# ANALYSIS OF PRODUCTION FUNCTION AND VALUE CHAIN OF TOMATO IN SELECTED POCKET AREAS OF BAGLUNG DISTRICT

**A** Thesis

Submitted to the Central Department of Economics, Faculty of Humanities and Social Sciences, Tribhuvan University, Kirtipur, Kathmandu, Nepal in partial fulfillment of the requirements for the Degree of MASTER OF ARTS in ECONOMICS

By

SANGITA SHARMA Roll No.: 74 / 2015 TU Regd. No.:6-1-53-492-2005 Central Department of Economics Tribhuvan University, Kirtipur, Kathmandu, Nepal October, 2018

#### **RECOMMENDATION LETTER**

The thesis entitled ANALYSIS OF VALUE CHAIN OF TOMATO IN SELECTED POCKET AREA OF BAGLUNG DISTRICT has been prepared by Mrs. Sangita Sharma, student of M.A. Economics, Tribhuvan University, Kathmandu under my guidance and supervision. I hereby forward this thesis to the evaluation committee for final evaluation and approval.

> Prof. Sohan Kumar Karn, PhD Central Department of Economics Kirtipur, Kathmandu Nepal

Date: 2075/05/03

19<sup>th</sup> August, 2018

#### **VIVA-VOCE SHEET**

We have conducted the viva-voce examination of the thesis

Submitted by

#### Ms. Sangita Sharma

### Analysis of Production Function and Value Chain of Tomato in Selected Pocket Areas of Baglung District

And found the thesis to be the original work of the student and written according to the prescribed format . We recommended the thesis to be accepted as the partial fulfillment of the requirement of Masters in Economics.

Thesis Committee

.....

Prof .Kushum Shakya (Ph.D)

(Head of the Department)

•••••

Prof. Ramchandra Dhakal (Ph.D)

(Externa Examiner)

.....

Prof. Sohan Kumar Karn (Ph.D)

(Thesis Supervisor)

Date: 2075/06/18 4<sup>th</sup> October, 2018

#### **ACKNOWLEDGEMENTS**

I would like to express my deepest gratitude to my supervisor, Prof. Dr. Sohan Kumar Karn for his excellent guidance, caring, patience, and providing me with an excellent atmosphere for doing research. It is my great pleasure to submit this thesis under his guidance. I would like to express my gratitude to all the respondents, for the participants of Key Informants Interview (KII) for their kind assistance for providing valuable information during field survey.

I am thankful to various stakeholder of the Baglung district, District Agriculture Development Office, DYC, Baglung for providing first hand as well as second hand data required for the study. I would also like to express my sincere thanks to all the value chain stakeholders who contributed valuable time and information for my study.

I take an opportunity to thank Tribhuvan University for providing me an opportunity to pursue a Master Degree. I would like to thank to respected teachers and staffs of the Central Department of Economics for their suggestions, help and cooperation.

I want to express my gratitude to my beloved husband, Mr. Basanta Gautam for his great support and encouragement throughout my study.

Sangita Sharma October, 2018

# Table of Contents

|                  |  | Page No. |
|------------------|--|----------|
| Reco             | ommendation Letter                           | i        |
| Viva-voce Sheet  |  | ii       |
| Acknowledgements |  | iii      |
| Tabi             | le of Contents                               | iv       |
| List             | of Tables                                    | vii      |
| List             | of Figures                                   | viii     |
| Abb              | reviations                                   | ix       |
| CHA              | APTER – I: INTRODUCTION                      | 1-6      |
| 1.1              | Background                                   | 1        |
| 1.2              | Statement of the Problem                     | 4        |
| 1.3              | Objectives of the Study                      | 5        |
| 1.4              | Significance of the Study                    | 5        |
| 1.5              | Limitations of the Study                     | 6        |
| 1.6              | Organization of the Study                    | 6        |
| CH               | APTER – II: REVIEW OF LITERATURE             | 7-21     |
| 2.1              | Theoretical Concept                          | 7        |
|                  | 2.1.1 Value Chain                            | 7        |
|                  | 2.1.2 Production Function                    | 8        |
| 2.2              | International Context                        | 9        |
| 2.3              | National Context                             | 16       |
| 2.4              | Research Gap                                 | 21       |
| CHA              | APTER – III: RESEARCH METHODOLOGY            | 22-27    |
| 3.1              | Research Design                              | 22       |
| 3.2              | Nature and Sources of Data                   | 22       |
| 3.3              | Description of the Study Area                | 22       |
| 3.4              | Sample Size, Sampling Method                 | 24       |
|                  | 3.4.1 Selection of Tomato Growers            | 24       |
|                  | 3.4.2 Selection of Wholesalers and Retailers | 24       |

