

**MARKET STRUCTURE AND PRODUCT UPGRADING IN THE SHEA
NUT VALUE CHAIN IN NORTHERN UGANDA**

**AKATWETABA DEBORAH
REG.N0: 17/U/3031/PHD
DIP. EDUC., B.VOC, MARI**

**A THESIS SUBMITTED TO THE DIRECTORATE OF RESEARCH AND
GRADUATE TRAINING IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR
OF PHILOSOPHY IN AGRICULTURAL AND APPLIED BIO-SCIENCES
OF GULU UNIVERSITY**

OCTOBER, 2025

DECLARATION

I Akatwetaba Deborah hereby declare that this research is entirely my own work and that it has not been submitted for the award of a degree at any other University.

Signature: Date 25th October 2025

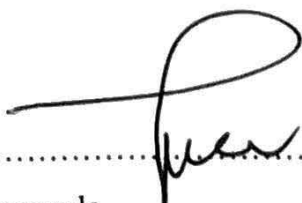
Akatwetaba Deborah

REG.N0: 17/U/3031/PHD



APPROVAL

This is to certify that this thesis developed under our supervision is now ready for submission to the Directorate of Research and Graduate studies of Gulu University.

Signature:  Date: 27/10/2025

Assoc. Prof. Basil Mugonola

Department of Rural Development and Agribusiness,

Faculty of Agriculture and Environment, Gulu University

P.O. Box 166, Gulu, Uganda

E-mail: b.mugonola@gu.ac.ug

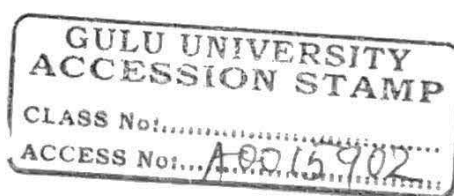
Signature:  Date: 26.10.2025

Dr. Appolo Kasharu

Department of Agriculture and Biological sciences

Faculty of Science and Technology

Uganda Christian University, Mukono



DEDICATION

To my family and more especially to my youngest son Amanyire Daniel Muhinda for their patience and endless support. Be blessed.

ACKNOWLEDGEMENT

I thank the Almighty God for giving me the gift of life and for enabling me to do this research.

I would like to express my deep and sincere gratitude to my supervisors Associate Prof. Mugonola Basil, Dr. Kasharu, Apolo for their professional guidance that has made my research to reach this level. Special thanks also to the family of Dr. Aliro Tony, Dr. Okello Daniel Micheal, Dr. Abenanye Jackline and Mr. Kabyanga Moris,,Dean faculty of Agriculture and Environment Dr.Okello Collins Prof.Opio Fina ,Prof. Ndyomugyenye Elly, Prof.Ogwang Charlce Prof. Kamatenesi Mauda Mugisha for their professional guidance that enabled me reach this far. I appreciate the contribution of my study respondents from the study sites, namely; from Gulu, Lira and Otuke for the cooperation given to me. Special thanks also go to my research assistants namely; Queen Priscilla and Dalton Karira who travelled long distances and ensured that the work was completed on time.

I also thank my dear sons Joshua, Joash, Joab and my youngest son Daniel in a special way for their support and courage given to me throughout the PhD journey that has not been easy at all. As the saying goes that the journey of 1000 miles begins with the first step, I can't under estimate their contributions. Special thanks to my husband Dr. Amanyire Jordan that is always and has always been there for me.

My former lecturers; Prof Fina Mr Waswa Bright, Ms. Kyomuhendo Jackline, Mr. Tumusiime Benard, Prof. Semakula Edward, and Associate prof. Kazibwe and Associate Prof. Kalibwani Rebecca. Their contribution should not be underestimated. I can't forget the former university secretary Ms Annah Asimwe and for their guidance and support to date. I also thank my doctoral committee that included Supervisors Dr. Kawube Godfrey, late Dr. Gregory and for their guidance in thesis preparation and presentation. The contribution of Prof. Egeru Anthony from Makerere university especially in securing the study grant shouldn't be forgotten. I shouldn't also forget Gulu university staff notably Dr. Aciro Eunice, Dr. Akite Irine, Thomas, Mercies Deric and Kasima Junior that helped me during defense preparation

Special thanks to my mother Mrs. Jovia Tushabe for her continuous prayers and guidance to date, my father Mr. George Baraba and late step mother Margaret Baryomunyena who provided the foundation stone to my education career. I also thank my sister Prosy Akankunda for standing in

for me when I needed her support. The following families are recognized for their contribution in my career advancement. They include the families of; Alex Yekwase, Late

Mboine, late Nkunda, Rev, Rwabushaia, and Davis Biryabarema. I can't forget their contributions of my late grandmother. Esther Masharazi for the motherly guidance. I also thank Bishop Stuart University administration for the research grant that helped me during data collection and publication. I would also like to thank RUFORUM management that covered my tuition and functional fees without which I wouldn't have been possible to complete the program. Finally, would like to thank all my friends who prayed and supported me in my academic struggle. May the Almighty God richly and immeasurably reward you all!

TABLE OF CONTENTS

DECLARATION	i
APPROVAL.....	ii
DEDICATION	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENTS	vi
LIST OF TABLES	xi
LIST OF FIGURES.....	xii
LIST OF ABBREVIATIONS AND ACRONYMS.....	xiii
LIST OF ORIGINAL PUBLICATIONS	xiv
ABSTRACT.....	xv
CHAPTER ONE	1
GENERAL INTRODUCTION	1
1.1 Background	1
1.2 Statement of the Problem	3
1.3 Objectives of the study.....	4
1.3.1 General Objective.....	4
1.3.2 Specific Objectives.....	4
1.4 Research Questions	5
1.5 Justification of the Study.....	5
1.6. Scope of the Study.....	6
1.7. Theoretical perspectives	6
1.7.1 Utility Maximization Theory	6
1.7.2 Social Network Theory	7
1.8 Conceptual Framework	7
1.9 Outline of the thesis	8
CHAPTER TWO	10
LITERATURE REVIEW.....	10
2.1 Theoretical Review	10
2.2 Value Chain Concept	12
2.1.1 Filière Concept	12
2.1.2 Porter's Concept.....	13

2.1.3 The Global concept	14
2.3 Shea nut product markets	15
2.3.1 International Shea nut market	15
2.3.2 East African Shea nut market	15
2.4 Typologies of Shea nut value chain participation	17
2.5 Empirical Review	21
2.5.1 Competitiveness Among Shea Nut Value Chain Actors.....	21
2.5.2 Value Addition and Product Upgrading Among Shea Collectors.....	24
2.5.3 Marketing Arrangements and Determinants in the Shea Nut Value Chain	26
2.5.4 Governance Structures and Upgrading Opportunities in the Shea Nut Value Chain	28
2.6 Summary of Literature	31
CHAPTER THREE.....	33
GENERAL RESEARCH METHODOLOGY	33
3.1 Study Context and Philosophical Underpinning	33
3.2 Study area description	33
3.3 Study population and research design.....	35
3.4 Sampling and Sample design	35
3.5 Data Collection.....	36
3.6 Data Analysis	37
3.7 Ethical considerations.....	38
CHAPTER FOUR.....	39
AN ASSESSMENT OF THE COMPETITIVENESS OF SHEA ACTORS IN THE SHEA NUT VALUE CHAIN OF NORTHERN UGANDA	39
4.1 Introduction	40
4.2 Methods.....	41
4.3 Results	43
4.3.1 Summary Statistics	43
4.3.2 Market Share of Shea value chain actors	44
4.3.3 Concentration ratio of the four largest actors for each player	44
4.3.4 Factors influencing actors' market share.....	45
4.4 Discussions.....	46
4.5 Conclusion.....	47

CHAPTER FIVE.....	49
DRIVERS OF VALUE ADDITION AND PRODUCT UPGRADING TO SHEA NUTS BY COLLECTORS IN NORTHERN UGANDA.....	49
5.1 Introduction	50
5.2 Methods.....	53
5.3 Results	56
5.3.1 Socio-demographic Characteristics	56
5.3.2 Shea nut value addition and product upgrading.....	57
5.3.3 Factors influencing Shea nut value upgrading among Shea nut collectors	59
5.4 Discussions.....	64
5.5 Conclusions	68
CHAPTER SIX	69
DETERMINANTS OF SHEA NUT MARKETING ARRANGEMENTS IN NORTHERN UGANDA	69
6.1 Introduction	70
6.2. Methods.....	73
6.3 Results.....	76
6.3.1 Socio-demographic and Economic Characteristics	76
6.3.2 Marketing Arrangements for Shea nuts and/or products.....	77
6.3.3 Factors influencing choice of Shea nut marketing arrangement	78
6.4 Discussions.....	82
6.5 Conclusions	87
CHAPTER SEVEN.....	88
ACTORS, CHALLENGES AND OPPORTUNITIES IN THE SHEA VALUE OF NORTHERN UGANDA	88
7.1 Introduction	88
7.2 Methods.....	90
7.2.1 Data Collection.....	90
7.2.2 Study Participants.....	90
7.2.3 Data Analysis.....	91
7.3 Results.....	92
7.3.1 The Shea Value chain actors and their conduct	92
7.3.2 Governance, power relations and challenges in Shea value chain of northern Uganda.....	94

7.3.3 Existing opportunities in the Shea value chain	97
7.4 Discussion	98
7.5 Conclusions	100
CHAPTER EIGHT.....	101
SUMMARY, CONCLUSIONS AND RECOMMENDATION	101
8.1 Introduction	101
8.2 Research objectives revisited	101
8.2.1 The level of competitiveness among Shea actors.....	101
8.2.2 Factors that influence upgrading in the Shea nut value chain.....	102
8.2.3 Factors that influence choice of marketing arrangements for marketing of Shea products.....	102
8.2.4 Challenges and opportunities that can be exploited in the Shea nut value chain.....	103
8.3 Conclusions	103
8.4 Recommendations	105
8.5 Limitations and suggestions for further research	105
REFERENCES.....	107
APPENDICES.....	124
Appendix 1: Chapter 1-7 Appendices	124
Appendix 1.1: Research Tools	124
Appendix 1.1.1: Questionnaire for Shea nut collectors.....	124
Appendix 1.1.2: Questionnaire for Shea nut Traders.....	134
Appendix 1.1.3: Questionnaire for Shea nut Processors	144
Appendix 1.1.4: Focus Group Discussion guide for Key Value Chain Actors (Traders and processors researchers, district officials).....	154
Appendix 1.1.5: Key informant interviews guide for – Government/Local official.....	155
Appendix 1.1.6: Key informant interviews guide for - Research and development organizations	156
Appendix 2: Approval documents.....	157
Appendix 1.2.1: GUREC Approval	157
Appendix 1.2.2: Uganda National Council for Science and Technology Approval	159
Appendix 1.2.4: District acceptance letters to carryout research	161
Appendix 3: Chapter 6 Appendices	164
Appendix 3.1: Correlation matrix for explanatory variables	164

Appendix 3.2: VIF	165
Appendix 3.3: Model fit indices.....	166
Appendix 3.4: IAA Assumption test results	167

LIST OF TABLES

Table 1.1: Research Questions	5
Table 2.1: Shea nut products in Uganda and their roles	16
Table 2.2: Shea nut markets in Uganda.....	17
Table 3.1: Summary of methods used in the study	37
Table 4.1: Description of variables used in the tobit models and their summary statistics	42
Table 4.2: Summary Statistics of explanatory variables used in the Tobit model regression.....	43
Table 4.3: Summary Statistics for market share of Shea actors.....	44
Table 4.4: Factors influencing actors' market share	45
Table 5.1: Description of variables used in the ordered logit regressions and their a priori expected signs	55
Table 5.2: Summary statistics for demographic characteristics	57
Table 5.3: Shea nut value addition and value-added products among Shea collectors.....	58
Table 5.4: Factors influencing the level of value addition among Shea nut collectors.....	59
Table 5.5: Marginal Effects results for factors influencing the level of value addition among Shea collectors	61
Table 5.6: Factors influencing the number of Shea products upgraded by a Shea nut collector ..	62
Table 5.7: Marginal Effects results for factors influencing the number of value-added products for Shea collectors	63
Table 6.1: Description of variables used in the model and their apriori expectation.....	75
Table 6.2: Summary statistics for demographic characteristics	77
Table 6.3: Comparing marketing arrangements by player type	78
Table 6.4: Comparing marketing arrangement by district	78
Table 6.5: Multinomial regression results for factors influencing choice of Shea nut marketing arrangement	79
Table 6.6: Marginal Effects of factors influencing choice of Shea nut marketing arrangement...	81
Table 7.1: Number of FGD participants by actor type.....	90
Table 7.2: Distribution of Focus Group Participants by Gender.....	91
Table 7.3: Distribution of Key Informants by Gender and category.....	91
Table 7.4: Key issues for actors conduct and performance in the Shea value chain	94
Table 7.5: Issues related to governance and power relations in the Shea value chain of northern Uganda	96
Table 7.6: Existing opportunities in the Shea value chain and their ranking of importance for each actor	98

LIST OF FIGURES

Figure 1.1: Conceptual Framework.....	8
Figure 2.1: The framework of Porter value chain	14
Figure 2.2: Shea nut value chain map	21
Figure 3.1: Map of the Study Area.....	34
Figure 3.2: Distribution of Shea actors included in this study	36
Figure 4.1: Concentration ratio of the four largest actors for each player	45

LIST OF ABBREVIATIONS AND ACRONYMS

CBEs	Cocoa Butter Equivalents
CBI	Cocoa Butter Improvers
CDF	Cumulative Density Function
CIRAD	The French Agricultural Research Centre for International Development
CREAM	Community Organization for Rural Enterprise Activity management
CVI	Content Validity Index
EIF	Enhanced Integrated Framework
EU	European Union
FAO	Food and Agriculture Organization
FFA	Free Fatty Acids
FGDs	Focus Group Discussion
GCC	Global Commodity Chain
GDP	Gross Domestic Product
GIS	Geographic information system
GVC	Global Value Chains
ITC	International Trade Centre
KIs	Key informants
MEMD	Ministry of Energy and Mineral Development
MWE	Ministry of Water and Environment
NEMA	National Environmental Authority
NOGAMU	National Organic Agricultural Movement of Uganda
NUSPA	Northern Uganda Shea Producers Association
SAFORGEN	Sub-Saharan African Forest Genetic Resources Programme
SBVAP	Shea Butter Value-added Products
SMEs	Small Medium Enterprises

LIST OF ORIGINAL PUBLICATIONS

1. **Akatwetaba, D.,** Mugonola, B., Kasharu, A., & Egeru, A. (2024). An Assessment of the Competitiveness of Shea Actors in the Shea Nut Value Chain of Northern Uganda. *East African Journal of Agriculture and Biotechnology*, 7(1), 361-369.
<https://doi.org/10.37284/eajab.7.1.2076>
2. **Akatwetaba, D.,** Mugonola, B., Kasharu, A., Okello, D. M., & Egeru, A. (2023). Drivers of value addition and product upgrading to Shea nuts by collectors in northern Uganda. *African Journal of Science, Technology, Innovation and Development*, 15(3), 349-361.
<https://www.tandfonline.com/doi/full/10.1080/20421338.2022.2115602>
3. **Akatwetaba, D.,** Okello, D. M., Kasharu, A., Egeru, A., & Mugonola, B. (2024). Determinants of Shea nut marketing arrangements in northern Uganda. *Discover Agriculture*, 2(1), 61. <https://doi.org/10.1007/s44279-024-00085-4>

ABSTRACT

Shea nut is an economically important parkland tree species found in parts of northern Uganda. Whereas the collectors form the bulk of the actors in the chain, it is not clear whether their scale of operations of actors above the chain makes them less competitive. To better understand the Shea value chain for purposes of proposing better ways of improving its competitiveness, this study assessed competitiveness of Shea actors along the chain. The study also assessed the factors associated with value addition and product upgrading as well as factors influencing Shea nut actors' choices of Shea nut marketing arrangements in northern Uganda. This study Cross-sectional primary data was collected using respondent driven sampling approach. A total of 252 collectors, 51 traders, and 22 processors were included in the study. Additionally, qualitative data was collected using focus group discussions and key informant interviews. Results showed that the average market share of the collectors, traders, and processors are 0.4%, 1.9%, and 4.5%, respectively. The concentration ratio (CR4), of collectors and traders, were both less than 40%, while, for processors was 65%. Further, results showed that 84% of Shea nut collectors practice some level of value addition with 11.5% adding value to all of the Shea nut collected. Over 50% of the Shea nut collectors had at least one value-added product, the most common products being roasted kernel and crude butter (37.3%). Regression analysis revealed that level of value addition and number of value-added products per collector were influenced by several factors including age, gender, household size, extension access, information access, association membership, and market arrangement. About 73% and 43% of Shea collectors and traders, respectively, sold their Shea nuts and/or products through spot markets, while, 45% of the processors sold their Shea nut and/or products through informal contracts. Formal contract was the least common marketing arrangement among all the actors. The probability of choosing each the marketing arrangement were influenced by several factors including experience, education, income level, access to extension, training, access to credit, awareness of innovations in the Shea value chain, awareness of value addition supporting institutions, main occupation, distance to the market, access to information and means of transport used. The findings of this study suggest an oligopolistic tendency among Shea processors, and the need for regulations to protect both the traders and the collectors from potentially unfair competition that may come from the few processors. Further, the findings imply increasing Shea value addition in terms of both proportions allocated to value addition and number of value-added products require adopting a group approach to provision of value addition and Shea processing information. Therefore, there is need to encourage Shea actors to form associations focused on value addition. Efforts to increase formal contract participation should focus on providing extension services and creating awareness about institutions that support value addition. There is need for a location and actor specific approach in promoting the different market arrangements in Shea products marketing.

Keyword: *Concentration Ratio, formal contracts, informal contracts, product upgrading, Shea Nut, Shea Nut Actors, Uganda*

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Background

Vitellaria paradoxa (Shea tree) is one of the important indigenous trees occurring in 21 African countries (Tom-Dery *et al.*, 2018; Seghieri, 2019) supporting the livelihoods of more than 16.2 million collectors and local processors (Naughton *et al.*, 2015). It is a non-timber tree that grows in the wild but socially and economically important to people, especially women (Elias & Arora-Jonsson, 2017; Sanou *et al.*, 2019). Though occurring from West Africa through the Sahelian drylands of Sudan to Eastern Africa, the Shea nut tree belongs to *Sapotaceae* family that grows in the wild in savannah lands and marginal dryland lands (Okullo *et al.*, 2012). Two species, namely *Vitellaria paradoxa* and *Vitellaria nilotica* exist. *Vitellaria paradoxa* is mainly produced in West Africa, while *Vitellaria nilotica* grows majorly in Sudan, South Sudan and northern Uganda (Ferris *et al.*, 2001).

