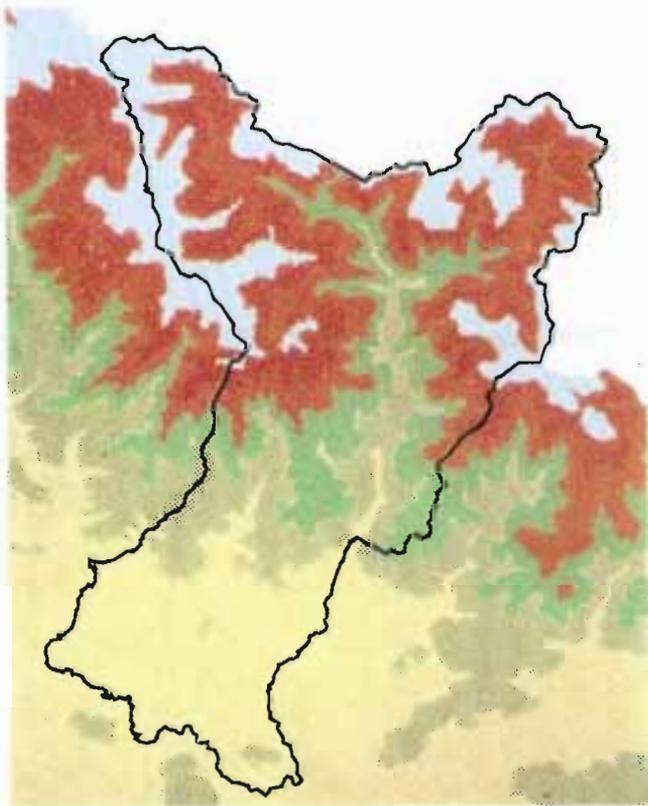


# **MENRIS CASE STUDY SERIES**

## **No. 3**

### **Application of GIS for Planning Agricultural Development in Gorkha District**



Mountain Environment and Natural Resources' Information Service (MENRIS)



**INTERNATIONAL CENTRE FOR INTEGRATED MOUNTAIN DEVELOPMENT  
(ICIMOD)**

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Cover: Elevation of Gorkha District, Western Development Region of Nepal  
Administrative Map of Nepal (Source: HMG Nepal, Survey Department, Topographical  
Survey Branch, Kathmandu)

Inset Photograph: Winnowing at Lamagaon, Chhekampar VDC, Shyar *Khola* valley,  
about 3,200masl.

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# **Gorkha Development Project (GDP)**

## **HMG/GTZ**

Application of GIS for Planning Agricultural  
Development in Gorkha District, Western Region of  
Nepal

prepared by  
**Hubert Trapp**

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Kathmandu, Nepal  
December 1995

# Foreword

One of the main reasons why mountain areas have been left behind in the development process is the lack of adequate information about their limitations to and potential for development. Geographic Information Systems (GIS) and remote sensing technology are powerful tools that can increase the information base essential for sustainable mountain development. The strength of GIS lies in its ability to integrate data and information on different subjects and from different sources using a common geographical reference.

Through remote sensing, new mechanisms for obtaining information on remote and inaccessible areas have become available. Since 1989 ICIMOD has developed a strong capacity in the fields of GIS and remote sensing through its Mountain Environment and Natural Resources' Information Service (MENRIS). The present study provides a good example of the applications of GIS and remote sensing technology for regional development planning.

It is the result of a joint effort of the Gorkha Development Project (implemented by His Majesty's Government of Nepal and the German Technical Assistance [GTZ]), and ICIMOD. It is primarily intended to meet the needs of development planners and extension agencies in the fields of agricultural planning and natural resources' management. Its contents will also be of interest to donor agencies of agricultural/natural resources' development projects/programmes, NGOs working in this field, researchers, and GIS experts. The paper is meant to stimulate the readers' interest in GIS applications and also help them to reorient development planning at district level so as to contribute to sustainable forms of mountain agriculture.

Prior to this case study, ICIMOD published 'Applications of GIS for Natural Resource Management in Dhading District, Nepal' in 1992. It illustrated basic concepts and the use of GIS to demonstrate how data integration enables decision-makers and development planners to improve the management of natural resources. The second case study series was published in 1994, 'Applications of GIS to Rural Development Planning in Nepal'. The illustrations presented both basic and advanced usage of GIS and remote sensing applications in several districts of Nepal.

