
FACULTY OF AGRICULTURE AND ANIMAL SCIENCES

**EFFECTS OF CLIMBING BEAN PRODUCTION ON SMALLHOLDER FARMERS'
LIVELIHOODS IN BUDWALE SUBCOUNTY, MBALE DISTRICT**

BY

MAJEME NASIF WAMOKA

REG.NO:BU/UP/2019/1074

E-MAIL: majemenasif@gmail.com

SUPERVISOR: DR. RONALD KABBIRI

**A RESEARCH REPORT SUBMITTED TO THE DEPARTMENT OF
AGRIBUSINESS AND EXTENSION IN PARTIAL FULLFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF A BACHELOR OF AGRIBUSINESS OF
BUSITEMA UNIVERSITY**

MAY 2023

DECLARATION

I **Majeme Nasif Wamoka**, hereby declare that the work presented in this attachment report is out of my personal commitment and effort and has never been submitted anywhere else by any other student for an award of Bachelor's degree in agribusiness.

Name: Majeme Nasif Wamoka

Sign:*Majeme*.....**Date:** *26/05/2023*.....

APPROVAL

This research was under supervision of

ACADEMIC SUPERVISOR

DR. RONALD KABBIRI

Sign:

Date:

Handwritten signature and date in blue ink. The signature is a stylized cursive script, and the date is written as "26/5/2023".

DEDICATION

I dedicate this research to the almighty Allah who has given me the gift of life and knowledge. I also dedicate this report to my dearest father Mr. Wamoka Asadi who has been there from the beginning through financing, caring and support.

ACKNOWLEDGEMENTS

I take my sincere gratitude to my parent Wamoka Asadi and Big brother Mauki Moses who have encouraged me and supported me with financial assistance throughout my research. I also thank the academic supervisor Dr. Kabbiri Ronald for his wholesome support and guidance and not also forgetting other supervisors Dr. Magumba David, Mr Okiror Simon Peter, Mr Ogulli Francis, Mr Amayo Robert and Mr Mayanja Ibrahim and others for their criticisms, advice and encouragement that has helped me to complete this report successful.

I also thank all my colleagues Kemigisha Ritah Valentine, Adongo Patricia, Opolot Calvin, and Wadada Fahad and other friends whom I interacted with both with in university and outside university for their words of encouragement have been more helpful to me.

ABSTRACT

Climbing bean has been a key source of dietary proteins to smallholder farmers and their families in Budwale subcounty for more than 20 years. This study therefore examined its relative effects to farmers' livelihoods and the objectives were determining the socio economic characteristics of the farmers, their different perceptions on climbing bean production and consumption, as well as determining climbing bean profitability. It involved data collection using simple random sampling technique where four parishes Budwale, Buwanangadi, Bunamahe and Bukingala in Budwale subcounty were chosen and respondents were randomly selected from every parish. Questionnaires were employed during data collection and data was analysed using Excel and SPSS version 20 .The results showed that male dominated females by a percentage of 87.5% to 12.5% respectively, most farmers who were engaged were having between 36-45 years of age (33.3%).The farmers perceptions show that climbing beans were easy to grow, grown for both subsistence and sale, easy to prepare and had a nice taste. Furthermore, the results on gross margins show that climbing beans were profitable where farmers got an average gross margin of 1,148,331Ushs/acre. This study also revealed that NABE 12C was the most grown variety. This study therefore concludes that climbing beans are highly profitable and can increase incomes of smallholder farmers and as well as improve the food security amongst households. Therefore the study recommends that smallholder farmers should consolidate their land to grow more climbing beans, more subsidies on agro inputs to support farmers and extension services enhanced to train farmers.

TABLE OF CONTENTS

DECLARATION	i
APPROVAL	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS AND ACRONYMS	xi
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background of study	1
1.2 Problem Statement	2
1.3 Objectives of the study.....	2
1.3.1 General objective	2
1.3.2 Specific Objectives.	2
1.4 Research questions.....	3
1.5 Significance of the study.....	3
1.6 Justification of the study	3
1.7 Scope of the study	3
1.8 Limitations of the study.	4
1.9 Operational definition of key terms	4
CHAPTER TWO	5
LITERATURE REVIEW	5
2.1 Introduction of climbing bean in Uganda	5
2.2 Importance of climbing beans in Uganda.	5
2.3 Areas for cultivating climbing beans in Uganda.....	6
2.4 Climbing beans and food security.....	6
2.5 Climbing and incomes of smallholder farmers.	6
2.6 Determining gross margins	6
2.6.1 Gross margin Analysis.	6
2.6.2 Uses of gross margin.....	7