In Uganda, Shea nut mainly grows in a number of districts in Northern, Eastern and West Nile regions of Uganda. The Shea tree scientifically called *Vitellaria paradoxa* is known by several local names in Uganda. For instance, it is known as *Ekungur* in *Teso*, *Komure* in *Kakwa*, *Kinakongole* in *Lugwere*, *Awa* in *Mad*, *Yao* in *Luo* and *Komoro* in *Lugbara*. Shea nut trees are characterized by extensive rooting that is critical for their survival during intermittent droughts in the savannahs and with a hardy bark that is essential in withstanding severe fire regimes (Orwa *et al.*, 2009). It is further important to note that the life span of Shea nut trees is a considerably long time estimated to last about 200-300 years. The tree's normal productive time commences after about fifteen years but the full fruit production is only attained at about 40-45 years (Karambiri *et al.*, 2017; Cottray *et al.*, 2003).

Shea tree is of economic importance to the people both on local and global levels. The Shea products are used in the food industry, cosmetics, and pharmaceutical industries. For Shea butter products like Shea oil, it has to go through the value chain of activities from collection up to consumption or exportation. The value chain is the description of the full range of activities that

are required to have the product or service move from conception through the intermediary phases of production, delivery to final consumers and final disposal after use (Trienekens, 2011). The Shea butter value chain is the main process of transforming the Shea fruit from Shea nut trees into Shea butter and its products (Rousseau *et al.*, 2015). In Africa, there are different Shea value chain actors which include collectors, traders, processors, exporters, manufacturers, and middlemen.

The Shea kernels are often processed with many traditional uses including medicinal purposes, edible oil, soap, and cosmetics. Meanwhile, its fruit pulp is rich in sugars, potassium, and calcium (Honfo *et al.*, 2014). Owing to the diverse medicinal benefits as well as industrial and economic returns associated with Shea butter, the global demand for Shea nuts has drastically increased, presenting the real opportunity for communities in Sub-Saharan Africa (SSA), Uganda inclusive. The real value of Shea nut is in the manufacturing of luxurious cosmetics and pharmaceutical products as well as in the confectionery industries especially in the production of high-value chocolates (Bup *et al.*, 2014). The Shea nut tree also provides good wood for charcoal production and ideal for house construction due to its termite resistance (Garba & Muhammad- Lawal, 2020; Gwali *et al.*, 2012).

It is estimated that the total yield of Shea nut globally is approximately 1,170,000 tons, translating into 432,000 tons of Shea butter annually. It is further reported that less than one-third of this amount is collected and approximates to 131,000 tons of Shea butter annually. In Uganda, Statistics from previous studies (Ferris *et al.*, 2004; Okullo *et al.*, 2012)) indicated that Shea nut production ranges from 70,000 to 380,000 tons per year. The Shea nut production in Uganda is mainly threatened by the increasing. population pressure which has led to higher levels of trees being felled for charcoal production, despite existence of local bylaws, which ban the use of Shea for charcoal burning. Shea nut is immensely valuable to a range of persons especially women in many African countries where it occurs. It has been described as a women's tree owing to the greater participation of women in its value chain especially; collection and products development (Elias *et al.*, 2006; Rousseau *et al.*, 2019).

Furthermore, the growing demand of Shea nut products by various industries has meant increased output and market size, triggering investment and productivity. As such, access to

markets has essentially facilitated trade, economic growth (Adekambi *et al.*, 2018) and demand for Shea butter by upscale cosmetics and personal care products (Bello-Bravo *et al.*, 2015; Agúndez *et al.*, 2020). Indeed, the global demand for Shea nut and Shea butter is increasing globally (Rousseau *et al.*, 2015). This makes Shea tree a very important tree both locally and globally. Amidst its economic and socio-cultural importance, the Shea tree is considered endangered due to activities such as charcoal burning (Gwali *et al.*, 2012; Garba & Muhammad-Lawal, 2020). Consequently, conservation efforts have been put in place to address the declining population of Shea tree where they exist. However, without focus on the role of the tree in supporting livelihoods of millions, the successes of the conservation efforts may be compromised due to increasing local and global demand of the Shea products.

1.2 Statement of the Problem

Shea nut has a potential of supporting livelihoods of people in northern Uganda. However, there is limited knowledge on the Shea nut value chain market structure, value addition and product upgrading which results in low marketing opportunities for Shea nut products (Tom-Dery *et al.*, 2018). Producers of Shea nut are mainly price takers, settling for whatever prevailing price, and this is attributed to the fragmented nature of Shea nut markets, lack of market information, inadequate business knowledge, and low negotiating power (Hatskevich *et al.*, 2011; Tanzile *et al.*, 2023). Although traditional institutions that operate Shea oil/butter processing exist in northern Uganda, there is a paucity of context specific literature on both formal and informal value chain governance structures for both local and value-added products in the form of food oils and cosmetics (Acema *et al.*, 2021; Gwali *et al.*, 2012; Ogwok *et al.*, 2019). Attempts to enhance coordination among Shea nut value chain actors have been done by organizing them into groups. For instance, the Northern Uganda Shea Producers Association (NUSPA) that has brought together value chain actors that are widely scattered, and small and village based into one unit with the purpose of marketing Shea products (Acema *et al.*, 2021). Despite these efforts, the Shea nut value chain actors' integration is still limited and market coordination among the actors is poorly understood. In addition, the power relations among the different Shea nut actors is not clearly understood in terms of power and authority over Shea nut production and marketing. Further, there are limited studies that have concentrated on understanding the marketing and inter-linkages among the value chain actors so as to exploit opportunities in the

Shea nut value chain ecosystem. The fragmented nature of Shea nut markets and the limited market information available to producers result in low prices and weak negotiating power for Shea nut products. There is a research gap in identifying and addressing the specific factors causing market fragmentation and developing strategies to improve market information dissemination. Specifically, understanding competition, upgrading, institutional arrangements as well as, power relations among different actors in the Shea nut value would go a long way in championing conservation efforts by improving the profitability of the Shea products. Additionally, investigating the power dynamics and their implications for the value chain could provide insights into improving the bargaining position of producers and other stakeholders. It is against this background that this study was conducted to explore the current status of competition among actors, value and product upgrading as well as factors limiting market coordination, governance and opportunities for Shea nut value chain upgrading so as to target different market niches that have not been exploited.

1.3 Objectives of the study

1.3.1 General Objective

The overall objective was to explore and gain understanding of the influencers of overall functioning and performance of the Shea nut value chain in Northern Uganda.

1.3.2 Specific Objectives

Specifically, this study was to:

1. Assess the level of competitiveness among Shea actors in the Shea value chain of northern Uganda
2. Determine the factors that influence product upgrading among Shea collectors in northern Uganda.
3. Assess the factors that influence choice of market arrangement used in the marketing of Shea products in northern Uganda
4. Explore the opportunities and challenges that can be exploited in the Shea nut value chain in northern Uganda.

1.4 Research Questions

To address the objectives of this study, the following research questions were answered (Table 1.1).

Table 1.1: Research Questions

Objective	Research Questions
Assess the level of competitiveness among Shea actors in the Shea value chain of northern Uganda	1. What is the market share of the Shea actors? 2. How does the market share of Shea actors differ among actors? 3. What factors influence the market share of Shea actors in the Shea value chain of northern Uganda?
To determine the factors that influence product upgrading in the Shea nut value chain in Northern Uganda.	1. What value added products do Shea collectors in northern Uganda engage in? 2. What factors influence the value addition among Shea collectors in northern Uganda 3. What is the proportion of Shea collected that is allocated to value addition? 4. What factors influence the proportion of Shea allocated to value addition?
Assess factors influencing choice of marketing arrangement used in the marketing of Shea products in northern Uganda	1. What marketing arrangements exist in Shea and Shea products marketing in northern Uganda? 2. How does choice of marketing arrangement vary across actor and geographical location? 3. What are the factors that influence the choice of the different market arrangements in Shea and Shea products marketing in northern Uganda?
Explore challenges and opportunities that can be exploited in the Shea nut value chain in northern Uganda.	1. Who are the actors in the Shea value chain of northern Uganda? 2. What are the challenges affecting each Shea value chain actor in northern Uganda? 3. What opportunities exist for the actors in the Shea value chain of Northern Uganda?

1.5 Justification of the Study

This study sought to understand and document the market structure, value addition and opportunities for upgrading Shea nut value chain. Overall, this study generated knowledge of

value chain upgrading and marketing arrangement that may influence the upgrading of Sheanut products, producers' skills and technologies that will position Uganda at competitive advantage for better markets with the global perspective. The study also generated knowledge on the factors that influence upgrading of Shea nut and performance of Shea nut market. Most studies have focused on documenting Shea nut production and existence in general; with limited literature on upgrading of Shea nut in Uganda. This research is unique as it concentrated on opportunities on Shea nut upgrading as well as the factors that influence upgrading and market performance of Shea nut in Northern Uganda and Uganda at large. This study thus, sought to provide information on the profitability of Shea nut value chain so that the community can realize the high value in Shea nut. This is expected to incentivize them to conserve the Shea nut and optimally utilize the tree for posterity. In addition, the opportunity for upgrading Shea nut value chain will provide relevant insights in formulating and implementing policies aimed at upgrading Shea nut. The study further, contributed to the pool of literature available on Shea nut upgrading and the factors influencing upgrading and performance of Shea nut markets.

1.6. Scope of the Study

This study was conducted in the shea belt districts of Otuke, Pader and Lira districts and focused on shea value chain marketing. The study also focused on only product upgrading which is more relevant to the collectors. This is opposed to other forms of upgrading that are not very practical to collectors. The study also focused on shea marketing activities for the last one year prior to the study.

1.7. Theoretical perspectives

This study was utilized two theoretical perspectives in understanding the key issues in the Shea value chain of northern Uganda. These are: the utility maximization theory (UMT) and the social network theory (SNT). These are briefly described below:

1.7.1 Utility Maximization Theory

This theory is a central concept in economics, explaining how producers make choices to maximize their satisfaction given competing choices of production decisions. Choice of market arrangements as well as decision to upgrade follows the utility maximization theory (UMT)

which postulates that, an actor would choose that course of action for which the expected and/or perceived utility is highest (Aleskerov *et al.*, 2007). In reality this choice is usually subject to a set of constraints (Rahm & Huffman, 1984). In the Shea value chain, these constraints relate to social, economic and institutional factors (Mugonola *et al.*, 2013). By applying the UMT, this study assessed the influence of the observed social, economic and institutional factors on both value and product upgrading as well as the choice of marketing arrangement for the sale of products. By applying the UMT, this study assumes that Shea nut actors are utility maximiximising agents whose actions are intended to maximized their utility. These actions include among decision on value addition, as well as market arrangement.

1.7.2 Social Network Theory

This theory is an interdisciplinary framework used to analyses and understand the relationships and interactions between actors (Liu *et al.*, 2017). It focuses on the relationship between actors and how these relationships shape behaviors, influence, and information flow within the value chain (Krause *et al.*, 2007). In this study, the study helped to understand the relationship between actors of the Shea value chain. This theory was applicable to objectives 1 and 4. It helped to understand how Shea value chain actors interact with each other, as well as identifying existing opportunities in the Shea value chain. This theory informed the inclusion of actors in the study. For instance, in objective 1, the market share of actors was compared along the value chain. Similarly, in objective 4, following SNT included all actors in the focus group discussions.

1.8 Conceptual Framework

Value chain activities aim at bringing products from pre-production to the end user and sometimes beyond. For this study, the dependent variable is value chain upgrading which is influenced by independent variables including the structure, conduct, and performance (SCP), governance and power relations and social economic, and institutional factors. Three forms of up grading were considered: product, process and functional up grading. This study focused on product upgrading which has been shown to be more critical to actors at the base of the chain. For the purpose of addressing the study objectives, multiple theories including, Social Network, Governance, and Neo- classic theories were adopted. In this study, the social network theory was used in explaining the existing and probable relationships among Shea nut actors (Collectors,

traders, processors and exporters. Shea Nut Value chain upgrading is expected to result into profitability at every level of the Shea nut value chain. This is because wherever there are relationships, governance issues will arise in terms of value chain organization, authority, and power on allocation and flow of products and services in a chain (Gereffi *et al.*, 2005). The SCP Paradigm is basically used to determine the degree of competition in an industry by assessing the level of concentration in the industry to see how it affects performance (efficiency and profits) within the industry. Level of concentration is calculated by determining the number of firms in the industry, as well as how the market power is shared between the firms. From these perspectives, the conceptual framework that guided this study is presented in Figure 1.1.

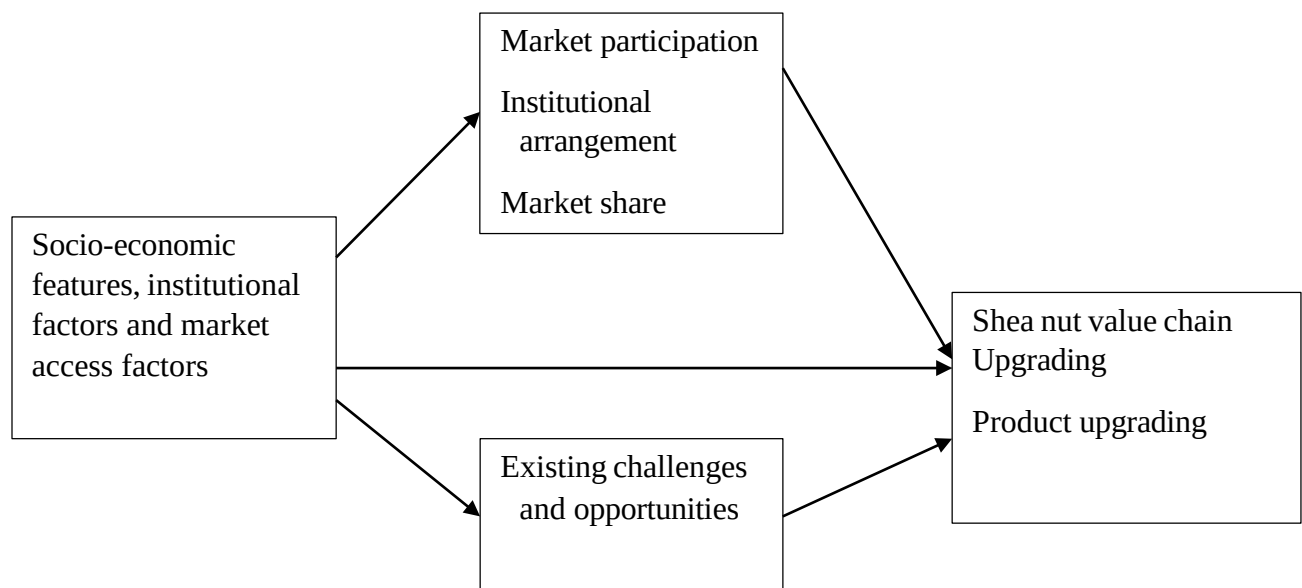


Figure 1.1: Conceptual Framework

Source: Gereffi *et al.*, 2005

1.9 Outline of the thesis

This thesis was developed following the general guidelines provided in the Gulu University graduate handbook. The whole thesis consists of eight chapters: Chapter one provides a general introduction to *Vitellaria paradoxa* (Shea tree) which is one of the important indigenous trees occurring in 21 African countries. The chapter also describes the statement of the problem, research gaps, theoretical perspectives, objectives, and research questions. It is also in this chapter that the conceptual framework of the study is illustrated and discussed. The next chapter

is literature review. The third chapter is the general methodology of the study that includes study design, study area, study population, sampling procedure, data collection, data analysis and ethical considerations. The next four chapters (Chapters 4 – 7) presents papers resulting from each specific objective. Within each chapter, there are chapter specific background, chapter specific methods, as well as results and discussions with respect to the respective specific research objective. Chapter eight provides a general summary of the study findings where the research objectives, conclusions and recommendations from the study to guide policy formulation. The chapter also presents the study limitations and suggestions for further studies.

CHAPTER TWO

LITERATURE REVIEW

This section presents review of published work on concept of value chain, typologies of Shea nut value chain participants, Shea nut product markets, value addition processes as well as market participation.

2.1 Theoretical Review

The study on governance and opportunities for upgrading in the Shea nut value chain in Northern Uganda is grounded in two key theoretical frameworks: The Utility Maximization Theory (UMT) and the Social Network Theory (SNT). These theories provide a robust foundation for understanding the decision-making processes and relational dynamics among Shea value chain actors. The UMT, rooted in neoclassical economics, posits that actors make choices to maximize their satisfaction or utility, given constraints such as limited resources, information, and institutional barriers (Aleskerov *et al.*, 2007). In the context of the Shea value chain, this theory explains why collectors, traders, and processors adopt specific strategies, such as value addition or choice of marketing arrangements, based on perceived benefits and constraints. For instance, Rahm and Huffman (1984) applied UMT to agricultural decision-making, showing how farmers allocate resources to maximize profits amidst socio-economic and institutional limitations. Similarly, Mugonola *et al.* (2013) demonstrated how smallholder farmers in Uganda make production and marketing decisions under constraints, aligning with the UMT's emphasis on rational choice within bounded conditions.

The Social Network Theory (SNT) complements UMT by focusing on the relationships and interactions among value chain actors, emphasizing how these connections influence behavior, information flow, and resource access (Liu *et al.*, 2017). SNT is particularly relevant in agricultural value chains, where trust, collaboration, and information sharing are critical for upgrading and competitiveness. Krause *et al.* (2007) highlighted how social networks enhance market access and collective bargaining power among small-scale producers. In the Shea value chain, SNT helps elucidate the role of associations, cooperatives, and informal networks in facilitating knowledge exchange, reducing transaction costs, and improving market coordination.

For example, Elias and Arora-Jonsson (2017) found that women Shea collectors in West Africa leveraged social networks to access better prices and processing technologies, underscoring the theory's applicability to gendered value chains.

The integration of UMT and SNT is justified by their complementary insights into individual and collective decision-making. While UMT explains why actors choose specific upgrading strategies (e.g., value addition or formal contracts), SNT reveals how relational dynamics, such as power asymmetries and network structures, shape these choices. Studies by Gereffi *et al.* (2005) and Kaplinsky and Morris (2016) on global value chains emphasize the interplay between individual rationality (UMT) and governance structures (SNT), showing how upgrading opportunities are influenced by both actor agency and network embeddedness. In Northern Uganda, Shea collectors' decisions to upgrade are likely constrained by limited access to capital and information (UMT), while their ability to overcome these barriers may depend on membership in producer groups or ties to traders (SNT).

Empirical studies have applied these theories to similar contexts. For instance, Abdul-Rahaman and Abdulai (2020) used UMT to analyze smallholder farmers' participation in high-value markets, finding that perceived benefits and constraints significantly influenced their choices. Similarly, Dubbert and Abdulai (2022) applied SNT to examine how social networks improved market access for Shea producers in Burkina Faso. These studies demonstrate the theories' relevance in explaining upgrading behaviors and market coordination in agricultural value chains. In Northern Uganda, the Shea value chain's fragmented nature and gendered dynamics make SNT particularly apt for analyzing how women collectors navigate power relations and access opportunities through networks.

