



REPORT
ON
**THE BASIC STUDY OF RURAL DEVELOPMENT
IN THE PROPOSED BANEPA - SINDHULI ROAD
CORRIDOR**

VOLUME I

MAIN REPORT

Submitted to:

JAPAN INTERNATIONAL DEVELOPMENT AGENCY
(JICA)
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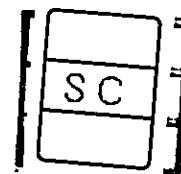


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by:

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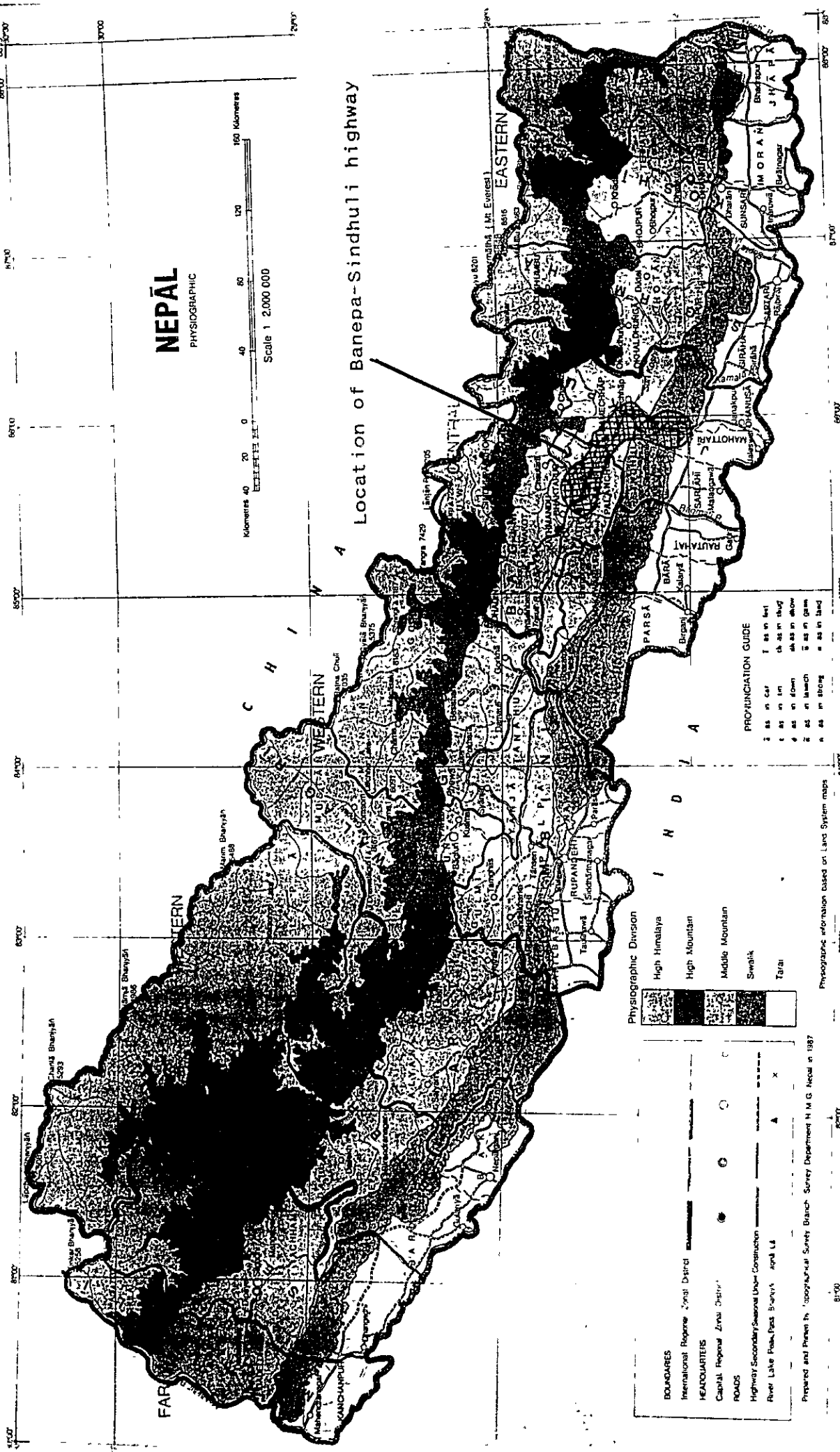
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NEPAL

PHYSIOGRAPHIC

Kilometres 40 20 0 40 80 120 160 Kilometres
 METRES 40 20 0 40 80 120 160 METRES
 Scale 1 2,000,000

Location of Banepa-Sindhuli highway

PRO-UNCIATION GUIDE

1	as in bed
2	as in car
3	as in tin
4	as in down
5	as in show
6	as in march
7	as in strong
8	as in land

Physiographic Division

High Himalaya	High Mountain	Middle Mountain	Swathik	Tarai
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BOUNDARIES

- International Border
- Zone District

HEADQUARTERS

- Capital, Regional, Zone, District

ROADS

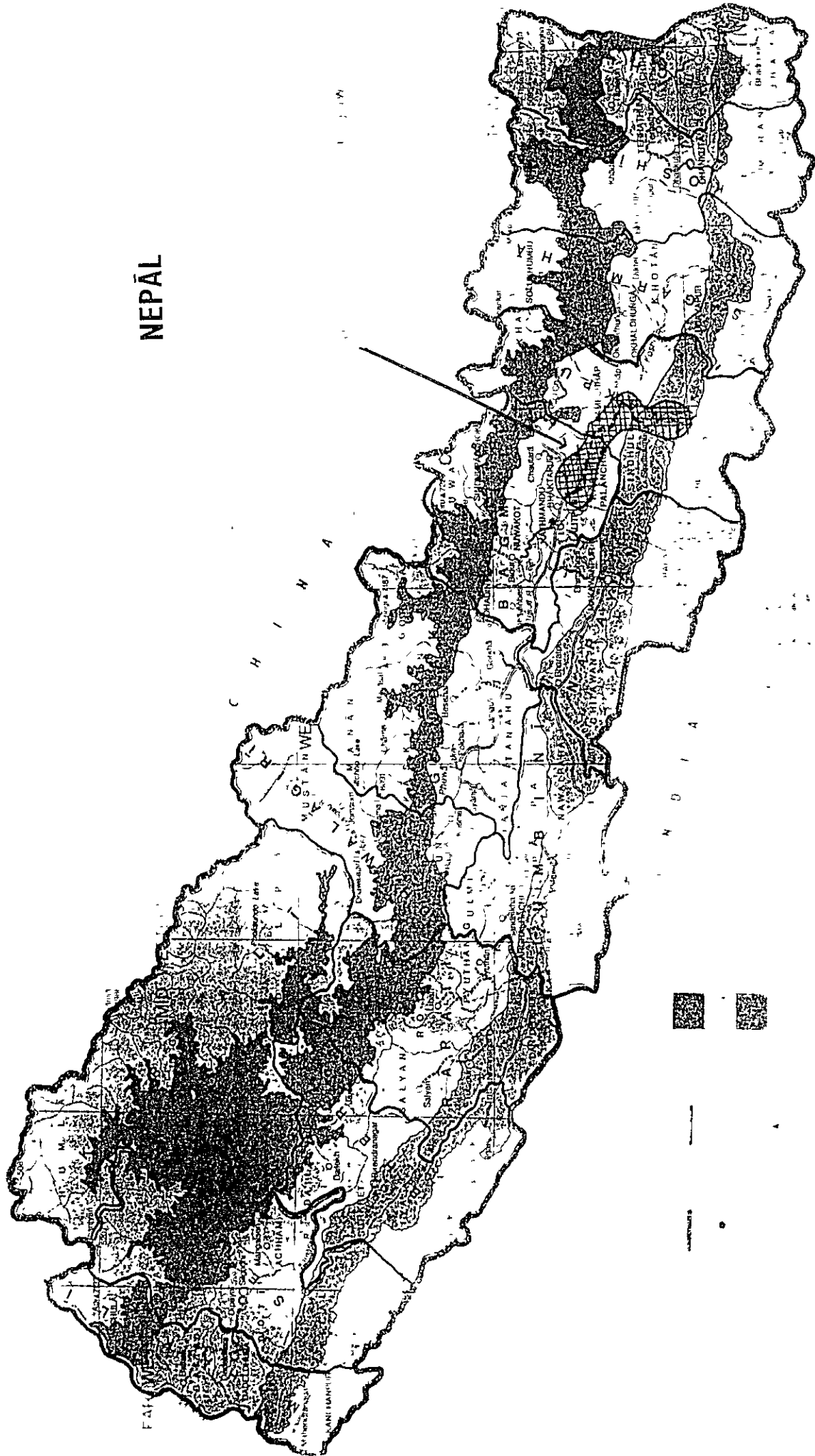
- Highway
- Secondary/Seasonal Under Construction
- River
- Lake
- Pass
- Point
- Survey
- April
- U.S.

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Annex 3: Women in Development with Special Reference to the Area Surrounding the Proposed Banepa-Sindhuli Road Corridor by Mrs. Padma Mahara

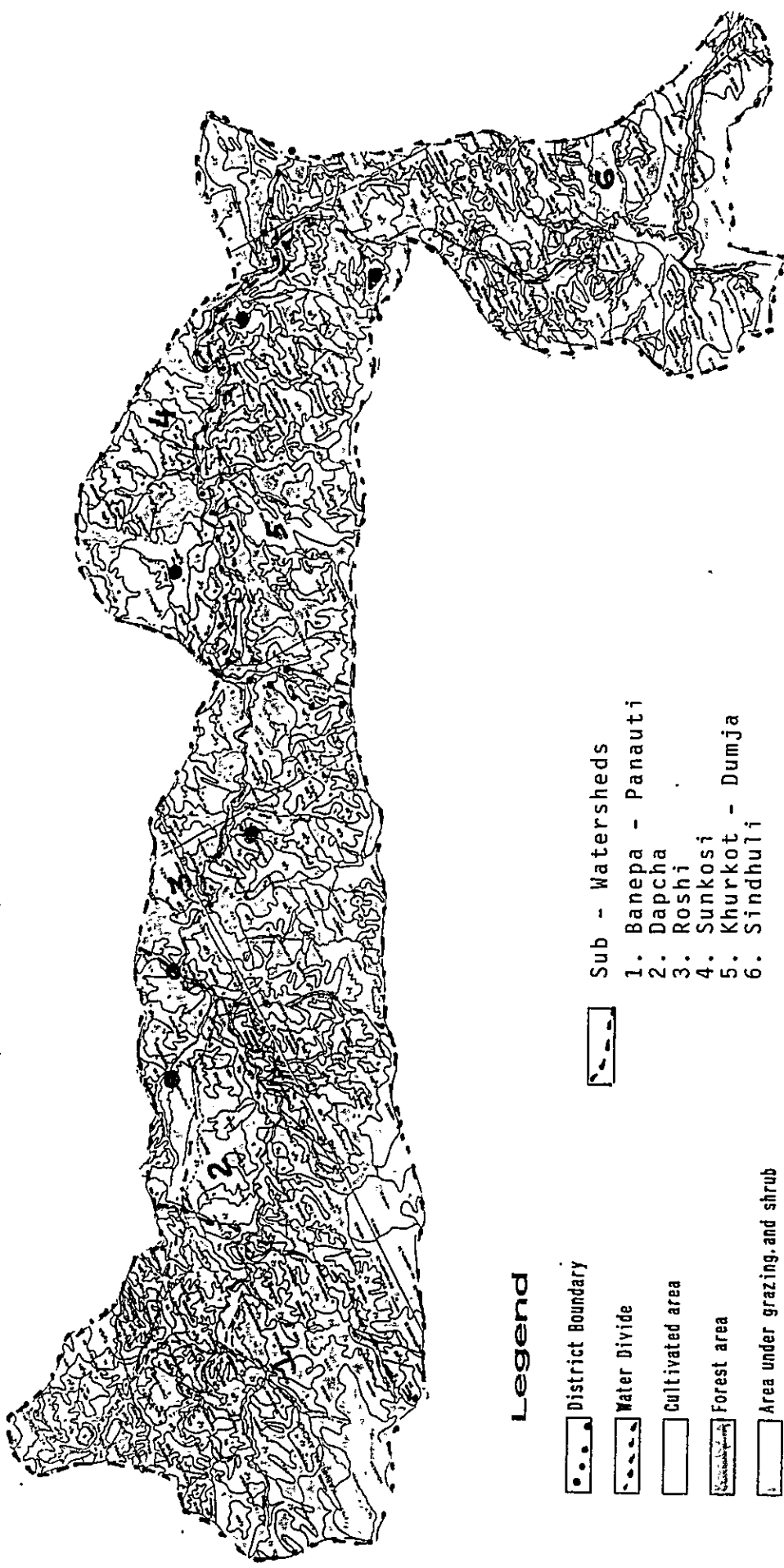
Annex 4: Environment and Forest Interactions in Nepal with Special Reference to the Area Surrounding the Proposed Banepa-Sindhuli Road Corridor by Mr. Jitendra Shrestha

NEPĀL










Land Utilization Map

Proposed Banepa-Sindhuli Highway Corridor



Legend

-  District Boundary
-  Water Divide
-  Cultivated area
-  Forest area
-  Area under grazing, and shrub
-  Locations of Household studies
-  Road Alignment (approximate)

- Sub - Watersheds
1. Banepa - Panauti
 2. Dapcha
 3. Roshi
 4. Sunkosi
 5. Khurkot - Dumja
 6. Sindhuli

PREFACE

This study, entitled Basic Study of Rural Development, has been conducted for the Japan International Development Agency (JICA) in Kathmanu in the area surrounding the proposed Banepa-Sindhuli Road corridor which is roughly estimated to be some 138 kms long and would link Dhulikhel, the district capital of Kavrepalanchok, with Sindhulimadi, the district capital of Sindhuli district. The road is likely to follow the Sunkosi river in Sindhuli district thus bringing the district of Ramechhap within the influence area of the proposed road.

The main purpose of the study is identify a suitable rural development project for the proposed road corridor by bringing together the experiences so far gained in the field of developing Nepal's rural areas in the country as well as in the intended road corridor area.

The study has been conducted in several parts. Firstly, six settlements at roughly equidistant points along the proposed road corridor have been selected for in-depth household study which constitutes one of the important bases for the assessment of the socio-economic situation and the prospects of development in the proposed area. The second part consists of succinct assessment of the existing and past rural development projects in the country and in the proposed area with a view to derive lessons of experience to guide the proposed formulation of a rural development project for the proposed road corridor area. The third and last part comprise an assessment of the development programmes being implemented in the two districts of Kavrepalanchok and Sindhuli.

Many consultants contributed to this project preparation by undertaking assessments of different aspects of the project. Dr. Tirtha Bahadur Shrestha, Environment Expert of the International Union for Nature Conservation (IUCN) and his co-author Mr. B.D. Shrestha contributed the study of the geographical situation of project area. Mrs. Padma Mathema, Under Secretary in the National Planning Commission Secretariat undertook the study on Women in Development for this project. Similarly, Mr. Shushil Bhattarai, ex-Director General of the Department of Soil and Watershed Management, HMG/N contributed on the Soil and Environment Conservation situation in the country, and Dr. Narayan Narsingh Khatri, head of the Small Farmer Development Division of the Agricultural Development Bank, Nepal prepared a status report on the Poverty Alleviation endeavour in country. Each of those studies also tried to relate their macro level findings to the particularities of the proposed project area within the limitations imposed by the deductive nature of such tasks.

Similarly, the field studies of the six settlements were coordinated and overseen by another set of consultants consisting of Mr. Tirtha Prasad Gyawali, former Chief District Officer in the government, Mr. Nayan Bahadur Khadka and Mr. Babu Ram Shrestha, both Senior Instructors in the Local Development

Training Academy of the Government. They were assisted by a team of research assistants who comprised Mssrs Mani Niraula, Bharat Bahadur Khadka, Shatrughan Chandra Poudel, Narendra Adhikari, Dwarika Shrestha and Suban Pokharel. In the computer analysis of data, the team was assisted by Mr. Ashwatthama Pokharel.

While the author is grateful to all the consultants and the research assistants for their valuable contributions to this study, he alone is responsible for the report including any act of commission and omission in it. The author is very grateful to JICA, Kathmandu for awarding him the opportunity to undertake the professionally rewarding task of this project preparation. The author is particularly grateful to its Resident Representative, Mr. Yasuyuki Kohori, Assistant Resident Representative, Mr. Hiromichi Murakami, and Advisor, Mr. Shiva Prasad Acharya for having read the inception report and provided useful guidance towards the preparation of this report. Grateful thanks are also to be expressed to Mr. K. Watanabe of Community Development and Forest/Watershed Conservation Project and to Mr. Yuichi Tomiyasu of Horticulture Development Project for the valuable counsel given to the author.

Lastly, but not the least, the author must also express his gratitude to the Chief District Officers of Kavrepalanchok and Sindhuli namely Mr. Devi Prasad Bhattarai and Mr. Ram Ratan Mishra respectively and the many officials in those districts who helped the author and the consultants in all possible ways including providing all necessary informations for making their field work a success.