The five case studies recorded in the present publication cover agricultural planning and natural resources' management in Gorkha District: Agroclimatic Zones; Analysis of the Feed Situation and Livestock Carrying Capacity; Horticultural Development Zones; Correlation of Land Use with Climatic Factors; and Potato Production. The studies have been undertaken by Mr. Hubert Trapp, ICIMOD/MENRIS specialist in GIS, in collaboration with professionals of the Gorkha Development Project: Mr. Binod Shrestha, Mr. Dhruva Pant, and Dr. Lakshman Pun. Other MENRIS staff members in the team who have assisted with the case studies include Mr. Basanta Shrestha, Mr. Anirudra Shrestha, Mr. Govinda Joshi, Ms. Mona Thapa, Ms. Mona Lacol, and Ms. Sabina Pradhan. On behalf of ICIMOD we would like to thank them all for their contributions and through GTZ the Government of Germany for the financial support it provided to undertake this study.

Pramod Pradhan  
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MENRIS/ICIMOD

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Director General  
ICIMOD

# Contents

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1. INTRODUCTION	i
1.1 The MENRIS Programme at ICIMOD	i
1.2 The Five Case Studies	i
1.3 Mountain Areas and the GIS Concept	ii
<i>Database and Techniques</i>	iii
<i>Data Problems and Limitations</i>	iv
1.4 Conclusions	iv
PART I AGROCLIMATIC ZONES IN GORKHA DISTRICT	1
1. INTRODUCTION	3
2. METHODOLOGY	3
2.1 Analysis of Temperature Regimes	4
2.2 Analysis of Moisture Regimes	5
3. RESULTS	6
3.1 Temperature Regime	6
3.2 Moisture Regime	7
3.3 Agroclimatic Zones	8
4. CONCLUSIONS	9
PART II ANALYSIS OF THE FEED SITUATION AND LIVESTOCK CARRYING CAPACITY IN GORKHA DISTRICT	11
1. INTRODUCTION	13
2. METHODOLOGY	14
2.1 Analysis of Feed Requirements	15
2.1.1 <i>Number of Livestock and Livestock Units</i>	16
2.1.2 <i>Feed Requirements per Livestock Unit</i>	16
2.1.3 <i>Development of a Model Incorporating Semi-nomadic Forms of Sheep, Cattle and       Buffalo Farming</i>	16
2.2 Analysis of Feed Supply and Feed Resources	18
2.2.1 <i>Feed from Crop Residues</i>	18
2.2.2 <i>Fodder from Forests and Shrubland</i>	19
2.2.3 <i>Fodder from Grazing Land/Public Grasslands/Pastures</i>	21
2.2.4 <i>Fodder from Private Trees</i>	22
2.2.5 <i>Soilage Fodder from Risers and Bunds</i>	22
2.2.6 <i>Fodder from Non-Cultivated Areas within Agricultural Land</i>	22
2.2.7 <i>Fodder from Grazing on Fallow Land</i>	23
2.3 Limitations of the Database	23
3. RESULTS	23
3.1 Population and Livestock	23
3.2 Total Feed Supply	24
3.3 Total Feed Requirements	26
3.3.1 <i>Feed Requirements on the Basis of Ideal Feed Supply</i>	26
3.3.2 <i>Feed Requirements on the Basis of Insufficient Feed Supply</i>	27
3.4 Livestock Carrying Capacity	28
3.5 Feed Situation	29
3.5.1 <i>Feed Situation on the Basis of Ideal Feed Supply</i>	29
3.5.2 <i>Feed Situation on the Basis of Insufficient Feed Supply</i>	29
4. CONCLUSIONS	30

PART III	HORTICULTURAL DEVELOPMENT IN GORKHA DISTRICT	31
1.	INTRODUCTION	33
1.1	Master Plan for Horticultural Development	33
2.	CRITERIA FOR HORTICULTURAL DEVELOPMENT ZONES IN GORKHA	33
2.1	Land System Requirements	34
2.2	Horticultural Development Areas	36
2.3	Temperature Regimes and Altitude/Agroclimatic Zones	36
2.4	Aspect	38
2.5	Accessibility and Marketing	38
3.	APPLIED METHODOLOGY	39
4.	RESULTS	40
4.1	Potential Horticultural Development Areas	40
4.2	Tropical Fruits	40
4.3	Citrus Fruits	42
4.4	Warm Temperate Fruits	42
4.5	Temperate Fruits	43
4.6	Accessibility and Marketing	44
5.	CONCLUSIONS	44
PART IV	CORRELATION OF LAND USE WITH CLIMATIC FACTORS IN GORKHA DISTRICT	45
1.	INTRODUCTION	47
2.	METHODOLOGY	47
3.	ANALYSIS AND RESULTS	47
3.1	Land-use Classes in Relation to Agroclimatic Zones	47
3.2	Land-use Classes in Relation to Aspects	51
3.3	Land-use Classes in Relation to Agroclimatic Zones and Aspects	53
3.4	Agricultural Land and Cropped Area in Relation to Aspect, Cultivation Type, and Cropping Intensity	59
3.5	Cropping Systems in Relation to Agroclimatic Zones and Aspects	59
4.	CONCLUSIONS	64
PART V	POTATO PRODUCTION IN GORKHA DISTRICT	65
1.	INTRODUCTION	67
2.	POTATO PRODUCTION IN THE MOUNTAINS OF NEPAL	67
2.1	Seed Potato Flow in Gorkha	67
2.2	Traditional Potato Cultivation Practices	68
3.	REQUIREMENTS FOR POTATOES	69
4.	APPLIED METHODOLOGY	70
5.	RESULTS	70
6.	CONCLUSIONS	72
ANNEXES		73
BIBLIOGRAPHY		129
MAPS		135
PLATES		170

