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Attachment

Transport Infrastructure Map 1: 125,000; District Transport Plan, Ramechhap District

FOREWORD

APPROVAL SHEETS

DISTRICT ROADS COORDINATION COMMITTEE:

1	Mr. Kailash Prasad Dhungel	:	DDC Chairman	:	Chairman
2	Mr. Ramesh Kumar Basnet	:	DDC Vice Chairman	:	Member
3	Mr. Ang Babu Lama	:	DDC Member	:	Member
4	Mr. Subas Lama	:	DDC Member	:	Member
5	Mr. Chaturman Sunuwar	:	DDC Member	:	Member
6	Ms. Purna Maya Karki	:	DDC Member	:	Member
			(Women Representative)		
7	Mr. Shanti Prasad Poudel	:	DDC Member	:	Member
8	Mr. Jagan Nath Dahal	:	DDC Member	:	Member
9	Mr. Hari Lal Udas	:	DDC Member	:	Member
10	Mr. Tara Nidhi Subedi	:	DDC Member	:	Member
11	Mr. Surendra Basnet	:	DDC Member	:	Member
12	Mr. China Tamang	:	DDC Member	:	Member
13	Mr. Janak Rana	:	DDC Member	:	Member
14	Mr. Pradip Yonjan	:	DDC Member	:	Member
15	Mr. Shiva Kumar Karki	:	DDC Member	:	Member
16	Mr. Govinda Prasad Sharma	:	NGO Representative	:	Member
17	Mr. Harindra Prasad Ghimire	:	NGO Representative	:	Member
18	Mr. Tej Bahadur Karki	:	Representative from Contractors' Association	:	Member
19	Mr. Puskar Raj Prasai	:	Representative from Bar Association	:	Member
20	Mr. Shree Kushashree Neupane	:	Party Representative (Nepali Congress)	:	Member
21	Mr. Bichav Singh Tamang	:	Party Representative (United Peoples Front)	:	Member
22	Mr. Kamal Prasad Sunuwar	:	Party Representative (CPM-UML)	:	Member
23	Mr. Ram Hari Dhungel	:	Member of Parliament	:	Member
24	Mr. Anirudra Mandal	:	LDO	:	Member Secretary

District Technical Team:

1	Mr. Shiva Dahal	:	Engineer/DRSP
2	Mr. Shashi K. Yadav	:	Overseer/DRSP
3	Mr. Bholu P. Kalawar	:	Overseer/DRSP

ABBREVIATIONS AND ACRONYMS

APP	Agricultural Perspective Plan
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
FY	Fiscal Year
HMG	His Majesty's Government
IEE	Initial Environmental Examination
IZI	Inner Zone of Influence
JICA	Japan International Co-operation Agency
km²	Square Kilometre
LDO	Local Development Officer
LRCC	Local Road Coordination Committee
LRUC	Local Road User Committee
MoLD	Ministry of Local Development
MoU	Memorandum of Understanding
msl	Mean Sea Level
NGO	Non Government Organisation
NPC	National Planning Commission
NRS	Nepalese Rupees
NTFPs	Non Timber Forest Products
OZI	Outer Zone of Influence
ProDoc	Programme Document
PSU	Programme Support Unit
RNAC	Royal Nepal Airlines Corporation
RCIW	Rural Community Infrastructure Works
SDC	Swiss Agency for Development and Cooperation
STAL	Short Take-Off and Landing
P	Poor
UP	Ultra Poor
VDC	Village Development Committee
YPO	Yearly Plan of Operation

1. INTRODUCTION

1.1 Background

Ramechhap district is located in the middle hills of the Central Development Region and is surrounded by Okhaldhunga and Solukhumbu districts from the east, Sindhuli district from the south, Kavrepalanchowk district from the west and Dolakha district from the north (See Map 1).

Ramechhap district is predominantly rural. It has an average population density of around 138 persons per square kilometre. Manthali, the district headquarter, is the largest urban centre in the district having a population of 3,780.

Manthali, is approximately 58 km south from Charikot, the district headquarter of Dolakha district. Manthali has motorable access by a single lane all weather road (40 km) with the construction of bridge at Khimti river from Lamosangu-Jiri Road at Nayapul. The access road from Nayapul to Kirnetar (24 km), the location of the Khimti hydro-power project, was constructed by the Khimti hydro-power project for transporting construction materials and equipments required for the construction of the project. The existing road from Kirnetar to Manthali is being up-graded to gravel standard by the Department of Roads (DoR).

However the headquarter remains inaccessible to vehicles during the monsoon period due to lack of bridge over Khimti River. The Department of Roads (DoR) is currently constructing the bridge. Ramechhap Bazaar, the previous headquarter of the district, is now connected by fair weather road where lorries and passenger buses passes along the road carrying construction materials, consumers goods and passenger.

The total area of the district is 1,564 sq. km¹. The distribution of the land resource base indicates that about 45.65 per cent of total area (713.6 sq.km.) is under forest/scrub and about 37.5 per cent of total area (586 sq. km.) is under agriculture.

Based on annual population growth of 1.53 per cent, it has been estimated that the district population was 215,603 during the year 2000.

The total length of the road within the district is 34 km and 39 km for strategic and district road. The road density is 8.03 sq km per km of cultivated land, and 2,954 population per km of road.

The DDC of Ramechhap has realised that providing better access through district roads to areas with resource potentials will have a positive impact on the social and economic development of the district. As a result the DDC has given high priority to the preparation of the District Transport Master Plan/District Transport Perspective Plan (DTMP/DTPP).

During the Programme Orientation and Vision Sharing Workshop in December 1999, Ramechhap, together with four other districts of the Central Development Region and one district in the Eastern Development Region, qualified for support through the District Roads Support Programme (DRSP). This support takes the form of capacity building as well as planning, implementation and maintenance of district roads. The programme is co-financed by the Swiss Agency for Development and Cooperation (SDC), His Majesty's Government of Nepal (HMG) and the participating districts.

¹ This finding is based on the data digitised with the use of Auto Cad software and compiled with the use of Arc View GIS software version 3.2 at DRSP office.

GENERAL INFORMATION ABOUT RAMECHHAP DISTRICT

Population 2000	215,603
Population growth (% per annum, 1991-2000)	1.53%
Regional /Urban centre	Kathmandu, Janakpur
Length of existing roads (km): Strategic road District road	34.0 39.0
Area of district (sq.km.)	1564.40
Area of Agricultural land (sq.km.)	586.50
Area of forest/scrub land (sq.km.)	713.6
Area of grassland (sq.km.)	99.5
Area of remaining land (sq. km.)	164.8
Road density (area of agricultural land/length of existing road, sq.km./km.)	8.03
Road density (population/length of existing roads, pop. /km.)	2953.47

Source: Digitised data, DRSP, May 2001.

TABLE 1.1**1.2 Objectives and Rationale of the DTMP/DTPP**

The lack of adequate transport infrastructure has been the major factor for the slow development of social and economic structures in Ramechhap district.

The objective of the District Transport Master Plan (DTMP) and District Transport Perspective Plan (DTPP) is to facilitate access to areas with resource potentials and to guide the spatial arrangement of rural settlements, market and service centres of the district. This is done through developing a sustainable road network that reduces the aggregate transportation cost and minimises the environmental impact.

The DTMP will provide the fundamental base for planning and implementation of the construction of new district roads in Ramechhap district over a period of five years starting from the fiscal year of 2001/2002 to 2005/2006. The plan recommends roads that have a high priority for construction in the district. This includes roads which link the district with national strategic road network. The DTPP reflects the perspective plan of the district over the next 20 years. In addition, these plans will provide HMG and donors a rational basis to decide on future investments towards the improvement of the district transport situation.

The implementation of the DTMP / DTPP will minimise the current ad-hoc practices of investing on roads based on short-term considerations. This is especially crucial due to high demand for rural roads and the shortage of funds for their construction.

1.3 Methodology

The different phases and procedures of the methodology for preparing the DTMP and the DTPP are elaborated in Volume I "Methodology". The methodology is an integral part of the Ramechhap DTMP/DTPP. It describes in detail the individual steps of the planning cycle and provides the basis for prioritisation and decision-making. The DRCC of Ramechhap district has approved the

methodology, particularly the scoring system, in September 2000.

The chronology of events in the course of DTMP/DTPP development can be summarised as follows:

CHRONOLOGIES OF EVENTS IN DTMP/DTPP DEVELOPMENT

Date	Achievement	Participants/ Ownership	Remarks
June 1999	Interactive Awareness Campaign	DDC Ramechhap DRSP/PSU	First Visit to Manthali Ramechhap
September 1999	Formation of District Road Coordination Committee (DRCC)	DDC Ramechhap DRSP/PSU	Workshop in Ramechhap
September 1999	Hire of District Technical Team (1 engineer and 2 overseers)	DDC Ramechhap	
December 1999	Ramechhap District agreed to participate in the District Roads Support Programme	DDC Chairman DDC LDO DoLIDAR SDC DRSP/PSU	DRSP Programme Orientation and Vision Sharing Workshop in Kathmandu
January to February 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
March 2000	Preliminary selection of road corridors for DTMP considerations.	DRCC DRSP/PSU	Workshop in Ramechhap
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	Development and approval of scoring system. Finalisation of criteria for prioritisation.	DRCC DRSP/PSU	Workshop in Ramechhap
December 2000	Analysis of expected funds available for road construction and maintenance works in the next five years.	PSU	Consultation meetings with HMG Departments and potential donor agencies
December 2000	Prioritization of the DTMP roads.	DDC/DRCC	Workshop in Kathmandu

Date	Achievement	Participants/ Ownership	Remarks
December 2000	Regional synchronization of DTMP roads in consultation with the neighbouring district and HMG stakeholders.	Members of: NPC DoR DoLIDAR SDC DRSP/PSU	One day workshop in Kathmandu
March 2001	Presentation of DTMP findings and guidelines for DTPP data collection to the VDCs	All VDC Chairman of the district Ilaka Members DDC/DRCC DRSP/PSU	Workshop in Ramechhap
April 2001	Collection of proposal from VDCs for DTPP in the VDCs.	VDC Chairman VDC Vice Chairman Ilaka Members	Consultation meetings in the VDCs
	Approval of Draft DTMP by DDC	DDC/DRCC	DRCC Meeting in Ramechhap
	Approval of Draft DTMP and DTPP by the District Council.	DDC DRSP/PSU	District Council Meeting in Ramechhap
	Final editing of approved DTMP/DTPP		DRSP/PSU
	Endorsement by MoLD Endorsement by NPC		

TABLE 1.2

The DTMP has been prepared in a participatory manner. This was started with the formation of the DRCC and continued with the involvement of the most important stakeholders of the district throughout the entire development process.