Lalitpur
May 22, 1995

Bihari Krishna Shrestha

CHAPTER ONE

INTRODUCTION

This is the report of the Basic Study of Rural Development in the area surrounding the proposed road corridor between Banepa in Kavrepalanchok district in Bagmati Zone and Sindhulimadi in the Sindhuli district in the Janakpur Zone. This road, proposed to be around 138 kms., would follow the Sunkosi river for considerable distance in between, thus bringing southern part of the district of Ramechhap across the river within the area of influence of the proposed road. While this region belongs to the Central Development Region of the country and is situated relatively close to the capital city of Kathmandu as well as the market centres like Janakpur in the terai, its paradox has been that it has remained roadless for so long and deprived of the socio-economic benefits and opportunities that access to them could have otherwise provided to its people. In essence, this report embodies a proposal for a programme of rural development for enabling the people of the area to benefit from the construction of the road towards enhancing their socio-economic status on a sustainable basis.

Objectives of the project preparation:

The central objective of the Basic Study of Rural Development and the ensuing project formulation is to alleviate poverty through major advances in:

- raising income generation,
- enhancing employment opportunities,
- environmental conservation and management, and
- participation of women in the local development process.

Towards that end, the report attempts:

- to identify, describe and analyze the physical, economic, social, cultural, political, and other relevant characteristics of the proposed project area,

- to undertake a comprehensive stock-taking study of the existing and completed major rural development projects implemented by the central government, District Development Committees, Village Development Committees, bi/multi-lateral donors, INGOs, NGOs and others,

- to formulate a long and a short inventory of significant and suitable rural development projects for the area, and

- to recommend to JICA an appropriate and feasible rural

development project for implementation in the proposed area.

Methodology:

The methodology employed for the study and project preparation has several components which are as follows:

1. Reconnaissance survey:

The study and project preparation exercise got underway with a reconnaissance survey of the proposed project area. It provided a very useful opportunity to get the firsthand experience of the project area and to interact with and interview the government officials, local leaders, local villagers, and passers-by on the trail. It also provided opportunity for making firsthand observations of the environmental problems afflicting the area. The findings of the survey laid the ground work for other studies undertaken for the project preparation which are discussed below.

2. In-depth household and village study:

During the reconnaissance survey, six different locations were identified for in-depth household and village study and were situated more or less at equidistant intervals between the two extremities of the proposed road namely Banepa and Sindhulimadi. The selected settlements and the districts to which they belong are as follows:

<u>District</u>	<u>VDC</u>	<u>Selected Settlement/s</u>
Kavrepalanchok	1. Khadalthok	Bhakunde & other adjoining hamlets
	2. Katunjabesi	Sections of Wards 1,4 & 5
	3. Mangaltar	
Ramechhap	4. Rakathum	Pangkhar
Sindhuli	5. Jalkannya	Batonigale
	6. Shitalpati	Khalte

In order to accomplish the in-depth household study a detailed questionnaire was drawn up which included all aspects of household socio-economy such as caste/ethnic background, literacy and schooling status, economic activity, land holding status, agricultural production, productivity and food sufficiency, migration and external employment, sale and purchase of household

products, sources and extent of non-farm income, indebtedness, access to and use of improved inputs, etc.

Three teams of one field coordinator/consultant and two research assistants each were engaged for the field study. The coordinators were extensively involved in the framing of the questionnaire and training of the research assistants. The computer specialist in the team revised the questionnaire to make it computer-friendly and trained the research assistants in administering them and coding the answers.

In order to make the study more manageable, a total of 50 households were selected for in-depth investigation in each settlement. In order to make the sample reflect the larger socio-economic composition of the VDC of which it was a part, a set of criteria were established for their selection and were as follows:

- The households should be in a cluster or situated in a cluster of hamlets to enable easy access for the interviewers and to impress upon the respondents of blanket coverage of all the households in their neighbourhood; and

- the sample should represent as far as possible the ethnic and economic make-up (stratification) of the VDC of which it is a part.

3. VDC-level investigation:

Another qualitative study was undertaken at the level of the VDC in which the settlement for in-depth household study was selected. The VDC-level enquiry was intended as a supplementation to the household study and was undertaken by the coordinator for the household study himself. The information for this study was to be collected from focus group discussions as well as knowledgeable informants and leaders in the community. The main aim of the study was to generate an impression of the state of development in the community and consisted of such details as the physical description of the VDC, population composition and occupational background, economic status and resource base, exports and imports, non-farm sources of income, external employment, development experience in terms of development projects completed, current status of completed projects, their perceived development problems and possible benefits from the proposed road corridor.

4. Macro-level study of specific rural development issues:

In addition, in-depth macro level studies were also undertaken on a few specific issues with direct bearing on the issue of rural development in the country. The subjects have been: Poverty Alleviation, Women In Development and Environment and Forest Conservation in Nepal. These studies were undertaken with a view to provide the larger national-level backdrop for the addressing those issues in the context of the proposed Project.

5. Information gathering of district level development programmes:

Informations were also collected on the different development programmes being implemented in the districts of Kavrepalanchok and Sindhuli. The aspects looked into were their coverage, budgets and programmes, their outreach system and impact, their potentiality in the district, and their problems and possible means of resolution.

6. Desk study and interviews:

Desk study of different secondary sources were undertaken and were supplemented by in-depth interviews with concerned officials and experts.

Contents of the report:

The report is divided into several parts. The following section (Chapter 2) describes and analyzes the physical, social, economic, cultural, political and other relevant aspects of the proposed project area. Chapter 3 deals with the stock-taking study of different existing and completed rural development projects in the country and in the project area. This will also include the description of the current development programmes being implemented in the districts of Kavrepalanchok and Sindhuli by the government and local elected offices.

Chapter 4 consists of an inventory of short and long term rural development projects for possible implementation in the project area. Chapter 5 undertakes a holistic analysis of the problem by addressing the implications of the socio-economic and other characteristics of the proposed project area, the lessons of other rural development projects, and the inventory of the projects mentioned above. Chapter 6 then goes on to make a detailed recommendation of a rural development project for implementation in the road corridor area. This includes the proposed organization and management system as well as a system of monitoring and indicators. The last two chapters 7 and 8 consist of references used and annexes respectively.

CHAPTER TWO

IDENTIFICATION AND CHARACTERIZATION OF PROJECT AREA

This Chapter is composed of several parts. It starts with the description of the Geophysical Characteristics of the proposed Road Corridor area which is then followed by the description and analysis of its population and ethnic composition. The third part consists of the description of the present socio-economic condition of the area which is primarily drawn from the household and village studies mentioned above. The Chapter ends with a discussion of the development experience of the local people and their current needs and priorities thereof.

1. GEOPHYSICAL CHARACTERISTICS OF THE PROPOSED CORRIDOR AREA:

The Area

The study area BSRC (Proposed Banepa-Sindhuli Road Corridor) lies in the Central Development Region of Nepal. Major portion falls in the Kabhre and the Sindhuli districts while the Ramechhap district also becomes to be one of the major beneficiaries of the road. The corridor area lies in three topographic units of Nepal i.e (i) the Mahabharat Lekh, (ii) the Midland Hills, and (iii) the Bhitri Madesh (Inner Terai or Doon Valley). The study area runs NW to SE from Banepa-Dhulikhel to Khurkot and thence extends southward to Sindhuli Madi. Total area covered by the study comes to over 1000 sq. km, of which 53 per cent lies in the Roshi, 28 per cent in the Sunkoshi and 19 per cent in the Gwangu catchments.

Physiography

The Mahabharat Lekh

The Mahabharat Lekh is the major topographical feature of the area. The crest line from Phulchoki peak (2765 m) to the Sindhuli Gadi at 1500 m (4950 ft) altitude is the watershed divide for the Sunkoshi valley. The crest line is continuous till the Sunkoshi meets the Arun Koshi at the Tribeni. The river flows at about 400 m at the northern foothill of the Mahabharat Range. Thus the river course of the Roshi and the Sunkoshi runs from west to east. A number of its northern tributaries such as the Tamba Koshi, the Likhu khola, the Maulung khola and the Dudh Koshi runs north to south. They create a complex series of ridges and valleys. The relief is moderate and goes up to 2000 m at some places.

The northern slopes of the Mahabharat Range is steep, and the rivers are small. They bring large quantities of boulders and rocks. Forests are found at higher elevation towards the crest,

and along gullies and ravines. The Mahabharat forests and adjoining shrub lands remain to be the main source of timber, fuelwood, bamboos and grasses.

The Midlands

The land mass between the Mahabharat Range and Himalaya is often referred as Midlands or Midland Hills or Middle Mountains. It occupies some 30 per cent of Nepal's area. It is the main habitat of mountain people throughout Nepal. The terrain is composed of a complex system of ridges and valleys. They extend towards the north with gradual rise in altitude. The Midland has a long history of terrace cultivation. The land is used intensively for agriculture, grazing and forestry. Original forests have been much altered and are limited to small sites. They are seen as sacred forests, strips along steep terrains, small patches on north facing unaccessible slopes, and at altitudes higher than the cultivable zone i.e above 3000 m. The terrain is dissected by snowfed rivers. A large number of landslide scars, side gullies, open slopes, patches of shrublands, and regenerating juvenile forests are seen here and there among long stretches of terraced slopes. Historically the Midlands had been densely populated, and recently the spill over of high population passes over to urban centres and even across the borders to India. Over 80 per cent of the study area and the impact zone of proposed Banepa-Sindhuli Road (BSR) falls in the Midlands of Kabhre, Ramechhap and Sindhuli districts.

Siwalik Hills and the Doon Valley

A lesser hill range called Siwalik or Churia runs parallel to the taller Mahabharat Range leaving a low lying valley between them. Such valleys are known as Bhitri Madhesh i.e inner Terai or Doon valley. Formerly a malarial hell, such valleys serve as bread-basket for most hill districts. The Sindhuli Madi is a typical example of a Doon Valley formed due to the rivers that drain the northern slopes of Churia hills and the southern slopes of the Mahabharat hills. They form the Kamala river. Major part of the valley is drained by the Gwangu Khola. It behaves erratically during monsoon season.

The Churia is formed due to the sediments produced by the rising Himalaya during the last 40 million years or so. It is composed of loose boulders, weakly consolidated gravels, sands and silts. The materials are Pliocene and Pleistocene sandstones, shales and siltstones.

Geology and Geomorphology

Geology

Alignment of Banepa to Sindhulimadi crosses through various lithologic faces of Midland region and through Mahabharat in the south. Major rocks of Rosi Khola catchment are hornfelses, mica

schists and granitic pocket. Apart from above said rocks, fine to medium grained massive sandstone associated with some limestone and quartzite are also present. These rocks are moderately hard in nature. In this area the rocks are dipping towards south-east showing the direction of bedding slope. Most of road alignment passes through the limestone zone in the lower part of Rosi Khola catchment. At the confluence of Rosi Khola and Sun Kosi, the rock type becomes green phyllite. From here onwards the dip direction changes to south-south-east. From the confluence of Sun Kosi and Tamba Kosi River, the high-way turns to south crossing garnetmica schist and granite up to the Main Boundary Thrust.

Gwangu Khola catchment lies in the Siwalik zone. Siwalik zone in the south Mahabharat or Middle Mountain zone in the north is separated by Main Boundary Thrust.

Geomorphology

Ninety to ninety five percent of the total length of Banepa Sindhuli highway lies in the Middle Mountain region. Very little part lies in the Siwalik region near Sindhulimadi.

The two major catchments namely the Roshi Khola and the Sun Kosi have steeply sloping mountain land form, with the foot-hills and the river beds forming the valley landforms. Most area has more than 30° slope angle. Lands having less than 30° slope can be used for cultivation or afforestation with proper soil conservation measures. Valley land-forms are currently under heavy cultivation.

Lot of alluvial plains and fans are seen along the river course. Ancient river terraces are also seen in place. It seems that most of the road alignment follows river course. Roads following river course are low cost to construct but may cost a lot for its maintenance. The life of road depends on the geological stability of the slope and the type of land system.

Gwangu Khola catchment covers large area in the Siwalik region. Siwalik region is highly erodible. The topography of Siwalik region is a badland type. It has unstable recent alluvial deposits along the river course. Moderate to steeply sloping alluvial terrain are found on the lower part towards the south, and steep to very steeply sloping mountain terrain area seen towards the north on the slopes of Mahabharat Lekh.

Watersheds

The area under present investigation may be divided into three major watersheds, namely (A) Roshi Khola watershed, (B) Sunkoshi watershed and (C) Gwangu Khola watershed.

Table 1: LAND USE STATUS IN DIFFERENT CATCHMENTS

Land Use Types	Roshi Catchment		S u n K o s i Catchment		Gwangu Catchment (Kamala River)	
	Area in ha.	%	Area in ha.	%	Area in ha.	%
Agricultural	27061	48.9	11011	37.3	3134	16.8
Forestry	17025	30.8	10064	34.1	14743	79.8
Grazing	11230	20.3	8427	28.6	788	4.2
Total	55316	100.0	29502	100.0	18665	100.0

Source : Based upon LRMP maps.

(A) Roshi khola Watershed

This watershed encompasses most of the area to be commanded by the section II-3 of the Initial Route Study lying between Nepalthok and the end point on the Kodari Road (Fig 1). The catchment has an area of 55, 316 ha of which 48.9 per cent is under agriculture, 30.8 per cent under forest cover of some sort, and 20.3 per cent under grazing area and shrubberies (Table 1), [Also refer to the landuse map supplied herewith]. A generalized cross-section of the valley passing through Dapcha is presented in Fig. 2. The terrain consists of moderately to steeply sloping mountain and valley landforms. This catchment is regarded as one of the worse ones in Nepal. Toe slopes are especially fragile and are prone to erosion. There are fertile lands of alluvial plains and fans along the river course. Ancient river terraces occur frequently.

This watershed has a series of ridges and lower slopes. This watershed has following three land types.

(i) Upper ridge slopes - These are convex ridge crests and upper slopes. The soils are deep reddish loams over clay loams. The forest is replaced by "Banamara". There are gullies and debris avalanches.

(ii) Midslopes - These are dissected benchy slopes. The vegetation in the ravines and on the steeper slopes is dominated by "Banamara" with scattered chirpine. Small landslides are found on the toe slopes.

(iii) Toe slopes - Toe slopes lie in the lower part of the drainage. The soils are deep, reddish brown clay loams. Vegetation is open. Bare ground and natural land slips are present.

The watershed condition of this catchment is "poor" according to the Land Resource Mapping Project (LRMP 1986) catagorization.

The Roshi Khola originates from near the Phulchowki peak (2765 m) and joins the Sunkoshi at Nepalthok (600 m). The river profile is very steep (fig 3). Dapcha khola is its major tributary which originates from near Kabhre Nityachandeswor at about 1200 m. Most tributaries bring large amount of silt and boulders during rainy season and the river course is rather rough although fields along the valley floor such as Panauti, Khopasi and Bhakunde Bensi are reputed sites for paddy cultivation. The river is not fed by any snowy mountain or glacier but it is perennial.

(B) Sunkoshi Watershed

The sector of watershed included in this study lies between Nepalthok (Roshi and Sunkoshi confluence) and Khurkot. It corresponds to the section II-2 of Initial Route Survey of the road project (Fig. 1). The Sunkoshi river is the district boundary between Ramechhap on the north and Sindhuli on the south. There is a catchment area of 29,502 ha in this sector. As per the LRMP information this sector consists of 37.3 per cent of agricultural land, 34.1 per cent forest land and 28.6 per cent grazing land inclusive of shrublands (Table 1). Mountain landforms are very steeply to steeply sloping (Fig 4). Valley floor is narrow at places but at most locations the river banks are broad and have excellent beach areas such as near Jhangajholi village.

This watershed has ridge and valley system. The river course is controlled by faults. There are plenty of landslides in the catchment area. This catchment may be divided into the following 6 landforms:

(i) Secondary Canyon Slopes - Secondary canyons have steep to very steep rocky slopes. Vegetation is Sal, Chilaune, Chir pine. The soil is clay loam.

(ii) Ridge and Canyons - The lower slopes are dissected. Soil are greyish brown to reddish brown, gravelly loams to gravelly, clay loams. Vegetation on upper slope is Chir pine and on lower slope Sal.

(iii) Secondary Canyon Slopes - Soils are deep, dark greyish brown, gravelly sandy loams or clay loams. The vegetation is Sal, Chir pine and Chilaune.

(iv) Bench and Terrace Land - Erosion is moderate. The surfaces are cultivated.

(v) Flood Plains and Fans - These are board, gravel plains that are flooded in the monsoon. Broad fans cover these plains at the mouths of entering streams

The Sunkoshi (gold river) is fed by snowy mountain and glaciers. A number of tributaries are antecedent to the Himalaya. They drain parts of the Tibetan plateau. They are known as Bhote kosi i.e the Tibetan river. Between Nepalthok and Khurkot there are several streams from Mahabharat Lekh to join the Sunkoshi, but

the major tributary river remains to be the Tamba kosi i.e Copper river which originates in the high Himalayan region. The Sunkoshi has a very gentle gradient to allow easy water transport and rafting. The gradient between Nepalthok and Khurkot is just about 75 m to cover a length of about 12 km (Fig 5). The river is currently used to raft chemical fertilizers, construction materials and retail commodities of domestic use, from Dolalghat at the Kodari Highway to Jangajholi at the BSR route. A 6 hour journey from Dolalghat to Jhangajholi saves lot of energy and labour. It's a worthwhile aspect of investigation for an improved transport system in the area.