The choice of UMT is further supported by its utility in modeling constrained optimization problems, such as the allocation of Shea nuts to value addition or the selection of marketing arrangements. Rahm and Huffman (1984) showed that farmers' adoption of innovations depends on perceived utility, aligning with this study's focus on value addition drivers. Likewise, the SNT's emphasis on relational governance (Gereffi *et al.*, 2005) suits the analysis of power relations and collective action in the Shea chain, where processors' oligopolistic tendencies may marginalize collectors without strong networks.

The theories also address the study's focus on governance and power relations. UMT highlights how unequal access to resources, for example, land, credit; constrains upgrading, while SNT reveals how network positions determine actors' influence over chain governance. For example, Bello-Bravo *et al.* (2015) found that Shea cooperatives in Ghana empowered women by strengthening their networks and bargaining power. In Northern Uganda, similar dynamics likely shape collectors' ability to upgrade, making SNT indispensable for analyzing governance challenges.

Finally, the theories align with the study's objectives. UMT underpins the analysis of factors influencing value addition and marketing choices (Objectives 1, 2 and 3), while SNT informs the exploration of governance and opportunities (Objective 4). Together, they provide a holistic framework for understanding how individual and collective actions drive upgrading in the Shea value chain, offering insights for policy and intervention design. Their combined use ensures a nuanced analysis of both the economic and social dimensions of Shea chain competitiveness and sustainability.

2.2 Value Chain Concept

There are various approaches to understanding value chains. These concepts evolved over time. In this section, three main concepts are discussed namely: *filière* concept, Porters concept and global concept.

2.1.1 Filière Concept

This approach (also known as Commodity Chain analysis) was first used by French scholars in the 1960s to analyze the agricultural systems of developing countries under the French colonial system. The analysis mainly served as a tool to study the ways in which agricultural production systems (especially, rubber, cotton, coffee and cocoa) were organized in the context of developing countries. It was used to map the flow of commodities and to identify agents and activities. Berg *et al.* (2006) noted that the rationale of the *Filière* approach is quite similar to the broader concept of value chain analysis and highlights two grounds on which the *Filière* approach shares resemblance with value chain analysis: The economic and financial evaluation of *Filière* focuses on income generation and distribution in the commodity chain and

disaggregates costs and incomes between local and internationally traded components to analyze the spillovers of the chain on the national economy and its contribution to GDP along the ‘_effect method’.

The strategy-focused analysis of Filière is used especially by research institutions working on agricultural development, examining in a systemic way the interplay of objectives, constraints and results of each type of stakeholder in the chain. Individual and collective strategies are also analyzed as well as patterns of regulations. Based on the strategy-focused analysis, Hugo (1985) defines four types of strategies with respect to commodity chains in Africa: domestic regulation, market regulation, state regulation and international agribusiness regulation.

The Filière approach is said to be more static, reflecting relations at a certain point in time and generally applied to domestic value chains, thus it generally stops at national boundaries.

2.1.2 Porter’s Concept

Porter (1985) describes the concept of value chain as the activities an organization performs and links it to the organization’s competitive position. Porter (1985) applies the framework to assess how a firm should position itself in the market and in its relationship with suppliers, buyers, and competitors. Porter (1985) identified five competitive forces interacting within a given industry: the intensity of rivalry among existing competitors, the barriers to entry for new competitors, the threat of substitute products and services, the bargaining power of suppliers, and the bargaining power of buyers.

Porter (1985) argues that the source of competitive advantage of a firm cannot be detected by looking at the firm as a whole. Instead, the firm should be disaggregated in a series of activities and competitive advantage found in one or more of such activities. Porter’s framework categorizes the activities the firm needs to undertake to find source of competitive advantage into two: Primary activities and Supporting activities (Figure 2.1). Primary activities contribute directly to value addition in the production of a good or service. Support activities have indirect effect on the final value of the product. Porter’s concept of Value Chain does not imply the idea of a physical transformation and analyzing the competitiveness of an enterprise’s value chain using this concept will focus on product design, input procurement, inbound logistic, out bound

logistic, marketing, sales, after sales and support services such as strategic planning, the management of human resources, research activities etc. Porter's framework therefore has strict business application and mainly applied to support management decisions and executive strategies.

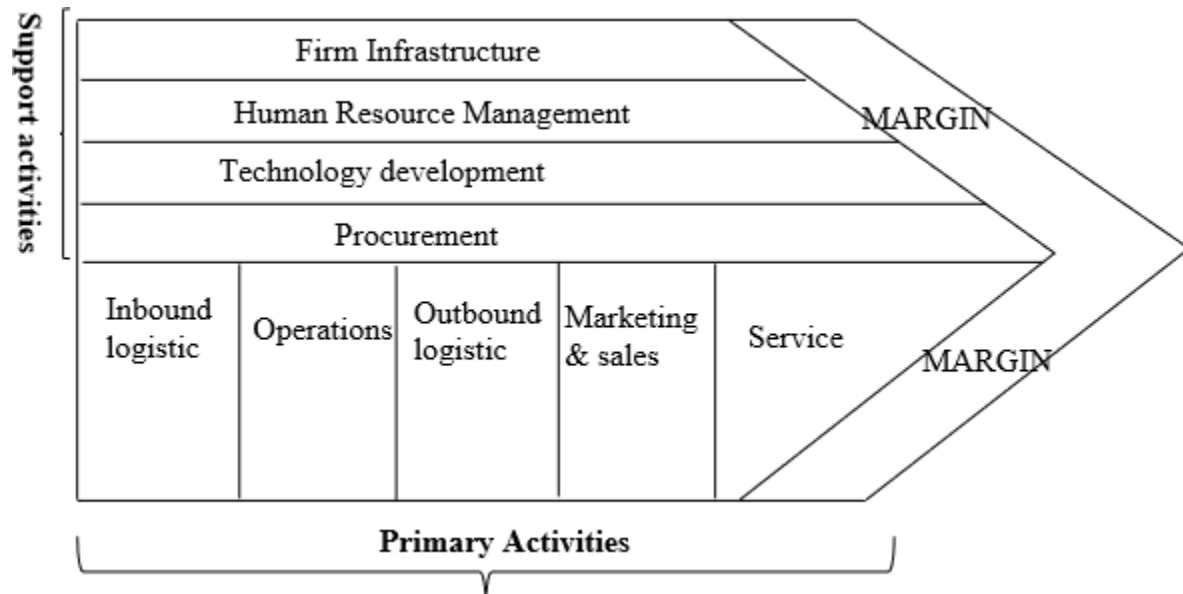


Figure 2.1: The framework of Porter value chain

Source: Porter, 1985

2.1.3 The Global concept

The Global Approach to Value Chain Analysis was introduced within the context of globalization. Gereffi (1994) introduced the concept in the mid-1990s and primarily focused on the analysis of international trading systems and the increasing economic integration of production marketing chains globally (Roduner, 2004). In the course of globalization there has been the perception that the gap in incomes within and between countries has increased and VCA can help explain this process in a dynamic perspective (Berg *et al.*, 2006).

The Global Commodity Chain (GCC) analysis highlights the power relations that are embedded in value chains with emphasis on governance of the chain. The Global Commodity Chain approach comprises five dimensions, including the technical structures, the actors in the chain, the territories the chain covers, the governance structure and the input-output structure (Gereffi,

1994). The Global Commodity Chain analysis seeks answers to questions relating to how the production process takes place, who participates at what stage, where are the different stages taking place, how are they linked, who has what benefit among other questions. Answers to these questions are critical in determining the relevant points of intervention for the successful integration of the poor in the chain so as to produce market outcomes that benefit the poor.

2.3 Shea nut product markets

2.3.1 International Shea nut market

Supply of Shea butter to the international market is flexible but demand is not. Only a fraction of potential production is exported for industrial use. Although Shea butter offers certain useful technical characteristics to the chocolate maker, its use in the chocolate industry depends on its price in relation to that of cocoa butter. The main buyers in the international trade are the refiners in developed countries, often associated with the chocolate and/or food industry. They prefer to buy the raw nuts rather than the butter in order to have as much control as possible in the processing and quality of the final product. Another reason for preferring nuts is that they can be stored for up to five years in the right conditions, whereas butter is more expensive to store and deteriorates more rapidly. Any exports of butter from African countries tend to be of unrefined material (Ferris *et al.*, 2001).

2.3.2 East African Shea nut market

In comparison with West Africa, the commercial development of Shea products in Uganda remains at an embryonic stage, with little documentation on the market dynamics of the crop in Uganda and its surrounding countries. Production of Shea in Northern Uganda is from a different subspecies to that of West Africa. In Eastern Africa, the species *Vitellaria Nilotica* is produced primarily in northern Uganda and southern Sudan. The crop is used mainly as a cooking oil in the Shea belt and market supplies are typically based on the local purchases of people from the Shea region, who know the product and have traditionally used it as a cooking oil, Vaseline product for babies and for other quasi-religious ceremonies (Table 2.1). The supply of Shea nuts from Eastern Africa, are minimal with no statistics available for export from the region (Ferris *et al.*, 2001).

In Uganda, Shea nuts and its products has not gained their full market potential with markets remaining traditional, concentrated in the Shea producing areas, with low volumes of sales and high levels of domestic consumption (Okullo *et al.*, 2004). Okullo *et al.* (2004) further reported that Shea products trade involves gathering of nuts, storage, processing of oil and marketing. It is also locally regarded as a preserve of women and children and Shea fruits (Nuts) are gathered by any one with interest. In addition, it is called an —opportunistic business because no one has ownership rights over any Shea trees. Okullo *et al.* (2004) posit that proper trade in Shea products is limited by High levels of consumption of the Shea oil in the Shea belt; Lack of proper market linkages between gatherers and users within and outside Uganda; Lack of adequate commercial markets in which to trade the commodity; and Lack of market information and awareness of the higher market opportunities for the commodity.

Table 2.1: Shea nut products in Uganda and their roles

Shea product	Uses
Shea nuts	Produce Shea oil Sold for cash
Shea oil	Baby oil Cooking oil Mixed with simsim paste and eaten Medicine (treat skin and throat infections) Lubricant (machines and bicycles) Soap making
Wood	Poles for building Firewood for cooking Timber Pounding motor Charcoal
Bark	Treat malaria Treat tooth defects Treat diarrhea
Fruit	Eaten
Seed cake	Fertilizer Burnt to make soda ash Used for killing termites
Wax	Treating cut wounds

Source: Okullo *et al.* (2004)

According to Okullo *et al.* (2004), the Shea business is dominated by local producers and consumers who are at the same time gather nuts, process and sell the oil in the local markets found mainly in the Shea zone. The same author further asserted that few markets exist outside the zone because of limited awareness about the qualities of Shea oil among communities outside the Shea zone. Local market players comprise retailers, itinerant traders, wholesalers and business organizations. It important to note that less than 20% of the Shea producers sell their nuts to organizations such as the Northern Uganda Shea Processors' Association (NUSPA) in Lira, Guru Nanak Oil Mills in Lira and CREAM in West Nile. Shea nut marketing in Uganda is done via various marketing outlet as shown in Table 2.2.

Table 2.2: Shea nut markets in Uganda

Type of market	Description
Farm gate	Gatherers and processors sell their products from home. Organizations also buy from homes because of trust and product traceability.
Village	Village markets are outlets for local gatherers and processors. Retail market for local consumers. Bulking up market for itinerant traders.
Periodic	Local processors retail Shea oil to local consumers. Weekly markets receive Shea products from across the Shea zone.
Wholesale	Not properly established Mainly operated by organizations who sell their products in bulk to retailers and industrial processors.

Source: Okullo *et al.* (2004)

2.4 Typologies of Shea nut value chain participation

Figure 2.2 presents the Shea nut value chain map. It shows that, in Uganda and the other African countries where Shea nut is produced, the major participants in the Shea nut value chain are women and children who usually harvest the fruits in the morning (Ferris *et al.*, 2004). The fruit is harvested in the months of May through August every year (Okullo, Hall, & Obua, 2009). Once the fruit is harvested, the pulp is eaten, and the kernel is sun dried and stored (Ferris *et al.*, 2004). In addition, women process some of the kernels into oil for household consumption. First the dry kernels are cracked with a hard object (usually wood or stone) to remove the outer shell.

It is then put in sand in a large saucepan or pot and roasted. After roasting to dark colour, it is left to cool (Ecuru and Lating, 2014). Other kernels are sold in the market or to local Shea butter producers who consist of cottage firms, usually small family owned processing units in the backyard of homes in trading centres or small towns. Important to note further is that a substantial amount of Shea butter is produced by the wider community using the traditional method and it is produced mainly for household consumption. A little bit of it is also sold in local markets (Ecuru and Lating, 2014).

The other key participants in the Shea nut value in Uganda are middlemen who buy kernels and sell to producers of Shea butter. Some producers buy directly from organized women or farmer's groups. In such a case, the producers organize and establish their own groups and enter a contract with them to buy/supply Shea kernels. A group may be up to 50 women. Besides Shea collections, the groups also deal in other commodities like simsim (sesame) and sun flower. In a good harvest season, each group member on average reportedly may collect more than 100 kilograms of Shea kernels (Ecuru and Lating, 2014).

Producers buy the kernels and sort them into three grades A, B and C according to size, moisture content, and breakage. The cold press method is used to extract Shea butter from the kernels and once it is extracted it is packaged in plastic containers of various sizes and sold as a raw material for the manufacture of other value-added products like ointments, hand and body lotions, hair creams, baby jellies, soap, and other skin care products. The left-over Shea cake is removed and discarded as waste. Some local producers report the cake repels mosquitos (Ecuru and Lating, 2014).

In Ghana, the nut value chain is not a very long chain and does not involve complicated preparation. The chain begins with the pickers who are usually women and children. When the nuts are ripened, they fall off from the branches due to their weight and can usually be found around the base of the Shea tree. The women go round to pick the nuts and carry them home. At home the fleshy part of the nut is removed by eating it off or through other means, they are then boiled and dried after which the shells are cracked and the kernel is stock piled for the buyers to come and carry (Awuviri, 2017). Findings by Awuviri (2017) showed that Middle men played in the past of moving from house to house, to buy the Shea nuts from the women, aggregate it and

then have it supplied to big time buyers who would then export the nuts. Accordingly, the benefits to women were not that great since a chunk of the profits were intercepted by third parties in the role of middle men. In order to ensure that women get a large share of profits, the role of middle men was eliminated by some organizations that organized the women in such a way that pickers and producers of Shea nuts and butter were brought together.

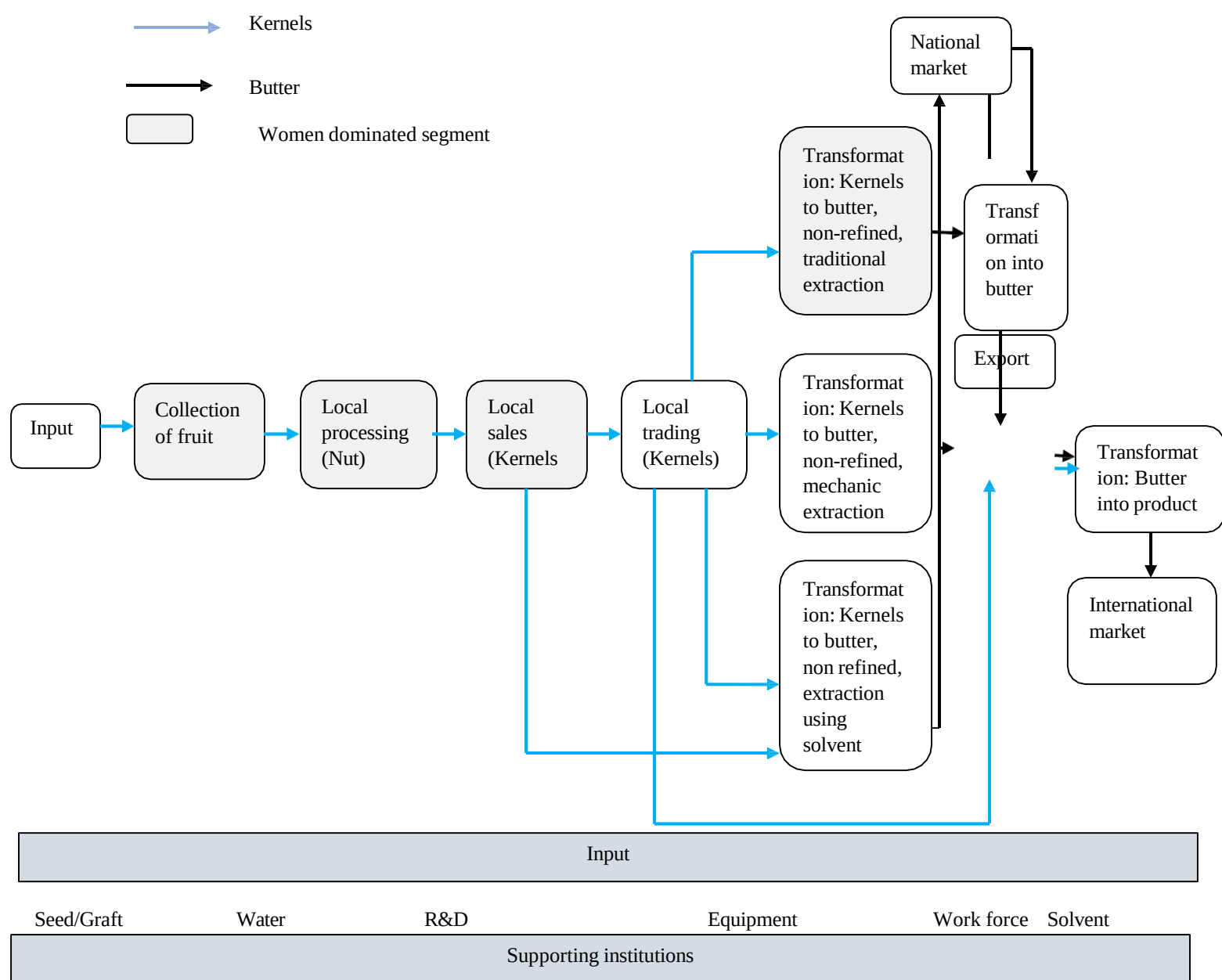
In Nigeria, rural women are at the bottom of local domestic market. Shea nuts are picked and processed mainly by the rural women. The nuts are also sold in the local market where they are bought by a range of actors including local butter processors, local nut traders and nut exporters. There are no Shea butter extraction facilities and Shea butter oil refineries in Nigeria. All processing is done by the rural people using traditional methods. The value chain is characterized by low technology input (Olife *et al.*, 2013).

In Burkina Faso's Shea value chain is characterized by the presence of various stakeholders and complex dependencies and relationships (Venturini, 2016). There are four types of actor in the Shea value chain: they function individually, in combination, in groups and in unions. Nut collectors are usually women and children engaged solely in the collection of Shea nuts. They collect nuts from fields or buy them from farmers and resell them to women's groups or to secondary nut sellers.