2. DISTRICT INVENTORY/DISTRICT PROFILE ANALYSIS

This chapter will provide a general overview of Ramechhap District. Emphasis has been given on issues related to transport development planning.

2.1 Physical and Meteorological Characteristics

2.1.1 Location

The Ramechhap district is located between the northern latitude of 27°28' and 27°50' and between the eastern longitude of 85°50' and 86°35'. The district is divided into two electoral constituencies dividing the north and south half of the district. There are 55 Village Development Committees (VDCs) divided in 11 Ilakas.

2.1.2 Geo-Physical Aspects

Most of the area in the district lies in the hills and mountains between Mahabharat Lekh and Lesser Himalaya between the altitude of 379 m and 6,958 m above mean sea level (msl) leading to agro-climatic variations in different pockets of the district. The topographical setting of the district is made up of undulated terrain, tars, low-land areas and riverbanks. The district has perennial rivers such as Sunkoshi, Tamakosi, Khimti and Likhu (refer to Map 2). About 12 percent of the district area lies in the high altitude (above 4,000 m), while the remaining 16 and 72 percent are located in middle and low altitude respectively.

2.1.3 Climate

Due to the different geo-physical conditions the climate varies from sub-tropical to cold temperate. The climate is hot and humid along the river valleys of Sunkoshi, Tamakosi, Likhu and Khimti rivers. Most of the parts in the hill areas are warm to temperate while high altitude areas like Gumdol, Chuchure located on the north experience cold temperate climate with snowfall in the winter season. The average minimum temperature in the hills is about 11 °C and 20 °C in the valleys and tars. The average maximum temperature is 20 °C in the high hills and 30 °C in mid-hills valley and tars. Ramechhap district is characterized by heavy rainfall. The average annual rainfall of the district is 2,025 mm.

2.2 Economic activities

Agriculture is the major source of income and employment in the district. It alone provides employment for over 90 percent of the total district population.

Porters carry commodities from Jiri (Dolakha district) to northern area of the district, while the main road from Nayapul to Manthali and Ramechhap provides service to areas located on both sides of this road. River Sunkoshi located on the western border is used for transporting commodities to western region of the district. Manthali, the district headquarter, serves the remaining area of the district.

The economy of the district is supported by formal sector employment like teaching, civil service, informal sector employment like agricultural labor, porter and remittance from seasonal migration to cities like Kathmandu, Terai and Indian cities for non-farm labor. Haat bazaar, a traditional periodic market system, contributes to the local economy providing opportunities for selling farm outputs and buying different consumer goods imported from Kathmandu and Terai. There are more than a dozen of Haat bazaars within the district. These bazaars take place during different days of the week for example Manthali, Ramechhap, Dhobi and Sangutar have a Haat bazaar during Monday, Tuesday, Wednesday and Saturday respectively.

2.3 Demographic and Social Characteristics

2.3.1 Demography

According to the latest 1991 population census, the total population of the district was 188,064 with 90,718 male and 97,346 female population. There are about 34,766 households and settlements randomly scattered over the district. The average household size is 5.4 (Table 2.1).

DEMOGRAPHIC CHARACTERISTIC OF THE DISTRICT

Characteristics	1991 census
Total population:	188,064
Male	90,718
Female	97,346
Total households	34,766
Average household size	5.4
Area of district (sq.km.)	1564.4
Population density per sq. km	120.2

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

TABLE 2.1

A review of population in the district suggests that the population density in the northern area of the district is considerably lower in comparison to valleys and southern areas. Consequently this is reflected in the figures of the individual corridors (see Annex 3.1).

The population of Ramechhap district consists mainly of Majhi, Sarki, Sunuwar, Brahmin, Tamang, Newar and Chhetri.

2.3.2 Social Aspects

The overall low economic activity in the district is also reflected by a high percentage of the population living below the subsistence level. About 64 percent of the population are living below the poverty line, while 58 percent of the population have food sufficiency for less than 9 months (poor households), and 6 percent have sufficient food for even less than 3 months (ultra-poor households). For their survival female members of poor and ultra-poor population seek employment as daily waged workers and as porters within the district, male members have to search for income outside the district in Kathmandu or India. Food scarcity in the district is experienced mainly between the months of February and July.

2.3.3 Health Aspects

Looking at the overall socio-economic situation of the district, the health status seems relatively poor. Throughout the district people still consult traditional healers. The services of health posts and the hospital are used only in serious cases. There is a primary health centre at Manthali and a general 15-bed hospital at Ramechhap. In addition, there are 12 health posts and 41 sub health posts scattered in the district. The overall hygiene situation of the district is also not satisfactory due to lack of sanitary installations.

2.3.4 Religious Activities

Hinduism is the major religion of the people. There are many Hindu temples and Buddhist monasteries scattered in the district. *Khadadevi* temple is famous in the district; many Hindu and Buddhist pilgrims visit this temple every year. *Panch Pokhari* is another important religious place situated in the high mountain region.

2.4 Service Centres and Services

2.4.1 Overview

Main Service Centres are the places that provide most of the economic facilities and public and private services to the population. They have been identified based on the criteria outlined in Chapter 3.7.3 of Methodology (Volume I).

Due to lack of accessibility, service systems in the district are not well developed and articulated. The main service centres are Manthali, Khimti, Ramechhap, Sangutar, Dhobi and Doramba. Ramechhap was the old district headquarter of the district. Jiri lies on the trekking route to Everest. Sangutar is the traditional service centre located at the border between Ramechhap and Okhaldhunga district on the bank of River Likhu. Doramba is the main service centre of the western half of the district.

Manthali is the main service centre of the district. The majority of the population from the district visit Manthali for official as well as for private reasons. Other service centres are scattered over the district. The main services including their population of these centres are presented in Table 2.2 (refer to maps 2 and 6).

The other service centres from the neighbouring districts that provide service to the population of Ramechhap district are Khurkot (Sindhuli district), Deurali Bagkhor and Jiri (Dolakha district). The distribution of population at service centres indicates that the bigger service/market centres of Ramechhap district are Manthali, Khimti, and Ramechhap.

MAIN SERVICE CENTRES

Main Service Centre	Population (2000)
Manthali	3,780
Ramechhap	1,080
Sangutar	540
Doramba	302
Banti – Bhandar	540
Khimti	1,890
Dhobi	270

Source: Annex 3.3.1

TABLE 2.2

2.4.2 Description of Main Service Centres

Manthali

Manthali is located on the bank of River Tamakosi. Most of the government offices, school, communication centres, police posts, hotels, grocery stores, clothing stores, and NGO offices are located here. A STAL airport is situated in Manthali. RNAC operates three flights per week to Kathmandu. Regular bus services operate between Manthali and Kathmandu. The altitude of Manthali is 550 m above mean sea level. Due to the location of government services the growth in building construction is taking place at rapid rate in Manthali. Manthali is surrounded by fertile agricultural land.

Khimti

Khimti is located on the road from Manthali to Nayapul. The growth of this service is primarily due to the location of Khimti hydropower station. Out of the total population of 1,890 the occupation of most households is trading. Khimti has services and facilities like women development office, co-

operative office, post office, veterinary office, telephone office, rice and flour mills, restaurant, tea stalls, shops selling agro-based, grocery, medical, hardware, clothes and household goods.

Sangutar

Sangutar is a traditional service centre located at the bank of River Likhu on the border between Ramechhap and Okhaldhunga district. It is also known for fishing. This service centre with its population of 540 provides service to population of eastern part of Ramechhap and three Ilakas of Okhaldhunga district. There is a weekly Haat bazaar on Saturday. Sangutar has different services and facilities like telephone, cooperative office, health post, police station, tea stall, school, campus, shops selling groceries, clothes, medicines, and hardware shop.

Construction materials and goods required for household consumption are transported either from Khimti through Dhobi or from Manthali by mules or porters. This area has fertile land, suitable for paddy on both sides of River Likhu river. Most of the population of Okhaldhunga district passes through Sangutar to reach Manthali or Devitar so that they could catch the bus to Kathmandu.

The proposed Likhu-II, Likhu-III and Likhu-IV hydropower projects are located north of Sangutar on the bank of River Likhu. River Likhu is known for its high current flow.

Ramechhap

Ramechhap is located on top of the hill at an altitude of 1,378 m from mean sea level. The service centre has a population of 1,080. At present Ramechhap is connected to the district headquarter by a fair weather road.

Some of the government offices like district health office with a capacity of 15 beds, telephone office, and Nepal Electricity Authority office are located here. Ramechhap has rice mills, hotels, lodges, school, shops for groceries, hardware, clothes shops etc. Ranashair Gaulum and Jail are situated in the service. At the time of weekly Haat bazaar on Tuesday, farmers buy and sell agricultural products and household goods. The pocket area for the production of sweet orange (*Junar*) was developed by JICA almost 15 years ago in the surrounding of this service centre. Most of the VDCs in the catchment area of this service center like Okhreni, Ramechhap, Bhaluwajor, Rampur, Salupati, etc. are famous for the production of *Junar*.

Dhobi

Dhobi is one of the main service centres of eastern Ramechhap. It has a population of 270 and provides different services and facilities like health post, telephone, co-operative office, NGO, high school, medical shop, grocery shop, household goods shop, clothes shop. It also has a weekly Haat bazaar on Wednesday, when people come to sell and buy cash crops.

Doramba

This is the main service centre of western Ramechhap. It has a population of 302. Similar to other service centres it has different services and functions like high school, health post, bank, post office, agriculture service office, veterinary office, telephone office, solar system, rice mills, textile, forest based industry, tea stalls. Doramba has rice and flour mills, hotels and shops for groceries, hardware, clothes, medicine, and household goods.

Bamti Bhandar

Bamti Bhandar is the main service centre on the trekking route to Everest camp from Jiri. A large number of tourists trek through this route to Everest base camp. This is one of the main trading routes in Ramechhap district. It is the service center of Ramechhap, Solukhumbu and Okhaldhunga district and is located on the bank of River Likhu.

The service centre has several facilities like bank, agriculture service, veterinary office, post office, health post, high school, solar system, micro-hydro, rice and flour mills, forest based industry, agro-

based industry. It has restaurants, teashops, hotel, lodges and shops for stationeries, groceries, clothes and household goods. Bamti also has a weekly Haat bazaar.

