

CLIMATE CHANGE AND ITS IMPACT ON AGRICULTURE:

A Case Study of Mahadev VDC, Kavre

A Thesis Report

Submitted to:

Central Department of Rural Development

Tribhuvan University, Kirtipur, Kathmandu, Nepal

In Partial Fulfillment of the Requirements for the Master's Degree

In Humanities and Social Science in Rural Development

Submitted by:

RANJU KAYASTHA

Exam Roll No: 281570

TU Regd. No: 9-1-245-992005

March 2017

LETTER OF RECOMMENDATION

This is certify that the Thesis Report entitled on **Climate Change and its Impact on Agriculture: A case Study of Mahadevtar VDC, Kavre, Nepal** has been completed by **Ranju Kayasth**, under my full guidance and supervision for the partial fulfillment of the requirement of Thesis report for master's degree of Social Science and Humanities in Rural Development. I hereby recommended this report for its evaluation and approval.

.....
Mr. Ratnamani Nepal
(Supervisor)

22th March 2017

2073-12-09

LETTER OF APPROVAL

This is certify that the Thesis Report entitled on **Climate Change and its Impact on Agriculture: A case Study of Mahadevtar VDC, Kavre, Nepal** completed by Ranju Kayasth has been examined by Central Department of Rural Development of University Campus, TU, Kirtipur, Kathmandu, Nepal. It has been declared to be a successful work for fulfillment of academic requirements towards the completion of Masters of Social Science and Humanities in Rural Development.

Evaluation Committee

.....
Prof. Dr. Pushpa Kamal Subedi
Department Head, Central Department of RD,

.....
Mr. Ramesh Neupane
External Examiner

.....
Mr. Ratnamani Nepal
(Supervisor)

2073-12-16

29th March, 2017

Declaration

I hereby declare that the thesis entitled **Climate Change and its Impact on Agriculture (A case Study of Mahadevtar VDC, Kavre, Nepal)** submitted to the Central Department of Rural Development, Tribhuvan University, is entirely my original work prepared under the guidance and supervision of my supervisor. I have made due acknowledgements to all ideas and information borrowed from different sources in the course of preparing this thesis. The result of this thesis have not been presented or submitted anywhere else for the award of any degree or for any other purposes. I assure that no part of the content of this thesis has been published in any form before.

.....

Ranju Kayastha

TU Regd. No: 9-1-345-992005

22th March 2017

2073-12-09

Acknowledgements

This thesis Report has been possible from the help of various people. In acknowledge my debt to all of them. I wish to express our gratitude and appreciation to the central department of rural Development, T.U., Kirtipur for the encouragement, supervision and guidance.

I am infinitely indebted to my research supervisor, Mr. Ratnamani Nepal lecture of the Department of Rural Development, T.U., Kirtipur for his kind support and continuous guideline in the course of study from beginning to the last. His suggestions about the technical aspect of the study have been more remarkable help to me. I am grateful to all the local people and VDC office of Mahadevtar VDC for their help while data gathering in the field.

Similarly, I would like to thanks Prof. Dr. Pushpa Kamal Subedi, Head of the Department, Central Department of Rural Development and TU for providing valuable source, support, suggestion and good conduct of the thesis research.

Finally, I am grateful to all my class friends, who heartily cooperate me by providing essential information, data and other necessary supports of this research, without their kind help, this study would not have a complete form.

March, 2017

Ranju Kayasth

ABSTRACT

The climate change in general is the change in rainfall and temperature pattern in any region which affects various other sectors such as agriculture and water resources. Local people of this area are practicing in mix type i.e. mix of traditional and modern farming system and they are suffering from climate change. This study attempts to find the impact of climate change on agricultural system of Mahadvtar VDC, Kavre Nepal. Kavre and the effects of climate change in agriculture in recent decade. It also aims to explore the knowledge of climate change adaptation techniques in agriculture and the local use of techniques and the benefits they get from the adaptations techniques.

This study used both primary and secondary data for the analysis. This shows that the warm days are increasing and cold nights are decreasing in the recent years. Cash crops and vegetable production trend are considered to analyze the climate impacts.

Paddy and millet yield shows the positive impact due to increasing temperature and production of other crops such as wheat, maize, cardamom, zinger, vegetables etc. The primary data were collected from the field and the primary data includes the knowledge of farmers towards climate change, their perceptions towards the climate change, effect of climate change in agriculture including for individual crops, climate change adaptations techniques used by farmers and the results of the techniques. The secondary data are location description, climate data (rainfall and temperature), the census data for total populations and different caste and the data of agriculture production of the district.