2.6.3 Limitations of gross margin.....	7
2.6.4 Empirical studies on profitability.....	7
2.7 Challenges facing climbing beans.....	7
CHAPTER THREE.....	8
METHODOLOGY.....	8
3.1 Introduction.....	8
3.2 Conceptual framework.....	8
3.3 Study area.....	9
3.4 Research design.....	9
3.5 Study population.....	9
3.6 Sample size.....	10
3.7 Sampling strategy.....	10
3.8 Data collection methods.....	10
3.9 Data analysis and interpretation.....	10
3.10 Data presentation.....	11
3.11 Ethical consideration.....	11
CHAPTER FOUR.....	12
RESULTS AND DISCUSSIONS.....	12
4.1 Introduction.....	12
4.2 Descriptive statistics of socio-economic characteristics of climbing bean smallholder farmers 12	
4.2.1 Social characteristics of climbing bean farmers.....	12
4.2.1.1 Age and gender of respondents.....	12
4.2.1.2 Marital status of respondent and Education level of respondents.....	12
4.2.1.3 Household size, household head and number of children.....	13
4.2.1.4 Land size, Land acquisition and Living standards.....	13
4.2.2. Economic factors.....	15
4.2.2.1 Occupation and Economic activities carried out by farmers.....	15
4.2.2.2 Main source of income and other sources of income.....	15
4.2.2.3 Average monthly income of the respondents.....	15
4.3.0 Perceptions on production and consumption.....	16
4.3.1 Perception on production.....	16
4.3.2 Perception on consumption.....	16
4.4.0 Gross margins of climbing beans.....	17
4.5.0 Overview on climbing beans in Budwale subcounty.....	18
4.5.1 Main varieties grown in study area.....	18

4.5.2 Time taken in climbing bean cultivation.....	19
4.5.3 Seasons for growing climbing beans	19
4.5.4 Off-farm activities.....	20
CHAPTER FIVE	21
CONCLUSIONS AND RECOMMENDATIONS.....	21
5.1 Conclusions.....	21
5.1.1 Socio-economic characteristics.....	21
5.1.2 Perceptions on production.....	21
5.1.3 Perceptions on consumption.....	21
5.1.4 Gross margin of climbing bean.....	21
5.2 Recommendations.....	22
REFERENCES.....	23
APPENDIX.....	28

LIST OF TABLES

Table 1: Descriptives of social characteristics	14
Table 2: Economic characteristics of climbing bean farmers	15
Table 3: Perceptions on production	16
Table 4: Perceptions on consumption	17
Table 5: Gross margins of climbing beans per acre in Budwale subcounty	17

LIST OF FIGURES

Figure 1: Conceptual framework	8
Figure 2: Map of Mbale district showing Budwale subcounty.....	9
Figure 3: Percentage of climbing bean varieties grown in Budwale Subcounty	18
Figure 4: Why farmers choose NABE 12c	18
Figure 5: Years taken in climbing bean cultivation.	19
Figure 6: Different seasons farmers grow climbing beans.	19
Figure 7: Percentages showing off farm activities.....	20

LIST OF ABBREVIATIONS AND ACRONYMS

CASA	Commercial Agriculture for Smallholders and Agribusiness
CGIAR	Consortium of International Agricultural Research Centers
CIAT	International Centre for Tropical Agriculture
ECABREN	East and Central African Bean Research Network
FAO	Food and Agriculture Organisation
GM	Gross margins
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MAC	Mid-Altitude Climbers
NABE	Narobeian
NARO	National Agricultural Research Organisation
PABRA	Pan African Bean Research Alliance
SPSS	Statistical Packages for Social Sciences
TR	Total revenue
TVC	Total variable costs
UBOS	Uganda Bureau of statistics
UNLRP	Uganda National Legumes Research Program

CHAPTER ONE

INTRODUCTION

1.1 Background of study

Common bean (*Phaseolus vulgaris*) is a legume which was domesticated 8000 years ago in the Americas and it's regarded as a staple food in the world today. Common bean is known to be an important source of protein and micronutrients. It's also appreciated in developing countries for their affordability (compared to animal protein) and its long storage life (Castro-guerrero et al., 2016). Common beans is often considered as the meat of the poor because of its high protein content and affordability (Larochelle & Alwang, 2015). In Eastern and Southern Africa, it is an important component of the production systems and a major source of protein. In Uganda it's an important staple food and important income source for majority of farmers and consumers. (Namayanja et al., 2018) and an important protein for over 30 million Ugandan (Beebe et al., 2016). Common beans are the most important grain legume in Uganda in terms of cultivated area, since more than 60% about 925,000ha of the total area under grain legumes is used for the cultivation of beans. Uganda is the largest producer of beans (44% of total bean production) and these beans are cultivated twice a year when sown in February/March and August/September (Bruere et al., 2014). However in this study our main emphasis is on the climbing beans. Currently, climbing beans constitute 20% of the total land area under bean cultivation (Takusewanya et al., 2018). The first improved climbing bean varieties were introduced from Rwanda through a targeted breeding programme in Rwanda since the mid-1980s (Ronner et al., 2018) through the East and Central African Bean Research Network (ECABREN) were officially released in 1999 in Uganda. These included NABE7C, NABE8C, NABE9C and NABE10C MAC31 as NABE12C (Takusewanya et al., 2018) However, climbing beans were traditionally grown in the high altitude areas of Kabale, Kisoro and Mbale. But they are being promoted to other areas with the introduction of the mid-altitude climbers (MACs) by the Uganda National Legumes Research Program (UNLRP). These climbing beans can yield 2-3 times higher than bush bean and is therefore a good option to increase bean yields in the eastern and south-western highlands (Marinus, 2015). These higher yields of climbing bean are attributed to higher leaf area index, which enables capturing of a bigger proportion of the available radiation than bush bean. In addition to that, they have longer periods of growth and maturity (4 months)" indeterminate" as compared to early maturing bush beans (3