During the past few years Bamti is developing as a tea estate. The service centre is situated near the location of potential Likhu-IV A hydropower project that lies in the north-east of Sangutar.

2.5 Existing Transport Situation

2.5.1 Accessibility

Ramechhap district as a whole is far behind in terms of transportation and communication infrastructure among the hill districts of the central development region. There are few road connections and a limited number of main trails (refer to Table 2.3 and Map 3).

Manthali has an access by a single lane fair weather road taking off from the Lamosangu-Jiri Road at Nayapul (see Map 3). Kathmandu is the urban/regional-trading centre for Ramechhap District. After the construction of Manthali-Khurkot road by the district and Khurkot-Sindhulimadi section of Bardibas- Dhulikhel highway (under construction with the assistance of the Japanese Government), the urban/regional trading centre will be Bardibas and other urban centres like Kathmandu and those located in the plains like Janakpur.

SUMMARY OF EXISTING DISTRICT ROADS

Road Linkages	Road reference [^]	Total Length (km)
Lamosangu-Tamakoshi-Ramechhap	F32	34.0
Chhageshwristhan-Gunsal	21A011R	7.5
Betali-Darkha	21A018E	8.5
Rasnal-Bhitrikhani	21A021R	6.0
Those-Khimti (Intake)	21A022R	8.8
Those-Bamti	21A023R	15.0
Ramechhap-Sangutar	21A035R	25.6
Baseri-Khimti	NA	2.2

Note: NA= not available

Source: Annex 3.01

TABLE 2.3

The socio-economic activities still largely depend on trail-based transport and communication system consisting of main and mule trails. Main trails provide access to the substantial region of the district, serve a larger number of pedestrian and porters and are longer in length. These trails are all-weather trails and mules are sometimes used for transportation on these trails.

2.6 Agricultural Profile

Agriculture is the main source of income in the Ramechhap district and over 90 percent of the population earns their livelihood from it. Following the land use analysis of the district (refer to 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 among these categories indicate that forestland covers most of the area of the district (45.6% or 713.6 sq. km.) followed by cultivated (37.5% or 586.5 sq. km.), grassland (6.4% or 99.5 sq. km.), and others (10.5% or 164.8 sq. km.) according to the land use map. The total district area is 1,564.4 sq. km.

The agriculture production system is subsistence in nature and market integration is very limited. The number of irrigation facilities in the district indicates that only about 5 percent of the total

[^] Rode references are based on DoLIDAR approach

cultivated land is under perennial irrigation system. It is very well known that without irrigation facilities it is virtually impossible to accelerate agricultural production and productivity. The overall irrigation facility within the district is summarized below in table 2.4.

IRRIGATION STATUS OF THE DISTRICT

Description	Area (ha)
Total cultivated land	45,557
□ Area under permanent irrigation systems	2,928
□ Area under partially irrigation systems	4,870
□ Rainfed	37,759

Source: District Agricultural Development Office, Ramechhap

TABLE 2.4

Therefore, upland farming is the predominant farming practice in the district. The cropping pattern of Bari land, which covers the main area of cultivated land, is maize-millet. Paddy-wheat, paddy-paddy is the major cropping patterns on irrigated khet land. Mono cropping with paddy is an overwhelming practice on rain-fed khet land.

The main export potential crop of the district is orange (*Junar*). The VDCs that have specialised in the production of orange are located in adjacent to Manthali. These VDCs are Salupati, Ramechhap, Bhaluwajor and Okhreni. Other VDCs are Tilpung and Fulasi. The district produces about 1,700 mt of oranges each year.

According to the information obtained from Ramechhap district the transportation cost of orange to Manthali from different VDCs is high due to lack of road. As a consequence farmers are not able to gain rational profit from their production. This is the first year that farmers were able to sell some of their oranges in Manthali due to access to vehicles.

Farmers started to shift to the production of orange almost 25 years back as an alternative enterprise with the loan from the Agricultural Development Bank. They assumed that their products would find a market after harvesting of their crops. After four to five years when the trees started to bear fruits they had no market for their oranges and they still had to support themselves based on their subsistence existence. At the same time they did not have the option of paying their loans back. Therefore, some of the poor and middle class farmers even destroyed their trees and used the land for subsistence farming. After the construction of roads to Manthali and Ramechhap farmers are getting limited opportunity for selling their oranges.

VDCs located in the northern part of the district are known for potato production and livestock farming. VDCs located along and nearby the proposed Manthali-Khurkot road are producing citrus fruits, particularly oranges. Despite large-scale production, farmers are not getting prices for their produce due to lack of transport network from the areas of production to the market centre. Producers have to carry their products by porters that eventually increase transportation cost and reduce the farm-gate price of the product.

Gelu, Chisapani, Rampur, Himganga and other VDCs along the River Tamakosi and Likhu are traditionally known for goat raising. Similarly, the northern part of the district like Bamti, Gumdel, Chuchure, Rasnal, Bujee, Preeti VDCs are prominent area of temperate forest enriched with varieties of herbs and non-timber forest products. Presently tea and coffee plantation has initiated in Sangutar and Bamti areas.

Potential pocket areas identified by the District Agricultural Development Office, for the concentration of agricultural production are given in the table below:

AGRICULTURAL DEVELOPMENT POCKET AREAS

Paddy and Wheat	:	Manthali, Khimti, Bhatouli, Tilpung, Chisapani, Bhaluwajor, Tokarpur, Sangutar
Maize	:	Ramechhap, Manthali, Khimti, Pakarbas, Doramba, Tokarpur, Bhatouli, Fulasi
Vegetables	:	Ramechhap, Okhreni, Sunarpani, Bhatauli, Pakarbas, Manthali, Bhaluwajor, Khimti, Fulasi, Sangutar
Potato	:	Gumdel, Chuchure, Those, Rasnal, Gupteshwar, Betali, Daduwa, Doramba, Goshwara, Bamti
Citrus	:	Ramechhap, Salu, Okhreni, Sukajor, Rampur, Betali, Namadi, Fulasi, Bhaluwajor, Doramba, Dimipokhari, Pakarbas
Temperate fruits	:	Chuchure, Those, Bamti, Kubukasthali, Gupteshwar, Bhuji, Bijulikot, Hiledevi, Dimipokhari
Bee keeping	:	Ramechhap, Shukajor, Okhreni, Hiledevi, Sangutar
Other fruits	:	Manthali, Bhatouli, Chisapani, Sangutar
Tea	:	Sangutar (just started planting)
Coffee	:	Bamti (just started planting)

Source: District Agricultural Development Office, Ramechhap

TABLE 2.5

The production system in the district is subsistence in nature with low level 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 shown in table 2.6.

AREA, PRODUCTION AND PRODUCTIVITY OF MAJOR CROPS AND VEGETABLES (1998/1999)

SN	Type of Crop	Area (ha)	Production (Mt)	Productivity (Mt/ha)
1	Cereal crops	16,695	33,948	2.00
2	Pulses crops	580	552	0.95
3	Oil seed crops	185	167	0.90
4	Potato	2,950	13,275	4.50
5	Vegetables	109	7,360	6.75

Source: District Agricultural Development Office, Ramechhap

TABLE 2.6

Despite of the favourable agro-climatic conditions in the district and the very high cropping intensity (area of temporary crops divided by arable land), the income of farmers is rather low. The main reasons for this are the low percentage of land available for cultivation as well as the lack of adequate road connections leading to comparatively high transport cost of goods to the next road head.

2.7 Industrial Profile

There are only few industrial activities within the district. Bamboo craft, clay pots, rice and flour mills are common types of rural industries in the district. Products from the cottage industries are in general for households and/or for the local market demand. Nepali paper from *Lokta* is another important product of the district contributing a larger share in the total export from the district.

2.8 Trends and Dynamics Observed

The main trends observed are related to the demographic dynamics in the district. As in many northern districts in the country, in-migration from the hill districts has stabilised substantially and the present in/out-migration situation in the district is balanced. The reason for this stabilisation may be the fact that since the 80's pressure on land and consequently the price of land in the Terai has increased to the extent that people from the hill districts cannot afford to settle there anymore.

At present, Lamosangu-Jiri strategic road at Nayapul, which has a direct link with Kathmandu, is the only road that provides access to Ramechhap district with other districts. After the construction of Manthali-Khurkot road and Khurkot-Sindhulimadi section of Dhulikhel-Bardibas highway, it will link Ramechhap district with terai region.

The other potential resource of the district is hydropower. The feasibility study of Likhu hydropower project is being carried out at different locations along Likhu river (refer to map 2). The construction of Likhu hydropower project will contribute to uplift the socio-economic condition of the Ramechhap and its neighbouring district like Okhaldhunga and Solukhumbu.

2.9 District Priorities

Agricultural development, infrastructure and tourism development are the general areas of district development priorities. The district has, therefore, given due emphasis on construction and maintenance of district road networks. Based on the general field survey of the district related to service centers, trade flows, agriculture, demography, development potential area and other related aspects and the assessment of collected data (see Methodology Vol. I, Section 3.7, 3.8 and 3.9) the District Roads Coordination Committee (DRCC) and the District Development Committee (DDC) proposed eleven road corridors for the purpose of study for preparing District Transport Master Plan (DTMP) during the workshop held in Ramechhap in March 2000. During the regional synchronization workshop in December 2000 in Kathmandu the district priorities were confirmed and included in the DTMP.

The eleven road corridors proposed by DRCC and DDC and based on the general assessment a brief description of each proposed DTMP road linkage is outlined hereunder.

PROPOSED DTMP ROADS

Transport Linkage	Reference No.	Total Length (km)	Existing* (km)
Manthali-Khurkot	21A004R	14.77	-
Manthali-Galpa	21A005R	26.60	-
Phulpa-Siktaghat	21A006R	16.98	-
Galpa-Lubu	21A007R	19.98	-
Doramba-Galpa	21A009R	7.70	-
Deurali (Bagkhor)-Doramba	21A013R	10.60	-
Fulasi-Dadwa-Doramba	21A014R	25.09	-
Khimti-Namadi-Betali	21A018R	26.10	8.50
Those-Bamti	21A023R	28.10	15.0
Tilpung-Dhobi	21A029R	13.61	-
Ramechhap-Sangutar	21A035R	25.60	8.0

* The existing roads are of varying standard

Source: Annex 3.01

TABLE 2.7

Manthali-Khurkot

Manthali-Khurkot (Sindhuli) road corridor will provide access from the district headquarter at Manthali to the service centre at Khurkot located on the route of the proposed Dhulikhel-Bardibas highway which, is being constructed with the assistance from the Government of Japan. Khurkot is located in Sindhuli district on the right bank of Sunkoshi River. It is about 1 km. downstream from the confluence point of River Sunkoshi and Tamakoshi. The total length of this road corridor is about 14.77 km. Alignment of the proposed Manthali-Khurkot road follows the left bank of the river Tamakoshi and a crossing of span > 100 m is required across the river Sunkoshi to reach Khurkot. The road passes diagonally through south-western region of the district.