#### List of Tables

1:	Digital Database of Gorkha District	iii
2:	Classification of Temperature Regimes	5
3:	Parameters for the Calculation of Potential Evapotranspiration (PET) in Nepal; Linear Equation: $PET = A - B(Z)$ , for computing PET (in mm/day) from Elevation, Z (in km).	5

4: Classification of Moisture Regimes	6
5: Area of Temperature Zones in Gorkha District	6
6: Area of Moisture Zones in the Gorkha District	8
7: Area of Agroclimatic Zones in Gorkha District	9
8: Calculation of Factors Applied to the Analysis of Sheep Grazing in the Cool Climatic Zone in the Gorkha District	17
9: Feed Derived from Crop Residues	19
10: Fodder Productivity of Different Sources	20
11: Amount of Feed from Different Sources in Two Climatic Zones of Gorkha District	25
12: Amount of Feed Derived from Crop Residues in Two Climatic Zones of Gorkha District	25
13: Total Number of Livestock and Number of Livestock Units per Livestock Category and Feed Requirement in an Ideal Feed Situation in Gorkha District	27
14: Total Number of Livestock and Number of Livestock Units per Livestock Category and Feed Requirement in a Likely Present Feed Situation in Gorkha District	28
15: Agricultural Land and Land System Categories in Gorkha District	35
16: Potential Development Area for Banana Crops	42
17: Potential Development Area for <i>Suntala</i> and <i>Junar</i> Crops	42
18: Potentials Development Area for Plum Crops	43
19: Potential Development Area for Apple Crops	43
20: Total District Area, Agricultural and Cropped Land, Forest and Shrubland, and Grazing in Relation to Agroclimatic Zones	48
21: Size of Agricultural Land in Relation to Agroclimatic Zones	50
22: Total District Area, Agricultural and Cropped Land, Forest and Shrubland, and Grazing Land in Relation to Aspects	51
23: Size of Agricultural Land in Relation to Aspect	52
24: Potential Agricultural Land and Potential Cropped Area in Gorkha Suitable for Potato Cultivation during various Potato Growing Periods	71
25: Potential Agricultural Land and Potential Cropped Area in Gorkha Suitable for Potato Cultivation during One Year	72

#### List of Figures

1: Feed Sources and Productivity Levels in the Western Region of Nepal	21
2: Feed Supply in Two Climatic Zones in Gorkha District	26
3: Horticultural Zones of Nepal	37
4: Suitable Areas for Fruit Crop Production in Gorkha	41
5: Agroclimatic Zones in Gorkha: Total Area and Agricultural Land	49
6: Agroclimatic Zones in Gorkha: Forest and Pasture Land	49
7: Distribution of Land-use Classes according to Aspect in Gorkha	52
8: Distribution of Land-use Classes: Subtropical/Subhumid Zone	53
9: Distribution of Land-use Classes: Warm Temperate/Subhumid Zone	54
10: Distribution of Land-use Classes: Warm Temperate/Humid Zone	55
11: Distribution of Land-use Classes: Cool Temperate/Humid Zone	56
12: Distribution of Land-use Classes: Alpine/Humid Zone	56
13: Distribution of Land-use Classes: Alpine/Perhumid Zone	57
14: Distribution of Low Density Forest and Net Cultivated Area on the Northwestern Aspects	58
15: Distribution of Low Density Forest and Net Cultivated Area on the Southern Aspects	58
16: Distribution of Agricultural Land (Net cultivated and Non-cultivated Area) according to Aspect in Gorkha	60
17: Distribution of Cropping Systems in the Subtropical Zone	61
18: Distribution of Cropping Systems in the Warm Temperate Zone	61
19: Distribution of Cropping Systems in the Subtropical/Subhumid Zone according to Aspect	62
20: Distribution of Cropping Systems in the Warm Temperate/Subhumid Zone according to Aspect	63
21: Distribution of Cropping Systems in the Warm Temperate/Humid Zone according to Aspect	63