(C) Gwangu khola Watershed

This ridge of Gwangu Khola is adjacent to Main Boundary Thrust. This is a continuous ridge with secondary ridges. Soils are shallow to moderately deep, gravelly loamy sand. The vegetation is tropical forest. Large landslides are common. Erosion is severe due to overgrazing and tree cutting. Watershed condition of Gwangu Khola is very poor.

The watershed under the present study covers an area of 18,665 ha, of which 79 per cent is forested land, 16.8 per cent agricultural land and only 4.2 per cent under grazing and shrubland. This watershed has a large alluvial plains towards southern region while the northern region is gently slopping and rising steadily towards the Mahabharat hill.

The Climate

Most of Nepal lies within the sub-tropical monsoon region with a 3-month rainy season (June-Sept.), and a dry autumn followed by a drier winter and the spring. Rainfall varies considerably due to orogeny of mountains, and the temperature varies dramatically due to altitudinal variation. Solar radiation show remarkable effects on the vegetation types and crop patterns as is evident on the south facing and the north facing slopes.

Temperature

Nepal lying in the sub-tropical region of the globe, there is a marked summer and winter seasons. The highest mean monthly temperatures occur during April or May. During monsoon mean temperatures remain fairly steady until September and October when the rate of fall increases rapidly until December and January. From February onwards the temperature increases steadily till May. March and April are dry and hot months. Occasional gusts of high wind and storm occur during this period. Some areas receive heavy hailstones and also spells of rain due to thunderstorms.

The range of temperature varies mainly due to altitude. Every rise of 1000 m altitude comes the fall of 5°C on the slopes of the mountain. On the basis of altitude the study area may be

divided into the following climatic zones, i.e. (i) Tropical (area lying below 1000 m.), (ii) Sub-tropical (between 1000-2000 m), and (iii) Temperate (between 2000-3000 m).

In the Sindhuli area the climate is tropical and the summer temperature ranges from 35°C to 40°C, while the annual average is about 20°C to 21°C, and the average of daily maximum is 28.3°C. In the subtropical and temperate region of Kabhre and Sindhuli the annual average falls between 15°C to 20°C. The average of daily maximum is 21.3°C in Ramechhap. These figures represent a fairly broad scale assumption based upon the records of a few climatological stations.

The Rainfall

The rainfall pattern and the volume of precipitation are strongly influenced by the position of mountain ridges. In the area of present investigation, the Mahabharat range creates a strong luff (Wind ward) and lee (Rain shadow) effect due to its east-west position acting as the barrier to the forwarding monsoon wind from south towards north. As such the luff side in Sindhuli Madi, the amount of annual rainfall is 3064 mm per year which is almost 3 times more than that of Ramechhap i.e 1023 mm. The rainfall figure of Dhulikhel in Kavre is 1601 mm which is very close to Kathmandu figures. In the same way the maximum rainfall in 24 hours is 342 mm in Sindhuli (16 Sept., 1984), 123 mm in Ramechhap (27 Aug., 1986) and 122 mm in Dhulikhel (5 Sept., 1985). Average annual rainfall of those three sites are presented in Table 2.

The Sunkoshi valley is comparatively dry than its adjoining areas towards the north or the south. However it should be noted that this valley is most eroded and has a greater number of landslides and other environmental hazards.

Table 2

Average annual rainfall from
1961 to 1986

	Roshi Khola Dhulikhel (in mm)	Sun kosi River Ramechhap (in mm)	Gwangu Khola Sindhuli (in mm)
January	14	17	20
February	14	6	10
March	26	20	26
April	68	40	98
May	99	88	241
June	206	100	476
July	463	312	762
August	314	192	645
September	282	176	639
October	91	42	129
November	6	12	16
December	18	18	22
Total	1601	1023	3064

Maximum rainfall in 24 hrs. in Dhulikhel=122 mm/5 Sep. 1985

Maximum rainfall in 24 hrs. in Ramechhap=123 mm/27 Aug. 1986

Maximum rainfall in 24 hrs. in Sindhuli=342 mm/16 Sep. 1984

Natural Vegetation, Flora and Fauna

Natural vegetation is best described in terms of climatic zones which are identified on the basis of altitudinal limits. Most of the area lying below 2000 m in the Roshi and the Sunkoshi valley has subtropical climate. Valley floors and river terraces which drop below 1000 m exhibit a tropical climate. It is often referred as upper tropical climatic zone. The Mahabharat Lekh rises to 3000 m and represent the temperate zone between 2000-3000 m.

The Sindhuli Madi (inner Terai) is mostly Tropical in character and the Siwalik hills bordering the valley have large number of tropical plants, while the Mahabharat side on the north of the valley exhibit sub-tropical and temperate climate depending upon the altitude.

The Roshi and the Sunkoshi valleys are heavily influenced and altered by human activities. Foot hills and ravines have tropical species of trees like *Shorea robusta* (Sal), *Trewia nudiflora*, *Toona ciliata* (Tooni), *Engelhardtia spicata* (Mahuwa), *Syzygium operculatum* (Jamun), *Duabanga gradiflora* (Lampate) and *Cassia fistula* (Rajbrikshya). Riverine terraces have *Acacia catechu* (Khaber) and *Dalbergia sisso* (Sissau) mixed with a large number of shrubs like *Phyllanthus emblica* (Amala), *Rhus parviflora* (Sati-bayer), and *Zizyphus jujuba* (Bayer). On dry slopes and terraces *Aegle marmelos* (Bel), *Bombax ceiba* (Simal), *Holmalium nepalense* are found as remnants of climax vegetation.

Occasionally, *Lagerstroemia parviflora* (Bot-dhaiyaro), *Woodfordia floribunda* (Ghangaru), and *Annonas annona* (Sarifa) are found on drier slopes.

Hill slopes lying between 1500 m and 2000 m have sub-tropical vegetation with *Schima wallichii* (Chilaune) and *Castanopsis indica* (Dhalne Katus) as dominant trees. Most of the greenery is provided by coppiced stumps of those two tree species with some additional amount of oaks and rhododendron stumps towards upper slopes. At places one would expect forest patches of *Myrica esculenta* (Kafal) and *Quercus glauca* (Falant) with some maples (*Acer oblongum*).

Low lying hill slopes facing towards the south are sites of Chir Pine trees (*Pinus roxburghii*). Regenerating forests of young pine trees are met with infrequently. Pine forest of any considerable size is not occurring in those two valleys.

The temperate zone of Mahabharat Lekh at 2000 m- 3000 m has forest area dominated by oaks (*Quercus lanata*) and the *Rhododendron arboreum* (Nepal's National Flower). The forest is enriched by a number of other broad-leaved trees such as *Betula ulnoides* (Saur), *Acer oblongum* (Firfire), *Machilus sp.* (Kaulo) and other lauraceous trees and shrubs. Deforested areas are covered by *Eupatorium adnophorum* (Banmara) where grazing of animals are not disturbing regeneration process.

Forest of *Quercus semecarpifolia* (Banjh) and *Rhododendron arboreum* with *Abies spectabilis*, *Michelia velutina* (Chanp), *M. kisopa* (Chanp) and a number of shrubs like *Daphne bholua* (Lokta), *Mahonia napaulensis* (Jamane-mandro) are found towards Phulchoki mountain.

The flora value (Biodiversity) of the area under the Roshi and the Sunkoshi valley is at a low level of significance. There are not any significant area for biodiversity protection. However, the Phulchoki mountain is considered to be of great biodiversity value for flora and fauna. This area does not fall directly within the impact zone of the proposed road.

The sector of the road lying between Khurkot and Sindhuli Bazar (Initial Route Survey Section II-1) does pass through vegetated area around Sindhuli Gadi and would need further consideration for impact studies.

The faunal wealth of the area under present study is significant mainly in terms of riverine fish and water bird species. Among the fish species Mahaseer or Sahar (*Tor putitora* and *Tor tor*) are said to be very significant as sportive fish. Similarly Asla (*Schizothorax sps.*), Fakota (*Barilius sps.*), Budina (*Garra sps.*), and Kavre (*Glyptothorax trilineatus*) are other examples of commonly known species of fish from Roshi and the Sunkoshi river.

Among the river birds, the Large Cormorant is one of the most commonly found birds along the Sunkoshi. Similarly a number of water birds such as Mallard, Pintail, common Teal, common

Poachard, Shoveller and also the Demossile Crane are to be found along the river courses. Among other birds of common occurrence, mention may be made of white checked Bulbul, Red-vented Bulbul, Common Myna, Jungle Myna, White-capped River Chat, Plumbias Red Start, Pied Wagtail, Large Pied Wagtail, Grey Wagtail, Spotted Dove, Bengal Green Pigeon, and some fowls and phesants like Black Partridge, Red Jungle Fowl, Kalij Phesant and the Quails.

Mammals are rather limited to the forested areas of the Mahabharat Lekh. Some of the well known ones are the Barking Deer, Yellow-throated Martin, Himalayan Palm Civet, Rhesus Monkey, Serow and Ghoral. Monkeys and Jackles are said to be the nuisance in the vicinity of villages.

Transportation Network, Trails and Nodal Points

The Road Network

The BSR provides a link between two major highways of Nepal i.e. the Kathmandu-Kodari Highway that traverses the Himalaya and opens up Tibet, and the East-West Highway that runs throughout the length of Nepal along the Terai. Banepa, a fastly growing township, lies about 30 km away from Kathmandu city on the Kathmandu-Kodari Highway. It is reached in about 2 hours' time on a local bus. Sindhuli Bazar lies 38 km north from the East-West Highway at Bardibas. The road from Bardibas to Sindhuli Bazar is not yet metelled and one would spend over 2 hours' time to negotiate the distance in a local bus.

Banepa is linked with the Roshi valley by a dirt road of about 10 km to Panauti and Khopasi. the road further extends to Namobudha, a famous Buddha Shrine and thence is linked with another dirt road between Dhulikhel, and Dapcha. Dhulikhel to Dapcha is just under 20 km distance but the regular truck service actually needs about 3 hours to cover. The Dhulikhel-Dapcha road has a bifurcation near the Bhanjyang, and the bifurcation leads to the Bhakunde Phedi.

The Lamosanghu-Jiri road which lies about 10-15 km north of the Sunkoshi valley in crows' flight is a major infrastructure that could be considered for future linkage with BSR. Currently Lamosanghu-Jiri Road is a single trunk of 110 km spanning between two points. This road serves for a large number of trekkers who head towards Solukhumbu and the Everest region. Besides, its main function as a backbone to integrated rural development activities is becoming more and more apparent.

The Trails

The three hill districts (Kabhre, Ramechhap and Sindhuli) have largely come under human occupancy for the past several centuries. This has resulted in the transformation of the landscape into vast stretches of terraced hill slopes and degraded hills threaded with numerous trails. Most of these

trails are suited only for human portorage. Very few of them can serve as mule trail. Currently, the trails are used in response to the magnetic attractions of Kathmandu market in the west and Sindhuli Bazar in the east. The township of Jhangajholi seems to lie at the neutral zone.

Most trails in Kabhre merge at the road heads in Dhulikhel, Dapcha, and Panauti. The Dhulikhel-Nepalthok trail, as a "Mul Bato" passes through Dapcha and thence descends to the Roshi valley and follows the river course. The Sunkoshi bridge at Nepalthok connects Kabhre with Ramechhap towards the north, and the southern trail passes through the main village of Dumja and crosses the Mahabharat Ridge over to the Marin Khola via Kapilthok. Traditionally this trail used to led to Malangawa.

From Nepalthok to Khurkot the trail is fairly easy except at riverine cliffs which limit the use of trail by mules and ponies. However the north-south trade between Ramechhap and Sindhuli has now been gradually taken over by mule transport via Khurkot.

There are a number of "Mul Bato" that provide north-south linkage between the existing Lamosanghu-Jiri Road and the proposed Banepa-Sindhuli Road. On the basis of Ramechhap District Map (1:125,000) published by HMG, Department of Roads (Suspension Bridge Division), it can be elucidated that at least 2 main trails could be considered - (i) Jiri to Khimtibensi along the Khimti River and thence to Bensi Ghat along the Tamba-Koshi to join Khurkot, and (ii) Charikot to Charange along the existing road and thence follow the Tamba Koshi till the Khimti confluence at Khimti Bensi, and follow as (i)

The River Raft

Dolalghat lying on the Kathmandu-Kodari Highway at the confluence of the Sunkoshi and the Indrawati river has been developed into a major trading township. The Sunkoshi River from this point onwards to Nepalthok and thence to Khurkot flows rather gently and has been used to raft down goods in regular basis. The river profile between Nepalthok and Khurkot (Fig. 5) illustrates an excellent opportunity of water transport within the Midland region of BSR corridor.

The Nodal Points

The Nodal Points in the BSR corridor are determined by three main functions of the place :

- (i) road heads/crossings
- (ii) commercial centres, and
- (iii) administrative centres.

Among existing Nodal Points, a number of township & settlements like Banepa, Dhulikhel, Panauti, Ramechhap and Sindhuli Bazar will continue to be significant after the proposed road is completed. Some market centres like Dapcha will fall out of the way while important junctions like Khurkot and Nepalthok would flourish as new Nodal Points. Present study has not looked into

the tourism potentials. However, prospects of tourism for mountain treks are quite promising to investigate upon.

Concluding Remarks and Recommendations

◦The Banepa-Sindhuli Road was being proposed for construction several decades ago, and expectations raised in the minds of the people have now turned into frustrations and distrust in Government promises. Any survey work or investigation in the area should be carried out with firm information on the project.

◦Midhills of Nepal are naturally fragile to the construction of infrastructures. There are a number of natural preconditions to be considered such as climate, geology, topography and environment (Schaffner, U. (1987) - ICIMOD Occasional Paper No. 8. Road Construction in the Nepal Hiamalaya : The Experience from the Lamosanghu-Jiri Road Project). Lessons learnt elsewhere especially in mountainous region should be fully employed for the operation of the project.

◦The role of survey and design in minimising and mitigating environmental damages should be recognised fully and an early Environmental Impact Assessment (EIA) should be considered.

◦Land-use comparisons between 1972 and 1990 based upon aerial photographs and remote sensing have shown that the area under forest cover has significantly increased as was evident from studies in the Jhikhu Khola Watershed (Tamrakar, R.M., Jabegu, K. (Subba), and Shrestha, B. (1991) - Land-use Changes in the Jhikhu Khola Watershed Area. Workshop Proceedings on Soil Fertility and Erosion Issues in the Middle Mountain of Nepal. 22-25, April 1991. HMG/IDRC, Kathmandu).