|     | 3.4.3                | Selection of Input Suppliers   | 25    |
|-----|----------------------|--|-------|
|     | 3.4.4                | Selection of Consumers   | 25    |
| 3.5 | Metho                | ods and Tools of Data Analysis                                       | 25    |
|     | 3.5.1                | Coefficient of Determination (R-square)                              | 25    |
|     | 3.5.2                | Goodness of fit: ANOVA Table   | 26    |
|     | 3.5.3                | To Test Multicollinearity , Variance Inflating Factor(VIF) Method is |       |
|     |                      | used   | 26    |
|     | 3.5.4                | To Test Autocorrelation, Darwin Watson (D-W) Method is used          | 26    |
| 3.6 | Mode                 | Specification and Its Features                                       | 27    |
|     | 3.6.1                | Cobb Douglas Production Function                                     | 27    |
| CHA | APTER                | <b>X – IV: PRESENTATION AND ANALYSIS OF DATA</b>                     | 28-44 |
| 4.1 | Descri               | ption of Study Area  | 28    |
| 4.2 | Land Holding Size 28 |  | 28    |
|     | 4.2.1                | Land Holding Size of Active Tomato Growers of Baglung                | 29    |
|     | 4.2.2                | Landholding Size of Tomato Growers on Selected Pocket Area of        |       |
|     |                      | Baglung  | 29    |
| 4.3 | Farmi                | ng Experience  | 30    |
| 4.4 | Value                | Value Chain Mapping and Analysis 31                                  |       |
|     | 4.4.1                | Mapping the Flow of Input  | 31    |
|     | 4.4.2                | Marketing Channels   | 32    |
|     | 4.4.3                | Marketing Margin and Producer's Share                                | 34    |
|     | 4.4.4                | Price Behavior   | 34    |
|     | 4.4.5                | Market Information   | 35    |
| 4.5 | Econo                | mics of Production of Tomato   | 36    |
|     | 4.5.1                | Share of Different Cost Items for Tomato Production Per Ropani       | 38    |
|     | 4.5.2                | Production Function Model Estimation and Productivity Analysis       | 39    |
|     | 4.5.3                | C-D Production Function  | 39    |
|     | 4.5.4                | Productivity of Tomato   | 42    |
| 4.6 | Const                | raints of Tomato Production and Marketing                            | 43    |

| CHAPTER – V: SUMMARY, CONCLUSION AND RECOMMENDATIONS   |   | 45-50 |
|--|---|-------|
| 5.1  | Summary   | 45    |
| 5.2  | Conclusions   | 49    |
| 5.3  | Recommendations   | 50    |
| REFERENCES   |   | 51-54 |
| APPENDICES   |   | 55-69 |
| App  | endix A: List of Farmers with Production Cost and Quantity of Tomato Produced |       |
|  | Per Ropani of Land  | 55-58 |
| App  | Appendix B: Log Value of Different Cost Items of Tomato Production Per Ropani |       |
| Appendix C: Semi-structured Questionnaire for Farmers  |   | 63-67 |
| Appendix D: Questionnaire or Wholesalers and Retailers |   | 68-69 |
|  |   |       |

# LIST OF TABLES

| Table No. | Title   | Page No. |
|-----------|---|----------|
| Table 4.1 | Size of landholding   | 29       |
| Table 4.2 | Actors and Enablers of Vegetable Value Chain of Tomato        | 31       |
| Table 4.3 | Marketing Margin and Producers Share                          | 34       |
| Table 4.4 | Average Cost of Production Per Ropani                         | 37       |
| Table 4.5 | Result of OLS Regression as Log Linear CD Production Function | 40       |
| Table 4.6 | ANOVA Table and D-W Test                                      | 42       |
| Table 4.7 | Index of production constraints                               | 43       |
| Table 4.8 | Index of marketing constraints                                | 44       |

## LIST OF FIGURES

| Figure No. | Title  | Page No. |
|------------|--|----------|
| Fig.1      | Baglung District in Map of Nepal                               | 23       |
| Fig. 4.1   | Bar diagram showing land holding size of study area            | 30       |
| Fig. 4.2   | Farmers' experience in tomato growing                          | 30       |
| Fig. 4.3   | Flow of inputs in study area                                   | 32       |
| Fig. 4.4   | Value chain mapping of study area                              | 33       |
| Fig. 4.5   | Graph showing price behavior in Kalimati vegetable market      | 35       |
| Fig. 4.6   | Amount of tomato production in comparison to total vegetable   | 36       |
| Fig. 4.7   | Share of different cost items for tomato production per ropani | 38       |

### **ABBREVIATIONS**

| CBS              | Central Bureau of Statistics                        |
|------------------|---|
| CD               | Cobb-Douglas  |
| CEDECON          | Central Department of Economics                     |
| CES              | Constant Elasticity of Substitution                 |
| CRS              | Constant Returns to Scale                           |
| DDC              | District Development Committee                      |
| DRS              | Decreasing Returns to Scale                         |
| FAO              | Food and Agriculture Organization                   |
| FY               | Fiscal Year   |
| GDP              | Gross Domestic Production                           |
| INGO             | International Non- Government Organization          |
| IRS              | Increasing Returns to Scale                         |
| MOF              | Ministry of Finance                                 |
| MOAD             | Ministry of Agricultural Development                |
| MP               | Marginal Propensity                                 |
| MPP <sub>K</sub> | Marginal Physical Productivity of Capital           |
| MPPL             | Marginal Physical Productivity of Labor             |
| MRTS             | Marginal Rate of Technical Substitutions            |
| MT               | Metric Tons   |
| NPC              | Nepal Population Clock                              |
| No.              | Number  |
| OLS              | Ordinary Least Square                               |
| PACT             | Project for Agriculture Commercialization and Trade |
| Rs               | Rupees  |
| TE               | Technical Efficiency                                |
| TEPC             | Trade and Export Promotion Centre                   |
| US               | United States                                       |
| VDC              | Village Development Committee                       |
| WB               | World Bank  |