#### List of Maps

- 1: Gorkha District, Western Region of Nepal - Location
- 2: Gorkha District, Western Region of Nepal - VDC Names

- 3: Location of Selected Meteorological Stations in Western and Central Nepal
- 4: Gorkha District, Western Region of Nepal - Temperature Regime
- 5: Gorkha District, Western Region of Nepal - Temperature Regime
- 6: Gorkha District, Western Region of Nepal - Moisture Regime
- 7: Gorkha District, Western Region of Nepal - Moisture Regime
- 8: Gorkha District, Western Region of Nepal - Agroclimatic Zonation
- 9: Gorkha District, Western Region of Nepal - Agroclimatic Zonation
- 10: Gorkha District, Western Region of Nepal - Distribution of VDCs According to Climatic Zones
- 11: Gorkha District, Western Region of Nepal - Population Density
- 12: Gorkha District, Western Region of Nepal - Livestock Density
- 13: Gorkha District, Western Region of Nepal - Fodder Sources
- 14: Gorkha District, Western Region of Nepal - Feed Requirements
- 15: Gorkha District, Western Region of Nepal - Livestock Carrying Capacity
- 16: Gorkha District, Western Region of Nepal - Feed Situation
- 17: Gorkha District, Western Region of Nepal - Feed Situation
- 18: Gorkha District, Western Region of Nepal - Feed Situation
- 19: Gorkha District, Western Region of Nepal - Feed Situation
- 20: Gorkha District, Western Region of Nepal - Land System
- 21: Gorkha District, Western Region of Nepal - Land Utilisation in 1979
- 22: Gorkha District, Western Region of Nepal - Potential Horticultural Development Area
- 23: Gorkha District, Western Region of Nepal - Mean Annual Temperature
- 24: Gorkha District, Western Region of Nepal - Aspect
- 25: Gorkha District, Western Region of Nepal - Accessibility of Road Infrastructure
- 26: Gorkha District, Western Region of Nepal - Accessibility of Road Infrastructure Including Proposed Road to Arkhet
- 27: Gorkha District, Western Region of Nepal - Accessibility of *Bazaar*
- 28: Gorkha District, Western Region of Nepal - Agricultural Land Suitable for Mango Trees
- 29: Gorkha District, Western Region of Nepal - Agricultural Land Suitable for Banana
- 30: Gorkha District, Western Region of Nepal - Agricultural Land Suitable for *Suntala* Trees
- 31: Gorkha District, Western Region of Nepal - Agricultural Land Suitable for Peach Trees
- 32: Gorkha District, Western Region of Nepal - Agricultural Land Suitable for Apple Trees
- 33: Gorkha District, Western Region of Nepal - Potential Potato Growing Area and Season

## ABBREVIATIONS/ACRONYMS

AAT	Arc Attribute Table
AIX™	Advanced Interactive Executive
APROSC	Agricultural Project Services Centre
C	Agricultural land on sloping terraces
DEM	Digital Elevation Model
DM	Dry Matter
F	Agricultural land on footslopes/tars
FAO	Food and Agriculture Organisation of the United Nations
DGP	Gorkha Development Project
GIS	Geographic Information System
GTZ	<i>Deutsche Gesellschaft für Technische Zusammenarbeit</i> (German Technical Agency)
ha	hectare
HKH	Hindu Kush-Himalayas
HMG	His Majesty's Government
HMR	High Mountain Region
IBM™	International Business Machines Corporation
ICIMOD	International Centre for Integrated Mountain Development
LRMP	Land Resource Mapping Project
LU	Livestock Unit
masl	metre above sea-level
MENRIS	Mountain Environment and Natural Resources' Information Service
MMR	Middle Mountain Region
mt	metric tonne
NGO	Non-government Organisation
NPDP	National Potato Development Programme
PAT	Polygon/Point Attribute Table
PC	Personal Computer
PET	Potential Evapotranspiration
PLBP	Promotion of Livestock Breeding Project
RISC™	Reduced Instruction Set Computer
RS	Remote Sensing
SBD	Suspension Bridge Division
T	Agricultural land on level terraces
TDN	Total Digestible Nutrients
UNDP	United Nations Development Programme
UTM	Universal Transfer Mercator
V	Agricultural land on valley floors
VDC	Village Development Committee