Nut collectors and transformers. These actors collect nuts and also participate in the transformation of the nuts into butter. Women often keep some of the butter for their households to eat. These groups sell their butter and derivative products at local markets, or to national or international traders. Nut and butter collectors and transformers. These actors are present in all areas of the value chain. They lead within the collection and also transform Shea nuts into products such as Shea butter, soap and pomade.

Traders do not usually specialize in a particular product: they sell raw nuts, Shea butter or products such as cosmetics and soap, passing from product to product according to availability and demand. Traders are mostly men because the job can require travel and women are required to stay close to the family and home. They are located all over the country. Traders normally sell

their products internationally: this constitutes another barrier for many women who generally lack the confidence, knowledge and ability to work with international buyers (FAO, 2017).



Government institutions and Associations	Ministry of water and environment	National Forest Institute	Banks and financial services	Technical services and maintenance	Technical services and maintenance
--	-----------------------------------	---------------------------	------------------------------	------------------------------------	------------------------------------

Figure 2.2: Shea nut value chain map

Source: Adapted with some modification from ITC and EIF (2015).

Women play a key role within the primary Shea value chain activities. These activities are at first facilitated by direct input supplies, including parklands and forests, Shea seeds for plant breeding, water and energy in the form of fuel wood (CIRAD, 2015) or electricity. The stakeholders providing these supplies include forest owners (typically the state) and landowners (typically the husbands, as women cannot claim property rights on land due to customary law).

It is predominantly women who ensure fruit collection on private or community land, either individually or as part of women's organisations (village groups, associations, cooperatives, unions or federations). The collection phase lasts from May to August (Boffa *et al.*, 1998), when other farming activities are at their peak. The local nut processing activities are also assigned to women. Women hold the knowledge on how to store, dry and crush the nuts to remove the kernel. They also sell kernels at markets and on roadsides and engage in local trading. Traders also include individual kernel collectors, wholesalers and exporters (ITC and EIF, 2015). The transformation of the kernels to butter is carried out mostly by women's groups or small enterprises (Boffa *et al.*, 1998), and Shea butter is then sold to the domestic and international market (Chalfin, 2004).

2.5 Empirical Review

2.5.1 Competitiveness Among Shea Nut Value Chain Actors

The concept of competitiveness in agricultural value chains has gained increased attention in recent years, particularly in resource-constrained rural economies. Competitiveness refers to the ability of value chain actors to sustain and increase their market share while responding effectively to price and quality demands (Porter, 1985). In developing contexts, small-scale

producers often struggle to compete due to weak institutional support, limited access to infrastructure, and dominance of a few large actors (Dubbert & Abdulai, 2022). In the Shea nut value chain of Northern Uganda, competitiveness is a function of market access, power dynamics, and the ability to capture value through upgrading.

Empirical studies from Sub-Saharan Africa have shown that market share in the Shea value chain is unevenly distributed, with processors and exporters controlling the most significant portions of the trade. For instance, Bup *et al.* (2016) found that in Burkina Faso, processors accounted for over 60% of total Shea exports, while collectors, mainly rural women, controlled less than 5%. Similarly, Adam and Abdulai (2019) reported that in Ghana, less than 10% of the market share was held by informal Shea nut collectors, even though they made up more than 80% of the workforce. These imbalances suggest that despite large numbers, small-scale actors lack the leverage to command prices or negotiate contracts. The disparity in market share indicates a skewed distribution of value along the chain, particularly disadvantaging collectors and traders.

Differences in market share among Shea value chain actors are largely determined by the actors' roles, scale of operation, and access to end markets. According to Ferris *et al.* (2021), processors typically engage in capital-intensive activities such as mechanized extraction, quality control, and bulk packaging, which enable them to meet export requirements. In contrast, collectors, who are mostly women using traditional methods, often lack the resources and organization required to add value or reach urban and international markets. A study in Nigeria by Tihamiyu *et al.* (2020) indicated that organized processors could capture 70% more value per kilogram of product than individual collectors. The vertical integration of processing and export activities contributes to higher competitiveness among processors compared to upstream actors.

Several socio-economic and institutional factors influence competitiveness and market share in the Shea value chain. Access to market information and membership in associations are consistently cited as key enablers. Bello-Bravo *et al.* (2015) found that women organized in cooperatives in Mali and Ghana increased their market share by 25% over five years, due to bulk sales, shared infrastructure, and improved price negotiation. Similarly, Dubbert and Abdulai (2022) observed that traders with better market information and access to mobile-based platforms in Burkina Faso could sell their products at prices 18–25% higher than those relying

solely on local market networks. These findings emphasize the importance of both social capital and technological inclusion in improving competitiveness.

Gender also plays a significant role in shaping market access and competitiveness. While women dominate the collection and initial processing stages, their market share remains minimal due to socio-cultural barriers, limited land rights, and financial exclusion. Elias and Arora-Jonsson (2017) in northern Ghana noted that even when women controlled over 70% of Shea nut production, they received less than 10% of total earnings from the final Shea butter products. Women's market participation is further constrained by lack of credit, transport, and formal education, all of which hinder their ability to meet quality standards and access lucrative markets.

Institutional arrangements, particularly cooperatives and contract farming schemes, have been instrumental in enhancing actor competitiveness. Agúndez *et al.* (2020) showed that membership in certified cooperatives in Benin led to a 30% increase in producer income and a 40% increase in market share for participating women. Similar findings in Uganda by Acema *et al.* (2021) highlighted that actors affiliated with Northern Uganda Shea Producers Association (NUSPA) had more stable access to urban and regional buyers. These associations offer collective bargaining power, facilitate compliance with quality standards, and serve as intermediaries with financial institutions and government programs.

Market access and infrastructure are also essential determinants of competitiveness. Poor roads, lack of storage facilities, and limited access to processing technology have been cited as critical bottlenecks in rural Uganda (Okullo *et al.*, 2018). For example, a study by Gwali *et al.* (2019) indicated that Shea producers located more than 10 kilometers from a major market center in Lango and Acholi sub-regions faced up to 35% reduction in profitability due to transport costs and product spoilage. Furthermore, Ferris *et al.* (2021) emphasized the role of mobile banking and digital trade platforms in enhancing rural competitiveness by reducing transaction costs and expanding customer bases.

Market relations within the Shea nut value chain significantly influence actor competitiveness. In buyer-driven chains, such as those seen in global cosmetics and chocolate industries—buyers set

the terms of engagement, and producers have little say over prices or standards (Gereffi et al., 2018). Kaplinsky *et al.* (2016) argue that without inclusive governance structures, upgrading by upstream actors remains limited. In Uganda, studies suggest that governance mechanisms are still evolving, with informal spot markets dominating the trade, particularly at collector and trader levels (Ogwok *et al.*, 2023). This limits predictability and reinforces dependency on middlemen, further weakening the market position of small actors.

2.5.2 Value Addition and Product Upgrading Among Shea Collectors

Upgrading within agricultural value chains is a process through which actors enhance their capacity to produce higher-value goods and services and to improve productivity, efficiency, and marketability. In the Shea nut value chain, upgrading is vital for smallholder collectors, most of whom are women, as it enables them to move beyond primary collection to value-added processing, resulting in higher income and market access (Giuliani *et al.*, 2018). Value chain upgrading in this context includes product upgrading, such as processing kernels into butter, process upgrading like using improved tools or methods, and functional upgrading like entering new market functions such as packaging and branding.

Shea collectors in Sub-Saharan Africa commonly engage in a variety of value-added activities, including roasting, grinding, and kneading Shea kernels into butter, soap, ointments, and moisturizers (Lovett *et al.*, 2016). In Uganda, studies have identified traditional Shea butter, roasted kernels, and crude oil as the most frequently produced products by women collectors (Okullo *et al.*, 2018). Similar findings were reported by Olife *et al.* (2017) in Nigeria, where approximately 65% of rural women involved in Shea collection also processed at least one form of value-added product, mainly for household consumption and limited market sales. These products are essential not only for income generation but also for local medicinal, cosmetic, and food uses, underlining their multifunctional importance.

The decision to engage in value addition is influenced by a range of socio-economic and institutional factors. Access to training and extension services is consistently associated with increased likelihood of value addition among rural producers. Elias and Carney (2017) found that training on hygienic practices and storage improved the proportion of women producing Shea

butter in Mali by 35% over three years. Similarly, Acema *et al.* (2021) reported that collectors in Uganda who received training from NGOs or cooperatives were significantly more likely to engage in roasting and grinding activities, enabling them to access higher-value local markets. Furthermore, education level, access to credit, and access to processing tools are strong predictors of whether a collector will engage in value addition (Bup *et al.*, 2016).

Gender dynamics play a pivotal role in upgrading decisions. While women dominate Shea nut collection and small-scale processing, structural constraints often hinder their progression to more sophisticated value-added activities. These include lack of land ownership, limited time due to domestic responsibilities, and exclusion from leadership roles in producer groups (Elias & Arora-Jonsson, 2017). Bello-Bravo and Pittendrigh (2018) revealed that women collectors with access to women-only cooperatives in Burkina Faso increased their value-added output by 28%, largely due to shared equipment and peer learning. Therefore, upgrading is not only a technical process but also a socio-political one, embedded in gendered power structures and cultural norms.

The proportion of Shea nuts allocated to value addition varies widely depending on household needs, market incentives, and processing capacity. In Benin, Adégbola *et al.* (2019) found that collectors allocate an average of 35–40% of their Shea harvest to value addition, while the remaining is sold raw to local buyers. However, the proportion allocated to value addition is higher when producers have access to reliable markets or participate in contractual arrangements. According to Agúndez *et al.* (2020), membership in certified Shea producer cooperatives led to a 45% increase in the proportion of nuts processed into butter for sale. These findings suggest that the level of commercialization and organizational affiliation strongly influences upgrading intensity.

Economic incentives and market orientation are also key drivers of the extent of value addition. In Nigeria, Tiarniyu *et al.* (2020) found that collectors who sold their products in urban centers or exported through cooperatives allocated up to 60% of their harvest to butter production, compared to only 20% among those dependent on village markets. Price differentials between raw nuts and processed butter often range from 100% to 200%, creating a compelling financial motive to upgrade, provided the producers have the means to do so. This aligns with Porter's

(1985) theory of competitive advantage, which posits that value-creating activities within firms or producers lead to higher margins when properly exploited.

Infrastructural and technological constraints, however, continue to limit the extent of upgrading. Lack of energy sources for roasting, inadequate water supply, and poor-quality milling machines reduce the quantity and quality of value-added Shea products (Gwali *et al.*, 2019). Moreover, the perishability of Shea butter in the absence of proper packaging and storage often discourages producers from allocating large quantities of nuts to value addition. Investments in solar dryers, energy-saving stoves, and access to clean water have been recommended as measures to enhance upgrading capacity in remote rural areas (Dubbert & Abdulai, 2022).

2.5.3 Marketing Arrangements and Determinants in the Shea Nut Value Chain

Marketing arrangements in agricultural value chains are crucial for determining how products are sold, the revenues earned by producers, and the level of coordination among actors. In the Shea nut value chain, marketing arrangements vary across countries and regions but are often dominated by informal transactions, particularly among collectors and traders (Ferris *et al.*, 2021). These arrangements include spot markets, informal contracts, and formal contracts. Spot markets involve immediate transactions with minimal negotiation or prior agreement. Informal contracts are based on verbal agreements, while formal contracts are documented and legally binding. The choice among these depends on a range of socio-economic, institutional, and market factors (Dubbert & Abdulai, 2022).

In West Africa, studies indicated that informal marketing dominates the Shea nut trade. In Ghana and Burkina Faso, spot markets account for over 70% of Shea nut transactions among rural collectors and small traders (Elias & Arora-Jonsson, 2017; Lovett *et al.*, 2016). This dominance is largely due to the seasonal and opportunistic nature of Shea nut collection, low investment in commercial infrastructure, and weak enforcement of formal agreements. Moreover, buyers prefer spot transactions for flexibility and minimal risk. In contrast, formal contracts are more common among processors and exporters who have established relationships with international clients and require consistent supply and traceability (Agúndez *et al.*, 2020).

Marketing arrangements vary significantly depending on the actor's role in the value chain. Collectors, who are typically women and operate at the lowest level, rely heavily on spot markets and informal exchanges, often selling to middlemen directly at farm gates or weekly markets (Bello-Bravo & Pittendrigh, 2018). Traders may engage in both spot and informal contracts, especially if they are linked to processors who prefer a reliable supply base. Processors and exporters, on the other hand, are more likely to use formal contracts when dealing with bulk suppliers or cooperatives (Adégbola *et al.*, 2019). These differences reflect disparities in bargaining power, transaction volumes, and market knowledge among actor groups.

In Uganda, studies show that collectors located in remote areas with poor road networks are more dependent on itinerant buyers and spot markets (Okullo *et al.*, 2018). In contrast, collectors in peri-urban areas or regions with cooperative presence tend to access semi-formal or informal contracts through organized bulking and supply arrangements. In Nigeria, Olife *et al.* (2017) noted that proximity to urban centers increased the likelihood of entering into buyer agreements, especially where aggregators operated. Thus, infrastructural development and market access are strong geographic determinants of marketing modes.

Socio-economic characteristics such as education, age, and gender significantly affect the market arrangement choices. More educated and younger actors tend to have better access to information and are more likely to experiment with formal contracts (Elias & Carney, 2017). Gender plays a dual role; while women dominate the Shea nut sector, they are underrepresented in marketing negotiations and contract-based selling, largely due to socio-cultural norms and lower access to assets like mobile phones, transport, and credit (Bup *et al.*, 2016). Empowering women with market literacy and infrastructure are therefore key to improving their access to diverse marketing arrangements.

Agúndez *et al.* (2020) observed that women collectors who underwent contract farming training in Benin were 60% more likely to adopt formal sales arrangements. This implies that access to extension services and training have emerged as a critical driver of formal and semi-formal marketing participation. Similarly, in Ghana, participation in cooperative-led marketing forums increased the incidence of semi-formal agreements among rural producers (Bello-Bravo *et al.*, 2015). Extension services not only improve awareness of market opportunities but also build

confidence in negotiating fairer deals and meeting product quality standards demanded by formal buyers.

Information access, especially via mobile platforms, is another powerful enabler of marketing arrangement diversity. Dubbert and Abdulai (2022) found that the use of mobile-based price information systems in Burkina Faso led to a 27% increase in producers switching from spot markets to informal agreements. Real-time information allows actors to anticipate market trends, identify reliable buyers, and negotiate better prices. However, digital exclusion among women and rural dwellers limits the impact of such innovations, reinforcing dependence on low-return marketing methods.

Institutional affiliations, such as cooperative membership and involvement in producer associations, greatly influence marketing arrangement decisions. Cooperatives often serve as intermediaries between rural producers and processors or exporters, offering opportunities to aggregate produce, meet volume and quality requirements, and access formal contracts (Adégbola *et al.*, 2019). In Uganda, organizations like NUSPA have played a role in connecting women collectors to both domestic and regional buyers. Membership in such groups increases trust among actors, enhances transparency, and reduces transaction costs, all of which are essential for successful contract arrangements (Acema *et al.*, 2021).

Transportation infrastructure and the means of transport used also affect marketing decisions. In regions where head-loading or bicycle transport is common, collectors tend to sell locally in spot markets due to the difficulty of transporting large quantities (Okullo *et al.*, 2018). Access to motorized transport increases the ability to bulk produce and sell in centralized markets, thereby opening up opportunities for contract-based marketing. Therefore, investment in rural transport services can play a transformative role in upgrading marketing practices among primary Shea actors.

2.5.4 Governance Structures and Upgrading Opportunities in the Shea Nut Value Chain

Governance in value chains refers to the relationships and institutional frameworks that determine how activities are coordinated and how value is distributed among actors (Gereffi *et al.*, 2005). In the context of the Shea nut value chain, governance structures dictate who controls

pricing, quality standards, market access, and production practices. These structures are particularly important in shaping how smallholder collectors, traders, and processors participate in the chain and whether they can engage in upgrading. The global nature of Shea as a commodity, used in cosmetics, food, and pharmaceuticals, has led to both local and international governance arrangements, each influencing actors differently (Kaplinsky & Morris, 2016).

Shea value chains across Sub-Saharan Africa often operate under buyer-driven governance, where international processors, exporters, or multinational firms dictate standards and prices, while rural producers operate with little influence (Gwali *et al.*, 2019). In such systems, governance is top-down, and producers are often —price takers— with limited ability to negotiate terms. For example, Lovett *et al.* (2016) noted that in Burkina Faso and Ghana, multinational cosmetic firms often set quality requirements and payment schedules, leaving little room for upstream actors to influence decisions. This limits their capacity to upgrade to higher-value functions like branding, exportation, or advanced processing.

However, governance can also take on more decentralized forms. In certain regions, particularly where cooperatives are strong, participatory governance has emerged. Cooperative-led governance empowers local actors to jointly control quality, set prices, and negotiate contracts. According to Agúndez *et al.* (2020), certified Shea cooperatives in Benin successfully created horizontal governance models where producers shared information, coordinated bulking, and collectively bargained with buyers. This type of governance allows for increased transparency and equitable benefit distribution, particularly for women who dominate the lower segments of the Shea chain.

Each actor plays a distinct role in value chain governance. Collectors are the primary producers but often operate informally and individually, giving them minimal influence on chain-wide decisions. Traders, acting as intermediaries, connect collectors to processors and buyers, often setting prices at their discretion and benefiting from asymmetric information (Ferris *et al.*, 2021). Processors and exporters, especially those engaged in high-volume or international markets, frequently play the role of chain coordinators. They determine processing timelines, quality grades, and delivery terms. In Uganda, similar dynamics have been observed where processors

act as gatekeepers to lucrative markets, limiting the decision-making power of upstream actors (Okullo *et al.*, 2018).

Governance structures significantly influence upgrading opportunities. In hierarchical chains, where buyers hold most power, upgrading is often limited to product or process upgrading, but not functional upgrading. That is, producers might learn to produce higher-quality butter, but they are rarely allowed to take on roles like packaging, branding, or exporting (Elias & Arora- Jonsson, 2017). Conversely, in relational governance, where trust and long-term relationships define actor interactions, producers can participate more meaningfully and invest in innovations that increase their value capture. Dubbert and Abdulai (2022) reported that relational governance among Shea cooperatives in Burkina Faso allowed rural women to innovate in packaging and access new urban markets.

Policy and regulatory frameworks play an essential role in shaping governance and upgrading potential. In Uganda, the lack of formal recognition of the Shea nut as a commercial crop has undermined the establishment of strong governance institutions (Acema *et al.*, 2021). In contrast, Ghana's regulatory support for Shea parkland conservation and cooperative formalization has strengthened governance mechanisms that include local producers in value addition and quality control (Adégbola *et al.*, 2019). This disparity illustrates how public policy can either constrain or facilitate inclusive governance and upgrading.

