast (Rs '000) for DTMP Implementation (2002/03-2006/07)

Sources	Years				
	058/59	059/60	060/61	061/62	062/63
DRSP (SDC fund)	6,450	12,075	12,075	12,075	12,075
DoLIDAR	4,600	5,290	6,084	6,996	8,045
DDC block- grant	1,000	1,000	1,000	1,000	1,000
DDC internal fund	495	545	599	659	725
VDC block-grant	1,219	1,219	1,219	1,219	1,219
Constituency Devt. Fund	300	300	300	300	300
DoR/MoLD	1,181	1,417	1,701	2,041	2,449
Total	15,245	21,845	22,977	24,289	25,813

TABLE 4.1

If the District and the DRSP can get additional funding from bilateral or multilateral donors like the Asian Development Bank, the World Bank etc., the roads that have a top priority in the District can be constructed at a faster rate.

4.3. Matching of Resources on High Ranked DTMP Roads

This section describes the implementation plan of DTMP roads and allocates the tentative budget (Table 4.1) to different components of the individual road corridors according to priorities given in Table 3.13. At this stage the estimated resources are matched with the highest ranked DTMP roads. Construction costs are already estimated (See section 3.7) so the number of highest ranked road links to be completed over the DTMP period is determined

DTMP carries out a thorough investigation and analysis of the availability of resources for road construction, rehabilitation and maintenance over the DTMP period. The investigation includes meetings with key individuals at district level at central level with relevant HMG ministries and departments, and with donors. Past funding trends are analysed and projected forward where necessary. Thus the total estimate of transport resources over the five-year period is determined.

A number of construction, rehabilitation and maintenance activities have already been initiated. These activities are all initiatives in the framework of this DTMP and will be continued over the coming years. Following the priorities given to the individual corridors the physical and financial planning over the DTMP planning period 058/59 to 062/63 has been compiled in Table 4.2. It reflects allocated/committed funds for defined activities and eventual annual surpluses/deficits. Whilst eventual surpluses can be utilised for additional activities, deficits will have to be deducted from already allocated DTMP road budgets. These additions/deductions have to be sanctioned during the annual meetings of the District Council.

Physical and Financial Plan for DTMP Roads

Roads by Priority	Length (Km)	Current year 057/58	DTMP Implementation Year				
			058/59	059/60	060/61	061/62	062/63
Likely available budget (Rs 000)			15,245	21,845	22,977	24,289	25,813
Okhaldhunga-Rampur	16.5						
New Construction (Rs 000)			6,450	8,807			
Physical output (Km)		6.0	4.7	5.8			
Periodic maintenance			301.2	601.7	1,034.9	1,159.1	1,298.2
Routine maintenance (Rs 000)					248	278	312
Okhaldhunga-Rumjatar	9.9						
New Construction (Rs 000)			4,095	2,835	3,175	2,489	2,438
Physical output (Km)			3.2	2.0	2.0	1.4	1.2
Periodic maintenance			250	181	328	508	679
Routine maintenance (Rs 000)					79	122	163
Okhaldhunga-Nishangkhe	13.3						
New Construction (Rs 000)		-	4,700	5,390	6,184	6,996	-
Physical output (Km)		2.0	2.7	2.8	2.9	2.9	-
Periodic maintenance			100	264.8	471.8	729.5	1,044
Routine maintenance (Rs 000)							250
Rampur-Sangutar	50.5						
New Construction (Rs 000)				3,074	14,921	15,426	18,717
Physical output (Km)				1.5	6.5	6.0	6.5
Periodic maintenance					94	562	1,101
Routine maintenance (Rs 000)							
Grand Total			15,896	21,154	23,361	25,781	23,565
Deficit (-)/Surplus (+)			(-) 651	(+) 39	(-) 345	(-) 1,837	(+) 411

Note: 12 percent annual inflation is used while calculating the cost.

TABLE 4.2

The plan allocates for the construction of 16.5 km. of the Okhaldhunga-Rampur road for the period between 2058/59 and 2059/60, followed by its maintenance during the remaining three years. During the fiscal year of 2059/60 the construction of the Okhaldhunga-Rampur road will continue to the Rampur-Sangutar road. Based on the assessment of forecasted fund available for the next five years, it is expected that by the end of the fiscal year 2062/63, 20.5 km out of 50.5 km will be completed. It is assumed that by the end of the current fiscal year a major part of Okhaldhunga-Rumjatar road will be completed and the remaining construction of this road will be finished by the end of fiscal year 2062/63. Therefore it is expected that during this DTMP period the construction of the Okhaldhunga-Rampur, Okhaldhunga-Nishankhe and Okhaldhunga-Rumjatar road will be completed.

The construction of the Okhaldhunga - Rampur road has already been started under the Training Road Construction Programme of DRSP with financial assistance of Rs 10,005,000. The DDC has started the construction of the Okhaldhunga - Rumjatar road with funds from HMG/N. There is an existing track along the proposed road corridor.

During the course of DTMP implementation, if DDC gets additional funding, the remaining roads and or road section of road under construction will be constructed based on priorities set out by the DTMP.

Since there are limited funding sources, funds will be allocated to the high priority roads in the DTMP. The surplus budget each year will be allocated to roads that have a high priority or a high score. These roads should be included in the YPO and be approved in the District Council meeting.