Finally, the study recommends for training to the farmers on different farming system based on adaptations techniques and concludes with a suggestion for introducing commercial farming programs in the community. So to minimize this problem awareness program and capacity building program should be focused for local people. Also, government needs to give attention on adaptation measures to climate change.

TABLE OF CONTENTS

DECLARATION	i
LETTER OF RECOMMENDATION	ii
APPROVAL SHEET	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
TABLE OF CONTENTS	vi-vii
LISTS OF TABLES	viii
LISTS OF FIGURES	ix
LISTS OF ACRONYMS	x
CHAPTER ONE: INTRODUCTION	1-4
1.1 Background of the Study	1
1.2 Statement of the Problem	3
1.3 Objective of the Study	3
1.4 Rationale of the Study	4
1.5 Limitations of the Study	4
1.6 Organization of the study	4
CHAPTER TWO: LITERATURE REVIEW	5-13
2.1 Climate Change	5
2.2 Impact of Climate Change in Agriculture	10
2.3 Adaptation Measures to Climate Change	13
CHAPTER THREE: RESEARCH METHODOLOGY	19-21
3.1 Research Design	19
3.2 Rationale of the Selection of the Study Area	19
3.3 Nature and Sources of Data	19
3.4 Sampling Procedure	20
3.5 Data Collection Techniques and Tools	20
3.5.1 Household Survey	20
3.5.2 Key Informant Interview	20
3.6 Method of Data Analysis	21
3.7 Limitation of the Study	21

CHAPTER FOUR: DATA PRESENTATION AND DATA ANALYSIS	22-35
4.1 Profile of respondent	22
4.1.1 Age group	22
4.1.2 Caste/ Ethnic Composition	23
4.2 Farmer's Knowledge on Climate Change	23
4.3 Perception towards climate change	24
4.3.1 Perception towards rainfall	24
4.3.2 Perception towards Temperature Change	26
4.3.4 Perception towards the change of other climatic pattern	27
4.3.5 Impact of Climate change in agriculture production	29
4.3.6 Change in Agriculture Production by Duration Wise	30
4.4 Adaptation Measures Taken in Agriculture	31
4.4.1 Protection of Crops from Natural Disasters	32
4.4.2 Use of Improved/New Seeds	32
4.4.3 Change in Cropping Pattern	33
4.4.4 Consulting Agriculture Experts	34
4.4.5 Practice of Food Storage	34
4.4.6 Different Supporting Organizations	35
CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS	36-39
5.1 Profile of Respondent	36
5.2 Farmers Knowledge on Climate Change	36
5.3 Impact of Climate in Agriculture Production	37
5.4 Adaptation Measures Taken in Agriculture	37
5.5 Conclusions	38
5.6 Recommendations	39
 ANNEX	
 REFERENCES	
 QUESTIONNAIRE	

LISTS OF TABLES

Table 4. 1 Age Group of the Respondent	22
Table 4. 2: Farmers perception on their knowledge in climate change	24
Table 4. 3: Farmer's perception of climate change	24
Table 4.4: People's perception towards rainfall in Mahadevtar Kavre	25
Table 4. 5: Monsoon onset and withdrawal date in Nepal	26
Table 4. 7: Farmer's perception on temperature	27
Table 4. 8: Farmer's perceptions on change in different climatic parameters parameters	28
Table 4. 9: Duration-wise change in production of different crops	30
Table 4. 10: Protection of crops from natural disasters	32
Table 4. 11: Use of improved seeds for different crops	33
Table 4. 12: Change in cropping pattern	33
Table 4. 16: Consulting agriculture experts	34

LISTS OF FIGURES

Fig 4. 1 Caste composition of the respondent	23
Fig 4. 2: Effect of climate change in production	29
Fig 4. 3: Knowledge of adaptation techniques in farmers	31
Fig 4. 4: Food storing practice	34

LISTS OF ACRONYMS

°C	Degree Celsius
AGDP	Gross Development Product
APP	Agriculture Perspective Plan
CBS	Central Bureau of Statistics
DADO	District Agriculture Development Office
DHM	Department of Hydrology and Meteorology
GDP	Gross Domestic Product
GoN	Government of Nepal
HVAC	High Value Agricultural Commodities
HM	High Mountain
HMM	High and Middle Mountain
IFPRI	International Food Policy Research Institute
IPCC	Intergovernmental Panel on Climate Change
km	kilometers
m	meters
mm	millimeters
MoAC	Ministry of Agriculture and Cooperatives
MoE	Ministry of Environment
NPC	National Planning Commission
TS	Terai and Siwalik
TU	Tribhuvan University
UNEP	United Nations Environment Programme
WMO	World Meteorological Organization