Access to information and transparency are key governance dimensions that affect actor empowerment. When market prices, buyer requirements, and input costs are opaque, producers operate at a disadvantage. According to Bello-Bravo and Pittendrigh (2018), information asymmetries in the Shea sector often enable traders and processors to manipulate prices and control transactions. Improved digital access, mobile platforms, and cooperative-based data sharing have been shown to correct some of these imbalances, increasing producers' bargaining power and enhancing governance fairness.

Gendered governance is another important consideration. Studies have shown that governance structures often reflect broader social inequalities. Women, despite comprising the majority of Shea nut collectors, are rarely represented in governance committees or producer associations

(Elias & Carney, 2017). This exclusion reduces their ability to influence decision-making processes, access resources, or benefit from upgrading initiatives. In Benin and Ghana, targeted governance reforms that increased female participation in leadership roles have led to higher income shares and improved quality standards (Bup *et al.*, 2016).

Power asymmetry within the chain remains one of the most significant governance challenges. Even where associations exist, large buyers or exporters often retain control over product specification and payment timelines. Gereffi *et al.* (2018) argue that these asymmetries stifle innovation and upgrading among smallholders. For example, in Burkina Faso, producers were required to meet strict butter quality standards but had little input into pricing mechanisms or cost-sharing for certification. These power imbalances underline the need for governance mechanisms that incorporate accountability and shared decision-making.

2.6 Summary of Literature

The literature highlighted the critical role of market structure and upgrading in enhancing the competitiveness and market participation of Shea nut value chain actors, particularly in Northern Uganda. Existing studies emphasize the skewed distribution of market share, with processors and exporters dominating while rural collectors—mostly women—remain marginalized due to weak institutional support, limited access to infrastructure, and gendered socio-economic barriers (Dubbert & Abdulai, 2022; Elias & Arora-Jonsson, 2017). While value addition through processing and cooperative participation has shown potential to improve incomes (Agúndez *et al.*, 2020; Acema *et al.*, 2021), challenges such as poor infrastructure, financial exclusion, and buyer-driven governance persist, restricting smallholders' ability to upgrade (Gereffi *et al.*, 2018; Kaplinsky & Morris, 2016). Marketing arrangements remain largely informal, with spot markets dominating due to information asymmetries and weak contractual enforcement (Ferris *et al.*, 2021; Okullo *et al.*, 2018). Despite evidence from West Africa on cooperative-led governance and digital innovations improving transparency (Bello-Bravo *et al.*, 2015; Dubbert & Abdulai, 2022), Northern Uganda's Shea sector remains understudied, particularly regarding how localized governance structures and institutional interventions can facilitate upgrading for rural collectors. Furthermore, the literature lacks empirical insights into the effectiveness of policy frameworks and gender-inclusive governance models in Uganda's Shea value chain. By applying

the UMT and SNT to further understand these challenges, this study addresses these gaps by examining how market structure and upgrading opportunities can be optimized to enhance equity, competitiveness, and sustainable participation for marginalized actors in Northern Uganda's Shea nut. Specifically, the study investigates the competitiveness and its drivers, product upgrading and its drivers and well as choice of market arrangement and its drivers. The study study also applies the SNT in identifying the existing challenges and opportunities for upgrading the Shea value chain in northern Uganda.

CHAPTER THREE

GENERAL RESEARCH METHODOLOGY

This chapter presents the general methods used in addressing the research questions. It starts by presenting the context and philosophical underpinning to the study followed by a description of the study area, as well as, the study population and research design. The chapter then presents the sample size, sample design and data collection tools. The chapter then presents the data analysis strategy and concludes with ethical considerations.

3.1 Study Context and Philosophical Underpinning

This study applied the UMT and SNT to understand the market structure and upgrading in the shea value chain of northern Uganda. These two theories are both This study followed a cross-sectional approach anchored in the UMT and SNT. The study focuses on the relationship between actors and how these relationships shape behaviors, influence, and information flow within the value chain (Krause et al., 2007). Based on the theoretic framework, the research paradigm of this study is thus pragmatism which combines both epistemology and ontology that allows blending of knowledge through use of mixed methods

3.2 Study area description

This study was conducted in northern Uganda, targeting the Shea belt in the districts of Pader, Lira, and Otuke where the Shea nut trees predominantly grow. Specifically, the districts of Otuke, Lira and Pader were selected due to the high concentration of Shea trees (Okullo *et al.*, 2012). These districts occur within Acholi and Lango sub-regions occurring within 02°50'N, 33°34'E and 1000 - 1300 meters above sea level. Lira and Otuke districts are located in the eastern part of Lango sub-region, while Pader is located in the eastern part of Acholi sub-region. Otuke district covers a total area of 1,550 km² and is located on geographical coordinates of 02°30' north, and 33°30' east. On the other hand, Lira District covers a total area of 1,549.8 km² and is located on geographical coordinates of 02°14'50" north, and 32°54'00" east. Pader district cover a total area of 3,362.5 km² and is located on geographical coordinate 02°50' north and 33°05' east. Rainfall in the study area is convectional and bimodal rainfall from mid-November to

Mid-May, with the annual rainfall ranging between 1000- 1500mm with relatively high temperatures whose maximum temperature is 26°C and the minimum is 18°C. All the three districts border each other, but are also surrounded by several other districts (Figure 3.1).

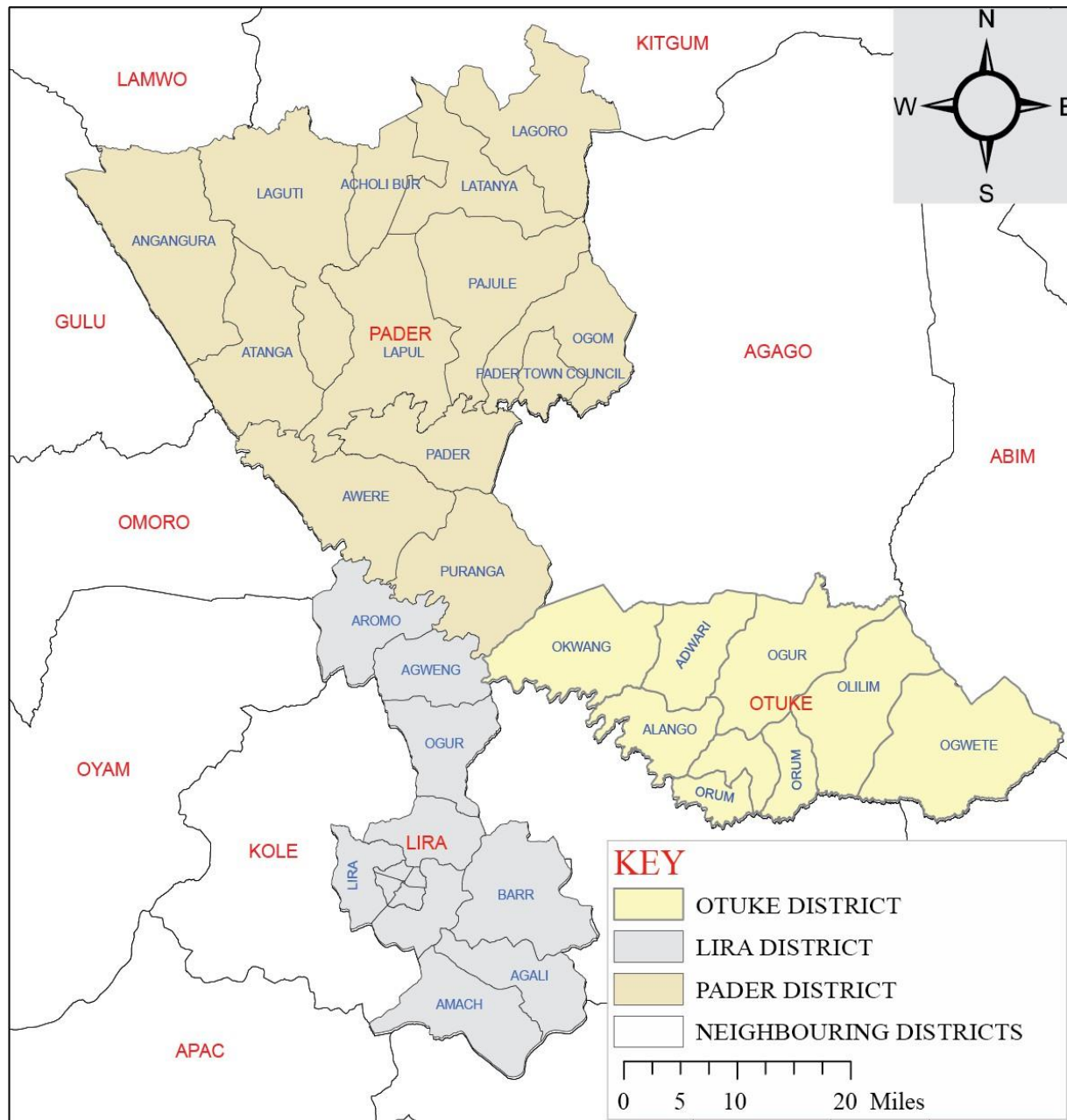


Figure 3.1: Map of the Study Area

The soils are ferrosols with woody Savannah thicket and riparian vegetation (Ministry of Agriculture, Animal Industry and Fisheries, 2015). The population of the study area is 690,301

people, with 145,143 households, of which 117,116 (80.7%) earn their livelihoods from subsistence farming (Uganda Bureau of Statistics, 2016). The main economic activity in these districts is crop and livestock farming, with majority of inhabitants involved in gathering of Shea nuts usually found growing natural in their gardens. Lately, other activities such as Shea nut collection and processing are providing alternative sources of household income.

3.3 Study population and research design

The study population comprised of various stakeholders in the Shea nut value chain/business right from collectors to exporters of Shea nut to the international markets. That is the household communities engaged in Shea nut collection, trading and processing. Others included in the study were the technical staff in the production department at the districts and sub county levels where Shea nut production takes place.

This study adopted a cross-sectional research design. The cross-sectional research design was used to collect data at a single point in time. The study used both qualitative and quantitative data to describe the nature, performance and upgrading of Shea nut value chain in the northern Uganda. This design was useful for descriptive purposes and in obtaining qualitative information as well as for determination of relationships between variables (Bailey, 1998).

3.4 Sampling and Sample design

This study used cross-sectional primary data that was collected from a sample of Shea value chain actors in the study area. The sample size for the study was determined using the formula proposed by Cockran (1977) for determining sample size of for an unknown population. This sample size was applied to chapters 4, 5 and 6. Chapter 7 adopted a qualitative approach and its study participants are described in chapter 7.2. Given that in the Shea value chain, the Shea collectors dominate and thus it is easier to identify collectors as opposed to the other Shea actors, the study determined the number of Shea collectors to be included in the study using the Cockran formula. The formula is specified in equation (3.1).

$$n = \frac{Z^2 p(1-p)}{e^2} \quad (3.1)$$

Where: n is the required sample size, Z is the test statistic at a level of significance. The study used Z at 95% which is 1.96. p is estimated proportion of Shea collectors in the study area. The study assumed that the proportion of Shea collectors in the study area was 78%. e is the level of precision assumed to be 5%. The number of Shea collectors to be included in the study was thus 264. The selection of these collectors followed a multi-stage approach, starting with the sub-counties with the highest concentration of Shea trees. In each district, two sub-counties were thus selected. In each sub-county, the study selected using quota sampling 44 Shea collectors. However, due to non-completeness of information, observations from twelve respondents were drop. The number of Shea collectors included in the final study thus dropped to 252. The selection of Shea traders and processors followed a respondent driven sampling (Heckathorn, 1997) approach in that each Shea collector was asked at the end of the interview to provide details of Shea traders and processors there were aware of. Using this approach, the researchers were able to survey 51 Shea traders and 22 Shea processors, all identified from the study districts. The total sample for the study was thus 325 Shea actors (Figure 3.2).

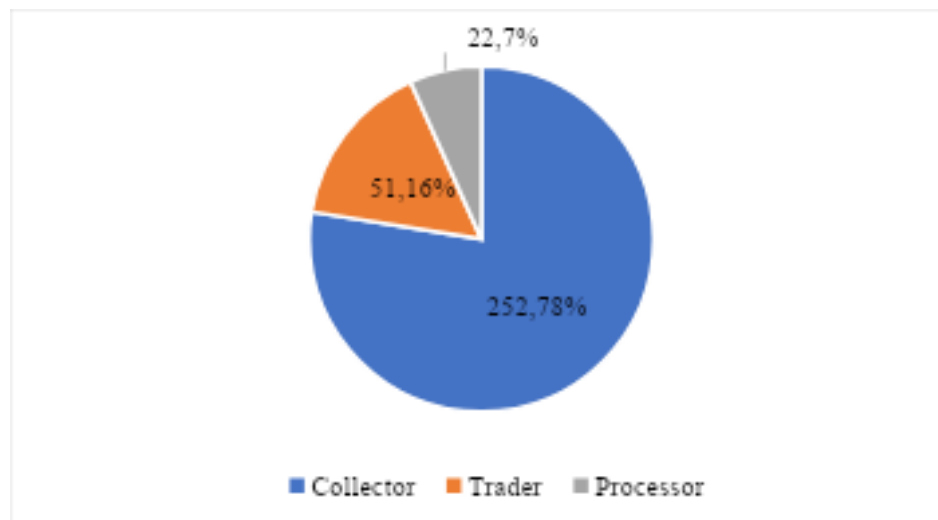


Figure 3.2: Distribution of Shea actors included in this study

3.5 Data Collection

For chapters, 4, 5 and 6, the primary cross-sectional data was collected using structured researcher administered questionnaire, while, for chapter 7, primary cross-sectional data was collected using key informant interviews (KII) and focus group discussions (FGD). The details of the KII and FGDs are presented in Chapter 7. The questionnaire was developed for purposes

of the study and contained information on socio-demographic and economic characteristics as well as Shea actor's marketing variables. Prior to data collection, the questionnaire was pre- tested in Gulu district, which neighbors Pader district. The pre-test was used to evaluate the content validity as well as reliability of the tool, by assessing the completeness, accuracy and clarity of the questions in the questionnaire with respect to study objectives. After the pre-test, the necessary amendments and improvements were made. Specifically, the amendments and improvements involved rephrasing questions that were not clear, ensuing all responses are mutually exclusive as well as revising the whole questionnaire to ensure easy readability, common interpretation and common understanding by everyone involved. Both the pre-test and actual field data collection were conducted by a team of competent enumerators who were trained on the tool prior to the start of the whole field work. Data was collected using hard copy questionnaires, and was entered into Microsoft Excel for further processing and analysis. Copies of the data collection tools are available in Appendix 1.1.

3.6 Data Analysis

Collected data were entered into Microsoft Excel and cleaned before being exported to Statistical Packages for Social Sciences (SPSS) and STATA for analysis. Data analysis involved both descriptive and econometric methods. Specifically, descriptive statistics were implemented in SPSS, while econometric analysis were performed in STATA v14. Data analysis following the objectives. The summary of data analysis methods for each objective is presented in Table 3.1 while, the details are presented in the respective chapters.

Table 3.1: Summary of methods used in the study

Objective	Data analysis approach	Key variables
One	• Descriptive statistics • Tobit regression model	• Market share • Market concentration ratio
Two	• Descriptive statistics • Ordered logit model	• Product upgrading, • Value upgrading
Three	• Descriptive statistics • Multinomial logistic model	• Marketing arrangement
Four	• Qualitative content analysis	• Challenges and opportunities for upgrading

3.7 Ethical considerations

While conducting this study, the researcher employed ethical approaches required for such a study. The permission to carry out this study was granted by the Ministry of Agriculture, Animal Husbandry and Fisheries (MAAIF) of Uganda, it followed the ethical guidelines for a human study. Firstly, the study was approved by Gulu University Research Ethics Committee (GUREC) and the Uganda National Council of Science and Technology (UNCST). GUREC and UNCST approval letters are presented in appendix 1.2. Secondly, introductory letters from the Chief Administrative Officers of each district were provided to allow data collection. Thirdly, informed consent was obtained from all study participants before the interviews and only willing participants were interviewed. An assurance of voluntary participation and confidentiality of the information collected was made to the study participants.

During data collection, the purpose of the study, expected outcomes and how these results would be used was clearly stated out to the participants. In adherence to the ethical guidelines provided by GUREC, participants' time were compensated with a bar of soap while transport refund and refreshments were provided for those who participated in the focus group discussion (FDG). Further, the study was in line with all the standard operating procedures involved the prevention and control of the spread of COVID 19 pandemic between and amongst the study participants and interviewers. Lastly, anonymity of the research participants in the data collection tools, processes and post-data collection was ensured.

CHAPTER FOUR

AN ASSESSMENT OF THE COMPETITIVENESS OF SHEA ACTORS IN THE SHEA NUT VALUE CHAIN OF NORTHERN UGANDA

This chapter presents empirical information on the competitiveness of the Shea value chain in northern Uganda as well as factors influencing the observed competitiveness.

The chapter investigated the following research questions:

1. What is the market share of the Shea actors?
2. How does the market share of Shea actors differ among actors?
3. What factors influence the market Shea of Shea actors in the Shea value chain of northern Uganda?

This chapter is based on:

Akatwetaba, D., Mugonola, B., Kasharu, A., & Egeru, A. (2024). An Assessment of the Competitiveness of Shea Actors in the Shea Nut Value Chain of Northern Uganda. *East African Journal of Agriculture and Biotechnology*, 7(1), 361-369.

<https://doi.org/10.37284/eajab.7.1.2076>

4.1 Introduction

Shea nut value chain contributes to the livelihood of many people in developing countries (Naughton *et al.*, 2015; Adekambi *et al.*, 2018). The Shea value chain in Uganda consists of collectors, traders, and processors who are mostly found in the Shea belt of the country (Akatwetaba *et al.*, 2023). The collectors form the base of the chain, participating in collecting the seasons Shea nuts produced from the Shea tree. After collecting, they either sell the nuts in its raw form to processors and/or traders or add some value before selling. Usually, the actors have several marketing arrangements that they employ. The choice of a given marketing arrangement is driven by several factors which usually vary across locations and products (Dubbart & Abdulai, 2022; Abdul-Rahaman & Abdulai, 2020; Dubbert, 2019). Shea can be market in any form including processed and unprocessed forms (Akatwetaba *et al.*, 2023).

The Shea value chain is currently becoming very competitive on the global scale (Dubbart & Abdulai, 2022; Abdul-Rahaman & Abdulai, 2020; Dubbert, 2019). This competitiveness is usually manifested in the global Shea value chains with local actors being at a disadvantaged (Boffa, 2015; Adam & Abdulai, 2014). Within the local Shea, it is not clear how market competitive forces affect the different actors.