REFERENCES

- kool, B. (2014). Farmers' practices and value chain of climbing bean production in South Western Uganda. *South Western Uganda Farmers' practices and value chain of climbing bean production in South Western Uganda. N2Africa Project Report Wageningen University, February.*
- Akter, T., Parvin, M. T., Mila, F. A., & Nahar, A. (2019). *Factors determining the profitability of rice farming in Bangladesh.* 17(1), 86–91.
- Bagamba, F., Ssenyonga, J. W., Tushemereirwe, W. K., & Gold, C. S. (1998). Performance and profitability of the banana sub-sector in Uganda farming systems. *Africa, April,* 729–739.
- Beebe, S., Chirwa, R., Rubyogo, J. C., Katungi, E., Clare, M., Bodo, R., Mutari, B., Nkalubo, S., Chisale, V., Macharia, D., Kamau, E., Kweka, S., Kilango, M., Karanja, D., Ugen, M., Demissie, D. A., & William, M. (2016). *Enhancing common bean productivity and production in Sub-Saharan Africa.* 64–101.
- Biam, C. K., & Tsue, P. T. (2013). *Profitability of Soyabean Production by Small Holder Farmers in Nigeria : A Guide for Sustainable Food Security .* 5(30), 89–97.
- CASA. (2020). *Beans Sector Strategy.* April.
- Castro-guerrero, N. A., Isidra-arellano, M. C., Mendoza-cozatl, D. G., González-guerrero, M., & Grusak, M. A. (2016). *Common Bean : A Legume Model on the Rise for Unraveling Responses and Adaptations to Iron , Zinc , and Phosphate Deficiencies.* 7(May), 1–7. <https://doi.org/10.3389/fpls.2016.00600>
- CGIAR. (2020). *Climbing bean technologies helped households increase productivity and food security in Rwanda.* <https://mel.cgiar.org/projects/-15/283/climbing-bean-technologies-helped-08-m-farming-households-increase-productivity-and-food-security-resulting-to-about-5000-households-climbing-out-of-poverty-in-land-constrained-rwanda>

- CIAT. (2008). *Farm level impacts of improved bean varieties and agronomic technologies in Rwanda*. 41, 2.
- David, S. (1999). *Beans in the farming system and domestic economy of Uganda : a tale of two parishes*. 28.
- Gaspard, N., Claude, T. J., Roger, M., Mburu, D. M., Jean, S., Vianney, M., & Ogwal, H. (2021). *An Economic Analysis of the Factors Influencing Adoption of Climbing Beans Varieties and Challenges of Smallholder Farmers in Rwanda : A Case Study of Burera District* To cite this article : 7(6), 191–198. <https://doi.org/10.11648/j.ebm.20210706.15>
- Kampala report. (2022). *Ugandan farmers adopt climbing beans for food security*. <https://www.thekampalareport.com/money/farming/2022072117290/ugandan-farmers-adopt-climbing-beans-for-food-security.html>
- Katungi, E., Larochelle, C., & Mugabo, J. (2016). *Estimating the impact of climbing bean adoption on bean productivity in Rwanda : Endogenous Switching Regression* .
- Katungi, E., Larochelle, C., Mugabo, J., & Buruchara, R. (2019). *Climbing bean as a solution to increase productivity in land-constrained environments : Evidence from Rwanda*. 48(1), 28–36. <https://doi.org/10.1177/0030727018813698>
- Katungi, E. M., Larochelle, C., Mugabo, J. R., & Buruchara, R. (2017). *The effect of climbing bean adoption on the welfare of smallholder common bean growers in Rwanda*.
- Krause, M. (2019). *Farm Gross Margin and Enterprise Planning Guide*. https://grdc.com.au/__data/assets/pdf_file/0034/392875/Gross-Margin-Enterprise-Planning-Guide-2020.
- Kulyakwave, D., Xu, S., Yu, W., Sary, S., & Muyobozi, S. (2020). *Profitability Analysis of Rice Production , Constraints and Consumption Profitability Analysis of Rice Production , Constraints and Consumption Shares by Small- scale Producers in Tanzania*. January. <https://doi.org/10.9734/AJAEES/2019/v37i430280>