Tilpung-Dhobi

The total length of the proposed road corridor is 13.6 km. The road starts from Tilpung located on Nayapul-Manthali road on the bank of River Tamakoshi. This road will provide access to the service centre at Dhobi located in the central part of the eastern region. There is a weekly Haat bazaar at Dhobi every Wednesday. This service provides service to population from Ramechhap and Okhaldhunga district. The proposed road passes through settlements like Gahate, Dhade, Chakharaka, Pipaldip and Kopche.

The continuation of this road to river Likhu will provide access to the potential Likhu-IV hydropower project. Along the bank of river Likhu four potential hydropower stations have been identified.

Galpa-Lubu

The proposed Galpa-Lubu road corridor passes through western region of the district. Its length is about 20 km. This road will provide access from the proposed Bardibas-Dhulikhel to the population located in remote VDCs. The alignment of the road passes through the forest area.

Doramba-Galpa

This road corridor will provide higher benefit to the population of the western region of Ramechhap district after it is extended from Galpa to service centre at Doramba. Doramba is the main service centre of the western region.

Those-Bamti

Those-Bamti road corridor lies in the main trekking route from Jiri in Dolakha to Mount Everest Region. Those is a minor service centre, located about 10 km from Jiri and 3 km. from River Khimti, the border between Ramechhap and Dolakha districts. The length of the proposed road from Those to Bamti (Thokharpa) is 28.11 km.

During the fiscal year of 1998/1999 GTZ funded Rural Community Infrastructure Work (RCIW) constructed 14.5 km. of Those-Bamti corridor and part of this road lies in the Dolakha district. Now they have already opened track till Bamti. The road is open to traffic for the first 15 km.

Khimti-Namadi-Betali

The proposed Khimti-Betali road corridor will provide access to the district headquarter for population from the northern region of the district. The total length of this road is about 26.1 km. Out of this 8.5 km. has already been constructed. This road passes through the forest area.

Fulpa-Siktaghat

The proposed Fulpa-Siktaghat road corridor will provide access from the Dhulikhel-Bardibas highway to the population located in the central part of Ramechhap district. Dhulikhel-Bardibas highway passes through the opposite bank of river Sunkoshi. The proposed length of this road is about 17 km. This road passes through the forest area. The nearest service centres for this corridor are Manthali and Doramba.

Ramechhap-Sangutar

The proposed Ramechhap-Sangutar road corridor provides access from the old district headquarter of Ramechhap to one of the main service centres of the district, Sangutar. The total length of this road is about 25.6 km. This road corridor provides service to population of Ramechhap and Okhaldhunga district. Before the construction of Lamosangu-Jiri strategic road, the people of Okhaldhunga used this trail from Sangutar to Ramechhap for travelling to Kathmandu.

Fulasi-Dadwa-Doramba

RCIW project is funding the construction of this road and had already completed the construction of the first 10 km stretch of this corridor. The completion of this corridor will provide access to the population located at the central part of the district to the main service centre of Doramba.

Manthali-Galpa

The District Development Committee has initiated construction of this road. The initial 16 km of the Manthali-Galpa road corridor has already been completed so far. As the construction work has been already initiated, DDC has requested to include this road in the DTMP lately. Due to time and resource constraint, the detail study for the said road has not been done.

3. INDICATORS FOR DISTRICT TRANSPORT PLANNING

As mentioned in Vol. I (Methodology) the indicators for district transport planning reflect basically the existing situation of a particular road corridor within a discrete area of influence. The selected road corridors for Ramechhap district have been compiled in Table 2.3 above. The ranking of individual road corridors was done following the approved scoring system

3.1 Demography

Based on Volume I, Chapter 3.7.1, population along the different road corridors have been divided into two categories: population located in the inner and outer zone 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 the thematic Map no. 5.

The scoring of the individual road corridor is 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 Pop. IZI	Total Pop. OZI	IZI	OZI	Score	Score	Total Score	Transformed Score
				(Pop/km)	(Pop/Km)	IZI (6)	OZI (4)		
Manthali-Khurkot	14.8	6,761	0	458	0	1.6	0.0	1.6	0.8
Tilpung-Dhobi	13.6	12,954	1,706	952	125	5.7	1.8	7.5	7.9
Galpa-Lubu	20.0	18,450	0	923	0	5.5	0.0	5.5	5.4
Galpa-Doramba	7.7	6,368	1,617	829	211	4.7	3.1	7.8	8.1
Those-Bamti	28.1	13,006	7,663	463	273	1.6	4.0	5.6	5.5
Khimti-Betali	26.1	12,505	4,345	479	166	1.8	2.4	4.2	3.9
Fulpa-Siktaghat	17.0	4,530	0	267	0	0.9	0.0	0.9	0.5
Ramechhap-Sangutar	25.6	25,213	5,841	985	228	6.0	3.3	9.3	10.0
Fulasi-Doramba	25.1	17,062	0	680	0	3.5	0.0	3.5	3.1
Deurali-Doramba	10.6	6,141	1,474	579	139	2.6	2.0	4.6	4.4
Galpa-Manthali	26.6	13,038	0	490	0	1.9	0.0	1.9	1.2

Source: Annex 3.1

TABLE 3.1

The **Ramechhap-Sangutar** road serves the large number of population compared to the other corridors particularly to Sangutar, Salupati, Deurali, Okhrenei VDCs in the inner zone of influence (IZI), and consequently this road has received a maximum score of 10. This linkage has high importance since it passes through the orange growing areas. Sangutar is located on the bank of river Likhu and is surrounded by fertile agricultural land.

Galpa-Doramba road corridor ranks second with a score of 8.1 and **Galpa-Lubu** road corridor ranks fifth with a score of 5.4. Both linkages are already located in the mid-hill area. Both roads start

from the service centre at Galpa and provide service to population located in central part of Ramechhap. These roads will provide service to a considerable population located in the immediate zone of influence.

Tilpung - Dhobi corridor is also expected to serve the large number of population especially along the inner zone of influence. The population serving along the IZI per km road length is 952 thus it ranks third with a score of 7.9.

Those-Bamti road corridor serves the comparatively small number of population in the IZI but the largest population among all in the outer zone of influence (OZI). Therefore it receives the highest score of 4.0 from the population serving at OZI and ranked fourth with a total score of 5.5.

3.2 Agricultural Resources / Potentials

The scoring related to agricultural resources and potentials was carried out based on the area of land available for agriculture located in the inner and outer zone of influence of the different road corridors. As per definition the agricultural area within 5 km from 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 based on above factor (Vol. I, 3.7.2) is compiled in Table 3.2 and the most important/extreme linkages related to agricultural resources and potentials described below:

Those-Bamti road corridor has received the highest priority from the agricultural development perspective. This road has been assigned a maximum score of 15 due to comparatively large area of cultivated land within inner and outer zone of influence followed by **Ramechhap-Sangutar** linkage with a score of 13.4. **Tilpung-Dhobi** road corridor ranks third highest with a score of 12.4. **Fulpa-Siktaghat** road on the other hand receives the least score because of the minimal area of cultivated land in its inner and outer zone of influence (refer to map 5).

SCORE OF PROPOSED ROADS BASED ON AGRICULTURAL RESOURCE BASE

Road corridor	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)		
Manthali-Khurkot	14.8	107	0	2.4	0.0	2.4	1.7
Tilpung-Dhobi	13.6	285	40	10.0	0.2	10.2	12.4
Galpa-Lubu	20.0	195	0	6.2	0	6.2	6.9
Galpa-Doramba	7.7	208	52	6.7	0.9	7.6	8.8
Those-Bamti	28.1	218	123	7.2	5.0	12.2	15.0
Khimti-Betali	26.1	134	63	3.5	1.5	5.0	5.3
Fulpa-Siktaghat	17.0	51	0	1.1	0	1.1	0.8
Ramechhap-Sangutar	25.6	255	77	8.7	2.4	11.1	13.4
Fulasi-Doramba	25.1	182	0	5.6	0	5.6	6.1
Deurali-Doramba	10.6	126	63	3.2	1.5	4.7	4.9
Manthali-Galpa	26.6	129	0	3.3	0	3.3	2.9

Source: Annex.3.2

TABLE 3.2

Investments in transport will facilitate the provision of services like credit and agricultural inputs such as seed, fertilisers. It will provide access to services for agricultural products and an economic access to different services. As a consequence the income of farmers from cash crops will substantially

increase due to reduction in transport cost from their farms to the road. This will lead to a gradual substitution of traditional subsistence farming by cash crop production.

There are opportunities in the district for transforming low productive subsistence agriculture to service oriented high-input high-output agricultural production systems through diversification and intensification of existing cropping pattern. The district is endowed with varieties of climatic zones starting from warm sub-tropical like climate along the river basin to cold temperate in the high altitude zone. Due to difference in climatic and edaphic condition and great heterogeneity in the distribution of agricultural resource base in the district described in terms of potential pocket areas for growing different crops with comparative advantage (Table 2.5) there are opportunities to grow both temperate as well as tropical crops. A complex set of farming can be practised after investments on transport.

Most of the mid altitude zone of the district is considered suitable for citrus (orange and mandarin) production. There are many patches of land along the river stream with sufficient moisture condition that are suitable for growing large cardamom. Therefore, like other hill district of eastern Nepal, Ramechhap district can also be developed as one of the cardamom exporting district provided with required transportation network.

3.3 Economic Structure and Service Centres

The concentration of economic and social activities are located at main service/market centres which are Manthali, the district headquarter, Bamti, Doramba, Dhobi, Khurkot and Deurali (refer to map 2). These market/service centres are located along traditional main trail routes and planned and partly existing district roads. The details of the scoring for each road corridor based on the weightage of service centre are summarized in the table below.