Whether this competitiveness is being reflected at the bottom of the chain is something that hasn't been investigated. For instance, given the size of the collectors, how competitive can they be, in relations to the size of other actors. Unfair competition implies that some actors are disadvantage and would not be able to reap the full benefits of participating the Shea value chain. This study assessed competitiveness in the Shea value chain using the market share analysis, and also assessed the factors influencing the market share of actors in the Shea value chain. The Specific objectives of the study were to: (i) determine the level of competitiveness among Shea actors using the market share approach and (ii) evaluate how socio-economic and market farmers influence the market share of the Shea value chain actors. These findings are critical in improving competitiveness of actors in the Shea value chain. In essence, improving competitiveness of the Shea value chain is critical to the conservation efforts of the endangered Shea tree species (Adekambi *et al.*, 2018). The findings of this paper will thus go a long way in

informing practices with respect to enhancing competitiveness of the Shea value chain as well as encouraging conversation efforts (Boffa, 2015).

The rest of paper is structured as follows. The next section presents the methods used in the study followed by a presentation of results, and subsequent discussions. The last section presents a conclusion from the findings and includes recommendations for practice.

4.2 Methods

This study area and sampling design for this study is as described in chapter 3. This section presents data analytical approaches relevant to this chapter. Specifically, data analysis involved descriptive statistics, market share analysis, and regression analysis. SPSS was used for descriptive analysis, while Stata was used for regression analysis. Specifically, market share was computed following equation (4.1) while concentration ratio was calculated based on equation (4.2).

$$S_i = \frac{V_i}{\sum V_i} \quad (4.1)$$

$$C = \sum_{i=1}^m S_i \quad i = 1, 2, \dots, 4 \quad (4.2)$$

Where: S_i is the Market share of buyer i , V_i is the amount of Shea products handled by buyer i and $\sum V_i$ is the total amount of Shea products handled by all actors in the market, C is the concentration ratio; S_i is the percentage share of the i th firm and m is the number of largest firms for which the ratio is going to be calculated. In this study, the four largest firms for each category will be considered.

Given that market share is bounded between 0 and 1, the study used a Tobit regression model to analyse the factors influencing the market share of Shea value chain actors. The bounded dependent variable (between 0 and 1) violates the assumptions of OLS, making the tobit model more appropriage. Following Wooldridge (2002) and Cameron and Trivedi (2005), the Tobit regression model is specified in equation (4.3).

$$Y_i^* = X_i\beta + u_i \quad (4.3)$$

Where, Y_i^* is the dependent variable that takes on values within specified limits, X_i is a vector of independent variables that have potential influence on the dependent variable, β is a vector of parameters to be estimated by the Tobit model, while u_i is an error term which is assumed to be independent and identically distributed. The Tobit model above will be modified for analysis of factors affecting Shea actors market shares as in equation (4.4)

$$Y_i^* = X_i\beta + u_i \quad (4.4)$$

Where;

$$Y_i = 0 \text{ if } Y_i^* < 0$$

$$Y_i = Y_i^* \text{ if } 0 \leq Y_i^* \leq 1$$

$$Y_i = 1 \text{ if } Y_i^* > 1$$

Where; Y_i^* is a latent variable representing marketing share of market player i . These scores take on a minimum value of zero and a maximum value of one. X_i represent a vector of explanatory variables which can affect the market share. Table 4.1 presents a description of these explanatory variables and also presents their a priori expectations. β is a vector of parameters to be estimated associated with firm specific attributes. The parameters of this Tobit model was be estimated using the method of maximum likelihood.

Table 4.1: Description of variables used in the tobit models and their summary statistics

Variable	Description/Measurement	Apriori sign
Gender (1=male)	Dummy =1 if actor is Male	+/-
Age years)	In years, transformed to natural log to improve model fit	+
Household Size	Number of members in the household	+
Education (years)	Number of years of formal education	+
Distance to source	Distance to source of Shea/Shea product in km	+
Distance to output market	Distance to market of Shea/Shea product in km	-
Head pottage as transport mean	Dummy (use of head pottage as means of transport =1, motorized = 0)	-
District (Otuke=Base)		
Lira	Dummy for Lira district	+/-
Pader	Dummy for Pader district	+/-
Experience (years)	Experience in the Shea trade in years	+
Contract	Dummy =1 if actor has contract with their buyer/seller	+
Group membership	Dummy = 1 if actor is a member of an association	+
Market Arrangement (Spot =base)		
Informal relationship with	Dummy for informal relationship with buyers	-

buyers		
Formal relationship with buyers	Dummy for formal relationship with buyers	+
Both spot and informal	Dummy for both spot and informal relationship with buyers	+

4.3 Results

4.3.1 Summary Statistics

Table 4.2 presents summary statistics for the variables used in the study. In this study, about 40% of the participants were males, while the rest were females. The average age of the actors was 41 years old. This age is related to actors' experiences. In fact, the average number of years of experience in Shea business was 10 years. Each actor's households had between six and seven members, while the average number of years of formal education was six. This suggests that majority of the actors were primary school drop-outs. Actors lived about three kilometers from where they obtain Shea or Shea products and six kilometers from where they sold their Shea or Shea products. In essence, about 48% of the actors used head pottage as the only means to carry Shea and/or Shea products to the market. The number of participants from all the districts were proportional, at about 33% in each district. The market commonness market arrangement was information relationship with buyers (23%), followed by contract (17%). About 22% of the actors were members of an actors' group.

Table 4.2: Summary Statistics of explanatory variables used in the Tobit model regression

Variable	Mean	Standard deviation
Gender (1=male)	0.406	0.492
Age years)	40.566	13.367
Household Size	6.560	2.860
Education (years)	6.243	2.644
Distance to source	3.439	5.255
Distance to output market	5.693	8.766
Head pottage as transport mean	0.486	0.501
District (Otuoke=Base)		
Lira	0.332	0.472
Pader	0.332	0.472
Experience (years)	10.257	8.494
Contract	0.171	0.377
Group membership	0.215	0.412
Informal relationship with buyers	0.228	0.420
Formal relationship with buyers	0.117	0.322

Both spot and informal	0.074	0.262
------------------------	-------	-------

In case of dummies, the values indicate proportions instead of means. The proportions are multiplied by 100 and reported as percentages.

4.3.2 Market Share of Shea value chain actors

Table 4.3 shows that the average market share for collectors was 0.00397 (approx. 0.4%), while that of traders was 0.01961 (approx. 1.9%), and that of processors was 0.04545 (approx. 4.5%). The smallest collector had a market share of 0.009% while the largest had a market share of 2.8%. Similarly, the smallest trader had a market share 0.2% while, the largest traders had a market share of 5%. In the case of processors, the smallest processor had a market share of 0.4% while the largest had a market share of 24%. The largest market share of 24% suggests oligopolistic tendencies is such large actors are many. However, this is presented in the next section on concentration ratio.

Table 4.3: Summary Statistics for market share of Shea actors

Actor	Mean	Std. Deviation	Minimum	Maximum
Collectors (n=252)	0.00397	0.00377	0.00009	0.02849
Traders (n=51)	0.01961	0.00724	0.00249	0.04985
Processors (n=22)	0.04545	0.06696	0.00482	0.24120

4.3.3 Concentration ratio of the four largest actors for each player

The concentration ratio (CR₄) for the four largest actors for each category shows that, the CR₄ for collectors and traders were all below 40% (0.4), while that of processors was above 40% (Figure 4.1).

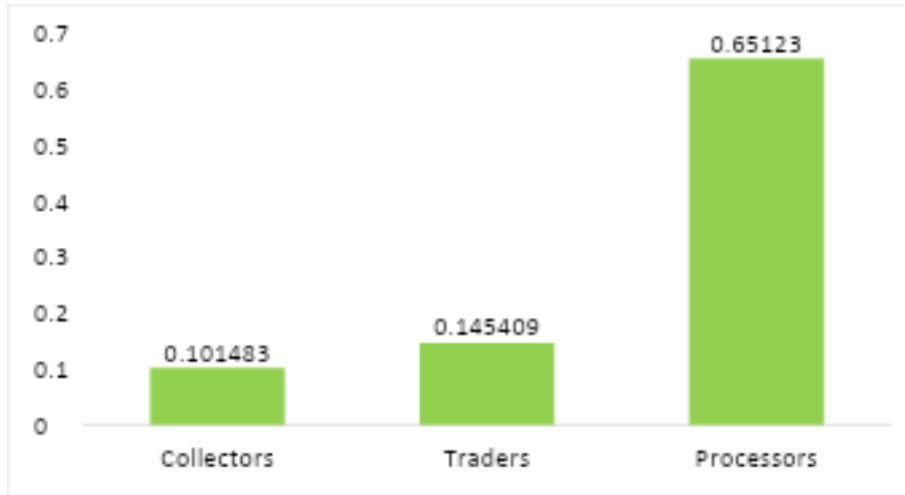


Figure 4.1: Concentration ratio of the four largest actors for each player

This suggests that both collectors and traders were small enough not to have market power that influences the pricing decisions. Their sizes are ideal for perfect competitions. On the other hand, the CR4 for processors suggest oligopolistic tendencies where a few actors can easily influence pricing and other decisions in the value chain leading to unfair competition.

4.3.4 Factors influencing actors' market share

Tobit model regression results show that distance to the source has a positive relationship ($p < 0.1$) with market share while distance to the output market has a negative relationship ($p < 0.01$) with market share of Shea actors. This implies that, Shea actors who stay nearer the output market have a higher market share. The opposite can be said for distance to the source of share. Also, market share of Shea actors was higher in Pader ($p < 0.01$) and Lira ($p < 0.01$) than in Otuke district (Table 4.4).

Table 4.4: Factors influencing actors' market share

Market Share	Coef.	Std. Err.	P>t
Gender (1=male)	0.00059	0.00059	0.318
Age (log years)	0.00086	0.00075	0.251
Household Size	-0.00009	0.00008	0.240
Education (years)	0.00010	0.00011	0.382
Distance to source	0.00011	0.00005	0.049
Distance to output market	-0.00011	0.00003	0.003
Head pottage as transport mean	-0.00076	0.00058	0.189

District (Otuke=Base)			
Lira	0.00214	0.00060	0.000
Pader	0.00261	0.00070	0.000
Experience (years)	-0.00011	0.00005	0.016
Contract	0.00194	0.00098	0.050
Group membership	-0.00110	0.00068	0.109
Market Arrangement (Spot =base)			
Informal relationship with buyers	0.00268	0.00100	0.008
Formal relationship with buyers	0.00052	0.00086	0.549
Both spot and informal	-0.00009	0.00078	0.904
Constant	0.00007	0.00268	0.979
var (e. VAR00001)	0.00001	0.00000	
F(15, 237)	2.33		
Prob > F	0.0040		
Pseudo R2	-0.0259		
Log pseudolikelihood	1076.2171		

Results also showed that the less experience Shea actors had significantly ($p < 0.05$) higher market share than the more experience actors, while actors who had contracts also had significantly ($p < 0.1$) higher market share. Finally, actors who had informal relationships with their buyers had a significantly higher ($p < 0.1$) market share (Table 4.4). Other factors including gender of the actor, age, education level, and group membership did not have any significant influence on market share of actors.

4.4 Discussions

The findings of this study show that in the Shea value chain, both Shea traders and collectors are small actors who do not have a significant market share to be able in cause imperfect competition. It is the processors, who are largely enough to act imperfectly in the market, influence pricing and other decision in the Shea value chain. According to Amanor (2019), the ability of agribusiness processors to undertake mergers and takeovers increases the monopolistic tendencies which affect the smallholders disproportionately. In the Shea value chain, it is possible for processors to create horizontal linkages that make them have a strong bargaining power, much more than the collectors and traders.

The observed unfair competition reported in this study is typical of what is observed in most agribusiness value chains, where the processors who are usually the link between the local producers/collectors and global market poses competitive threats to actors at the bottom of the

chain (Lee *et al.*, 2012; Clay & Feeney, 2019; Barrett *et al.*, 2022). This is largely because most of the traders and producers/collectors are unable to add value to their produce. In other words, they are unable to take on additional value chain functions that would have made them more competitive. In practice, encourage such actors to take up additional value chain functions would help them achieve value chain upgrading thereby increasing their competitiveness.

Strategies to improve competitiveness of the lower-level actors include contracting which has been shown to collectors and trader greater market power (Lee *et al.*, 2012; Opoku–Mensah, 2023). A study by Elias and Arora-Jonsson (2017), recommends horizontal integration of the Shea value chain as a way of improving on the competitiveness of the disadvantaged actors including collectors and traders. In the Shea value chain of Uganda, such integration involves collectors coming together to address challenges of undifferentiated products that makes it hard for them to compete (Akatwetaba *et al.*, 2023). Success of such initiatives would also depend on addressing market access factors. Results of this study has shown that distance to the output market which can be interpreted as distance from the collectors to the trader and processors in the case of collectors and distance from the traders to the processors in the case of traders has an inverse relationship with market share. This suggests that, actors staying near their upstream players can easily access the market (Olife *et al.*, 2013). This is an indicator of market inaccessibility among actors who stay far away from the up-stream players. Such difficulties in accessing the market disproportionate affects collectors who are usually in the remote rural areas (Alex *et al.*, 2015).

4.5 Conclusion

This study has shown that, unfair competition manifested by higher-than-normal market share exists in the Shea value chain with the processors, have the potential to have oligopolistic tendencies. The traders and collectors on the other side of the continuum, are however, individually, too small to influence market outcomes in the Shea market value chain. Addressing the observed differences in market share partly requires harnessing the potential of the factors that influence the market share of these actors. Contracting for instance, would improve the market share of collectors and traders making able to compete favorably with the processors. The

findings suggest the need to tackle the inefficiencies in the market that is manifested has extremely high market share of some actors and extremely low market share among some actors.

CHAPTER FIVE

DRIVERS OF VALUE ADDITION AND PRODUCT UPGRADING TO SHEA NUTS BY COLLECTORS IN NORTHERN UGANDA

This chapter evaluated the drivers of Shea value addition and Shea product upgrading among Shea actors in northern Uganda. The chapter also presents empirical information on the factors influencing value addition and product upgrading among Shea collectors in northern Uganda.

The chapter investigated the following research questions:

1. What value added products do Shea collectors in northern Uganda engage in?
2. What factors influence in the value addition among Shea collectors in northern Uganda
3. What is the proportion of Shea collected that is allocated to value addition?
4. What factors influence the proportion of Shea allocated to value addition?

This chapter is based on:

Akatwetaba, D., Mugonola, B., Kasharu, A., Okello, D. M., & Egeru, A. (2023). Drivers of value addition and product upgrading to Shea nuts by collectors in northern Uganda. *African Journal of Science, Technology, Innovation and Development*, 15(3), 349-361.

<https://www.tandfonline.com/doi/full/10.1080/20421338.2022.2115602>

5.1 Introduction

The Shea nut tree, *Vitellaria paradoxa*, is a multipurpose tree crop, indigenous to Sub Saharan African (SSA) and found growing naturally in the wild (Kabiru & Ayanfunke, 2018; Orwa *et al.*, 2009; Tijani & Sanusi, 2020). The tree is widely encountered in dry savannas, forests, and parklands of the Sudan zone covering an estimated one million square kilometers between western Senegal and northwestern Uganda (Fontaine *et al.*, 2004; Hatskevich *et al.*, 2011; Tom- Dery *et al.*, 2018). The tree supports the livelihoods of more than 16.2 million collectors and local processors (Naughton *et al.*, 2015). Today the Shea tree is the second most important oil crop in Africa after the palm nut tree. With about 500 million Shea trees currently in existence, this naturally occurring parkland tree species has the potential of producing Shea nuts worth about 150 million United States Dollars (USD) annually (Bup *et al.*, 2014). This potential represents substantial earnings for SSA economies when fully exploited

In Uganda, Shea nut mainly grows in Northern, Eastern and West Nile sub-regions (Okullo *et al.*, 2012). Shea nut trees are characterized by extensive rooting that is critical for their survival during intermittent droughts in the savannahs and with a hardy bark that is essential in withstanding severe fire regimes (Orwa *et al.*, 2009). It is further important to note that the life span of Shea nut trees is a considerably long time estimated to last about 200-300 years. The tree's normal productive time commences after about fifteen years but the full fruit production is only attained at about 40-45 years (Karambiri *et al.*, 2017).

The tree is a source of livelihoods to several people especially women both locally and globally due to the economic value attached to oil extracted from nuts and the kernels (Adekambi *et al.*, 2018). The products are used nationally and internationally in food industry, cosmetics, pharmaceuticals (Bup *et al.*, 2014). The Shea value chain starts with collectors, and ends with the consumers (Adekambi *et al.*, 2018; Bello-Bravo *et al.*, 2015). Although the Shea value chain starts with the collectors, the sequence of activities that follow after collection depends the intended final use of the product (Glew & Lovett, 2014). For instance, Shea intended for consumption may first be roasted by the collectors or other actors along the chain, while, Shea meant for cosmetics may be sold to local processors in its raw form, for onward processing (Ferris *et al.*, 2001). This implies that, depending on the final use, the Shea value chain may be

longer or shorter. Consequently, the Shea value chain comprises of several activities and functions, some of which can be performed by collectors and others requiring other actors higher in the chain (Ferris *et al.*, 2001; Kent *et al.*, 2014). However, the collector, who sits at the bottom of the chain is becoming disadvantaged. This disadvantage arises from the increasing competitiveness of and globalization of the Shea value chain (Rousseau *et al.*, 2015; Bello-Bravo *et al.*, 2015; Lovett, 2015; Elias & Arora-Jonsson, 2017). This increased competitiveness and globalization implies that, Shea collectors who are mostly women and children (Bello-Bravo *et al.*, 2015; Hammond *et al.*, 2019; Adekambi *et al.*, 2018; Seghieri, 2019) have to take additional value chain functions and activities through enhance value addition so as to remain competitive (Rousseau *et al.*, 2015). This value addition is usually associated with increased income of Shea actors including collectors at the bottom of the chain (Agúndez *et al.*, 2020; Kodua *et al.*, 2018; Tihamiyu *et al.*, 2014) in addition to improve quality of Shea products (Honfo *et al.*, 2017; Adekambi *et al.*, 2018). The need to increase the competitiveness of Shea collectors in terms of their increased participation in the Shea value chain is becoming common place in development thinking. This is attributed to increased competition from other chain actors and then need to enhancing sustainability of the Shea value chain (Adekambi *et al.*, 2018; Rousseau *et al.*, 2015). For instance, Gyau *et al.* (2014) and Bello-Bravo *et al.* (2015) noted that collectors of agroforestry products had poor access to markets. Garba, Sanni and Adebayo (2015) also noted a number of challenges for which smallholder Shea collectors are faced with including discrimination by buyers. Similarly, Tanko (2017) reported low levels of efficiency for most Shea traders selling Shea nuts. Elias and Saussey (2013) raised the question of fairness in international Shea trade due to the low returns of Shea producers in Burkina Faso, while, Kombiok and Agbenyega (2017) pointed out the challenges associated with financing arrangements in the production and marketing of Shea butter.