- Larochelle, C., & Alwang, J. (2015). *Impacts of Improved Bean Varieties on Food Security in Rwanda Impacts of Improved Bean Varieties on Food Security in Rwanda. July 2014.*
- Larochelle, C., Alwang, J., & Norton, G. W. (2015). *Impacts of Improved Bean Varieties on Poverty and Food Security in Uganda CGIAR - CABI (Issue January 2016).*
<https://doi.org/10.1079/9781780644011.0314>
- Larochelle, C., Dorene Asare-Marafo, Birol, E., & Alwang, J. (2016). Assessing the Adoption of Improved Bean Varieties in Rwanda and the role of varietal Attributes in Adoption Decisions. *Harvest Plus, September.*
- Larochelle, C., Katungi, E., & Cheng, Z. (2016). *Household consumption and demand for bean in Uganda : Determinants and implications for nutrition security.*
- Marinus, W. (2015). *Opportunities and constraints for climbing bean (Phaseolus vulgaris L.) cultivation by smallholder farmers in the Ugandan highlands. July.*
- Monitor. (2021). *Climbing Beans: More pods, more yields, ready markets.*
<https://www.monitor.co.ug/uganda/magazines/farming/climbing-beans-more-pods-more-yields-ready-markets-1538338>
- Namayanja, A., Nkalubo, S., Odong, T. L., & Bwogi, G. (2018). *Climbing beans in Uganda : A perspective of smallholder farmers on their determinants , associated challenges and implications for research. September 2020.* <https://doi.org/10.5897/AJAR2017.12131>
- Nasar, S., Shaheen, H., Murtaza, G., Tinghong, T., Arfan, M., & Idrees, M. (2023). *Socioeconomic Evaluation of Common Bean (Phaseolus vulgaris L .) Cultivation in Providing Sustainable Livelihood to the Mountain Populations of Kashmir Himalayas.*
- Organic farmer. (2021). *Growing runner beans for improved food security – The Organic Farmer.* <https://theorganicfarmer.org/growing-runner-beans-for-improved-food-security/>
- PABRA. (2015). *How to stake climbing beans.* <https://www.pabra-africa.org/how-to-stake-climbing-beans/>

- Patrick, T. (n.d.). *Factors affecting production and Marketing in Nyakitunda Subcounty, Isingiro District.*
- Ronner, E., Descheemaeker, K., Almekinders, C. J. M., Ebanyat, P., & Giller, K. E. (2018). Agriculture , Ecosystems and Environment Farmers ' use and adaptation of improved climbing bean production practices in the highlands of Uganda. *Agriculture, Ecosystems and Environment*, 261(September 2017), 186–200.
<https://doi.org/10.1016/j.agee.2017.09.004>
- Ronner, E., Descheemaeker, K., Marinus, W., Almekinders, C. J. M., Ebanyat, P., & Giller, K. E. (2018). How do climbing beans fit in farming systems of the eastern highlands of Uganda ? Understanding opportunities and constraints at farm level. *Agricultural Systems*, 165(December 2017), 97–110. <https://doi.org/10.1016/j.agry.2018.05.014>
- Sibiko, K. W. (2012). DETERMINANTS OF COMMON BEAN PRODUCTIVITY AND EFFICIENCY: A CASE OF SMALLHOLDER FARMERS IN EASTERN UGANDA. *Thesis.*
- Siri, B. N., Nchanji, E. B., & Tchouamo, I. R. (2020). *A Gender Analysis on the Participation and Choice of Improved and Local Haricot Bean (Phaseolus vulgaris L .) by Farmers in Cameroon.* 1199–1216. <https://doi.org/10.4236/as.2020.1112079>
- Takusewanya, R., Namayanja, A., Ugen, M. A., Nkalubo, S., Odong, T. L., & Bwogi, G. V. (2018). *Climbing beans in Uganda : A perspective of smallholder farmers on their determinants , associated challenges and implications for research.* 13(27), 1374–1388.
<https://doi.org/10.5897/AJAR2017.12131>
- Takusewanya, R., Namayanja, A., Vianney, G., Mwine, J., & Odong, T. L. (2017). *assessment of staking in a climbing bean production system as practiced by smallholder farmers in uganda.* 2(February), 18–27.
- UBOS. (2022). *Annual Agricultural Survey (AAS) 2019 – Statistical Release.* 2019, 1–10.

Venance, S. K. (2016). Factors influencing onfarm common Bean Profitability. The case of smallholder Bean farmers in Babati District, Tanzania. *Journal of Economics and Sustainable Development*, 7(22), 28.