SCORE OF PROPOSED ROADS BASED ON SERVICES PROVIDED BY EXISTING SERVICE CENTRES

Road Corridor	Service Centres	Service Centres' Weightage	Total Weightage	Length of the Road (Km)	Weightage Per Km Road Length	Total Score (10)	Transformed Score (10)
Manthali-Khurkot	Manthali	92.5	140.0	14.8	9.5	6.2	6.2
	Khurkot	47.5					
Tilpung-Dhobi	Dhobi	49.4	49.4	13.6	3.6	0.8	0.8
Lubu-Galpa	Doramba	73.8	73.8	20.0	3.7	0.9	0.9
Galpa-Doramba	Doramba	73.8	73.8	7.7	9.6	6.3	6.3
Those-Bamti	Bamti	58.8	121.3	28.1	4.3	1.5	1.5
	Jiri	62.5					
Khimti-Betali	Khimti	70.6	70.6	26.1	2.7	0.0	0.6
Fulpa-Siktaghat	Manthali	92.5	92.5	17.0	5.4	2.5	2.5
Ramechhap-Sangutar	Ramechhap	90.0	161.3	25.6	6.3	3.3	3.3
	Sangutar	71.3					
Fulasi-Doramba	Doramba	73.8	144.4	25.1	5.8	2.8	2.8
	Khimti	70.6					
Deurali-Doramba	Deurali	70.6	144.4	10.6	13.6	10.0	10.0
	Doramba	73.8					
Galpa-Manthali	Doramba	73.8	166.3	26.6	6.3	3.2	3.2
	Manthali	92.5					

Source: Annex 3.3

TABLE 3.3

A review of functions and services of service centres at the centre and in its catchment area has been carried out based on the information collected during the field survey (Annex.3.3). The evaluation of the data indicates that the district headquarter Manthali provides the maximum number of economic facilities and government services to district population. As a consequence **Manthali** receives the maximum score of 92.5 out of 100 (see Table 3.3) followed by **Ramechhap, Doramba** and **Sangutar** and with scores of 90, 73.8 and 71.3 respectively. These service centres are located in the eastern region of the district. The score of other centres ranges from 49.4 to 70.6.

Deurali-Doramba road has the maximum score of 10 due to location of the medium size market centre at both Deurali and Doramba on this road and shorter length of this road. Since the final score is obtained by dividing the total score by the length of the road there is the chance that the short length with bigger service centres will have higher scores.

This road is followed by Galpa-Doramba and Manthali-Khurkot road with the scores of 6.3 and 6.2 respectively.

3.4 Trade Flow/Predicted Changes

Most of the commodities required for household consumption like kerosene, salt, cloth, rice are transported by trucks along the Nayapul-Manthali road and distributed to different region of the district from the existing service centres at Manthali, Ramechhap, Sangutar, Tilpung, Dhobi, Those, Banti and Doramba.

The trade flows within Ramechhap district are summarized in Table 3.4 (See 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 than the export volume.

SCORES OF PROPOSED ROADS BASED ON VOLUME OF TRADE FLOW

Road corridor	Trade volume (Ton/year)					Existing trade volume (Ton/year)	Average transport cost (Rs/ton/km)	Yearly Average transport cost (Rs/km)	Total Score (15)	Transformed Score (15)
	Porter	Mule	Truck	Bus	Others					
Manthali-Khurkot	850	2,160				3,010	246	740,460	15.0	15.0
Tilpung-Dhobi	2,445	240				2,685	177	475,245	9.4	9.4
Galpa-Lubu	1,071	173				1,244	168	208,958	3.7	3.7
Galpa-Doramba	255					255	130	33,150	0.0	0.5
Those-Banti	1,695	972				2,667	165	440,055	8.6	8.6
Khimti-Betali	1,700					1,700	96	163,200	2.8	2.8
Fulpa-Siktaghat	750					750	177	132,750	2.1	2.1
Ramechhap-Sangutar	1,921	497				2,418	187	452,129	8.9	8.9
Fulasi-Doramba	1,275					1,275	159	202,725	3.6	3.6
Deurali-Doramba	850	432				1,282	267	342,294	6.6	6.6
Galpa-Manthali	850	151				1,001	206	206,206	3.7	3.7

Source: Annex 3.4

TABLE 3.4

The total transport cost of commodities was calculated based on the findings from the field survey. The flow of commodities included the flow in both directions from origin to destination and vice versa.

Following the methodology (Volume I), in order to estimate the average transport cost per ton per km of road, 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. The average transport cost was then assigned a value based on a pro rata system out of the total score of 15.

Manthali - Khurkot Road

Along the proposed Manthali - Khurkot road, the total traffic is expected to be increased by the generated and diverted traffic. It is assumed that at least fifty percent of the traffic on Lamosangu Jiri will be diverted to Manthali-Khurkot road. During August 2000, the traffic on Lamosangu Jiri road was 60 vehicles/day. Commodities imported to Charikot or Jiri and then carried by porters to the Everest region could be transported directly to Jiri or Charikot from Manthali-Khurkot road. The goods from the *terai* belt would not have to pass through Kathmandu to reach Dolakha anymore.

This road provides service to substantial population of the district. Due to the high trade volume (3,010 ton/year) the total transportation costs per year along this corridor is highest and thus receives the maximum score of 15.

Tilpung - Dhobi Road

The existing trade volume carried by porters on Tilpung Dhobi road was the second highest with 2,658 ton/year. The yearly average transport cost was also high (Rs. 0.48 million per km.) due to commercialisation of trade. The total length of this road is 13.61 km. As a consequence this road receives a second highest score of 9.4 out of 15.

Ramechhap - Sangutar Road

Along the proposed **Ramechhap - Sangutar** road corridor that is located in the Mahabharat range, all goods are transported by porters. This trail had a higher traffic level before the construction of Lamosangu-Jiri road. This route was used for travelling to Kathmandu from Okhaldhunga and Khotang district. The trade on this route was even higher when Ramechhap was the district headquarter. Even though the trade flow has declined the transport cost is still high with Rs. 0.45 million per km. per year, in comparison to other proposed roads. Consequently this road has been assigned a score of 8.9.

Those - Bamti Road

This road lies on the trekking route to Everest base camp and consequently the trade flow is high on this route. This route has the maximum number of commodities carried by mules, 850 tons, and a high amount by porters, 1695 tons per year. This road has been assigned a score of 8.6.

The main commodities imported to this area are salt, rice, wheat, maize, clothes and other groceries. The main commodities exported from the area are potato, malt barley, tea, cheese, Nepali paper, medical herbs, ghee, goats, sheep and fruits.

Previously freight was carried out by helicopter charter flights operating several times a day, from Jiri to Salleri, the district headquarter of Solukhumbu district, and to Lukla, the service centre that provides an access to the Everest region. They had regular flights from September to May and do not have flights during the monsoon period.

3.5 Development Potential

Other resources and activities along the individual road corridors, which are beyond the sectors identified in the previous sections, are introduced as development potentials.

There are few areas with distinct development potentials. However, the survey carried out with district representatives identified the different potentials with a high significance (see Annex 3.5) in

the respective road corridors. Ramechhap district has a high potential for hydropower due to high current rivers like, Tamakoshi, Likhu, Khimti, and Sunkoshi located in the district. The district is rich in natural herbs.

Based on the survey the proposed road corridors have been rated related to their significance to development potential. Table 3.5 is a summary of scores of proposed roads based on development potential.

SCORES OF PROPOSED ROADS BASED ON DEVELOPMENT POTENTIALS

Proposed roads	Total Weightage	Total Score (5)	Transformed Score (5)
Manthali-Khurkot	4.0	1.8	1.8
Tilpung-Dhobi	3.7	0.9	0.9
Lubu-Galpa	3.5	0.3	0.3
Galpa-Doramba	3.4	0.0	0.3
Those-Bamti	4.5	3.2	3.2
Khimti-Betali	4.7	3.8	3.8
Fulpa-Siktaghat	3.7	0.9	0.9
Ramechhap-Sangutar	4.5	3.2	3.2
Fulasi-Doramba	3.8	1.2	1.2
Deurali-Doramba	4.3	2.6	2.6
Galpa-Manthali	5.1	5.0	5.0

Source: Annex 3.5

TABLE 3.5

The construction of Galpa-Manthali road will lead to the development of the trade flow along the route and agricultural intensification. As a consequence this road has been assigned a maximum score of 5.

The construction of Ramechhap-Sangutar road will promote the growth of market centre at Ramechhap and has been assigned a score of 3.2.

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 at Manthali. 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 3.6).

The district clearly prioritised the three main road linkages Manthali-Khurkot, Those-Bamti and Ramechhap-Sangutar.

SCORES OF PROPOSED ROADS BASED ON DISTRICT PRIORITIES

Proposed roads	Total Marks given	Total Score (5)	Transformed Score (5)
Manthali-Khurkot	5.0	5.0	5.0
Tilpung-Dhobi	3.0	2.5	2.5
Galpa-Lubu	2.0	1.3	1.3
Galpa-Doramba	2.0	1.3	1.3
Those-Bamti	4.0	3.8	3.8
Khimti-Betali	3.0	2.5	2.5
Fulpa-Siktaghat	1.0	0.0	0.6
Ramechhap-Sangutar	4.0	3.8	3.8
Fulasi-Doramba	2.0	1.3	1.3
Deurali-Doramba	3.0	2.5	2.5
Galpa-Manthali	3.0	2.5	2.5

Source: Annex 3.6

TABLE 3.6**3.7 Tentative Construction Costs of Proposed Roads**

The initial cost estimate covers the total costs for the construction of new roads. It includes the cost for labour, local construction materials, imported materials and transportation costs. The costs are prepared for the construction of Fair Weather Class 'A', District Road. The 'Green Road Concept' of construction is taken into consideration. Stone pitched causeways with gabion and river training works along narrow streams is the only form of water crossings taken into consideration. Retaining structures shall be limited to dry stone masonry for low height walls.

The cost estimate is prepared for the purpose of comparative cost analysis of the proposed roads. The technical information picked up during the walkover survey along the corridor of the proposed road is used in the preparation of the costs. The walkover survey was carried out over eight road corridors out of a total of eleven roads proposed. Three roads namely; Galpa-Doramba, Fulasi-Daduwa-Doramba and Those-Bamti, are under construction by RCIW. The expenditure incurred for the progress achieved to date is projected to arrive at the total cost for the three roads under construction.

The cost per kilometer is taken as the basis of engineering rating for each proposed road. The most economical road is given the highest score. From the analysis it is observed that the Those-Bamti road is the most economical and hence has achieved the highest score.

The initial cost along with the engineering rating is summarized in the Table 3.7 below.