Fig. 1 Alternative Routes in Section II-3

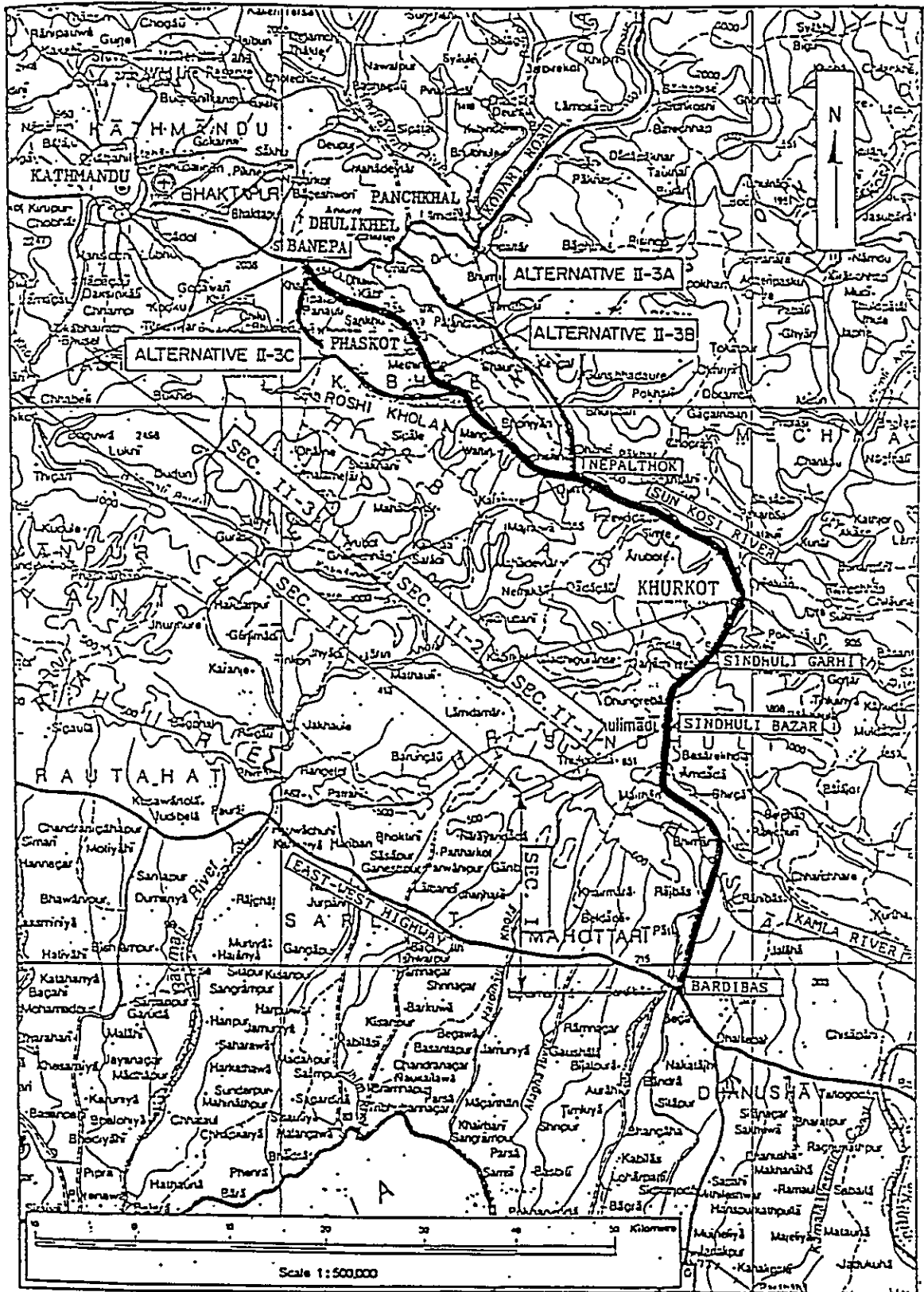


Fig. 2

CROSS SECTION OF ROSI VALLEY

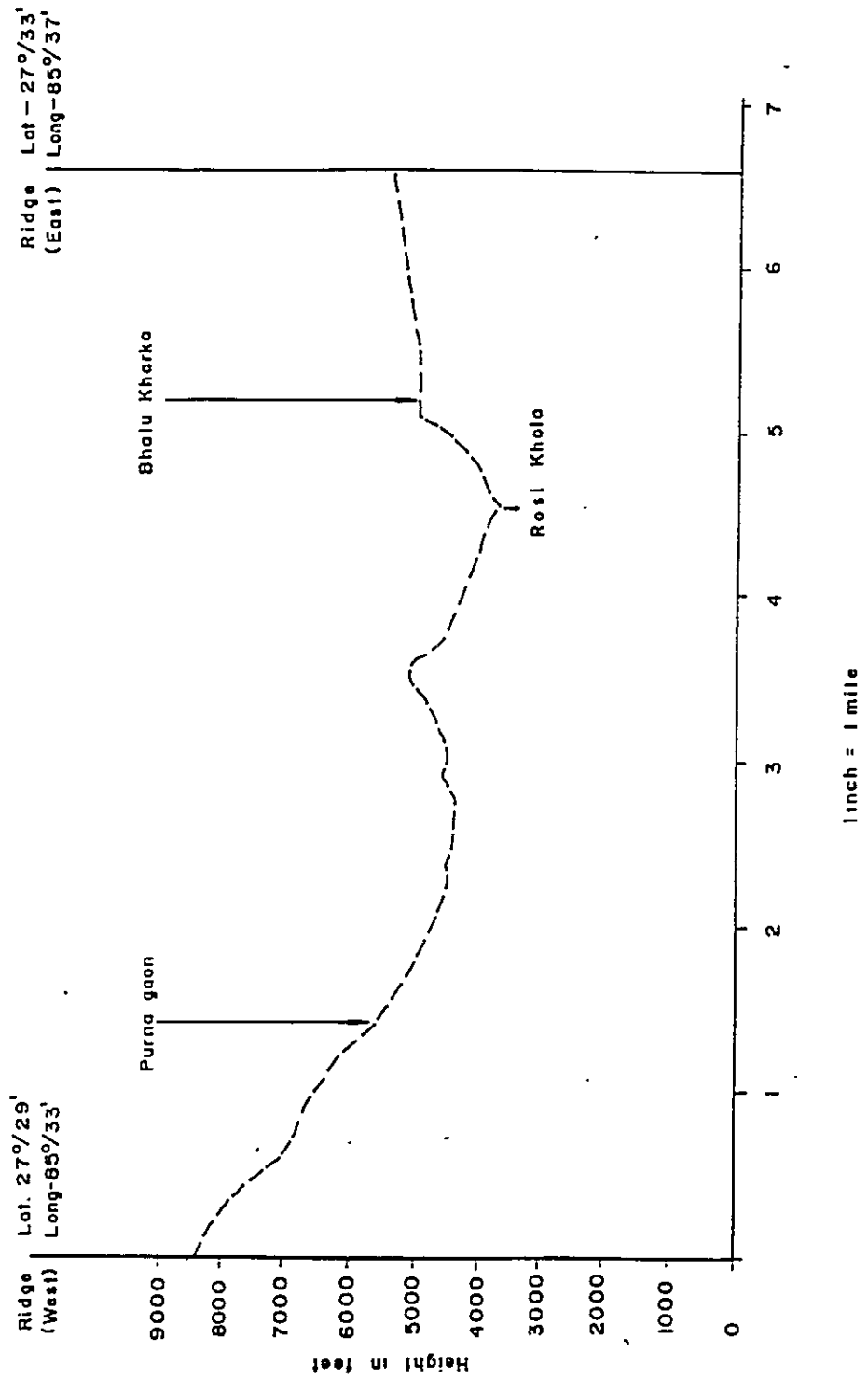


Fig. 3

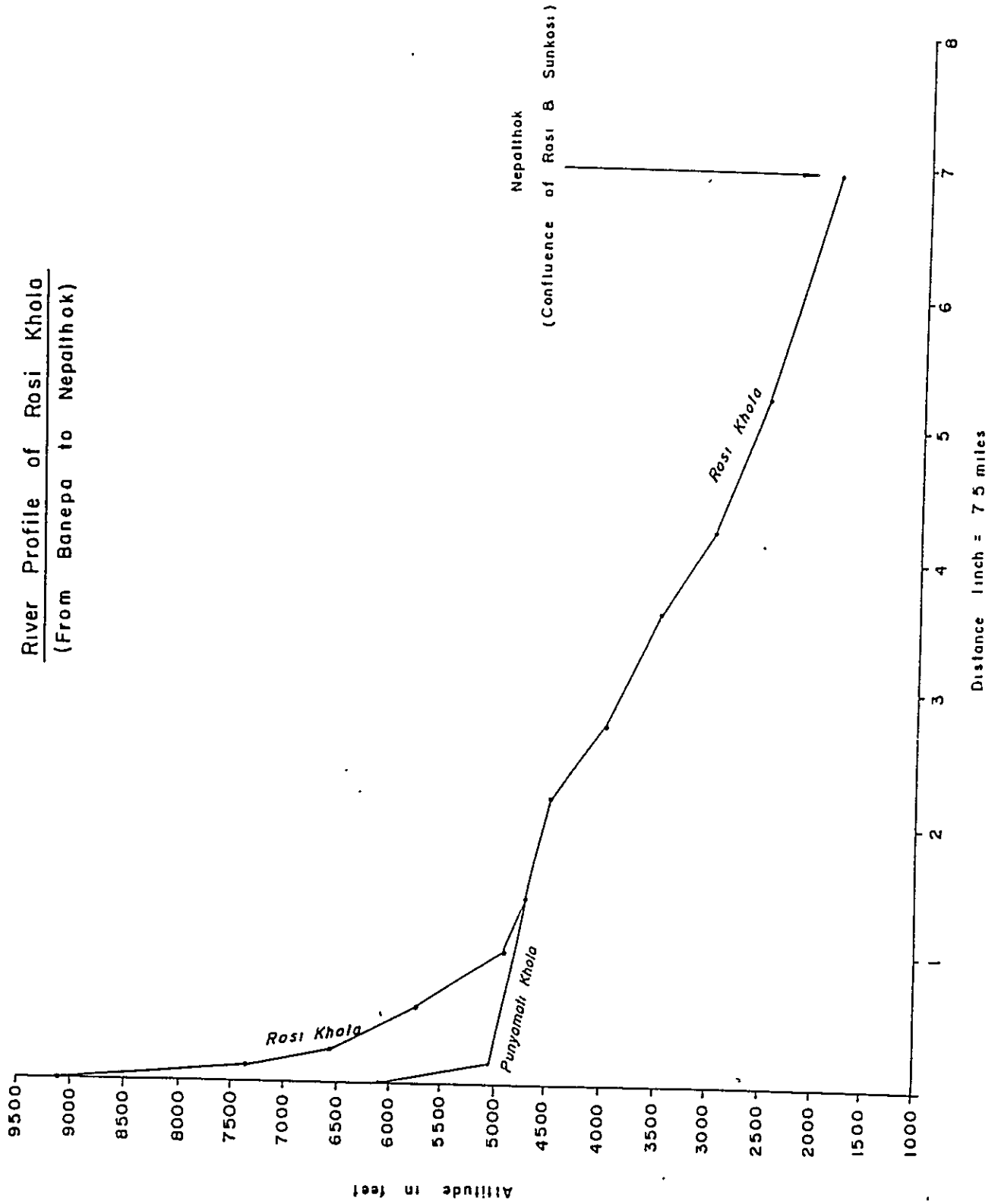


Fig. 4

CROSS SECTION OF SUN-KOSI VALLEY

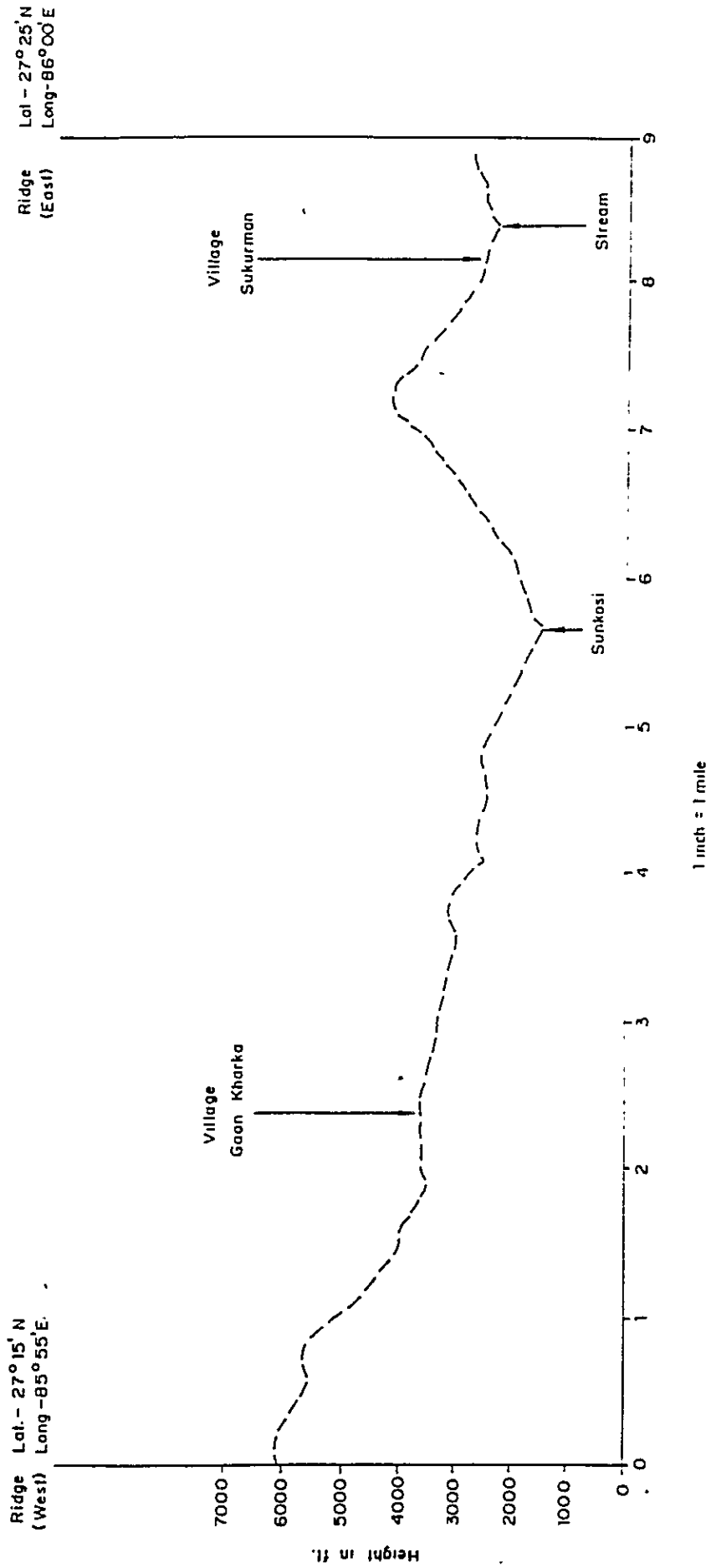
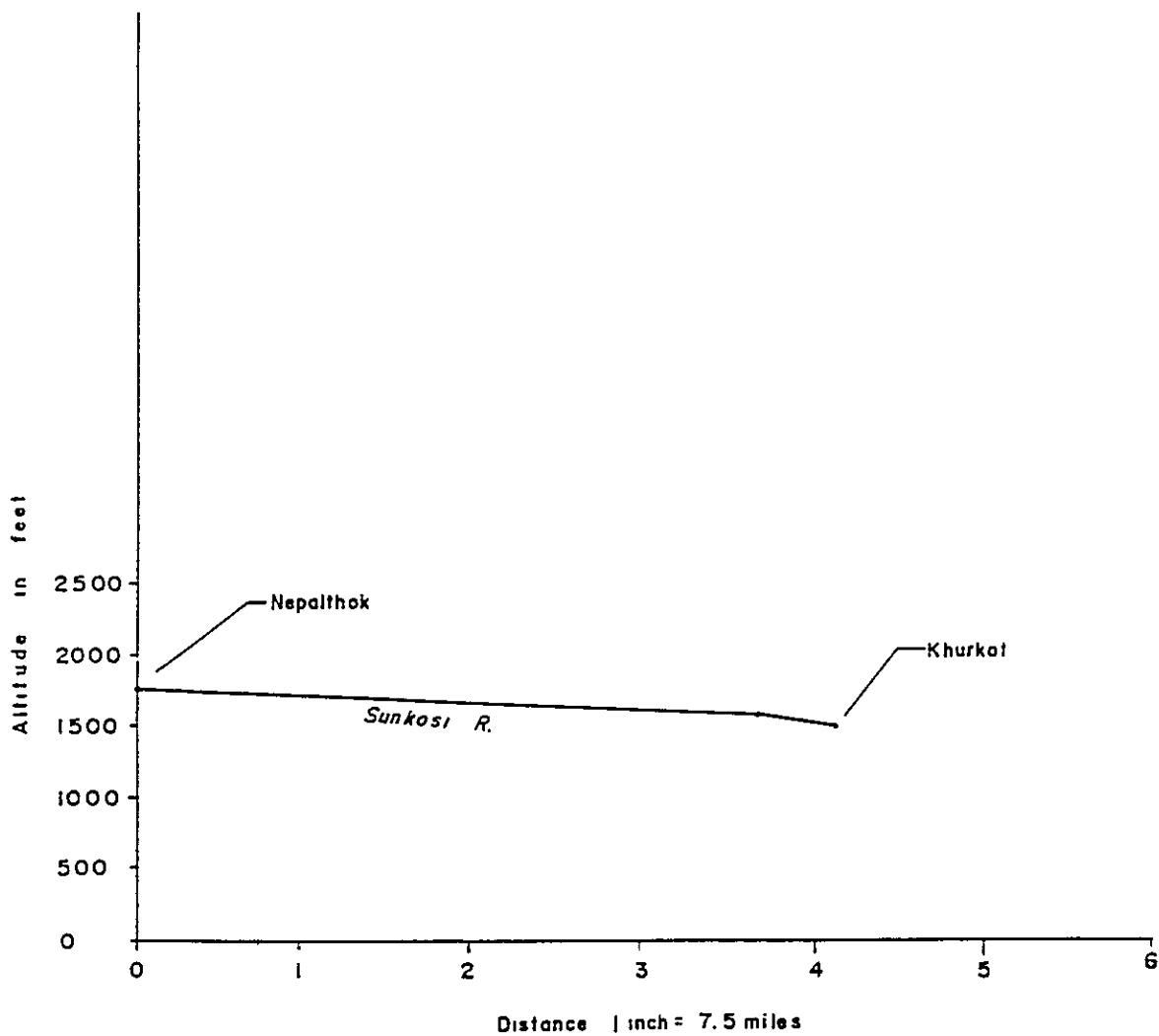


Fig. 5

River Profile of Sunkosi River
(From Nepalthok to Khurkot, Sindhuli)



2.2. POPULATION AND ETHNIC CHARACTERISTICS OF THE PROPOSED AREA:

2.2.1. Population:

As has been indicated above, three districts of the Central Development Region of the country namely Kavrepalanchok, Ramechhap and Sindhuli come within the direct influence area of the proposed road corridor. Nepal is one of the most populous mountain countries in the world. Thus, the hill and mountain regions of the country are highly populated. According to the 1991 Census, the population of the three districts are as follows:

District	Household Number	Total Population	Male	Female
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Kavrepalanchok	56,633	324,329	159,784	164,545
Ramechhap	34,766	188,064	90,718	97,346
Sindhuli	38,535	223,900	111,409	112,491
Total:	<u>129,934</u>	<u>736,293</u>	<u>361,911</u>	<u>374,382</u>

The three districts together represent 4 percent of the country's population of 18,491,097.

