

Tribhuvan University

ORANGE CULTIVATION IN SIKKIM

(A Case Study of Khamdong Gram Panchayat Unit of East District)

A Dissertation

Submitted to Central Department of Geography

The Faculty of Humanities and social Science in

Partial Fulfillment of the Requirement for the

Master's Degree in Geography

By

LALITA RUCHAL

Central Department of Geography

TRIBHUVAN UNIVERSITY

Kirtipur, Kathmandu, Nepal

September, 2006

Tribhuvan University
Faculty of Humanities and Social Sciences
Central Department of Geography

ORANGE CULTIVATION IN SIKKIM

(A Case Study of Khamdong Gram Panchayat Unit of East District)

Approved By

Head of Department

Internal Examiner

External Examiner

Dissertation Committee

ACKNOWLEDGEMENTS

Firstly, I would like to express my sincere thanks to the Central Department of Geography for giving me an opportunity to write this dissertation entitled "orange cultivation in Sikkim: A case study of Khandong Gram Panchayat Unit of East Sikkim" for the partial fulfillment of the Master's Degree in Geography.

I would like to express my sincere gratitude to respected Lecturer, Mr. Umesh Kumar Mandal, Central Department of Geography T.U. for his guidance, suggestions, encouragement and continual support to complete this dissertation.

I would like to express my grateful thanks to Prof. Bhim P. Subedi, Ph.D. Head of the Central Department of Geography, T.U., and all the respected teachers and staffs for their support.

I am really thankful to the members of different organizations and institutions such as central library T.U., State library, Gangtok and Geography Department Library T.U., for providing me with valuable materials required for this study.

I am really thankful to all the staffs of Khamdong Gram Panchayat and local peoples for their cordial support while collection of data from the fields. Similarly, I am indebted to close friend Mr. Sanam Rinchen Lepcha, Krish (Judas) and Reena Chettri for their moral support and encouragement in the completion of this study. I would like to thank Mr. Rajiv and Bishow Maharjan of Friends Computer Service for computer work.

I am very much thankful to Mr. Arbind Thapa and Nim Thapa for their support and true company to complete this dissertation.

Last but not least, I pour all my gratitude indebtedness and respect to my parents and family members for their inspiration and supporting me in each and every steps to reach up to this level.

Lalita Ruchal

September, 2006

CONTENTS

	Page
CHAPTER I : INTRODUCTION	1-13
1.1 General Background	1
1.2 Statement of Problems	3
1.3 Objectives of the Study	4
1.4 Significance of the Study	4
1.5. Limitation of the Study	5
CHAPTER II : LITERATURE REVIEW	6-
CHAPTER III : RESEARCH METHODOLOGY	14-19
3.1 Selection of the Study Area	14
3.2 Source of Data	14
3.2.1 Primary Source of Data	15
3.2.2 Methods of Primary Data Collection	15
3.2.2.1 Tools of Primary Data Collection	16
3.2.3 Source of Secondary Data	18
3.2.4 Data Analysis	18
3.2.5 Experiences from the Field Survey	19
CHAPTER IV : GENERAL BACKGROUND OF THE STUDY	
AREA	20-36
4.1 Physical Setting	41
4.1.1 Relief	23
4.1.2 Drainage	23
4.1.3 Natural Vegetation	26
4.1.4 Climate	26
4.1.5 Soil	27
4.2 Socio-Economic Condition	28
4.2.1 Population	28
4.2.2 Ethnic Composition	30

4.2.3	Status of Education	31
4.2.4	Occupational Status	32
4.2.5	Animal Husbandry	35
4.2.6	Settlement	36
4.2.7	Transport and Communication	36

CHAPTER V : ORANGE PRODUCTION AND ITS DETERMINING FACTORS

37-51

5.1	Economic Factor	37
5.1.1	Farm Size and Use of Pesticides and Insecticides	37
5.1.2	Relationship between Farm Size and Income Earned	39
5.1.3	Relationship between Income and Loan Obtain from Government	40
5.1.4	Income Group Road Accessibility	40
5.1.5	Road Accessibility and Use of Pesticides	41
5.2	Physical Factors	42
5.2.1	Altitude	42
5.2.2	Soil	43
5.2.3	Climate	43
5.3	Nursery Management of Orange	44
5.3.1	Selection of Mother Plants	44
5.3.2	Collection of Seeds	45
5.3.3	Primary Nursery Raising Methods	45
5.3.3.1	Sowing of Seeds on Ground/bed	45
5.3.4	Secondary Nursery Raising	46
5.3.5	Planting and Spacing	46
5.3.6	Fencing	47
5.3.7	Manuring and Fertilization	47
5.3.8	Intercrops with Orange	49
5.3.9	Weeding and Hoeing	49
5.3.10	Prunning	50
5.4	Distribution of Orange of Sampled Household by Wardwise	50