SUMMARY OF INITIAL COSTS AND ENGINEERING RATING OF PROPOSED ROADS

Name of Road	Type of Alignment	Length (km)	Total Cost (NRs)	Cost per km (NRs)	Engineering Rating	
					Total Scores (20)	Transformed Score (20)
Manthali-Khurkot	Valley	14.77	40,174,400	2,720,000	0.0	4.2
Tilpung-Dhobi	Ridge	13.61	18,781,800	1,380,000	14.8	14.8
Galpa-Lubu	Ridge	19.98	27,372,600	1,370,000	14.9	14.9
Galpa-Doramba	Ridge	7.68	7,603,200	990,000	19.1	19.1
Those-Bamti (RCIW)	Valley	28.11	41,550,000	910,000	20.0	20.0
Khimti-Namdi-Betali*	Valley	28.31	28,336,000	1,610,000	12.3	12.3
Fulpa-Sitkaghat	Side-long	16.98	28,696,200	1,690,000	11.4	11.4
Ramechhap-Sangutar	Ridge	25.60	29,440,000	1,150,000	17.4	17.4
Fulasi-Dadhawa-Doramba (RCIW)	Ridge	25.09	41,600,000	990,000	19.1	19.1
Deurali (Bagkhor)-Doramba	Ridge	10.6	25,758,000	2,430,000	3.2	3.2
Manthali-Galpa	Ridge	26.60	60,300,000	2,270,000	5.0	5.0

Source: Annex 3.7

* Of the total length 17.61 km to be constructed.

TABLE 3.7

3.8 Environmental Issues / Predicted Impacts

During the walkover survey carried out by the District Technical Team the preliminary environmental profile of the road corridor and potential environmental implications of the proposed road were assessed. Besides the description of the profile of the road link, water bodies, topography, geology, vegetation, socio-economic, etc. also have been described. Out of all the aspects, the significance of negative environmental impacts has been considered and rated in Table 3.8. Detail assessment of the roads where the construction is already in progress under RCIW programme, which is included for DTMP preparation, has not been carried out.

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

a) Tilpung - Dhobi

Along the alignment there are numbers of spring fed, perennial streams and streams that dry up during the dry season. Tilpun khola is the most significant river along the alignment wherein under cutting effect by the river is observed along its bank. Kharan-khurung community forest in the Chhap area of the proposed road corridor is a dense, naturally grown community forest, while the Gidde National forest in the Dhobi area and the Kuthurke-gorki community forest in the Tilpung area are naturally grown thin forest. However only short lengths of the forest falls along the proposed alignment. The majority of the road corridor passes through farmland. A minor landslide on the banks of the Hile khola is the only active landslide observed.

b) Fulpa – Siktaghat

Approximately 2 km of this road is expected to pass through forest area where Khayar species of trees are found. Major length of the proposed alignment passes through poor fertility farmlands. Sitka khola and Gandru khola, which dry up during the winter, are the only rivers along the alignment. Aapchaur ko bhir and Thulo pahiro are the areas along the proposed road corridor which needs to be avoided.

c) Ramechhap – Sangutar

The alignment runs along the ridge for the major length of the road. The existing 2 m width trail can be widened to full width road for approximately 15 km. About 4 km section of the proposed road corridor passes through thin forest. A total of 25% of the road length passes through cultivated farmland that depends on rainwater for irrigation. Rivers along the proposed road corridor are Phalate khola and Deurali khola, which are perennial, spring fed type, Bhagure khola dries up for short period of the year, and Likhu khola is the major river which is a snow fed and perennial. Chhhatiban pahiro is the landslide along the proposed road corridor where careful selection of the alignment is possible to avoid the slide.

d) Galpa – Lubu

The total length of this road corridor is 20 km wherein the proposed alignment runs along the ridge for the major part of its length. Oderi khola, Gopi khola and Nigalpani khola are the main streams along the alignment, which are of the non-perennial type. Baghoban bhir and Phayayang bhir are the steep sections along the proposed road corridor where the proposed road alignment needs to be deviated. Approximately 50% of the proposed alignment passes through thin forests and 4 km length passes through farmland.

e) Khimti - Namdi - Betali

Chhautane ban is a dense forest along the proposed road corridor for approximate length of 3 km. Other forests, Ramite ban and Haluwa ban are thin forests. Chhautene khola, Pharpu khola, Haluwa khola and Bohere khola are the rivers that need to be crossed by the proposed alignment. Khorendo pahiro is an area, which has weak geological formation that is susceptible to landslide during heavy rains.

f) Manthali - Khurkot

The alignment follows the eastern bank of the Tamakoshi river. Approximately 4.5 km length of the proposed alignment passes through thin community forests while 1.5 km passes through national forest. Ranajor, Sukajor, Bhaluwa khola, Thulo khola and Masan khola are the major rivers along the proposed alignment. All the rivers are non-perennial. The possibility of the glacial outburst of Chho Rolpa glacial lake is a risk to the proposed road corridor at certain low land areas. Bokshe ko bhir, Pokha danda bhir and Laliteko bhir are the steep rocky areas along the proposed road corridor.

g) Deurali (Bagkhor) - Doramba

The alignment runs along the ridge for the major length of the road. Rivers along the proposed road corridor are Thulo khola and Bhute khola, which are perennial, spring fed type. Thulo khola, which dries up for short period of the year, and Bhute khola is the major river which is a snow fed and perennial. The partial section of the proposed road is expected to pass through Biraute community forest and Shailung forest.

Three other roads proposed for DTMP study namely; Doramba-Galpa, Fulasi-Daduwa-Doramba and Those - Bamti are under construction by RCIW. The need for environmental surveys along the roads under construction is not required and hence no surveys conducted. For the purpose of providing the scores necessary for prioritisation, maximum scores attained by the roads surveyed have been provided.

In conclusion, indications from the initial environmental walk over survey show that there could be significant environmental effects along some of the road corridors (See Table 3.11). However, it was found that none of the roads included in DTMP selection needed substantial environmental measures. In order to ascertain the environmental effects, detailed environmental examination of the proposed road alignment will need to be carried out before construction begins.

SUMMARY OF ENVIRONMENTAL RATING OF PROPOSED ROADS

Name of Road	Length (km)	Environmental Rating				
		Minimum	Significant	Serious	Total Score (10)	Transformed Score (10)
Manthali-Khurkot	14.77	32	5	0	5.0	5.0
Tilpung-Dhobi	13.61	33	4	0	10.0	10.0
Galpa-Lubu	19.98	33	4	0	10.0	10.0
Galpa-Doramba	7.68	33	4	0	10.0	10.0
Those-Bamti (RCIW)	28.11	33	4	0	10.0	10.0
Khimti-Namdi-Betali*	28.31	33	4	0	10.0	10.0
Fulpa-Siktaghat	16.98	31	6	0	0.0	4.0
Ramechhap-Sangutar	25.60	32	5	0	5.0	5.0
Fulasi-Dadhuwa-Doramba (RCIW)	25.09	33	4	0	10.0	10.0
Deurali (Bagkhor)-Doramba	10.60	33	4	0	10.0	10.0
Manthali-Galpa	26.60	32	5	0	5.0	5.0

* Of the total length 17.61 Km to be constructed.

TABLE 3.8

3.9 Social Issues

Better access to areas with resource potentials through improved transport infrastructure is expected to enhance economic growth and open up better opportunities also to the poorest social strata in the district. Therefore by means of this indicator road corridors in areas with the highest density of people living in poverty will get highest priority. In order to identify households living below the poverty line a food sufficiency survey conducted by DDC in the proposed road corridors was considered. The results are compiled in Table 3.9.

With the largest population per km of road Ramechhap-Sangutar corridor combines the biggest number of people living in poverty followed by Galpa-Lubu and Galpa-Doramba road links.

POPULATION UNDER POVERTY IN THE INFLUENCE AREA OF THE PROPOSED ROAD AND RATING

Road Corridor	Length (km)	Total Pop. of IZI+OZI	Total Ultra Poor Pop. of IZI+OZI	Total Poor Pop. of IZI+OZI	Pop. Per km road length		Score			Transformed Score (10)
					UP	P	UP (6)	P (4)	Total (10)	
Manthali-Khurkot	14.77	6,761	382	4,628	26	313	1.3	1.0	2.3	1.5
Tilpung-Dhobi	13.61	14,660	680	8,788	50	646	3.4	2.9	6.3	5.9
Galpa-Lubu	19.98	18,450	1,586	10,592	79	530	5.9	2.3	8.2	8.0
Galpa-Doramba	7.68	7,985	452	4,646	59	605	4.1	2.7	6.9	6.5
Those-Bamti	28.11	20,669	950	10,174	34	362	2.0	1.3	3.3	2.5

Road Corridor	Length (km)	Total Pop. of IZI+OZI	Total Ultra Poor Pop. of IZI+OZI	Total Poor Pop. of IZI+OZI	Pop. Per km road length		Score			Transformed Score (10)
					UP	P	UP (6)	P (4)	Total (10)	
Khimti-Betali	26.1	16,850	790	10,980	30	421	1.7	1.6	3.3	2.6
Fulpa-Siktaghat	16.98	4,530	192	2,367	11	139	0.6	0.4	1.0	0.6
Ramechhap-Sangutar	25.60	31,054	2,050	21,144	80	826	6.0	4.0	10.0	10.0
Fulasi-Doramba	25.09	17,062	1,224	10,345	49	412	3.3	1.6	4.9	4.3
Deurali-Doramba	10.6	7,615	488	5,258	46	496	3.0	2.1	5.1	4.6
Galpa-Manthali	26.6	13,038	1,039	7,406	39	278	2.4	0.8	3.2	2.5

Source: Annex 3.9

Note: P= Poor; UP= Ultra-poor

TABLE 3.9

3.10 Aggregation of Scores from all Nine Scoring Indicators

The total scoring of all indicators per road corridor has been compiled in Table 3.10. 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

Road Corridor	Parameters Used for the Prioritisation of Road Corridors and Their Corresponding Scores										
	Demography (10)	Agriculture (15)	Service Centres (10)	Trade flow (15)	Dev't. Poten. (5)	District Priority (5)	Const. Cost (20)	Environment (10)	Social Aspects (10)	Total Score (100)	Rank
Manthali-Khurkot	0.8	1.7	6.2	15.0	1.8	5.0	4.1	5.0	2.3	41.9	9
Tilpung-Dhobi	7.9	12.4	0.8	9.4	0.9	2.5	14.8	10.0	6.3	65.0	3
Galpa-Lubu	5.4	6.9	0.9	3.7	0.3	1.3	14.9	10.0	8.2	51.6	6
Galpa-Doramba	8.1	8.8	6.3	0.5	0.3	1.3	19.1	10.0	6.9	61.3	4
Those-Bamti	5.5	15.0	1.5	8.6	3.2	3.8	20.0	10.0	3.3	70.9	2
Khimti-Betali	3.9	5.3	0.6	2.8	3.8	2.5	12.3	10.0	3.3	44.5	8
Fulpa-Siktaghat	0.5	0.8	2.5	2.1	0.9	0.6	11.4	4.0	1.0	23.8	11
Ramechhap-Sangutar	10.0	13.4	3.3	8.9	3.2	3.8	17.3	5.0	10.0	74.9	1
Fulasi-Doramba	3.1	6.1	2.8	3.6	1.2	1.3	19.1	10.0	4.9	52.1	5
Deurali-Doramba	4.4	4.9	10	6.6	2.6	2.5	3.2	10.0	5.1	49.3	7
Galpa-Manthali	1.2	2.9	3.2	3.7	5.0	2.5	5.0	5.0	3.2	31.7	10

Source: Annex 3.10

TABLE 3.10

The findings of the scoring system indicate that four roads namely Ramechhap-Sangutar, Those-Bamti, Tilpung-Dhobi and Galpa-Doramba have top priorities for construction. A comparison of findings among these roads indicates that scores of Ramechhap-Sangutar, Those-Bamti, Tilpung-Dhobi and Galpa-Doramba were higher in comparison to other roads. Their scores were 74.9, 70.9, 65.0 and 61.3 respectively. This is partly because of higher scores they received from agriculture land availability, construction cost, environmental issues and social aspects.