2.2.2. Ethnic composition:

In terms of ethnic composition of the three districts, they are as mixed as most of the districts in the country. According to the 1991 Census, there are some 63 different castes and ethnic groups in the country. And to take one of the three districts as an example, the district of Kavrepalanchok has some 60 of them represented in it. Similar is the case with alos Ramechhap and Sindhuli.

However, not all of them are represented in equal proportion. The dominant caste/ethnic groups in the three districts together are the Tamang (197,797), Chhetri (125,206), Hill Brahmin, colloquilly Bahun (113,318), Newar (87,164), Magar (63,056), Kami (22,813), Sarki (16,780), Damai (15,480), Sunuwar (14,516), Majhi (14,235), and Danuwar (14,103). There are still other groups which are represented by a few thousand people and consist of Sanyasi, Rai, and Sherpa in the norther reaches and Thauru in the south.

The ethnic map of Nepal is composed of two broad cultural divisions. First, there are the different Indo-Aryan Hindu caste groups which occupy different ranks in the traditional caste hierarchy which is based on the Varna model of Hinduism.

According to this scheme, in the project area the traditionally priestly caste of Bahun occupy the highest position, followed by the warrior caste of Chhetri, then by Sanyasi (the mendicant turned householder) and then by the castes traditionally considered untouchable namely Kami (blacksmith), Sarki (cobbler) and Damai (tailor and musician). Of these caste groups, the Bahun, Kami, Sarki and Damai still perform their traditional functions and are therefore, spread out all over the country including in the project districts.

The other division is the Tibeto-Burman ethnic groups such as the Tamang, Magar, Newar, Majhi, Danuwar, Sunuwar, etc. Given the ubiquitous nature of Hinduism in the country, these groups too have together been assigned a specific place in the larger Hindu caste hierarchy between the Chhetri and the Untouchables. Despite this, however, each of these ethnic groups have distinct cultural traditions of their own which are often inconsistent with the orthodox Hindu norm and mutually incompatible among themselves. For instance, for a Tamang boy the daughter of his mother's brother or father's sister would be a preferred bride. But it will be an incest for a Magar to marry the latter and for a Newar and a caste Hindu it will be so to marry either way.

In the ethnic mosaic of Nepal many ethnic groups are identified with certain territorial region as being their "homeland". In the case of the project area, Kavrepalanchok district constitutes the core of the Tamang homeland which extends to the rest of the project districts as well as several districts to the west of it. Of the total Tamang population of 1,018,252 in the country, these three districts alone represent almost 20 percent of it.

The same case is true also of the Majhi, Sunuwar and Danuwar. All of them share, to different extents, the three project districts as parts of their homeland too. Thus, the project region, like the rest of the country, is ethnically quite heterogenous.

Furthermore, their inter-ethnic differences are not limited to their social and cultural practices. Due to historical and other socio-political reasons, there are also major differences in terms of their land endowments and access to development resources and benefits. For instance, historically the Bahun and Chhetri groups have been at the centre stage of national politics and therefore, were favoured in the distribution of productive resources primarily the land. Newars too, having been the indigenous inhabitants of the capital valley and given to trade, commerce and industry, have been both economically and politically dominant. In contrast, however, other ethnic groups who mostly inhabited the outlying mountainous or forested terrain have been much less favoured. Similarly, the untouchables too for historical and religious reasons have remained the subjects of extreme social and economic deprivation in the society. These are very significant differences that inhere the ethnic and caste differences in the Nepalese society

even at present.

2.2.3. Ethnic composition of the sample settlements:

As has been mentioned earlier, six settlements in six different Village Development Committee (VDC) areas were selected for in-depth household studie at different points along the proposed road corridor. The selection was made in such a way as to reflect as closely as possible the socio-economic composition of the VDC of which they were a part. Consistent with the ethnic heterogeneity of the project districts, the ethnic distribution of the 300 households (Table 1 in Annex 1) that constituted the sample has also been similarly diverse.

Furthermore, for reasons of inter-ethnic social and economic differences described earlier, the eleven caste and ethnic groups represented in the sample have been lumped together into four different clusters for the purpose of different comparisons and analyses in this study. Each of these clusters, except the Newar, is composed of such ethnic or caste groups which have more or less comparable socio-economic attributes or disabilities in terms of resource endowments and access to development benefits. It is done so on the premise that there is a direct relationship or association between the caste/ethnic background of the households and their economic status. The caste/ethnic composition of the sample population organized into different clusters and the proportion they represent is as follows:

<u>Cluster 1</u>		<u>Cluster 4</u>	
Bahun (Brahmin)	23.0%,	Bhujel	5.7%
Chhetri	5.3%	Majhi	4.0%
		Untouchables	6.9%
<u>Cluster 2</u>		(Kami, Sarki & Damai)	
Newar	34.0%		
<u>Cluster 3</u>			
Tamang	18.7%,		
Gurung	2.0%,		
Magar	1.0%,		

Of the total population of 2,186 in the sample (Table 2 in Annex 1), the dominant population is that of Newar (731) followed by Bahun (542) and by Tamang (413). Other ethnic and caste groups are represented in smaller numbers.

2.2.4. Age composition of the sample population:

Of the total population of 2,186 in the sample households (Table 2 in Annex 1), 16.3% are within the age-group of 0-5 years, 28.0% between the ages of 6 to 15, 49.5% between 15 to 59 years and 6.1% are 60 years and above. Assuming that the population between the age groups of 0 to 15 years (which are technically school-going age) and those of 60 years and above are to be treated as dependent population, then it is to be observed that the dependency ratio of the population is 100 i.e. there is one person dependent for each person of working age.

Besides, since the proportion of the population above 59 years of age is only 6.1%, it further indicates that the sample population has a larger proportion of children below 15 years implying a high fertility rate in the population. It is thus impregnated with a built-in momentum for still higher rates of population growth in the region in the years to come. In other words, even if fertility is to be controlled and brought down to low levels, the population would still continue to increase for several years because of the children already born growing up to be come reproducing males and females. This has to be seen as a major constraining factor for development planning in the proposed corridor region.

2.3. ECONOMIC AND SOCIAL STATUS OF THE PROPOSED AREA:

The proposed road corridor, as stated above, is expected to pass through the heartland of Kavrepalanchok district, bring the Ramechhap district within its range of influence and again pass through the mountainous northern part of Sindhuli districts. The road, therefore, is expected to impact in the transformation of the socio-economic situation of a major mountain region east of the Kathmandu valley.

In this region Kathmandu valley and Sindhulimadi act as two magnetic poles for the socio-economic activities of the region. While almost the whole of Kavrepalanchok district is oriented towards the capital valley for its exports, imports and non-agrarian employment opportunities, most of Sindhuli district is, as expected, drawn towards the district headquarter of Sindhulimadi which is linked by road to the terai towns and India to the south. Ramechhap is divided between the two poles. While Kathmandu remains a major destination for some of its exports like livestock and its outmigrants for employment, the imports to its district headquarter itself are channeled through Sindhulimadi. What follows is a detailed account of the socio-economic situation and the developmental experience of six Village Development Committees along the proposed road corridor of which three belong to Kavrepalanchok, one to Ramechhap and two to the northern mountain region of the Sindhuli district.

2.3.1. Detailed account of some selected communities in the proposed road corridor:

- Khanalthok VDC of Kavrepalanchok District:

This VDC is situated some 17 kms south east of Dhulikhel and has a land area of 31,597 ropani (appx. 1,580 ha.) and a population of 6,124 (1992). It comprises several dispersed settlements of different caste/ethnic groups such as Newar, Bahun, Tamang, Kami, Damai, Sarki, etc. While some of these settlements are exclusively caste-specific such as the Jaisithok of the Jaisi Bahuns or Kamidanda of the Kami caste, most of them are mixed like in many places elsewhere.

Agriculture: The total cultivated area of the VDC is 17,110 ropani (appx. 856 ha.) which comes to some 2.8 ropani (0.14 ha) per capita. The major occupation of the people in the VDC is agriculture and animal husbandry and is supplemented by working for daily wages, service out of the community, trading, etc. The agricultural produce consists of rice, maize, wheat, soyabeans, buckwheat, beans, mustard, potato etc. Vegetables are also grown and consist of green-leafed vegetables, cauliflower, cabbage, radish, garlic, onion, pumpkin, gourd, brinjal, tomato, ginger, turmeric, corraiander and bitter gourd.

In terms of fruits, given the VDC's tropical conditions, they include mango, jackfruit, guava, banana, pomegranate, orange and lemon. Cows, buffalo, goat, pigs and poultry comprise the livestock population in the community.

Non-farm pursuits: In terms of non-farm pursuits, three rice mills are operating here. Some Kamis, consistent with their traditional caste occupation, have obtained loans from the Agricultural Development Bank and fabricate and sell brass and copper jars, pots and pans. Similarly, some Damais too have obtained the loan and bought sewing machines for tailoring clothes for clients. Tamangs and other people weave bamboo baskets, ropes, mats and headstraps. A Magar makes some wooden furniture like chairs. And of course, brewing is more common.

Imports and exports: The VDC imports many things from outside. They consist of rice, lentil, salt, kerosene, soap, sugar, tea, spices, clothes, seeds and fertilizer, construction materials, utensils, and other items of daily needs. Similarly, its exports consist of paddy, maize, soyabean, milk, ghee (clarified butter), castrated and uncastrated goats and fruits. Its main market centres for imports and exports are Banepa and Kathmandu.

There are three small market centres in the VDC. They are Bhakundebesi Bazar in ward No. 7 with some 6 different stores and two teashops, Tallo Hatiya Bazar in Ward 8 (which is part of a larger bazar in a neighboring VDC) and Kakre Bazar with some 10 stores and 4 teashops. During non-monsoon times, there is a regular bus service to the latter two bazars from Banepa and Dhulikhel respectively. There are other still smaller places

with a store or two in the VDC including Dharmasala where there is also a milk collection centre of the Dairy Development Corporation of Kathmandu.

External employment: Seventeen persons are employed in the government offices outside the VDC. One is employed in India. Two Kamis are employed in scisso-making, one drives a 3-wheeler, another has a private job and one is in trading, all in Kathmandu. Two of them regularly go to the border market of Khasa inside Tibet and bring goods for sale worth a thousand rupees or two each time. A few also go to brick kilns in Patan and Bhaktapur in Kathmandu during winter. A number of children from the VDC are also engaged in the carpet industries in Kathmandu.

Development institutions: The VDC hosts a number of development institutions such as the VDC Office, Additional Post Office, a Sub-branch of Agricultural Development Bank, a clinic of the Family Planning Association of Nepal and a Health Sub-post. In addition, more such institutions are situated in its vicinity as the Agricultural Services Centre at a distance of 3 kms, a regular post office 2 kms away, a branch of the Baniya Bank at the same distance, Area Forest Office one-half kms away, and a Health Post 2 kms away.

Development experience:

- Education: Five primary schools are running in the VDC area with a total enrollment of 412 male and 268 female students. In addition there is a Secondary School in the neighboring VDC which is attended also by students from this VDC. Lack of furniture and teaching materials are the main problems in these schools. In addition, adult male and female literacy classes are also occasionally run with the support of the Small Farmer Development Programme. School buildings have been built by the villagers themselves and UNICEF and District Development Committee provided the roofing materials for them.

- Health and sanitation: Nobody including the rich ones use latrines; they all go to open fields, the hideouts in the terraces, gulleys, and river banks. When sick, they use allopathic medicine and also use the services of magic healers. Diarrhoea, worms and asthma are the main health problems here.

- In addition, there is a Small Farmer Development Programme as well as the Forest programme of the Australia-Nepal Forestry Project. Nurseries and community forest have been established in the VDC under the latter programme.

- Drinking water: Five different drinking water projects have been constructed in the VDC over the last few years which are going through different states of operation at present. The one built with UNICEF support between 1982-85 in Wards 3, 4 & 5 with a total of 12 public taps was wrecked by the earthquake of 1988 resulting in the drying up of the water source. Only 3 taps are

still operational, the rest of population have once again gone back to the wells with turbid waters.

The second UNICEF-built drinking water project serves about 100 households in wards 4, 6 & 7 with a total of 14 taps. User Committees were formed and each households paid 2 rupees per month to pay the maintenance worker. But in ward 7 beneficiaries no longer pay the fee, maintenance worker has stopped working, and two taps have ceased to function.

Two more drinking water projects have also been funded by UNICEF. One in ward 2 built in 1990 provides water to 17 households, and another in ward 3 built the same year provide water to 21 households.

Another two more drinking water projects have been built also with the grant assistance of the District Development Committee. One completed in 1994 provides water to some 6 households in ward 5 and another built the same year in ward 1 has 3 taps providing water to 40 households.

- Irrigation: An irrigation project completed in 1994 under the so-called "Sector Project" (World Bank-funded Irrigation Sector Project) irrigate fields in two settlements of the VDC. The channels presently need some maintenance but the User Committee does not seem to be active.

Conclusion:

Despite some advances in the infrastructural front, primarily in drinking water and the establishment of development agencies locally, the village has a long way to go in terms of enhancing their standard of living. Underemployment is widespread and many young men while away their time in the village gambling, gossiping, drinking or otherwise simply doing nothing.

Women are particularly disadvantaged. They are mostly illiterate but carry the main brunt of the problem of managing household and agriculture. While larger number of girls have begun to attend school, they also tend to drop out in much larger proportion for several reasons. They are needed at home to help their mothers. Parents believe that girls in their teens must not be sent long distances from home which would be necessary to attend secondary schools. Since they are to be married away, they further think that it is not necessary to invest in their education. Even younger girls are at a disadvantage, because they have to help in the household tasks before and after school hours.

The poorer children are even worse off. They are generally expected to hire themselves out in the village to earn some money. With the growth of carpet industry in Kathmandu in recent times, many parents have sent them to work in one of the many factories there.

While the farmers have tried to seize what opportunity is available to increase their farm production, the lack of proper technical support has been their principal problem and complaint. Despite the establishment of a number of agriculture-related institutions in the area, they have not been able to benefit from the potential that exists for its growth.

Similarly, management of infrastructures also leaves a lot to be desired. While there are user groups created for this purpose, they have not been properly active. After some time of their creation, they simply wane both in interest and in effectiveness.

- Katunjabesi VDC of Kavrepalanchok District:

This VDC is situated some 20 kms south-east of Dhulikhel and is bifurcated by Rosikhola river. This is a relatively small village with the 1991 population of 1,986. This VDC derives its name from its capital which is a bazar with a number of teashops, 2 lodges, 2 eating places for porters, and a few stores selling goods for household needs such as clothes, medicine, etc.

Ethnicity and economy: The VDC too is a multi-ethnic village with Tamang being the most numerous, followed by Bahun, Chhetri, Newar, Kami, Damai, etc. The main occupation of the people consist primarily of agriculture and animal husbandry, working for wages and service. Agriculture products consist of paddy, maize, wheat, soyabean, potato, beans, peanut, sweet potato, buckwheat, mustard, etc. Vegetables grown include cauliflower, cabbage, green leaf vegetables, garlic, onion, gourd, squash, cucumber, turmeric, chilli etc. Garlic is planted in large quantities and has become a principal export crop accounting for considerable income. Fruits include mango, jackfruit, guava, banana, lemon, orange, and pomegranate. The fruits of a plant called Buddhachittamala are beads used by Buddhists for prayer and are said to have good export market in Japan. Livestock include cattle, buffalo, goat, poultry and pigs, the last kept only by Kami and Damai. Most of the livestock belong to local breed. Only in the case of goats, hybrids are imported from the terai.

Imports and exports: The village imports consist of rice, salt, kerosene, medicine, iron, implements and utensils, construction materials, seed, fertilizer, and other items of daily consumer needs. Exports consist of paddy, corn, wheat, soyabean, beans lentil, buckwheat, goat, lemon, ghee, potato, garlic, and the Buddhachittamala beads. Some vegetables and fruits are also locally sold.

Most exports take place through Kankre Bazar of Khanalthok VDC mentioned above. Only the goats are brought all the way to Banepa and Kathmandu. For the goats and Buddhachittamala, traders from outside come to the villages to buy them from growers to be brought to Banepa and Kathmandu. Imports too come from the local bazars as well as from Banepa and Kathmandu.

Non-farms pursuits: In the VDC, there are no cottage industries other than a few rice mills. In addition, people traditionally manufactured such bamboo products like mats, ropes, headstraps for carrying loads. A few Tamang women have obtained training in carpet weaving in Kathmandu and have even installed looms. But no carpets are woven here.