According to Adekambi *et al.* (2018), addressing the challenges faced by smallholder Shea collectors requires integrating into high value markets by enhancing their levels of value addition and product upgrading. Value addition and product upgrading are processes that enables a firm or any other actor of the chain to take on more value intensive functions in the chain, make itself harder to replace, and thus appropriate a larger share of the generated profits. It entails the acquisition of technological capabilities and market linkages that assist producers, enable firms

to improve their competitiveness and move into higher-value activities (Kaplinsky & Morris, 2000; Fessehaie, 2013; Akite *et al.*, 2021; Yongabo, 2022; Biurrun *et al.*, 2022). In many cases, smallholder Shea collectors must respond to market opportunities by innovating and increasing value added products, a process also known as —upgrading. Through upgrading, smallholder Shea collectors can enhance the competitiveness of a value chain and thus contribute to economic growth (Rousseau *et al.*, 2015). At the same time, they benefit when their increased value-added contributions to the value chain translate into higher returns to the collectors (Adekambi *et al.*, 2018). After collecting Shea, collectors have to make decisions on what quantity to add value to and what value-added products to deal in. In other words, they have to make decisions on two possible upgrading scenarios. First, they can decide to sell 100% of the collected Shea without any value addition, or add value all or a proportion of the collected Shea. This is in case of value upgrading which, in this study is being looked at as actions that change the economic value of the collected Shea. Second, they can also decide to have no value-added product or to have one of more added products. This is the case of product upgrading, which, in this study is being looked at as changing the form of product by undertaking some processing activities.

Although several options exist in both cases, the collector will choose the options that give him best satisfaction. This upgrading decision can be explained by the Utility Maximization Theory (UMT), which suggest that economic actors which are in this case Shea collectors will choose a given course of actions only if there is perceived benefit associated with such a decision. Usually, such decisions are subject to a set of social, economic and institution constraints (Rahm & Huffman, 1984). Consequently, when there is no perceived benefit associated with upgrading, a collector will decide not engage in either value or product upgrading, and when, there is a perceived benefit, a collector will only engage in value upgrading up to a level where the benefit is perceived to be highest, amidst existing constraints. The perceived benefits cannot in reality be directly measured but are a direct function of observed constraints which include social, economic and institutional factors (Mugonola *et al.*, 2013).

Despite the benefits associated with both product and value upgrading, it is not clear, what drives smallholder Shea collectors to undertake upgrading activities. By applying the UMT, this study assessed the influence of the observed social, economic and institutional factors on both value

and product upgrading. Specifically, it is important to understand the factors that drive collectors to allocate their collected Shea to value addition, and on what products they decide to participate in value addition. This study sought to determine the factors that influence upgrading in the Shea nut value chain in northern Uganda with specific focus on Shea collector at the base of the chain. Specifically, the study assessed the factors associated with the proportion of Shea value added and the number of value-added products that collectors decide to engage in.

5.2 Methods

The study area, sample size, sample design as well as data collection approaches used for this chapter are presented in Chapter 3. This section presents the data analysis approaches specific to this chapter. Specifically, descriptive statistics were used to describe and summarize the variables under study, while, econometric methods were used to assess factors influencing value addition and upgrading. Specifically, the ordered logit model was chosen due to its ability to model ordered responses. This chapter assessed the factors influencing level of value addition in terms of proportion of value added and number of value-added products. All these two dependent variables were defined in an ordered way signifying low levels of value addition to high levels of value addition. The ordered logit model is a regression model for an ordinal response variable. The model is based on the cumulative probabilities of the response variable: in particular, the logit of each cumulative probability is assumed to be a linear function of the covariates with regression coefficients constant across response categories. Value addition, a dependent variable was analyzed basing on different levels of value addition to Shea nuts by collectors as well as the number of value-added products sold by collectors.

Let Y denote the response variable with C categories for the i th subject, alongside with a vector of covariates X_i as specified in equation (5.1). This regression model establishes a relationship between the covariates and the set of probabilities associated with each of the ordinal categories.

$$g_{ci} = \Pr(Y = y_c | X_i), \quad c = 1, 2, \dots, C \quad (5.1)$$

Note that the last cumulative probability is necessarily equal to 1, so the model specifies only $C - 1$ cumulative probabilities. An ordered logit model for an ordinal response Y with C categories is defined by a set of $C - 1$ equations where the cumulative probabilities $g_{ci} =$

$\Pr(Y = y_c|X_i)$ are related to a linear predictor $\beta X_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots$ through the logit function as specified in equation (5.2)

$$\text{logit}(g_{ci}) = \log\left(\frac{g_{ci}}{1-g_{ci}}\right) = \alpha_c - \beta X_i, \quad c = 1, 2, \dots, C - 1 \quad (5.2)$$

In the Ordered logit regression, the level of value addition for each actor is the dependent variable, and the transaction attributes and socio-demographic characteristics of the actors, the independent variables. Level of value addition was measured using two approaches, giving rise to two dependent variables. First, the study considered the proportion of value added with five ordinal outcomes of: 1=no proportion value added, 2=low proportion, 3=medium proportion, 4=high proportion and 5=full proportion value added. The study proposed a cut-off that presented in Table 5.1. Secondly, the study considered the number of value-added products with four ordinal outcomes of: 1=no product, 2=one product, 3=two products and 4=three or more products.

In this study, a separate model was estimated for each of the two dependent variables associated with product upgrading and value upgrading. The specification for each model followed equation (5.3).

$$Y = f(X, \varepsilon) \quad (5.3)$$

Where:

$$Y = \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{matrix} \begin{matrix} = no\ proportion \\ = Low\ proportion \\ = medium\ proportion \\ = high\ proportion \\ = full\ proportion \end{matrix} \quad \text{in the case of proportion of value added for value upgrading}$$

And

$$Y = \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \end{matrix} \begin{matrix} = None \\ = Low \\ = Medium \\ = High \end{matrix} \quad \text{in the case of number of value-added products for product upgrading}$$

X is a vector of explanatory variables as described in Table 5.1; is the error term. Given the potential correlation between the proportion of Shea value added and the number of products values added, the study estimated the two ordered logit models simultaneously using the bivariate ordered logit approach. The adjusted Wald test ($F = 6.08$; $\text{Prob} > F = 0.0026$) was significant implying combined model fit for the models.

Table 5.1: Description of variables used in the ordered logit regressions and their a priori expected signs

Variable	Description	
Dependent variables		
Value upgrading	Proportion of Shea that is value addition to Shea nuts by collector 1 = No Proportion; 2 = Low proportion; 3 = Medium proportion; 4 = High proportion and 5 = Full Proportion	
Product upgrading	Number of value-added products 1=None; 2=Low; 3=Medium and 4=High	
Explanatory variables		
	Description	<i>A priori sign</i>
Marital status	Dummy i.e., 1= Married, 0 Otherwise	+
Male	Dummy i.e., 1= Yes, 0 = No	+/-
Age	Continuous: (In Years)	+/-
Household size	Continuous: (Number of people)	+
Education	Continuous (number of years spent in school)	+
Land size	Continuous (acreage)	+
Distance to market point	Continuous (in Kilometers)	-
Shea income	Continuous (amount in Ugandan shillings)	+
Non-Shea income	Continuous (amount in Ugandan shillings)	+
Experience	Continuous (years in Shea nut collection)	+
Extension services	Dummy for extension access i.e., 1= Yes, 0 = No	+
Receive training	Dummy for received training i.e., 1= Yes, 0 = No	+
Receive information	Dummy for received information i.e., 1= Yes, 0 = No	+
Aware of institutions	Dummy for awarenss of institutions i.e., 1= Yes, 0 = No	+
Member of Association	Dummy for membership to an association i.e., 1= Yes, 0 = No	+
Spot marketing	Dummy for use of spot markets i.e., 1= Yes, 0 = No	+
Informal marketing	Dummy for use of informal marketing arrangement i.e., 1= Yes, 0 = No	+
Formal marketing	Dummy for use of formal marketing arrangement i.e., 1= Yes, 0 = No	-
Spot and formal	Dummy for use of both spot and formal marketing arrangement i.e., 1= Yes, 0 = No	+
Otuke district	Dummy for actor coming from Otuke district i.e., 1= Yes, 0 = No	+/-
Lira district	Dummy for actor coming from Lira district i.e., 1= Yes, 0 = No	+/-

Pader district	Dummy for actor coming from Pader district i.e., 1= Yes, 0 = No	+/-
----------------	---	-----

Note: The categories for the proportion of value added were created as: - No proportion = 0% of Shea value added, low (1 – 49% value added), medium (50 – 75% value added), High (76 – 100% value added), and Full = 100% value added. For the number of value-added products, high and very high levels were combined to high, since very high (4 value added products) had very few observations

In order, to estimate the actual effects of the different categories of the dependent variables, the study estimated marginal effects as specified in the equation (5.4).

$$\frac{\partial P_{ij}}{\partial x_i} = [g(\alpha_{j-1} - x'_{j-1}\beta) - g(\alpha_j - x'_j\beta)]\beta \quad (5.4)$$

Where: $g(.)$ is the standard normal density function.

5.3 Results

5.3.1 Socio-demographic Characteristics

Males were less involved in Shea nut collection (40%) than their female counterparts (60%) with significant variation across districts. Average age of collectors was 39.5±13.64 years with no significant variations across districts. On average, collectors had 7 years of formal education with significant variations across districts. Collectors on average had access to 4.5 acres of land under Shea nut trees this varied across districts smaller in Lira and Otuke and highest in Pader district (Table 5.2). Most of the collectors had an average of 10 years' experience but collectors in Pader district were found to have the least experience in Shea nut collection. Comparatively, the income from Shea (UGX. 22,2885±211,951/US\$ 61±50) was less than the income earned from non-Shea activities (UGX. 276,502±537,337/US\$ 76±146). Shea income significantly varied across the districts, while non-Shea income did not. The low Shea income could be attributed to reliance on spot marketing. Most of Shea income was generated through a spot marketing that was deployed by 67% of the respondents. Only 12% of the respondents had access to extension services and of these, 25% received training, 10% received information, and 8% were aware of institutions dealing with Shea nut (Table 5.2). There were significant associations between district of the collector and access to services including extension, information, in addition to the marketing arrangements.

5.3.2 Shea nut value addition and product upgrading

Results showed that 84% of the Shea collectors practice some level of value addition with 11.5% adding value to 100% of all the Shea nuts they collected. Fifteen (15%) percent of the Shea collectors sold all the Shea kernels without any value addition. There is a positive correlation between number of Shea products value added and proportion of Shea value added with a Pearson correlation coefficient of 0.404 ($p < 0.01$). District wise, 74% of the collectors added some value to their Shea nuts in Lira, 85% in Otuke and 95% in Pader. Over 50% of the Shea collectors had at least one value-added product with 2.78% having four (4) value-added products. Thirty-seven (37%) percent of the respondents had roasted kernel and crude butter (37.3%) as the main value-added product (Table 5.3). Other products included fine butter, cosmetics and dried kernels.

Table 5.2: Summary statistics for demographic characteristics

Variable	Mean (SD)				F-value/Chi-square	p-value
	Overall (n=252)	Otuke (n=80)	Lira (n=90)	Pader (n=82)		
Gender (Male)	0.40(0.49)	0.55(0.50)	0.43(0.50)	0.22(0.42)	19.033	0.000
Age	39.54(13.64)	39.95(39.95)	38.78(13.3)	39.96 (13.66)	0.210	0.807
Household size	6.42(2.91)	6.11(2.40)	6.42(2.74)	6.72 (3.48)	0.880	0.415
Education	6.8 (1.92)	7.38 (1.99)	6.22(1.11)	6.95 (2.35)	8.350	0.000
Land size	4.47(4.64)	3.91(4.17)	3.09(3.44)	6.53 (5.47)	14.030	0.000
Distance to market point	4.86(7.18)	4.02(4.02)	4.42(3.96)	6.17 (11.11)	2.110	0.123
Processing income	222,884.90 (211,951.30)	160,850.00 (87,604.56)	255,244.40 (260,760.10)	247,890.20 (226,744.70)	5.220	0.006
Non-processing income	276502.00 (537337.80)	249256.30 (232041.70)	307755.60 (794857.60)	268780.50 (382258.00)	0.260	0.780
Experience	10.26(8.76)	10.21(8.41)	12.57 (10.41)	7.76 (6.11)	6.760	0.001
Extension services	0.12(0.33)	0.15(0.36)	0.00(0.00)	0.23 (0.42)	22.144	0.000
Receive training	0.25(0.43)	0.26(0.44)	0.00(0.00)	0.50 (0.50)	57.997	0.000
Receive information	0.10(0.29)	0.15(0.36)	0.00(0.00)	0.15 (0.36)	14.743	0.001
Aware of institutions	0.08(0.28)	0.15(0.36)	0.03(0.18)	0.07 (0.26)	7.711	0.021
Member of Association	0.07 (0.26)	0.04 (0.19)	0.01 (0.11)	0.17 (0.38)	18.517	0.000
Spot marketing	0.67 (0.47)	0.69 (0.47)	0.44 (0.50)	0.91 (0.28)	43.302	0.000
Informal marketing	0.17 (0.38)	0.09 (0.28)	0.33 (0.47)	0.07 (0.26)	24.246	0.000

Formal marketing	0.10 (0.30)	0.19 (0.39)	0.11 (0.32)	0.01 (0.11)	13.545	0.001
Both Spot & informal	0.05 (0.22)	0.04 (0.19)	0.11 (0.32)	0.00 (0.00)	11.302	0.004

Note: In case of dummies, the values in the column for means are proportions which are multiplied by 100 to get percentages for the reference category. SD=Standard deviation. One-way Analysis was used to compare means value across districts, in case of continuous variables and the chi-square test of association was used to compare association between districts and dummy variables.

Shea kernels processing was most pronounced in Pader district. Lira district had the highest proportion of Shea nut collectors with no value-added product, while, Pader district had the lowest proportion of Shea collectors with no value-added product. The most common products being roasted kernel and crude butter (37.3%) and dried kernel being the least with only 1.2% of the respondents. Pader district had highest proportion of collectors processing collected Shea kernels to roasted kernel and crude butter, while Lira district had the least proportion of collectors processing collected Shea kernels to roasted kernels and crude butter (Table 5.3).

Table 5.3: Shea nut value addition and value-added products among Shea collectors

Variable	Category	Percent				Chi-square	p-value
		Overall (n=252)	Otuke (n=80)	Lira (n=90)	Pader (n=82)		
Proportion of Shea value added†	No proportion	15.48	15.00	25.56	4.88	41.214	0.000
	Low proportion	34.13	41.25	37.78	23.17		
	Moderate proportion	20.24	13.75	14.44	32.93		
	High proportion	18.65	20.00	6.67	30.49		
	Full proportion	11.51	10.00	15.56	8.54		
Number of value-added products‡	None	49.21	41.25	68.89	35.37	26.474	0.001
	Low	19.84	25.00	8.89	26.83		
	Medium	18.65	17.50	15.56	23.17		
	High	9.52	13.75	5.56	9.76		
	Very high	2.78	2.50	1.11	4.88		
Value added product is roasted kernel	Yes	37.30	37.50	20.00	56.10	23.908	0.000
	No	62.70	62.50	80.00	43.90		
Value added product is crude butter	Yes	37.30	41.25	30.00	41.46	3.192	0.203
	No	62.70	58.75	70.00	58.54		
Value added product is fine butter	Yes	15.08	20.00	8.89	17.07	4.461	0.107
	No	84.92	80.00	91.11	82.93		
Value added product is a cosmetic product	Yes	5.95	10.00	1.11	7.32	6.382	0.041
	No	94.05	90.00	98.89	92.68		
Value added product is a dried kernel	Yes	1.19	2.50	1.11	0.00	2.159	0.340
	No	98.81	97.50	98.89	100.00		

†There is a significant ($p < 0.01$) correlation between number of Shea products value added and proportion of Shea value added. The Pearson correlation coefficient = 0.407

5.3.3 Factors influencing Shea nut value upgrading among Shea nut collectors

Table 5.4 presents results of the ordered logistic analysis for factors influencing proportion of Shea that is value added by Shea nut collectors. It shows that, male gender indicator ($p < 0.1$), age ($p < 0.05$), non-Shea income ($p < 0.01$), access to information on Shea marketing ($p < 0.05$), membership to an association ($p < 0.01$) and engaging in spot marketing ($p < 0.01$) had negative significant influence on the proportion of Shea that is value added by a Shea nut collector. Consequently, these factors were associated with reduced proportion of Shea that is value added by the Shea collectors. On the other hand, land size under Shea trees ($p < 0.05$), Shea income ($p < 0.01$) had a positive significant influence on the proportion of Shea that is value added. This implies that Shea collectors with more land and who earn more income from Shea, were most likely to add value to more of the Shea kernels they collect.

Table 5.4: Factors influencing the level of value addition among Shea nut collectors

Explanatory	Coef.	Robust Std. Err.	Z	P>z
Gender (Male)	-0.509	0.270	-1.880	0.061
Age	-0.026	0.011	-2.460	0.015
Household size	0.036	0.048	0.740	0.460
Education	0.054	0.076	0.720	0.472
Land size	0.080	0.032	2.460	0.015
Distance to market point	0.024	0.016	1.520	0.129
Log Shea Income	0.426	0.149	2.850	0.005
Log Non-Shea Income	-0.312	0.102	-3.070	0.002
Log Experience	-0.110	0.184	-0.600	0.549
Extension services	-0.366	0.343	-1.070	0.287
Receive training	0.512	0.319	1.610	0.110
Receive information	-0.680	0.307	-2.210	0.028
Aware of institutions	-0.617	0.522	-1.180	0.238
Member of Association	-1.299	0.487	-2.670	0.008
Spot marketing	-1.941	0.618	-3.140	0.002
Informal marketing	-0.300	0.602	-0.500	0.619
Lira	-0.513	0.461	-1.110	0.266
Pader	-0.304	0.319	-0.950	0.341
Intercept/cut1	-1.802	1.727		
Intercept/cut2	0.283	1.730		
Intercept/cut3	1.341	1.718		
Intercept/cut4	2.723	1.710		
Number of observations	252			

Note: Spot marketing was the base category for market arrangements variables, while Otuke was the base category for districts variables

With the exception of non-Shea income, group membership and access to information, all the other significant variables conformed to the hypothesized signs presented in Table 5.1. Other factors including household size, collector's level of education, distance to the market point, experience, access to extension services, training, awareness of Shea institutions, and geographical location of the Shea collector did not have any significant influence on the proportion of Shea, value-added. This study also presents results of the marginal effects analysis for factors influencing the level of value addition to collected Shea nuts (Table 5.5). It shows consistent estimates of the effects of the independent variables on the different categories of the dependent variable.