The importance, advantage and other details of top priorities road corridors are explained briefly in the following sections.

Ramechhap-Sangutar

Ramechhap-Sangutar road corridor has the maximum score for demography (10), agricultural land availability (13.4), trade flow (8.9), construction cost (17.3) and social aspect (10). This road has the maximum total score of 74.9 out of 100. It will provide service to Ramechhap-Deurali portion, known for the production of orange over the last two decades. It will reduce the transport cost of orange to Manthali and to Bardibas via Dhulikhel-Bardibas highway. It will encourage diversification of the cropping pattern to production of fruits and milk. It is recommended for construction for opening up the large agricultural producing area in the south-east region. This road is being constructed with funds from DoR, DoLIDAR and from VDCs.

This road corridor has a potential of being extended to the service centre at Rampur, located in Okhaldhunga district, and this linkage could ultimately develop as inter-district link road. This road has also the possibility of extending up to potential hydropower projects sites like Likhu I and Likhu II.

Those-Bamti

Tourists from Jiri travelling to Everest camp will use the proposed road. Currently a large number of tourists trek through this route to Sagarmatha base camp located in Solukhumbu district. Tourism development will gain momentum if this linkage is improved.

River Likhu forms the eastern boundary for the district. The construction of Those-Bamti (Bhandar) road will provide access to Likhu-IV 'A' hydropower project. This project is located at a distance of 10 km from the road alignment. After the construction of Those-Bamti road the other 10 km and 6 km road will have to be constructed to the powerhouse and to the site of headwork. At present it takes between two and three hours to reach the proposed headwork and the powerhouse.

The installed capacity of the Likhu-IV 'A' hydroelectric power could produce 60 MW with the gross head of 240 m and a design discharge of 12.5 cu m/sec. This is just 50 percent of the dependable flow. This project has a high head and fair geological condition.

This road will also encourage the export of potato to terai and Kathmandu from Ramechhap and Okhaldhunga districts.

Tilpung-Dhobi

Tilpung-Dhobi road receives the maximum score from construction cost (14.8), agricultural land availability (12.4), environmental issues (10) and trade flow (9.4). Therefore, this corridor receives the total score of 65.0 out of 100.

The feasibility study has been already completed for the continuation of this road to the proposed site of Likhu -IV hydropower station (20MW) called LK-IV.

Furthermore this corridor provides the service to the population of Ramechhap district and about 10 VDCs of Okhaldhunga district as well. The road will reduce the transport cost of orange to export to the market area that has been currently produced in Saipu and Bijulikot VDC. This corridor will also provide access to iron and lead (glass) mines found at Guptyeshor, Bhuji and Priti VDCs.

Galpa-Doramba

The total score received by this corridor is 61.3 out of 100 and ranked as fourth in the overall assessment. The maximum score received by this corridor are from the aspects of construction cost (19.1), environment (10.0), agriculture (8.8) and demography (8.1).

This Corridor will provide linkage between Galpa (Haat bazaar) and Doramba. The construction of this road corridor will provide higher benefit to the population of the western region of the Ramechhap district by getting better access to the main service/market centre of Doramba. This corridor will also help to promote the tourism by providing access to the potential tourist site of Khandadevi.

Manthali-Khurkot

Although this corridor did not receive the considerable score to appear in the list of top priorities, this is one of the most important roads in the context of Ramechhap district. Manthali Khurkot road is the road of regional/national importance. The Regional Synchronisation Meeting held during December 2000 recommended that this road should be upgraded to feeder road inspite of the fact it did not appear in the list of top priorities.

One of the main reasons for not being in the top priorities is due to the low score received in demography, agricultural land availability, and social aspects. These three aspects are highly influenced by the population and land available in the inner and outer zone of influence of the road. Due to the other roads being closed to this road, it has no outer zone of influence that overlaps with the inner zone of other road.

This road corridor will provide access to the service centre at Khurkot located in Sindhuli district. Khurkot is located on Bardibas-Dhulikhel highway presently under construction with the assistance from the Japanese Government. They are currently constructing the sector from Khurkot to Sindhuli. They have already constructed double lane all weather gravel road from Sindhuli to Bardibas located on the East-West highway. After the construction of Khurkot-Sindhuli and Manthali-Khurkot roads people from Manthali can travel directly to Bardibas, located on the East-West highway.

Commodities currently imported to Charikot or Jiri from the plains via Kathmandu and then carried by porters to the Everest region could be transported directly to Jiri or Charikot from the plains using Manthali-Khurkot road. The daily traffic on Lamosangu-Jiri road was 60 during August 2000. It is assumed that more than fifty percent of the traffic on Lamosangu Jiri road will be diverted to Manthali Khurkot road.

This road corridor will serve approximately 168,768 population from 29 VDCs of Ramechhap district, and 14 VDCs of Okhaldhunga district. This road corridor has a high priority in the district due to access to both Kathmandu and to the East West highway after the completion of Manthali-Khurkot road and Dhulikhel- Bardibas highway. This requires the construction of bridge over River Sunkoshi to get linked with Dhulikhel-Bardibas highway

The remaining roads have a lower priority. Their scores range from 52.1 to 23.8 as summarized in Table 3.13. Lubu-Galpa, Galpa-Doramba and Fulpa-Siktaghat can be constructed only after the construction of the road from Manthali to Doramba and the construction of Nepalthok-Khurkot sector of the Bardibas-Dhulikhel road.

4. FUNDING SOURCES FOR THE DTMP IMPLEMENTATION

4.1 Potential Funding Sources

Details of the anticipated resources available for DTMP implementation are collected by the PSU from the districts, HMG and donors. Ongoing rural road/rural access programmes are consulted with regard to future plans for expansion or curtailment. The most likely sources of funding are listed as follows:

- HMG
- National Road Fund
- DDC resources
- VDC resources
- Donors

Following an investigation by DRSP amongst potential funding agencies of the Ramechhap DTMP implementation the following sources were identified:

a) DoLIDAR

Under the Agricultural Perspective Plan (1995/2015) DoLIDAR is allocating Rs 3.0 million to the districts road sector during the FY 58/59. Based on the past experience it can be assumed that this contribution will increase by at least 15% every year.

b) DDC

There are basically two sources of funding within the district.

- ◆ DDC block grants are coming into the district from MoLD for general development activities (development grant) and for the road sector (rural road grant). It is expected that Ramechhap District will reserve 55 % of the total block grant including development and road sector grants for the district road activities. This will amount to Rs 5.5 million per year. It is not expected that the block grant will increase significantly over the years to come.
- ◆ DDC internal funds in Ramechhap are mainly generated through taxes and royalties. Out of DDC's internal sources, Rs 2.64 million is expected to go into transport. An annual increase of 10 % is expected. Internal sources will be increased by royalties from, Khimti hydropower project, which generates electric from Khimti river of the district.

c) VDC

VDCs receive a block grant of Rs 500,000 each year. Out of this total grant Rs 200,000 goes to internal human resources management. 25 % of the remaining grant, which amounts to Rs 4.63 million, is expected to be used for district roads in VDCs through which the road passes. No increase in this contribution is expected.

d) Constituency Development Fund

At present each Member of Parliament (MP) receives Rs. 1 million for their constituency. Ramechhap has two constituencies and it is expected that about 10% of this block grant will be allocated to the transport sector. This will amount to Rs 0.2 million per year.

e) DoR/MoLD

The DoR/MoLD provides a special grant for village and district road development to the district. From the fiscal year 057/58 DoR had started to allocate certain amount to construct Ramechhap-Sangutar road and allocated Rs 4.0 million for the fiscal year 058/59 to continue the construction of this road. It is likely to be continued until the completion of this Ramechhap-Sangutar road. According to the annual budget of HMG/N, DoR/MoLD had allocated total of Rs 6.2 million for 058/59 fiscal year. Based on the study of the past trend it is expected that the DoR/MoLD budget for district road construction and maintenance will likely to be increased by 15 % every year.

f) DRSP

The DRSP budget reserved for DTMP implementation in the Ramechhap district is Rs 14.2 million during the build-up phase of the project till March 2002. This amount may increase by approximately 15% every year.

g) Rural Community Infrastructure Works (RCIW)

The RCIW programme has been implemented in Ramechhap district over the last two years. RCIW grant includes food-for-work and small cash component for purchasing construction materials. Discussions with RCIW authorities indicated that the budget of Rs 14.25 million would remain constant during the next five years.

The district will have to get additional funding sources to finance the ambitious implementation of road construction and maintenance works, as identified in the District Transport Master Plan.

4.2 Budget Forecast for DTMP Implementation

Based on the above sources a tentative budget perspective can be made as shown in Table 4.1.