External employment consist of a large assortment of jobs. A few go to India. Others work in government and private offices in Kathmandu. Still others work in portering and doing dishes in restaurants, painting, roasting and selling groundnuts, running curio and other stores, driving, Tanka painting, contracting in house building, and working in carpet industries. Those who run industries or stores have all their family members living in Kathmandu. Others employed in petty jobs go to Kathmandu for some time leaving their family members back home. A few families have also migrated for good to such destinations as Chandranighapur and Bharatpur in terai and to Kathmandu valley. Most outmigrants have retained some of their land here and are expected to come back after road construction and expansion of opportunities locally.

Education: There are three primary schools and one secondary school in the VDC. Female participation progressively decreases with increase in grade level. For instance, in the secondary school there are 255 male and 211 female students in the primary level (1-5) classes, 49 male and 20 female in lower secondary level (6-8) classes and 76 male and 15 female student at the secondary level (9-10) classes. Teaching materials and physical facilities are limited. For instance, in one of the local primary school there are a total of 170 students crammed into three class rooms and taught by only two teachers. During monsoon spate, students from villages across the bridgeless Rosi Khola river cannot attend school.

The buildings for the secondary school and for one primary school had been constructed with assistance from Canadian School Project. An additional building facility has been recently added to the secondary school for which resources have been generated through donations from local residents as well as the students and teachers singing deusi carol from door to door during Tihar festival collecting donations from the local households in the process.

In the field of health, only limited facilities are available. The recently opened Health Sub-post has limited staff and often remains closed. People do not use latrines. Diarrhoea, asthma, worm and tuberculosis are the four main disease suffered by people. Accidents due to fall from trees or slopes occasionally occur. Pregnancy related problems often result in the death of the expectant mothers. There are two private drug stores in the bazar which provide useful service to the people.

Government services: There are a number of development-related institutions such as the VDC Office, Range Post of the Forest Department, Health Sub-post and Additional Post Office. Other

services potentially relevant for the local villagers are situated at different distances from the VDC. The nearest Agricultural Service Centre is located at Mangaltar some 10 kms away, Veterinary Centre at the district capital of Dhulikhel 20 kms away, Agricultural Development Bank at Khanalthok 5 kms away and a branch of the Commercial Bank 8 kms. away

Development experience:

Forestry: Three forest user groups have been formed under the Nepal Australia Forestry Project covering all the nine wards of the VDC. Each user groups has 13 members including 2 female members. One of the user groups planted 100,000 saplings in 1992/93 of which some 60,000 survived. Three smokeless stoves have also been distributed in the bazar but remains unused.

Drinking water: Several drinking water projects are different stages of construction or operation. In Raghuchaur of the VDC a drinking water project has been completed in July 1994 by UNICEF and has provided 11 taps in ward no 4, and 10 in ward 5 which together provide water to most of the households in the wards. A 13-member user committee has been constituted. Each beneficiary household pays 5 rupees a month as fee which has now accumulated to 12,000 rupees. This sum has been lent to local borrowers at 2% per month rate of interest out of which two maintenance workers have been employed at 200 rupees each per month.

Another drinking water project is also under construction with HMG assistance channeled through the District Development Committee. Thirtyfive households will benefit from the 10 taps to be installed under the project which is slated for completion in December 1995. There is also another small drinking water scheme that provides water to only 6 households in ward 6 undertaken with assistance from the DDC. Similarly, with what little assistance the VDC got from the DDC in the three years between 1984 to 1987, the VDC installed one tap each in the midst of the three wards 7,8 & 9.

But there are also failed water projects in the VDC. In 1982 the VDC installed a drinking water project in ward 3 by using the water source in ward 4. But after about 10 months of successful operation of the project, a dispute arose about the usufruct of the source resulting in the non-functioning of the project. The story was repeated once again in 1994 when ward no 2 installed its drinking water system with DDC assistance by using the source in ward 4. But soon after its completion, dispute arose again, and today the water scheme also remains non-functional.

Irrigation: Two irrigations projects too have been built on the Rosi river. One was built in 1988 under the donor-funded Hill Irrigation Project of the government for a cost of 600,000 rupees and irrigated about 100 ropanis (5 ha) belonging to some 30 households. However, in 1994 it was damaged by flood and landslide and presently, provides less water. There is no formal

user groups as such, but local farmers make adhoc arrangements and repairs for irrigating their fields.

Another irrigation project on the same river was built in 1994 in the VDC with 60% grant assistance from the government and 40% loan of the Agriculture Development Bank at a total cost of 113,000 rupees. However, the same flood and landslide also damaged this irrigation system resulting in the reduction of water supply by 50%.

NGO activities: There is one Women Development Council and a Rosi Youth Club in the area. The women's organization, established in 1994, has a membership of 45 women who pay 20 rupees a month as fee and has also generated more resources by singing Deusi carol during Tihar festival. They have presently a bank deposit of 12,500 rupees. But they seem to be at a loss as to what activities they can undertake for women's development. The youth club itself has been non-functional right from the time when it was registered several years ago.

- Mangaltar VDC of Kavrepalanchok District:

This VDC is situated on the banks of Rosi river some 27 kms from Dhulikhel in the south east. Its settlements range in altitude from 3500 fsl to 6000. Of its total land area some 70% is estimated to be slopes, 25% terraced bari land and the rest is tar (tableland) and khet in the river valley. Some 33% of the VDC area is covered with forest. Of its total 1991 population of 3,533 Tamang represents some 50% of the local population followed by other caste/ethnic groups such as Bahun, Chhetri, Newar, Magar, Kami, Damai, Pahari and Gharti.

There are several institutions in the Mangaltar bazar which include a Post Office, Police Office, Agriculture and Veterinary Service Centre, Health Post, Ayurvedic Dispensary, a High School and 5 primary schools. There are one youth club and a local chapter of the Nepal Red Cross Society. While the literacy rate is estimated to be 32% in the VDC, it is more concentrated in the Mangaltar bazar where mostly Newars live and where it is estimated to be as high as 75%. It is said there are some 170 SLC graduates, 25 IA, 15 BA, 4 MA and 3 Engineers.

Agriculture is the mainstay of the village economy. The agricultural produce of the area consists of groundnut, potato, buckwheat, barley, corn, paddy, wheat, soyabean, sorghum, pea, pine apple, jackfruit, orange, lemon and other citrus fruits. In agricultural exports, paddy, corn and wheat are exported to neighbouring villages. But potato, beans, onion and garlic are exported to the nearest market centre of Kankre mentioned earlier. Although there is much potential for expansion of citrus production, transportation costs have made it too expensive for export. Of different livestock kept by the local people, buffalo and goats are highly valued; the latter and ghee from the former are exported to Kathmandu.

Non-agrarian pursuits are limited. There is one rice mill, 9 water mills, 3 teashops, 3 cloth stores and 21 general merchandise stores. Some people also produce bamboo products like containers and ropes.

Local people are busy only for about 6 months in a year. A large proportion of people do not produce enough to last them for more than half a year. Therefore, outmigration is high. Those with some education are employed in such jobs as in army, police, and in teaching. In addition some 1500 persons are estimated to be working in Kathmandu in odd jobs like carpet making, driving, Thangka painting, brick making, or just portering.

Health situation leaves much to be desired. People do not have latrines and use open field instead. Water supply comes from Rosi river and wells. Diarrhoea, cough and cold, tuberculosis, worms, etc. are the common ailments of the people.

Development projects undertaken in the VDC consist of a Secondary School, a drinking water project with 3 taps in Mangaltar bazar constructed by Indian ex-servicemen from the area, 6 private gohar-gas plants, and a few community forests, and 4 nurseries. An irrigation channel built some four years ago due to leakages at different points. People deny having financial capacity to renovate it.

Other development problems consist of low level of female literacy, lack of programmes addressed to women, lack of transportation facility, insufficient irrigation facilities, shortage of agricultural credit, and lack of improved seed and timely supply of fertilizers. The problems are made worse by the staff absenteeism in the development offices in the area.

Some of the possible development projects in the area would be small hydro-electric project on Rosi river, irrigation scheme, telecommunication, etc. The construction of proposed road is expected to contribute to their realization positively as well as to promote further such developments as poultry and dairy farming, horticulture development and setting up of canning industry, and increase in local employment opportunities.

- Rakathum VDC of Ramechhap District:

Rakathum is the only VDC included in this study from Ramechhap district for detailed investigation. It lies in the south-west end of the district adjoining Sunkosi river and ranges between 3,500 to 7,500 fsl in altitude. Given its terrain, only about 15% of the cultivated land is khet and the rest is bari. About 20% of the VDC land area is estimated to be under forest of which only 40% is community-owned and 60% is private. The 1991 census population of the VDC is 3,102. The Tamangs are the dominant population in the VDC followed by Magars, Newars, Majhi, Chhetri, Kami, Damai and Sarki. The last occupational groups work for their clients on what is locally known as the

Bali or literally "crop" system under which they get fixed payments in food grains following the harvest of different crops.

Agriculture is the mainstay of the village economy. As elsewhere, corn, millet, paddy and sorghum are grown in the area as are soyabean and lintel. More recently, junar has been widely introduced in the village but they have market problems. Goat and ghee constitute the major agricultural exports of the village. Imports consist of basic consumer items such as salt, clothes, spices, kerosene, soap and so on.

Some 50% of local able-bodied people are estimated to go to Kathmandu for at least six months in a year. About half of them are said to be engaged in carpet making, a smaller proportion in Thanka painting, some in brick making and the rest in portering and unskilled jobs. Carpet weavers save about 500 rupees a month. Thanka painters make much more, about 3000 a month. This income is useful to them for bringing the necessary household supplies to the family regularly. There are some 6 stores in the area selling clothes and general merchandise, 2 rice mills and 9 water mills.

There are 3 primary school, six so-called basic level school conducting classes upto grade 3, one Health Post in addition to the VDC office. Literacy level is low and female literacy is much worse. Female children are used for fetching water, collecting firewood and fodder and tending the cattle. When a little grown up, like 13 or 14, they have to be part of the local labour exchange system called Parma. Some 30 students from the VDC have passed SLC, 4 IA, and 1 BA. Diarrhoea is quite frequent. Several people suffer from Tuberculosis. A number of people are also suffering from eye cataract. Health practitioners are mostly absent from the local Health Post. Magic healers continue to provide services to people. Sanitation is minimal in the village. People do not use latrines. Taking the VDC as a whole the state of drinking water projects are also quite bad. They are often not maintained.

The local people, as those elsewhere on the proposed road corridor, are looking forward to its construction. With access to market, they are confident that they can enhance their fruit, vegetable and livestock production and generate more local employment. They even have plans to build link road to their village from the proposed Banepa-Sindhuli road.

- Sitalpati VDC of Sindhuli District:

Sitalpati literally means a "cool resting place on the trail", and the VDC gets its name from just such a place to which one comes after a rocky trail and a brief upclimb east of it. The VDC in the Sunkosi valley is about 10 hours walking distance from the district headquarter of Sindhulimadi. Hills, terraced land and rivers constitute the topography of the VDC. Khet land is minimal. There are 599 households in the VDC with a total

population of 3,299 (male 1,588 and female 1,711) and average household size of 5.5. The Chhetri are the most numerous (47.4%) in the VDC followed by the Magar (28.9%). Other groups comprise Sarki, Bahun, Majhi, Damai, Kami and Newar in numerically descending order. A few Kami, Sarki and Damai households continue to be engaged in their traditional occupations namely blacksmithy, making shoes and tailoring respectively. In the last 12 months, 2 families have moved to the terai and one to Sindhulimadei.

There are 6 primary schools and one lower secondary school in the VDC managed by a committee which includes their teachers. Local people have built buildings for them. While most children go to school, those of Magar, Sarki, Majhi, Kami and Damai do not go to them regularly. The boy girl ratio in school is said to be 100:62. In addition, literacy classes are also run in the VDC by the Small Farmer Development Project and an NGO called Informal Education Service Centre. Five local teachers have been trained for the purpose.

Sick people often go to the hospitals in Sindhulimadi and Manthali, the district headquarter of Ramechhap district. A local NGO called Tamakosi Sewa Samiti has also run a health clinic in the area. People have no latrines; adults use the hideouts in the fields, and children the village trailside. Wards 1,2, and 4 have piped drinking water supply managed by their user groups. Residents of several wards have to trek long distances to fetch their drinking water.

Agriculture is the mainstay of the local economy. Crops grown are maize, millet, wheat, potato, paddy and different kinds of lintels. Fruits like orange, junar, lemon and lime are also grown. People use both chemical and compost fertilizers. Locally available improved seeds are used for paddy, corn, wheat etc.

Many people supplement their agricultural income by carrying loads of merchandise from Sindhulimadi to different market centres in the valley such as Ratmate. They also work as waged agricultural labourers in the village. Some 180 persons are working outside the village including some 50 of them in India. Of them Sarkis go to Kathmandu to work in loading and unloading trucks and Majhi and Gharti to work in brick and tile and carpet factories.

The VDC has two shopping centres, one in Khalte and other in Ghumaune Chainpur with a few shops in each. For major sales and purchases people go to Sindhulimadi. Other major market centres for the people in the district are Ratmate and Jhangajholi which in turn receive their supplies on river rafts over Sunkosi river from Barabise on the Kathmandu-Tibet highway.

Development institutions in the village are Small Farmer Development Project (SFDO) office, an Additional Post Office, and a Health Post. The SFDP covers all the wards of the VDC and has formed 23 small farmer groups including 3 female groups. Each group consists of some 5 - 10 members. Altogether there are

144 such members including 20 women members:

Other development projects in the community include 2 drinking water project supported by the DDC. User groups manage the projects with monthly user fee charged from the beneficiaries. Three irrigation projects constructed with DDC support have also been functioning. There is also a forest user group which, with the assistance of the District Forest Office, is engaged in plantation and protection works including awareness dissemination. One nursery is also operational in the VDC.

Despite these projects, the overall picture of the VDC is not encouraging. Land fertility is low. Irrigation facilities are minimal. Deforestation is widespread. Landslides and erosions are frequent. Female illiteracy is high. Off-farm employment is limited. Livestock productivity is low. And drinking water and sanitation facilities continue to be limited. Potentialities for growth and development include farmer responsiveness to innovations, increased irrigation potential and possibility for expansion for horticulture,

- Jalkannya VDC of Sindhuli District:

This VDC is situated north-west of Sindhulimadi at a distance of about 5 hours' walk on the main trail to the district capital. Batonigale settlement of this VDC is well-known for its junar and orange production. Its topography constitutes a part of Mahabharat mountain range and includes terraced agricultural fields. The VDC has 327 households, a population of 1,958 and an average household size of 6. Its ethnic composition is mixed. The Chhetri are the most numerous (34.9%), followed by Bahun (28.9%), Newar (13.2%), and the rest represented in small proportions by Bhote, Hau, Damai, Kami, Sarki and others. The few official institutions in the VDC are the Health Post, Additional Post Office, a Police Post and a branch of the Nepal Red Cross Society in addition to the office of the VDC itself.

There are a total of 5 primary schools and one lower secondary school in the VDC. Most schools have their own buildings constructed by the local people. One primary school and the lower secondary school buildings are being renovated under the Earthquake Rehabilitation Project funded by the World Bank. Girls too attend school, although in lesser numbers than boys. However, groups like Hau, Bhote, Magar, Sarki, Kami and Damai do not send children to school regularly. Piped drinking water is available in all the wards in the VDC, although some of them need rehabilitation due to the damage done by earthquake of 1988. Latrines are infrequent in the village.

Like elsewhere, women's role is confined to such domestic chores as fetching water, collecting fodder and firewood, working in the fields, preparing meals and looking after children, etc. The VDC has no female member.

Agriculture is the main occupation of the people and consists of

cereal production, livestock raising and vegetable and fruit growing. Cereal crops consist of maize, paddy, millet and wheat. Cattle, goats and chicken form the main livestock population. Departing from the tradition, the Bahuns too have started to raise chicken once considered unclean. Banana, lime, lemon, orange and junar are important horticultural crops of the area and constitute one of the principal sources of cash income. The occupational caste people continue to perform their traditional work: Kami blacksmithing and Damais tailoring. But the traditional cobblers, Sarki, have since moved to more lucrative occupations such as masonry and carpentry.

Many people also leave the village on seasonal and long-term basis in search of employment in and outside the country. Some 90 persons are estimated to be working in Delhi, Calcutta and Bombay and 25 inside Nepal. Many people also work for wages in the village or portering between Sindhulimadi and local market centres ferrying merchandise for traders. There are a total of five stores in the VDC selling different things. The village produces surplus food grains which are exported to neighboring villages as well as to those in Ramechhap. Orange and junar find market on the main trail locally as well as in Sindhulimadi. Most people buy their supplies of daily need in Sindhulimadi which consist of clothes, soap, cigarette, shoes, tea, sugar, salt, spices, kerosene, etc.

Drinking water schemes and school buildings constitute the main development projects of the VDC. Landslides occur in the area often damaging their local projects such as the drinking water projects. But people are at a loss in terms of its remedy. People do apply chemical fertilizer and pesticides on their crops including the use of locally multiplied improved seeds for paddy, corn and wheat.