5. PREPARATION AND PRIORITISATION OF DTPP

The DTPP has a perspective of 20 years. The DTPP is revised every five years when a new DTMP is being prepared according to the rolling plan system (See Figure 2.2)

As outlined in Section 2 of the DTMP "Methodology" relevant sections of the draft DTMP along with a map which shows the proposed DTMP roads and existing village, district and strategic network roads is prepared by the PSU were distributed to each VDC. Guidelines are also prepared and distributed by the PSU to assist the VDCs in understanding the maps and the sections of draft DTMP that have been distributed to them. The guidelines also give details of the procedures for suggesting modifications to the Draft DTMP and for formulating proposals for DTPP (as outlined below in Table 5.1).

In January 2001, the DTMP was presented to representatives of the Ilakas. The DTMP map was distributed to them with the request to complement DTMP with their own priorities. Immediately before the District Council at the end of January 2001 the same Ilaka members were invited in a workshop to present their proposals, harmonise them and separate village roads from district roads.

In the end of January, the meeting of the Chairman and Vice Chairman of VDCs together with the DDC Council approved following roads (Table 5.1 and 5.2) for the District Transport Perspective Plan based on the consultation that they had with the people from their VDCs. The District Council held on 13 February 2001 has approved DTMP/DTPP

DTPP Roads with High Priority

Road Reference no.	Name of Road	Remarks
12A008R	Katunje-Sangutar (Rampur-Sangutar)	
12A016R	Rumjataan-Khani Bhanjyang	
12A010R	Rampur-Khijiphalate	
12A014R	Bigutar -Shreechaur	
12A006R	Mane Bhanjyang-Dadkhola	
12A020A	Mane Bhanjyang - Moli (Kudule)	Agricultural road

TABLE 5.1

Initially, the first three roads were recommended for the DTMP, but looking at the likely available budget over the next five years they cannot be constructed with this DTMP period. Therefore, those three roads or sections of the roads are put under the high priority list of DTPP roads. However, if any additional fund, which is not foreseen yet, is available for district roads construction the three roads under DTPP list can also be constructed with the DTMP period

Other Roads proposed for DTPP

Road Reference No.	Name of the Road	Remarks
12A003R	Sangutar-Dadkhola	
12A005R	Dadkhola-Kos Bhanjyang	
12A007A	Betini-Okhaldhunga	Agricultural road
12A018R	Nishankhe-Rabuwabazar	to Khotang district
12A017R	Rawabazar-Kuibhir (Silaurighat)	
12A011R	Khiji Phalate-Sangutar	
12A012R	Khijiphalate-Rawadolu	
12A013R	Jantarkhani-Rawadolu (Jiri)	to Ramechhap district
12A004R	Kosh Bhanjyang-Sisneri Bhanjyang	
12A002R	Dhadkhola-Harkpur	
12A021R	Ketuke-Ubu	
12A001R	Mane Bhanjyang-Thakle (Arubote)	

TABLE 5.2

6. ORGANISATIONAL AND FINANCIAL ISSUES

6.1 Relevant Institutions in the District

In September 1999, during an initial workshop, the DDC Okhaldhunga formed the DRCC. The DRCC is an institutionalised body to the DCC that advises them on formulating, managing and monitoring district level road and trail policies and rules and regulations.

In November 1999 a district technical team was formed within the DDC Technical Unit. The DDC hired one engineer and two overseers.

The LRCCs and UGs have been established for the Okhaldhunga-Rampur and Okhaldhunga-Nisankhe road.

6.2 Budgetary Arrangements and Flow of Funds

After the agreement between the Okhaldhunga District, DoLIDAR and DRSP, a District Road Fund (DRF) was established. The DRF will be replenished by contributions from DoLIDAR, DDC block-grants, DDC internal funds, VDC block-grant, Constituency Development Fund, DoR/MoLD and DRSP.

All activities related to the implementation of the DTMP implementation will be financed through the DRF.

Expenditures will be made based on approved cost estimates in concurrence with the concerned donors.

6.3 Road Construction, Operation and Maintenance

The district, the DRSP and the DCC of Okhaldhunga have agreed to apply labour intensive and environment friendly methods throughout the implementation period of the DTMP. The district roads are to be constructed to fair weather standard using local labour and material resources - either through contractors and/or user groups.

For the sake of consistency, it is strongly recommended to apply the same methods on district roads that are implemented through other programmes.

Maintenance of the completed road should be carried out and the regular budget for maintenance should be allocated to keep the road in operational standard. Therefore, maintenance budget is proposed according to the increment in the length of the road section in the implementation plan of DTMP roads (Table 4.2). A concept of routine maintenance through length workers will be introduced. Local user groups will be responsible for the management, co-ordination and supervision of maintenance work. In order to prevent early damages on the roads during the rainy season, the district roads will be closed to heavy traffic and other traffic will be controlled.

Wherever possible the poorest strata of the population and in particular women will be involved in the construction and maintenance works.

The principles, concepts and implementation steps for construction and maintenance are described in detail in Vol. I Methodology. (Section 2 and Section 3)

LIST OF MAPS

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- Map no. 2 Indicative Development Potential
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- Map no. 5 Zone of Influence of DTMP Roads
- Map no. 6 Land Use, 1996
- Map no. 7 Existing Trade Flow
- Map no. 8 DTMP Roads for 2001 - 2006
- Map no. 9 DTMP and DTPP Roads

Attachment

Transport Infrastructure Map 1: 100,000; District Transport Plan, Okhaldhunga District