CHAPTER VI : PRODUCTION TREND OF ORANGE	
CULTIVATION AND MARKET SYSTEM	52-61
6.1 Trend of Orange Production from 2000-2005	52
6.2 Market System of Orange Cultivation	54
6.3 Channel of Marketing in the study Area	55
6.3.1 Farmers/Producers	55
6.3.2 Pre-harvest contractors/Brokers	56
6.3.3 Commission Agent	56
6.3.4 Local Traders	56
6.4 Selling method adopted by farmers of study Area	57
6.5 Economic Change by Orange Production	58
6.6 Causes for Orange Cultivation in the Study Area	59
6.7 Cost and Benefit of Orange Cultivation	60
CHAPTER VII : PROBLEMS AND PRESPECT OF ORANGE	
CULTIVATION	62-71
7.1 Problems of Orange Cultivation Faced by Farmers	62
7. 1.1 Lack of Storage	63
7.1.2 Lack of Organized Market	64
7. 1.3 Problem of Financial Institution	64
7. 1.4 Lack of Improved Varieties of Seed	65
7. 1.5 Natural Calamities	65
7. 1.6 Common Fungal Diseases and Pests	66
7. 1.7 Problems of new Tools and Technique	69
7.2 Prospects	70
CHAPTER VIII : CONCLUSION AND	
RECOMMENDATION	72-75
8.1 Conclusion	72
8.2 Recommendation	74
REFERENCES	76-78
ANNEX	79-84

LIST OF TABLES

Table 1 : Distribution of total Household, Orange Grower and Sample Households	16
Table 2 : Wardwise Distribution of Households Population 2001	29
Table 3 : Ethnic Composition of Population by wardwise	30
Table 4 : Educational Attainment of Sampled Population	31
Table 5 : Occupational Structure of Sampled Population	33
Table 6 : Number of Animals in the Sampled Households	35
Table 7 : Farm Size Group Using Insecticides and Pesticides	38
Table 8 : Income Group and Farm Size Group	39
Table 9 : Income Group Loan from Government for Horticulture	40
Table 10 : Relationship Between Income group and Road Accessibility	41
Table 11 : Relationship Road Accessibility and Insecticides and Pesticides	41
Table 12 : Altitude of Orange Growing Farms	42
Table 13 : Planting Spacing Adopted by Farmers in Study Area	47
Table 14 : Doses of Fertilization	48
Table 15 : Wardwise Distribution of Orange	51
Table 16 : Area and Production of Orange from 2000-2005	52
Table 17 : Methods of Orange Selling by Farmers	58
Table 18 : Causes for Orange Cultivation in Khamdong G.PU	59
Table 19 : Cost and Benefit of orange	60
Table 20 : Weighted Ranking of Problem Associated to Orange Cultivation	63

LIST OF FIGURES

Figure 1 : Educational Attainment of Sampled Population	32
Figure 2 : Occupational Structure of Sampled Population	34
Figure 3 : Farm Size Group Using Insecticides and Pesticides	38
Figure 4 : Production Trend of Orange from 2000-2005	53
Figure 5 : Marketing Channel of Orange	57

LIST OF MAP

Map 1 : Location Map of the Study Area (Khamdong GPU)	21
Map 2 : Drainage Map of Study Area (Khamdong GPU)	24

LIST OF ABBREVIATION

C	-	Centigrade
CDG	-	Central Department of Geography
Cm	-	Centimeter
DOA	-	Department of Agriculture
DOH	-	Department of Horticulture
gm	-	gram
GPU	-	Gram panchayat Unit
GSDP	-	Gross State Domestic Product
HH	-	Households
Kg	-	Kilogram
Km	-	Kilometer
m	-	Meter
No.	-	Number
SGC	-	Sikkim Government College
SOI	-	Survey of india
sq.km	-	Square Kilometer
T.U.	-	Tribhuvan University