As can be expected forest depletion, soil erosion and landslides are major problems in the area. Other problems concern limited fertility of land, lack of irrigation facilities, high illiteracy of women, low productivity of livestock, and limited opportunities for off-farm employment. However, the potential is there. Farmers are receptive to innovative inputs and practices. Farming can be intensified in irrigated fields. Irrigation facilities can be enhanced. Horticulture can be further developed. Quality of livestock can be increased. Some kind of tourism is seen as a possibility around the then fortress of Sindhuligadi where the invading contingent of the East India Company under Captain Kinloch's command was defeated by the Gorkha soldiers in 1768.

2.3.2. Important socio-economic characteristics of the proposed road corridor area based on the household studies of sample settlements in the selected VDCs:

This section is based primarily on the data generated through the indepth household study conducted in the selected sample communities in the VDCs described under 3.1 above. As has been

stated earlier, the study has been based on a total sample of 300 households which have been selected at the rate of one cluster of 50 households in each of the six VDCs. For the purpose of easy identification, each of the sample clusters have been identified by the name of the VDC to which they belong.

- Economic status and stratification of sample households:

In the Nepali rural context it is very difficult to identify a commonly acceptable and reliable criteria to arrive at a valid and proper identification of the economic status of a given agricultural household. Although land constitutes the mainstay of the household economy, there are many variables to it namely, the size of cultivated land, its quality in terms of khet (irrigated paddy land) and bari or pakho (unirrigated upland), grade of khet land (traditionally awal i.e. top quality with very high fertility, doyam or medium, seem i.e. swampy land or third grade, and chahar or very poor quality), quality and quantity of labour and other inputs. the number of members in the household, etc. The extent of food scarcity in a given household has been the commonly acceptable criterion for determining the economic status of the households in the rural context in Nepal. Even when a poor man makes money from non-farm sources like going into foreign army etc. it is soon reflected in the size of his agricultural holding, because he would invariably invest his savings in land. It is more secure and lends prestige in the community.

For the purpose of this study, therefore, the extent of food security has been taken as the criterion for determining the economic standing of the sample households. It is more manageable and reliable at the same time.

In the study the respondents were asked if their agricultural produce were sufficient for their year-round food needs. If it were not, they were asked to give the number of months for which there would be food scarcity in the household. Based on the responses the households were then categorized as follows:

- Marginal i.e. a food scarcity lasting 7 months or more in a year,
- Small i.e. a food scarcity lasting 4-6 months in a year,
- Medium i.e. a food scarcity lasting 1-3 months in a year, and
- Large i.e. no food scarcity at all.

According to this scheme of assessment the 300 sample households fall into the following categories (Table 4 in Annex 1):

- Marginal households - 51 or 17%

- Small households - 69 or 23%
- Medium households - 41 or 13.7% and
- Large households - 139 or 46.3%.

The classification of the sample households show that more than 50 percent of them do not produce enough for their year round food needs and therefore, have to supplement their agricultural production through other sources of income and acquisition of food grains.

- Caste/ethnic vis-a-vis economic status of the sample households:

When we review the food scarcity categories in the context of caste/ethnic background of the households (Table 5, Annex 1), a clear association is discernible. Of the total Marginal households of 51, only 2.0% belong to Cluster 1 and 25.5% to Cluster 2, whereas cluster 3 is 45.1% and Cluster 4 27.5%. Similarly, among the total Small households of 69, clusters 1 and 3 represent only 20.0% and 7.8% respectively, whereas clusters 3 and 4 represent 33.8% and 45.8% respectively.

However, the pattern changes when Medium and Large households are concerned. In the Medium category, there are a total of 41 households of which 22.0% and 41.5% belong to Clusters 1 and 2 respectively, and Clusters 3 and 4 represent only 19.6% and 17.1% respectively. Similarly, of the 139 households in the Large category, 41.7% and 46.0% belong to Clusters 1 and 2, but Clusters 3 and 4 represent only 8.6% and 3.6% respectively.

The same relationship is borne out when we look at the distribution of households of specific clusters between different economic status categories. For instance, of the total households of 85 in Cluster 1, only 2.0% are Marginal and 24.6% are Small. 22.0% and 41.7% belong to Medium and Large categories respectively. In contrast, of the 48 households in Cluster 4, only 3.6% and 17.1% are Large and Medium categories, and 27.5% and 31.9% belong to Marginal and Small categories. Therefore, it can be observed that in most of the cases there exists a direct relationship between the caste/ethnic background of the households on the one hand and its economic standing on the other.

Furthermore, it can also be safely assumed that the same case is largely true of other localities in the proposed project districts. Thus, the problem of poverty in the proposed road corridor area has structural dimensions. It is not randomly distributed in the population. Instead, it consistently follows the caste/ethnic status of the individual households within the framework of a historically defined inter-ethnic relationship. This fact is quite essential to be borne in mind when designing interventions for poverty alleviation in the proposed project

area.

- Occupational background:

Table 6 (Annex 1) shows that the main occupation of the people aged 10 years and above in the sample population is agriculture. However, it ranges between 70.9% in Jalkanya and 42.2% in Mangaltar. Besides, the data also show that a large proportion of the population have reported to being a student. The responses are consistent across all the VDCs in the sample and range between 12.4% in Sitalpati to 26.7% in Katunjebesi. The third important occupation is reported to be "service" whose proportion ranges between 4.8% in Rakathum and 9.5% in Sitalpati. Most of that service is performed outside of the village and results from the compulsion of having to supplement their agricultural income by earning from other sources. Other occupations reported are Industry, Trade, Wages, Contract and Household Work all of which report only a very small proportion.

- Secondary occupations:

Respondents were also asked about their secondary occupations. While not all the respondents had a secondary occupation, those who responded in the affirmative (Table 7) reported Agriculture and Wages to be the two most important of them.

The two Tables 6 and 7 together show that the proportion of people dependent upon agriculture as the main occupation has substantially decreased (range 42.2% in Mangaltar to 70.9% in Jalkanya). A relatively high proportion of population in the households is in school, and dependency on non-agrarian sources of income is on the increase.

- Cultivated land:

The average size of cultivated land in the sample households in the six VDCs is given in Table 8 in Annex 1. The Table records the average size of owner-cultivated land, and of land rented in and land rented out including total land cultivated in the sample households. According to it, the average size of owner cultivated land ranges from 10.44 ropani in Jalkanya in Sindhuli to 22.27 in Rakathum in Ramechhap. The average size of owner-cultivated land is 15.85 ropani (1 ha = Appx. 20 ropani) and that of total land cultivated 16.18 ropani. There is, thus, very little land that is being rented in (average size 0.33 ropani) or rented out (average size 0.12 ropani) in the sample population.

- Khet (paddy land) and Bari (upland):

Given the mountainous topography of the proposed corridor area,

most of land owned by the households in the area are upland which is locally known as bari or pakho. As shown in Table 9 in the Annex, the average size of irrigated and unirrigated khet owned by the households is 2.84 ropani and 1.20 ropani respectively. The proportion of bari predominates and the average size of bari owned is 11.81 ropani on average. Given the fact that the average size of households in the sample population is 7 persons per household, the average size of land owned by average household (15.85 ropani) adds up to only a little over 2 ropani per capita. The percapita land endowment in the area, therefore, is quite meagre i.e. 0.11 ha which is much lower than the national average of 0.24 ha.

- Distribution of cultivated land:

While the availability of cultivated land in the sample households is quite limited as discussed above, the problem is made worse by its skewed distribution. Table 10 in Annex 1 shows that the average size of land owned by Marginal households is only 9.10 ropani or 0.5 ha, that of the Small households is 10.34 ropani or 0.52 ha, Medium households 15.40 ropani or 0.8 ha and that of the Large households is 21.90 ropani or 1.1 ha. For the Marginal and Small households, the cultivated land is indeed quite scarce in the area and less than half of the size owned by the Large households.

- Area under different cereal and potato crops:

Paddy, wheat, maize, millet and potato are the major crops grown by the farmers in the region as elsewhere in the country, basically because of the subsistence nature of farming in the country. Table No. 11 (Annex 1) gives the average area (in ropani) under those crops including whether they are under improved or local seeds. The Table shows that the overwhelming majority of land is cultivated with local seed. For instance, in Jalkanya VDC sample households, 4.75 ropani of land per household are under local seed whereas the extent under improved seed is only 0.16 ropani per household. The same case is true across the board in all the crops mentioned above. However, it must be mentioned that the questions did not probe into whether a certain seed was really a local seed or improved. Instead, the questions were framed to have the respondents give their impression as to whether the seeds they have been using were, in their opinion, "local" or 'improved'.

The area under different crops show that there is more area under maize than under paddy which only point to the fact that bari land which does not grow paddy predominates.

- Use of modern inputs in agriculture:

Table 12 gives the number of households in different sample settlements using one or more modern inputs in farming. It shows

that the data there corroborates the ones given above in terms of application of improved seed versus local seed under different crops. The Table shows that a very small proportion of farmers use improved seeds in farming other than in Sitalpati where the proportion of farmers using improved seed is as high as 28%. But the proportion of farmers using chemical fertilizer in combination with compost is greater than that of improved seed users. The two categories together add up to 84.8%.

In the case of use of pesticides for crop protection the proportion of users is limited. Only in Khanalthok and Katunjebesi of Kavrepalanchok district, the users of pesticides seem to be significant. The use of modern implements such as sprayers, pumping sets, threshers and improved plough too is minimal.

- Crop yield:

Table 13 gives the average rate of yield of different crops grown by the people. The respondents were asked to respond in the measurer with which they have traditionally been familiar namely pathi per ropani. The conversion rate of a pathi of different crops are as follows:

paddy/pathi = 2.44 kg	Millet/pathi = 3.63 kg
Wheat/pathi = 3.16 kg	Potato/pathi = 3.4 kg
Maize/pathi = 3.16 kg	

According to the Table, there is immense variation in productivity between different places in the sample. For instance the productivity of paddy is lowest (110kg/ropani or 2.2mt/ha) in Jalkanya and highest (340.4kg/ropani or 6.8mt/ha) in Khanalthok.

Similarly, in wheat again it is lowest in Jalkanya (42.0kg/ropani or 0.8mt/ha) and highest in Khanalthok where it is 114.8kg/ropani or 2.3mt/ha.

In maize, the lowest productivity is in Sitalpati with 54.6kg/ropani or 1.1mt/ha and it is again in Khanalthok where it is highest 207.3kg/ropani or 4.1mt/ha. Similarly, in millet the lowest productivity is in Mangaltar with 22.1kg/ropani or 0.4mt/ha whereas it is highest in Khanalthok with 87.7kg/ropani or 1.7mt/ha. In potato too, the variation is similarly wide. It is lowest in Mangaltar with 61.5kg/ropani or 1.2mt/ha whereas in Khanalthok it is highest with 311.2kg/ropani or 6.2mt/ha.

Compared to national yield rate the productivity in the sample villages seems to be much higher in several cases as can be seen in the next page.

Yield rate comparisions

<u>Crops</u>	<u>S a m p l e</u> <u>lowest</u>	<u>highest</u>	<u>National</u> <u>average (1992/93)</u>
Paddy	2.2 mt	6.8 mt	2.0 mt
Wheat	0.8 "	2.3 "	1.2 "
Maize	1.1 "	4.1 "	1.7 "
Millet	0.4 "	1.7 "	1.2 "
Potato	1.2 "	6.2 "	8.4 "

The above Table shows that in many cases the local yield rate exceeds the national average. It is much more pronounced in the case of Khanalthok whose yield rate excell the national yield rate by wide margins in paddy, wheat and maize, and by relatively smaller margin in millet. Only in the case of potato is the national yield rate higher than the highest in the sample villages.

One possible explanation for the higher yield rate in Khanalthok could be that hundred percent of the 36 responding households apply (Table 11) both chemical and compost fertilizer in their farm. Similarly, their application of pesticides is also quite high. Thus, with greater access to export markets and ease of import of modern inputs, the environment for increased production is obviously much more conducive than in other places not similarly endowed.

- Livestock ownership:

The local people keep several kinds of large and small livestock consisting of cow, bullock, buffalo, sheep, goat, pig, and rabbits including chickens. While the number of such animals varied between sample villages (Table 14), the per household average of such animals across the sample consists of 1.08 cows, 1.19 bullocks, 0.22 he-buffaloes, 1.28 she-buffaloes, 0.06 sheep, 3.78 goats, 0.16 pigs, 0.14 rabbits and 7.99 chicken. It is to be noted that five kinds of animals have special value in village economy namely cows for milk, manure and off-spring, bullocks for traction purpose, she-buffaloes for milk and manure and meat, and goats and chicken for meat. Therefore, they are often an important source of cash income in the village economy. The households in the sample own those animals in larger numbers than the other kinds.

The ownership of the number of livestock varied also according to the economic status of the households (Table 15). The Large households, on the average, owned 3 times as many cows, 2 times

as many bullocks, 2 times as many goats and sheep, and 3 times as many chicken than the Marginal households in the sample.

- Fruit trees:

Given the great diversity in the geophysical composition of the proposed area, several kinds of fruits are grown in the sample settlements. They are orange, lemon, junar, guava, pear, banana, jack-fruit, pineapple and more tropical fruits like mango and lichi. Table 16 in the Annex gives the average number of those fruit plants per household in the sample settlements. The Table shows that the distribution of different kinds of fruit trees varies depending upon the geophysical condition of the settlement. For instance, the sample village in Jalkanya in Sindhuli district is more mountainous and therefore, lays greater emphasis on different kinds of citrus like orange and junar which is not so pronounced when it comes to more tropical places like Mangaltar, Katunjebesi or Khanalthok in Kavrepalanchok district. In the latter places, the emphasis is more on other fruits like guava, lemon, pears, pineapple, banana, etc.

Like in other aspects, there is also inter-household difference in the ownership of the number of fruit trees (Table 17). According to the Table, with the increase in the economic status of the households, the number of fruit trees owned by them also increased. For instance, whereas the Marginal households own 26.88 plants on the average, the corresponding number for the Large households are twice that number i.e. 53.40.

- Non-farm products:

According to Table 18 (Annex 1) there are very few households that engage in non-farm productions in the villages. There are only 4 such households in the Rakathum sample, 8 in Mangaltar. and 3 each in Katunjebesi and Khanalthok. Their products consist of honey making, bamboo products, iron implements, and brewing. It thus shows that cottage industries do not constitute a major source of income and subsistence for the local households.

- Migration:

Seasonal and longer term migration has emerged as one of the major sources of supplemental income for the villagers in the sample. Table 19 (Annex 1) show that a large number of people go out of the district some of whom end up in India or beyond. Most of the people go for what is called service or in search of service and for working for wages. In the last one year, the number of people who left their village from each of the settlements in the sample ranged between 29 (Jalkanya) to 52 in Rakathum. "Wage labour" and "search for jobs" which in most cases will be working for wages constitute the largest proportion of the people leaving the villages. Trade, commerce,

etc. represent a very small proportion. The situation is therefore, one of desperation and the people have to leave the village to find something to do in order to make some cash income to supplement their meagre agricultural incomes in their own homes back in the village.

- Cash income:

As seen in Table No. 20 (Annex 1) there are several sources of cash income for the villages in the proposed road corridor area. They consist of sale of food grains, vegetables, fruits, and livestock and livestock products, trade, commerce and contract, wages and salaries, and remittances from abroad. Of these sources, as shown by the Table, sale of food grains, wages, salaries, and trade and commerce are the important ones in the local household economy.

Table 21 further shows that cash incomes are much bigger in magnitude (20,836 rupees) for marginal households whereas they get smaller in size for medium and small households. But large households have the highest cash income (22,246 rupees) which is understandable given their capacity to invest in lending and trade.

- Credit:

Indebtedness to institutional sources as well as local money lenders is quite high in the sample communities (Tables 22 and 23 in Annex 1). Table 20 gives the level and sources of indebtedness for each of the sample villages separately. It shows that local people have access to institutional sources such as the Agriculture Development Bank, Small Farmer Development Project and other commercial banks for several kinds of their credit requirements such as for agriculture, livestock rearing, and purchase of land and houses. But it still is the money lender to whom there is more widespread recourse for their credit needs including for marriages and other social purposes for which no institutional loans are available.

Table 23 gives the cumulative picture of borrowing from different sources in the sample villages which is quite extensive. For instance, out of the total 300 households in the sample, there are 90 borrowers who have borrowed from the Agriculture Development Bank alone. But there are even more people in the sample who borrowed from the money lenders.

The per borrower size of loan from different sources (Table 24 in Annex 1) is also relatively big. It ranges between 7,970 rupees from commercial banks to 11,991 rupees from the Agriculture Development Bank.

Table 25 further shows that large farmers can borrow from government institutional sources in larger numbers and in bigger sums compared to their small and marginal counterparts. The only deviation is in the case of 2 marginal households which

succeeded in borrowing larger sums from commercial bank.

- Literacy, educational attainment and school enrollment:

Literacy in this region is higher than the national average (Table 26 in Annex 1). Nationally, the male literacy stands at 54.1% (1991) and female literacy at 24.7% together accounting for 39.3% in the population of 6 years of age and above. But in this region the corresponding figure for male literacy is 77% and that of female 39% together accounting for 57%.

In terms of caste/ethnic "Clusters" (Table 27) the lowest cluster comprising Bhujel, Majhi and the Untouchables represent only 40% which is still slightly higher than the national average.