BUDGET FORECAST (RS '000) FOR DTMP IMPLEMENTATION (058/59-062/63)

Sources	058/59	059/60	060/61	061/62	062/63
DRSP	14,259	14,259	14,259	14,259	14,259
DoLIDAR	3,000	3,450	3,968	4,563	5,247
DDC block- grant	5,500	5,500	5,500	5,500	5,500
DDC internal fund	2,640	2,880	3,120	3,360	3,600
VDC block- grant	4,625	4,625	4,625	4,625	4,625
Constituency Development Fund	200	200	200	200	200
RCIW/MoLD	14247	14247	14247	14247	14247
DoR/MoLD	6200	7440	8928	10714	12856
Total	50,671	52,601	54,847	57,467	60,534

TABLE 4.1

As mentioned in the previous section, with the present funding allocations to the district and the VDCs, not all plans can be realised. It is therefore of the utmost importance other sources of funding can be secured such as bilateral or multilateral donors for example the Asian Development Bank, World Bank etc.

In view of the limited resources the recommendation is to concentrate on roads under the DTMP, and to use funds that have already been secured on them.

4.3 Matching of Resources on High Ranked DTMP Roads

This Section describes the implementation plan of Ramechhap DTMP roads and allocates the tentative budget (Table 4.1) to different components of the individual road corridors according to priorities given in Table 3.10. 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 58/59 to 62/63 has been compiled in Table 4.2. It reflects allocated/committed funds for defined activities and eventual annual surpluses/deficits. Though the present forecast shows a huge deficit, the implementation plan has been prepared with provision of completing all high ranked (first sections) DTMP roads. Eventually surplus/deficits will have to be deducted or added from allocated DTMP road budgets. The changes in the implementation plan will have to be sanctioned during the annual meetings of the Ramechhap District Council.

PHYSICAL AND FINANCIAL PLAN FOR DTMP ROADS

Roads by priority	Length of Road (Km)	2057/58	Current year ²	DTMP Implementation Year			
				2058/59	2059/60	2060/61	2061/62
Likely available budget (Rs 000)			50,671	52,601	54,847	57,467	60,534
1. Manthali-Khurkot	14.8		9,248	10,662	8,530	7,146	
Construction (Rs 000)		3.5	3.4	3.5	2.5	1.9	
Physical output (Km)			175	386	652	906	1,162
Periodic maintenance (Rs 000)			42	93	157	217	279
Routine Maintenance (Rs 000)			9,465	11,142	9,339	8,270	1,441
Sub-total			9,248	10,662	8,530	7,146	
2. Ramechhap-Sangutar	25.6						
Construction (Rs 000)			4,000	6,000	5,770	6,912	
Physical output (Km)		8.0	3.5	5.8	4.0	4.3	
Periodic maintenance (Rs 000)			400	643	1,086	1,498	2,014
Routine Maintenance (Rs 000)			96	154	261	359	483
Sub-total			4,496	6,356	8,853	8,769	2,497
3. Those-Bamti (RCIW)	28.1						
Construction (Rs 000)			11,930				
Physical output (Km)		15.0	13.0				
Periodic maintenance (Rs 000)			750	1,574	1,763	1,975	2,212
Routine Maintenance (Rs 000)			180	378	423	474	531
Sub-total			12,860	1,952	2,186	2,449	2,742
4. Tilpung-Dhobi	13.6						
Construction (Rs 000)			4,140	7,728	6,578		
Physical output (Km)		1.8	3.0	5.0	3.8		
Periodic maintenance (Rs 000)			91	269	615	956	1,071
Routine Maintenance (Rs 000)			22	65	148	229	257
Sub-total			4,252	8,062	7,341	1,186	1,328
5. Khimti-Betali	26.1			6,440	7,213	8,078	11,310
Construction (Rs 000)			6,440	7,213	8,078	11,310	10,133
Physical output (Km)			4.0	4.0	4.0	4.0	4.0
Periodic maintenance (Rs 000)				224	502	843	1,259
Routine Maintenance (Rs 000)				54	120	202	302
Sub-total			6,440	7,491	8,701	12,355	11,694
6. Fulasi-Doramba (RCIW)	25.1						
Construction (Rs 000)			5,940	6,653	4,967	5,564	4,035
Physical output (Km)		2.5	6.0	6.0	4.0	4.0	2.6
Periodic maintenance (Rs 000)			125	476	909	1,300	1,770
Routine Maintenance (Rs 000)			30	114	218	312	425
Sub-total			6,095	7,243	6,095	7,175	6,230

² Fiscal Year 2001/2002

Roads by priority	Length of Road (Km)	Current year ²	DTMP Implementation Year					
			2057/58	2058/59	2059/60	2060/61	2061/62	2062/63
7. Galpa-Doramba (RCIW)	7.7							
Construction (Rs 000)						4,173	7,322	
Physical output (Km)						3.0	4.7	
Periodic maintenance (Rs 000)							236	
Routine Maintenance (Rs 000)							57	
Sub-total						4,173	7,614	
8. Galpa-Lubu	20.0							
Construction (Rs 000)			4,603	2,740	8,593	9,624	10,779	
Physical output (Km)			3.0	2.0	5.0	5.0	5.0	
Periodic maintenance (Rs 000)				168	314	702	1,180	
Routine Maintenance (Rs 000)				40	75	169	283	
Sub-total			4,603	2,948	8,982	10,495	12,242	
9. Manthali-Galpa	26.6							
Construction (Rs 000)			4,540	5,085	5,695	3,189	14,288	
Physical output (Km)			2.0	2.0	2.0	1.0	4.0	
Regular Maintenance (Rs 000)				112	251	421	551	
Routine Maintenance (Rs 000)				27	60	101	132	
Sub-total			4,540	5,224	6,006	3,712	14,970	
Grand Total			52,752	50,858	55,767	58,583	60,760	
Deficit (-)/Surplus (+)			(-)2,081	(-)338	(-)1,258	(-)2,373	(-)2,599	

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

TABLE 4.2

During the preparation of this plan it is assumed that the budget allocated by the DRSP, will be used for the construction of Manthali-Khurkot road while the remaining resources will be allocated for the construction and maintenance of other roads. Since RCIW has continued its support to Those-Bamti, Fulasi-Doramba and Galpa-Doramba road construction under the Food for Work Programme, fund expected from RCIW project has been allocated only for those roads. Furthermore, it is expected that DoR will continue its contribution in the construction of Ramechhap-Sangutar road for the next five years. Similarly, DoLIDAR will continue its contribution in the construction of other agriculture and district roads within the district.

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

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 Section 2 Vol. I).

As outlined in step 17 (Figure 2.1) of the DTMP "Methodology" (Vol.I), relevant sections of the draft DTMP along with a map which shows the proposed DTMP roads and existing village, district and strategic roads were distributed to each VDC representative (Chairman and Vice-chairman). Guidelines are also prepared and distributed to assist them in understanding the maps and the sections of draft DTMP, which have been distributed. The guidelines also give details of the procedures for suggesting modifications to the draft DTMP and for formulating proposals for DTPP roads.

After reaching mutual agreement between DRCC/DDC and PSU on preliminary DTMP, a meeting of all VDC Chairmen, Vice Chairmen and Ilaka Members was organised at the district headquarter for the orientation Workshop for the DTPP on 17 February 2001.

5.1 Roads Recommended for DTPP

A one-day workshop was organised on 7 April 2001 for Chairman of VDCs and Ilaka members to present their proposals, harmonise and prioritise them for DTPP roads. The workshop proposed following roads (Table 5.1) for the District Transport Perspective Plan (DTPP) that has yet to be approved from District Council. Both DTMP and DTPP are expected to be approved from District Council that will be held (tentative schedule) on early February 2002. The roads proposed for DTPP are as follows:

PROPOSED DTPP ROADS

Road Reference No.	Road Corridor	Remarks
21A006R	Fulpa-Siktaghat	A
21A013R	Deurali-Doramba	A
21A020R	Dhobi- Bhitrikhani-Deurali	A
21A029R	Dhobi-Deurali (Gyanle)	A
21A027R	Dhobi-Limti	A
21A002R	Khurkot-Ramechhap	A
21A010R	Gunsal-Galpa (Rameche)	A
21A019A	Namadi-Farpu-Tamadandagaun	A
21A033A	Hilepani-Okhreni-Kolanjorghat	A
21A001R	Ramechhap-Dhaneghat	B
21A003R	Hulakdanda-Manthali	B
21A015R	Dadhuwa-Khanda Devi	B
21A017R	Khimti-Gailu	B
21A012R	Goswara-Dadhuwa	B
21A035R	Machhedanda-Salupati	B

Road Reference No.	Road Corridor	Remarks
21A016R	Mugitar-Fulasi	B
21A008R	Lubu-Bethan-Galpa	B
21A032R	Charghare-Bolunbolun-Likhu	B
21A023R	Mahbhir-Panchpokhari 9(Sernachowk)	B
21A024R	Bamti-Sernachok	B
21A030R	Sangutar-Sirise	B
21A025R	Limti-Bamti	B
21A026R	Bhitrikhani-Sano Pritee	B
21A031R	Likhu-Sangutar	B

A: High Priority

B: Others

TABLE 5.1

6. ORGANISATIONAL AND FINANCIAL ISSUES

6.1 Relevant Institutions in the District

During the initial workshop in September 1999 the DDC Ramechhap formed the DRCC. The DRCC is an institutionalised advisory body to the DCC with regard to formulating, managing and monitoring district level road and trail policies, rules and regulations.

In November 1999 the district technical team has been formed within the DDC Technical Unit and 1 engineer and 2 overseers were hired by the DDC.

The LRCC and UG had already been established for the Manthali-Khurkot road.

6.2 Budgetary Arrangements and Flow of Funds

Following the agreement between Ramechhap District, DoLIDAR and DRSP a District Road Fund (DRF) has been established. The DRF will be replenished by contributions from DoLIDAR, DDC block grant, DDC internal funds, VDC block grant, Constituency Development Fund, DoR/MoLD and DRSP. RCIW is another organisation under the Ministry of Local Development involved in district infrastructures development through Food for Work Programme in the district for the last two years

All activities related to the implementation of the DTMP will be financed through the DRF. Expenditure will be made based on approved cost estimates.

6.3 Road Construction, Operation and Maintenance

The district, DRSP and the DDC of Sindhuli 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 human and material resources either through contractors and/or user groups. For the sake of consistency, it is strongly recommended to apply the same methods also on district roads that are implemented through other programmes.

The basic principle of DTMP implementation is to bring prior to new construction existing roads into maintainable condition. A concept of cyclic maintenance through length workers will be introduced. Local user groups will be responsible for management, coordination and supervision of maintenance work. In order to prevent early damages on the roads during rainy season 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 process. The principles, concepts and implementation steps for construction and the maintenance are described in detail in the methodology (See Section 1.4, Volume I).