In terms of economic status (Table 28), the difference in literacy status between the three economic status groups of Marginal, Small and Medium is not perceptible. Only the members of Large status group have outdistanced the rest of them with a literacy rate of 64%, male literacy 84% and female 45%.

Similarly, in terms of educational attainment, however, the region's performance does not seem to be distinctive. In all of the sample villages (Tables 29, 30 & 31 in Annex 1) in a population of 1480 of 11 years of age and above, only 18.0% have completed primary education, 9.7% secondary, 4.7% SLC, 1.8% Intermediate and 1.4% BA and above. In terms of caste /ethnic groups, only the Bahun/Chhetri group have relatively higher attainment. In terms of economic status too, the inter-group distinction is not prominent. All these go to show that while literacy is becoming relatively quite widespread, the priority for higher educational attainments is still not there. It is, however, particularly heartening to note that female literacy rate is higher than national average which makes it easy for development communication with the women in the communities.

Regarding the level of school enrollment in the two age groups of 6 - 10 and 11-15 (Table 32 in Annex 1) it is systematically very low in both the age groups. The economic status of the households seems to have some effect in it. For instance, in the All VDC section of the Table, only 22% of children of 6-10 age group and 7% of those in 11-15 in the households belonging to the Marginal category are enrolled in school. But their corresponding proportions for the Large households are 44% and 20% respectively. But the effect of the economic status on school enrollment, however, is not that conclusive. On the one hand the proportions of such enrollment for the 6-10 age group under the Small category is much higher at 63%. And the enrollment proportion in the age group of 11-15 under Medium category is the lowest of all at 6%.

In terms of Caste/Ethnic categories too (Table 33), the status of school-going behaviour is not mutually too different, except for the category of Bahun/Chhetri who have 59% enrollment for

both males and females in 6-10 age group and 32% and 27% respectively for the 11-15 category. However, all these proportions taken together do point to an important lacuna in the educational picture of the region in that the level of school enrollment of the children of school going age continue to be quite low.

- Access to drinking water:

In the sample villages piped drinking water systems provide water to some 45.7% of the people, and 32.3% of the people get their water supply from the rivers nearby (Table 34 in Annex 1). Public wells/springs provide water to 19.3% of the people. Public stone taps installed at spring sources also provide it to 2.3% of the people. The point to note is that, except in the Sitalpati VDC of Sindhuli district, in the rest five sample villages different proportions of people have access to piped drinking water supply. These proportions range from 18% in Jalkanya to 94% in Rakathum.

- Access to health facilities:

In this connection the respondents were asked if they had any sickness in the family during the last 12 months and how they were treated. Different number of households in different sample villages responded to it (Table 35 in Annex 1). According to them, substantial proportions of people visited either hospital or health posts 26.4% and 37.0% respectively), although the local Dhami or Jhakri (magic healers) provided such aid to 14.4% also. Some 10% of the people acquired the services of private practitioners who in most cases would be the pharmacist in a local bazaar.

- Sanitation:

Regarding sanitation people were asked if they used a safe latrine. To this, a overwhelming majority of respondents, 86.3%, said they used open fields for the purpose (Table 36 in Annex 1). Only a very small proportion (12.7%) used pit latrines and 1% well built latrines.

2.4. IMPLICATIONS OF THE SPECIFIC ISSUE STUDIES FOR THE IDENTIFICATION OF DEVELOPMENT NEEDS OF THE PROPOSED AREA:

2.4.1. Environment and Forest Conservation Issues:

The proposed road corridor area is a fragile mountain area encompassing Mahabharat range. An assessment of the landuse of the watershed areas of the Sunkosi and Rosikhola valley adjoining the proposed road corridor area shows that the forest cover is only 37% including 10% crown cover, 28% agricultural land including 7% non-cultivated inclusions, 12% grasslands and 18% other lands. Although the forest area in the region has been

reported to have increased between 1972 to 1990, there are plenty of degraded areas in the watersheds. All accessible forests have been overused at present. And the steep topography, broken terrain, fragile geology and monsooning climate make the area vulnerable to environmental degradation.

Furthermore, it is established that 1 ha of cultivated land requires 1.3 ha of forest for fodder and bedding materials. Besides, 75% of energy requirement is met by fuelwood nationally in the country. In the case of the proposed where there are limited access to commercial energy sources, this proportion is bound to be much more. Population increase, uncontrolled use of natural resources, unscientific agricultural activities on fragile mountain slopes and lack of environmental consideration have been the principal factors contributing to the accelerated degradation of environment in the area. Therefore, in order to ensure the sustainable existence and development of the local communities in the proposed area, the balance between humans, livestock, cultivated land and forest has to be carefully maintained and nurtured.

2.4.2. Poverty Alleviation Issues:

Poverty in Nepal which is variously estimated between 49% (National Planning Commission) to 70% (World Bank) is mostly a rural phenomenon. Rural poverty, however, is not an accidental phenomenon nor a function of the apparent difficulties of topography and remoteness. Several factors have militated against the well-being of the rural population in Nepal. Firstly, there are policy distortions at the macro level which manifest themselves in such decisions as subsidizing the goods and services in favour of the limited urban population of the country. Similarly, industries and large-scale agricultural producers are given different kinds of fiscal concessions which adversely affects the poor rural populace of the country. Poverty-related programmes are consistently underfunded. Investment in education is low and poor children cannot receive proper education.

Secondly, there are such problems as the mounting population pressure on limited agricultural land. For the land-hungry poor, more children, primarily male, and the wages they can earn in later years hedges against possible starvation and act as old age security. But this also ends up increasing pressure on land. Thus the poor are generally caught in an increasingly downward spiral of degradation.

Thirdly, the poor mostly suffer from food deficit condition, often chronic. This adversely impacts on their nutritional and health status which again contribute to their downward spiral mentioned above.

Fourthly, environmental degradation takes its own toll on the poor. Because of increasing population and animal pressure on the land and forest, the poor are adversely affected. It is said

that in Nepal 53% of all natural catastrophes result from human activities.

Fifthly, the widespread rural poverty notwithstanding, the existing government and other institutions are not responsive to the needs of the poor. Rural credit which is considered an instrument of poverty alleviation has not been properly accessible to the poor in the villages. While institutional credit represents only 35% of total credit in the country, the poor has been almost systematically left out of access to this limited resource. Issues such as these have to be addressed both at the macro and micro level, before there can be sustainable turn around in the increasingly acute poverty scenario of the country. It is this challenge that has to be borne in mind before designing a rural development and poverty alleviation strategy for the inhabitants of the proposed road corridor between Banepa and Sindhuli.

2.4.3. Issues regarding Women in Development:

Low participation of women in development is also a structural problem. They too are steeped into a tradition that continuously discourages their possible role outside of home. Their involvement in agriculture compared to that of men, to take one example, is simply overwhelming. According to 1991 Census, of the total "economically active" population 7.3 million, 59.6% are reported to be male and only 40.4% female. But when it comes to their relative involvement in agriculture, it is only 74.9% of the "economically active" male population but 91.0% of female. The females are thus almost exclusively tied down to home and field.

The disparity becomes even more starker when we take the 10-14 age-group into consideration. Of the total "economically active" population of 531,835 in this age bracket, the proportion of males is only 41.2% and that of females 58.8%. It is a complete reversal of the total relative proportion given above and only goes to show that a disproportionate number of females are already out of schools engaged in the toil to earn bread compared to their more fortunate male counterparts.

In the succeeding age group of 15-24, "economically active" men (1,015,668) do outnumber the number of similar women (911,364). But here again, it is 90.7% of women engaged in agriculture whereas the relative proportion of men is only 74.4%. The same relationship is borne out in the case of the three road corridor districts too which is seen in the Table in the following page.

Proportion of Economically Active and of those Engaged in Agriculture

District	Economically Active			Engaged in Agriculture		
	Total	Male	Female	Total	Male	Female
<u>Sindhuli</u>	93,935	55,211	38,724	83,276	47,387	35,889
(%)	(100)	(58.8)	(41.2)	(100)	(56.9)	(43.1)
10-14	9,675	3,834	5,841	8,825	3,402	5,423
(%)	(100)	(39.6)	(60.4)	(100)	(38.5)	(61.5)
<u>Ramechhap</u>	93,711	45,584	48,127	79,972	36,867	43,105
(%)	(100)	(48.6)	(51.4)	(100)	(46.1)	(54.0)
10-14	6,752	2,071	4,681	6,560	1,983	4,577
(%)	(100)	(30.7)	(69.3)	(100)	(30.2)	(69.8)
<u>Kavre'chok</u>	148,706	77,418	71,288	132,780	64,429	68,351
(%)	(100)	(52.1)	(47.9)	(100)	(48.5)	(51.5)
10-14	11,276	3,723	7,553	10,824	3,466	7,358
(%)	(100)	(33.0)	(67.0)	(100)	(32.0)	(68.0)

In the above computation it can be seen that in the total "economically active" population, except in Ramechhap men outnumber female. But in the population "engaged in agriculture" females outnumber males except in Sindhuli where males lead the females. However, when it comes to the 10-14 age group, it is the females who outnumber the males by a wide margin both in the proportion of "economically active" as well as in the proportion "engaged in agriculture". Therefore, the deprivation of females in general and of those in the 10-14 age group is quite evident.

In addition to the stark inequality in access to education, there are several other disabilities that characterize the role of women in society. There are severe sanctions enjoined upon them against their participation in community and public life. And it is even more severe when it comes to more orthodox groups like Bahun and Chhetri. The outside world of politics, government and market contacts are totally monopolized by men. Legally, women cannot inherit paternal property except under certain unusual conditions, and once married, they are almost totally dependent upon the husband for their sustenance and support. In their own right they do not own productive resources like the land.

Although some rhetoric is there in favour of women, most of the stated and implied policies of the government is not gender neutral. Knowingly or unknowingly, they favour men and provide them the access to resources represented by them. There are some women-specific programmes like the Production Credit for Rural Women (PCRW), the female component of the Small Farmer Development Programme (SFDP), etc. But the contents of their

interventions as well as their outreach and coverage are so very limited that they are anything but significant interventions when seen in the context of the colossal magnitude of the deprivation of women in the country. The full potential of women in development still remains to be mobilized in the country.

2.5. IDENTIFICATION OF DEVELOPMENT NEEDS OF THE PROPOSED ROAD CORRIDOR AREA:

The preceding sections have analyzed the development problems of the proposed road corridor area at different levels of analysis namely specific issues at macro level, VDC level development performance and problems and the detailed assessment of socio-economic attributes and problems at the household level. Based on their findings the following can be identified as development needs for the proposed area.

2.5.1. THE OBVIOUS PROBLEMS OF RURAL DEVELOPMENT IN THE AREA:

Like many other hill areas in the country this proposed corridor area is also lent similar attributes some of which are as follows:

- Poor resource base:

Agricultural land base is very small. In the case of the sample villages, the per capita land availability of 0.11 ha is marginally smaller than the already low national average of 0.14 ha. This would be one of the major challenges for trying to bring about improvements in the living standards of the people based on improvements in agriculture.

- Skewed distribution of limited resources:

As can be expected in a heterogenous and stratified society like that of Nepal, inter-personal distribution of productive resources, primarily the land, is very skewed. In the sample households, the average landownership of the lowest 40% of households (Marginal and Small taken together) is less than 50% of the land owned by the Large ones. In other words, cultivated land is generally much scarce in the area and worse yet, it is highly unevenly distributed between households.

- Young population, high growth rate, built-in future momentum and intensifying push factor:

The population in the area is young indicating a high rate of population growth. Population pressure on the cultivated land as well as on the forest is mounting. Less than 50% of the sample population grow enough from their own land to feed themselves for the whole year. However, to fulfill their other daily

necessities like salt, sugar, clothes, etc., they also sell and export parts of their cereal production, and livestock and livestock products which, given their food deficit conditions and nutritional needs, could have been locally consumed. Many find their supplemental incomes from one or the other of several non-farm pursuits such as working for salary, painting Thanka, small-time trading or just working as wage labour. This is sufficiently evidenced by the fact that "wages and salaries" constitute two important sources of cash income for the sample households.

Most such non-farm employment, however, are available only in places out of the district, mostly in Kathmandu, some in the terai and rest in India. Thus given the present socio-economic situation in the corridor area, the push factors are intensifying so that a large proportion of people have to leave their village for different durations in order to make their ends meet. This could be one of the explanations for the finding that the main occupation of a sizeable population in this rural hinterland is no longer agriculture.

Additionally, because the population is young, there is already a built-in momentum, as mentioned earlier, for further natural growth of population in the area. So other factors of economy remaining static, the outmigration from the villages could only be expected to turn into an exodus.

- Near complete absence of women development programme:

While the women are so much lagging behind in the communities in the proposed area, there is near complete absence of any intervention designed to uplift the status and well-being of women in the area.

- Limited social services:

Social services and access to them are minimal in the area. Even after years of support for drinking water, the access to it is less than universal in the proposed area. Access to health services is limited. Sanitation is literally non-existent. Literacy rate is much lower than national average, and female literacy is even worse.

- Untapped potential:

The area is not devoid of what is generally known as "comparative advantage". It can produce things that neither Kathmandu valley nor the Terai can produce. It has immense untapped potential in growing horticultural products and exporting them to those markets. But because of the lack of access to market, the potential remains largely unused.

2.5.2. INSTITUTIONAL AND POLICY CONSTRAINTS .IN RURAL DEVELOPMENT:

The above problems or deficiencies are, however, merely the manifestations of a more deep-seated malady which characterizes the larger policies and institutional arrangements existing in the country. Despite the plethora of rhetoric favouring rural development in the country, it has never been seriously looked into in its proper perspective at the level of policy planning. Issues such as the following have never received proper attention and priority in the planning of policies at the national level: cultivable land availability is limited; its distribution is highly skewed and conditioned by the persistence of historical causations; alternative employment opportunities are extremely limited in the rural areas; population is rising and the resultant environmental degradation is making situation worse, etc.

The few poverty-focussed projects that were implemented in the country such as Small Farmer Development Project (SFDP) or the Production Credit for Rural Women (PCRW) have largely been the input of such donor agencies as the FAO and UNICEF respectively to start with. And the fact that both the projects over the years have increasingly failed to address the problem of the poverty of the poor in content as well as in magnitude in the country results primarily from the lacuna at the policy-making level mentioned above. Some of the policy and institutional constraints resulting from this situation would be as follows:

- Lack of sufficient focus on poverty:

As will be seen in the next chapter, there is a rather large number of development programmes implemented in the districts of the proposed road corridor area. However, there are none that looks into the deep-seated and structural nature of poverty in the area. The community studies show that other than the SFDP in one sample VDC (with all the programme's attendant deficiencies mentioned earlier), such an intervention simply does not exist. Besides, trying to alleviate poverty is not an easy affair to accomplish in the context of limited agricultural land, unskilled and increasing population, progressive deterioration of environment and a household economy based on substantial external employment. Given the diversity among the people in the communities, each household is specially attributed or disadvantaged in its own way. Therefore, the challenge in the alleviation of their poverty lies in assisting them to identify and realize their own special potential to its full for raising their standard of living. It will no longer be sufficient to look at those people only in the limited confines of the village community but to deal with them as individuals participating in the dynamics of the larger national economy.

- Lack of sufficient institutional mechanism:

The existing institutional mechanism is inadequate to meet the

challenges inherent in the nature of rural development problems in the area. Most institutions dealing with possible improvements in different aspects of the life and economy of the rural people are situated too far away from the communities. Their interaction with the communities members are extremely limited.

Staff absenteeism in such sub-district offices are widespread and chronic. Resources necessary for rendering assistance to the people are too limited. Even when these problems are not there, the low level of motivation of the government officials effectively limits their contribution.

- Lack of overall planning system:

Problems in the communities are mutually integrated. As seen in the need for forest/agriculture balance for instance, the planning for livestock and agriculture development cannot be properly undertaken without, at the same time, taking into account the environmental and forest considerations. The same thing could also be true establishing a balance between population and resource. Therefore, a holistic frame of reference for the planning and allocation of resources at the community level is a necessary condition for the sustained development of the rural communities in the country including the proposed road corridor area. But as it is, there is conspicuous lack of planning system in general and such focussed planning in particular. Without a systematic but simple planning tradition of planning instituted at the local level, development of communities in their relevant aspects will not be attainable.

- Lack of coordination of inputs:

Closely allied with the issue of planning is the issue of coordination. At present there are often several government and non-government sources of inputs into the rural communities in the area. There, therefore, exists a need for establishing mutual coordination in terms of their non-duplicating allocation, more judicious distribution between localities and beneficiaries, etc. and their proper prioritization. This also indicates the need for a holistic planning frame for the communities in the area.

- Lack of local resource mobilization:

Local beneficiary resource mobilization is one of the preconditions for effective participation of people, transparency in the management of resources, more optimal allocation and use of scarce resources, accountability and responsiveness of local leaders and the chances of sustainable development. Initiating and institutionalizing such a process requires deliberate, serious and sustained intervention in the communities. This too is only conspicuous by its absence.

Briefly stated, the development needs of the diverse local population is quite complex. Their fulfillment would demand nothing less than an approach that is capable to custom-tailor the solution to the specificities of the needs of each individual households in the communities.