Table 5.5: Marginal Effects results for factors influencing the level of value addition among Shea collectors

Variable	No Value addition			Low value addition			Medium value addition			High value addition			Full value addition		
	dy/dx	Std. Err.	P>z	dy/dx	Std. Err.	P>z	dy/dx	Std. Err.	P>z	dy/dx	Std. Err.	P>z	dy/dx	Std. Err.	P>z
Gender (Male)	0.053	0.029	0.066	0.073	0.040	0.064	-0.032	0.019	0.087	-0.058	0.032	0.069	-0.036	0.019	0.061
Age	0.003	0.001	0.022	0.004	0.002	0.017	-0.002	0.001	0.037	-0.003	0.001	0.018	-0.002	0.001	0.026
Household size	-0.004	0.005	0.466	-0.005	0.007	0.457	0.002	0.003	0.457	0.004	0.006	0.463	0.003	0.004	0.469
Education	-0.005	0.008	0.479	-0.008	0.011	0.470	0.003	0.005	0.468	0.006	0.009	0.479	0.004	0.006	0.476
Land size	-0.008	0.003	0.018	-0.012	0.005	0.020	0.005	0.002	0.038	0.009	0.004	0.019	0.006	0.003	0.024
Distance to market point	-0.002	0.002	0.137	-0.004	0.002	0.134	0.001	0.001	0.151	0.003	0.002	0.138	0.002	0.001	0.142
Log Shea Income	-0.043	0.015	0.005	-0.064	0.025	0.009	0.026	0.011	0.016	0.050	0.019	0.007	0.031	0.013	0.016
Log Non-Shea Income	0.031	0.012	0.007	0.047	0.016	0.003	-0.019	0.008	0.024	-0.036	0.013	0.005	-0.023	0.008	0.003
Log Experience	0.011	0.018	0.549	0.017	0.028	0.550	-0.007	0.011	0.539	-0.013	0.022	0.549	-0.008	0.014	0.563
Extension services	0.041	0.042	0.338	0.050	0.042	0.236	-0.026	0.028	0.350	-0.041	0.037	0.267	-0.024	0.020	0.243
Receive training	-0.046	0.027	0.081	-0.081	0.052	0.125	0.024	0.013	0.055	0.061	0.039	0.118	0.042	0.030	0.172
Receive information	0.084	0.044	0.058	0.081	0.031	0.008	-0.054	0.030	0.073	-0.072	0.030	0.016	-0.039	0.016	0.012
Aware of institutions	0.075	0.076	0.321	0.075	0.047	0.112	-0.048	0.049	0.325	-0.066	0.050	0.192	-0.036	0.024	0.124
Member of Association	0.179	0.086	0.038	0.121	0.030	0.000	-0.106	0.046	0.022	-0.126	0.039	0.001	-0.068	0.022	0.002
Spot marketing	0.325	0.143	0.023	0.073	0.071	0.304	-0.161	0.047	0.001	-0.158	0.032	0.000	-0.080	0.022	0.000
Informal marketing	0.033	0.073	0.651	0.041	0.074	0.579	-0.021	0.048	0.653	-0.034	0.064	0.601	-0.019	0.036	0.591
Lira	0.054	0.053	0.301	0.073	0.061	0.233	-0.034	0.034	0.327	-0.058	0.052	0.257	-0.035	0.029	0.219
Pader	0.032	0.034	0.357	0.044	0.045	0.330	-0.020	0.021	0.352	-0.035	0.036	0.338	-0.021	0.023	0.348

Results on the factors associated with the number of value-added products for which the Shea collectors engage in shows that, age, access to Shea marketing information, and both formal and informal marketing arrangements had a negative and significant influence on the number of value-added products that a Shea collector engages in. The household size, access to extension services, membership of an association, and use of both spot and informal marketing arrangements had a positive and significant influence on the number of value-added products that a Shea collector engages in. There were also significant differences in number of Shea value added products that collectors engaged in across districts (Table 5.6). Only informal marketing and formal marketing conformed to the hypothesized signs stated in Table 5.1. On the other hand, gender and marital status of collector, education level, land size for Shea, experience, training and awareness of institutions did not have any significant influence on the number of value-added products. In order to understand the specific effects of the explanatory variables on the dependent variable (number of value-added products), the study estimated marginal effects for each category of the dependent variable. The estimated marginal effects were consistent with the model estimates (Table 5.7).

Table 5.6: Factors influencing the number of Shea products upgraded by a Shea nut collector

Explanatory variable	Coef.	Robust Std. Err.	Z	P>z
Married	0.557	0.529	1.050	0.294
Gender (Male)	-0.297	0.312	-0.950	0.343
Age	-0.033	0.013	-2.490	0.013
Household size	0.093	0.049	1.900	0.059
Education	0.038	0.075	0.510	0.607
Land under Shea nut	0.039	0.033	1.190	0.235
Log Experience	0.187	0.172	1.090	0.277
Extension	0.989	0.427	2.310	0.022
Receive trainings	0.381	0.380	1.000	0.316
Receive information	1.172	0.626	1.870	0.062
Aware of institutions	-0.407	0.332	-1.230	0.220
Member of Association	1.163	0.541	2.150	0.032
Informal marketing	-0.910	0.463	-1.970	0.050
Formal marketing	-1.499	0.419	-3.580	0.000
Spot informal marketing	1.543	0.573	2.690	0.008
Lira	-1.079	0.387	-2.790	0.006
Pader	-0.438	0.364	-1.200	0.230
Intercept/cut1	1.025	1.136		
Intercept/cut2	2.040	1.157		
Intercept/cut3	3.339	1.201		
N	252			

Note: Spot marketing was the base category for market arrangements variables, while, Otuke was the base category for districts variables.

Table 5.7: Marginal Effects results for factors influencing the number of value-added products for Shea collectors

Variable	None			Low			Medium			High		
	dy/dx	Std. Err.	P>z	dy/dx	Std. Err.	P>z	dy/dx	Std. Err.	P>z	dy/dx	Std. Err.	P>z
Married	-0.137	0.125	0.275	0.039	0.046	0.389	0.059	0.051	0.250	0.038	0.030	0.203
Gender (Male)	0.074	0.078	0.340	-0.017	0.019	0.371	-0.033	0.036	0.349	-0.024	0.024	0.325
Age	0.008	0.003	0.013	-0.002	0.001	0.049	-0.004	0.002	0.019	-0.003	0.001	0.015
Household size	-0.023	0.012	0.058	0.005	0.003	0.104	0.011	0.006	0.066	0.008	0.004	0.061
Education	-0.010	0.019	0.607	0.002	0.004	0.618	0.004	0.008	0.608	0.003	0.006	0.601
Land under Shea nut	-0.010	0.008	0.234	0.002	0.002	0.265	0.004	0.004	0.238	0.003	0.003	0.240
Log Experience	-0.047	0.043	0.276	0.010	0.010	0.285	0.021	0.020	0.287	0.015	0.014	0.281
Extension	-0.235	0.092	0.011	0.015	0.018	0.387	0.110	0.044	0.013	0.109	0.063	0.082
Receive trainings	-0.095	0.093	0.310	0.017	0.014	0.216	0.044	0.044	0.324	0.034	0.037	0.363
Receive information	0.270	0.123	0.027	-0.094	0.059	0.109	-0.110	0.048	0.022	-0.066	0.023	0.004
Aware of institutions	0.101	0.080	0.210	-0.028	0.027	0.292	-0.044	0.034	0.200	-0.029	0.021	0.174
Member of Association	-0.268	0.106	0.011	0.002	0.031	0.945	0.124	0.050	0.013	0.141	0.088	0.107
Informal marketing	0.219	0.103	0.035	-0.068	0.039	0.085	-0.092	0.043	0.033	-0.059	0.027	0.027
Formal marketing	0.331	0.074	0.000	-0.121	0.035	0.001	-0.132	0.033	0.000	-0.078	0.021	0.000
Spot informal marketing	-0.333	0.093	0.000	-0.026	0.045	0.559	0.145	0.039	0.000	0.214	0.105	0.042
Lira	0.262	0.088	0.003	-0.068	0.032	0.032	-0.114	0.039	0.003	-0.079	0.027	0.003
Pader	0.109	0.089	0.223	-0.027	0.024	0.265	-0.048	0.039	0.220	-0.034	0.028	0.227

5.4 Discussions

This study has shown that there are different levels of engagement in value addition activities by collectors. This variation could be attributed to gender roles at household level with Shea nuts picking mainly associated with women, children and young adults than men. It is also a cultural attribute within these communities for Shea nuts collection and processing to be undertaken by women as women over historical time have amassed immense local knowledge associated with Shea nuts handling. Similar patterns have been documented elsewhere in the case of Benin for example, women were more engaged in Shea value addition than males because most of the locally available value-adding activities are usually less preferred by men since they have traditionally been considered women's roles (Agúndez *et al.*, 2020). Further, in parts of Ghana, this has been considered to be a women's role (Awo & Anaman, 2015). Meanwhile, while value addition is considered a women's role, the protection of the Shea nut trees, the primary source for the raw material is considered the role of men. This is because land is traditionally owned by men and it is their role to safe guard the land and resources on it including Shea nut trees. According to Kent (2018) this gender disaggregation of roles was evident in areas that are dependent on non-timber forest products (NTFPs) such as Shea nuts.

Whereas value addition increases collectors' incomes (Tom-Dery *et al.*, 2018), there were still some collectors who did not engage in any type of value addition. Similar findings were also reported in Ghana by Adams *et al.* (2016) who observed that about 14% of the Shea collectors did not participate in local Shea butter processing in Ghana. Adégbidi *et al.* (2017) observed that despite the benefits, not all actors usually embrace value addition. Several factors were identified to influence the level of value addition activities reported in this study. The factors had either negative or positive influence on the proportion of collected Shea that is value-added and the number of value-added products that Shea collectors engage in. Whereas some of the factors were only significant for one aspect of study (either proportion of value added or number of value-added products) a number of them had significant influence on both. Specifically, collector's age, access to information, group membership and marketing arrangement had significant influence on both proportion of Shea value-added and number of value-added products, although there were varying direction and magnitudes of the influence.

An increase in collector's age was associated with increased probability of having no value-added product, and, zero and low proportion of Shea that is value added, reduced probability of engaging in medium, high and full levels of value addition and also more than one value added product. These findings imply that value addition activities are more preferred by relatively younger farmers who engage in more value-added products and also add value to a larger proportion of their collected Shea kernels. Similar observations were also reported by previous studies. According to Khoza *et al.* (2019), older farmers in the Gauteng province of South African were less likely to participate in agro-processing. In another study in northern Ghana, older Shea collectors were also reported to be less efficient in Shea processing (Tanko, 2017). Relatedly, Maku, Kitambo and Mugonola (2023) observed that age of the youth was a significant driver of their participation in value addition in the maize value chain. This finding can be explained by the negative influence of age on innovation (Parsons, 2015). Specifically, older individuals are usually reluctant to try new approaches to processing and marketing their products including value addition.

Whereas access to Shea market information is important, the type of information received can either improve and reduce the level of value addition of the collectors. This study has shown that collectors who had access to Shea marketing information were more likely to sell raw kernels and not have any value-added products, and also allocated none or only small quantities of collected Shea for value addition. Shea marketing information usually creates awareness on the availability of markets for non-value-added Shea. Consequently, collectors may be attracted by the need to obtain cash from the collector Shea amidst uncertainty involved in value addition. According to Ngenoh *et al.*, (2019), access to market participation discouraged participation in high value vegetable chains in Kenya. Whereas value addition would increase the premium received, Shea collectors usually find it hard to forego ready market.

Unlike access to information, access to extensions was only significant for number of value-added products but not for the proportion of Shea that is value added. Consequently, Shea collectors who had access to extension were more likely to be engaged in value addition of two or more Shea products. The influence on extension in number of value-added Shea products can be attributed to the fact that during extension services Shea collectors are usually exposed to several other Shea products for which they can choose from. A study by Donkor *et al.* (2018),

reported that access to extension was important in enhancing the decision to participate and the level of participation in cassava value addition in Nigeria. Similar findings were reported by Gashaw, Habteyesus and Nedjo (2018), in the coffee value addition in Ethiopia. Whereas extension is able to influence the number of value-added products Shea collectors engage in, it may not be able to influence how much of the collected Shea is value-added. Generally, access to extension improves the level of participation in agro-processing (Khoza *et al.*, 2019).

This study has also shown that membership to an association is important in enhancing collector's participation in value addition activities. Specifically, collectors who are members of an association were more likely to add value to none or only a low proportion of Shea collected. They were however more likely to have one or more value added products. This contradicting finding was expected given that associations and groups are usually involved in a number of activities including Shea processing and marketing. Where group membership supports collective marketing in addition to sharing of skills on value addition, collectors would prefer to add value to only a small portion of their collected Shea, while, marketing the rest collectively since they are able to bargain for better prices. Several studies (Adekambi *et al.*, 2018, Donkor *et al.*, 2018, Hans, Taruvinga and Mushunje 2018) have shown the importance of membership to a farmers group in enhancing value addition activities. In study on wild non-timber forest products in the Eastern Cape Province of South Africa, (Hans *et al.*, 2018), reported that bee farmers who were members of a farmer group were more likely to bottle their honey, but were less likely to process bee wax.

The need to increase the premium received from Shea drives participation in value addition activities. Findings from this study has showed a significant relationship between income from Shea and income from non-Shea sources, and the proportion of Shea which is value added. It revealed that increased levels of Shea incomes were more associated with higher (medium, high and full) proportions of Shea that are value added. Contrarily, increased levels of non-Shea incomes were more associated with lower (none and low) proportions of Shea that is value-added. According to Olorunfemi *et al.* (2015), the probability of participating in a fish value addition initiative increased with increased fish income of the fish farmer in north central Nigeria. Consequently, the need to increase income usually motivates collectors to participate in value addition activities.

Gender plays a critical role in the decision to participate in value addition activities. From this study, male collectors were more likely to add value to none or only low proportions of Shea collected, while, female collectors were more likely to add value to higher (medium, high and full) proportions of Shea collected. Most of the value-added products and activities including procession crude butter, and roasting the kernels are associated to conventional roles of women. It is thus not surprising that men were seen to allocate only a portion of the collected Shea to value addition. According to Adams *et al.* (2016), most value adding activities of the Shea value chain are usually performed by women. According to Kent (2018), men are usually involved in appropriate roles other than performing the roles in Shea production and processing. Similar findings were also reported in other studies. According to Hans *et al.* (2018), most of honey value addition activities were more likely to be performed by female farmers.

This study has also shown that, although household size did not influence the proportion of Shea that is value added, it had a significant influence on the number of value-added products that a collector engages in. According to Khoza *et al.* (2019), household size has a positive influence on level of participation in agro-processing. Specifically, larger households were more likely to have one or more value added products, as opposed to small households who were more likely to have no value-added products.

Participation in value addition activities is also influenced by the market arrangement adopted. Collectors, who were using spot marketing as their means of access to markets, were more likely to add value to none or low proportion of collected Shea. Similarly, collectors who had either formal or informal contracts were less likely to engage in one or more value added products, while, those who engage in both spot and informal marketing arrangement at the same time, were less likely to engage in one or more value added products. This study therefore shows that, although spot marketing does not favor higher proportions of Shea to be value added, it promotes engagement in many products, while contracts, discourage engaging in many products. Usually, contracts have strict product specification that collectors have to abide by. Such collectors would therefore have to agree to the terms and conditions which includes product specification and supply quantities.

Location of the collection usually influences the level and form of value addition activities. In this study, whereas there was no significant difference in proportion of value added across the districts, collectors in Lira were more likely to engage in no value-added product, as opposed to collectors in Otuke and Pader. Similar findings were reported by Donkor *et al.* (2018), who reported that a location was significantly associated with a farmer's decision to participate in cassava value addition, but not with the level of value addition. This could be attributed to proximity to urban centre with large scale Shea processors that usually, buy raw Shea for their processing plants. Collectors in Lira are thus able to reach the urban market in Lira city, much faster than those of Otuke and Pader, who would opt or add value to their Shea.

5.5 Conclusions

This study assessed the factors associated with Shea upgrading activities. Specifically, the study assessed factors associated with value upgrading as measured by the proportion of value added and factors associated with product upgrading as measured by the number of value-added products undertaken by Shea collectors. Findings point to the need to support older farmers in enhancing their capacity for value addition, since they were less likely to participate in value and product upgrading. Results also showed gendered participation in value addition with females more likely to engage and allocate more of the collected to value addition. There would be need to encourage participation of men in Shea value addition activities to enhance sustainability of Shea value addition. The study also shows the importance of access to marketing information and extension services in enhancing Shea value addition. Focus on provision of market information for the raw Shea has been seen to hinder value addition. There is need to package vital value addition message together with market information to enhance value addition activities. Dissemination of such information to Shea actors belonging to their various associations would enhance uptake and lead to better value addition outcomes. Lastly, collectors should be encouraged to negotiate contracts that allow for value addition options if they are to increase their level of value addition.

CHAPTER SIX

DETERMINANTS OF SHEA NUT MARKETING ARRANGEMENTS IN NORTHERN UGANDA

This chapter presents the empirical evidence on the factors influencing choice of the different market arrangements in Shea and Shea products marketing in northern Uganda.

The chapter investigated the following research questions:

1. What marketing arrangements exist in Shea and Shea products marketing in northern Uganda?
2. How does choice of marketing arrangement vary across actor and geographical location?
3. What are the factors that significantly influence the choice of the different market arrangements in Shea and Shea products marketing in northern Uganda?

This chapter is based on:

Akatwetaba, D., Okello, D. M., Kasharu, A., Egeru, A., & Mugonola, B. (2024). Determinants of Shea nut marketing arrangements in northern Uganda. *Discover Agriculture*, 2(1), 61. <https://doi.org/10.1007/s44279-024-00085-4>

6.1 Introduction

Shea tree (*Vitellaria paradoxa*) is an economically important tree with multiple purposes including nutritional, cosmetic and pharmaceutical uses (Cottray, Miles, & Newton, 2003; Teklehaimanot, 2004; Bup *et al.*, 2014; Hammond *et al.*, 2019; Seghieri, 2019). The tree and its products support livelihood of millions of actors in its value chain (Naughton *et al.*, 2015; Adekambi *et al.*, 2018). Due to health and nutritional benefits associated with the tree, it is becoming an important foreign exchange commodity (Rousseau *et al.*, 2015; Adekambi *et al.*, 2018). It is also considered a pro-poor commodity that has the potential of uplifting the livelihoods of millions including women (Hammond *et al.*, 2019; Sanou *et al.*, 2019) dominating the bottom of the value chain as Shea nut collectors (Akatwetaba *et al.*, 2023).

The Shea value chain in Uganda consists of collectors, traders and processors who are mostly found in the Shea belt of the country. The collectors form the base of the chain, participating in collecting the seasons' Shea nuts produced from the Shea tree. After collecting, they either sell the nuts in its raw form to processors and/or traders, or add some value before selling (Akatwetaba *et al.*, 2023). Given the associated benefits, Shea and its products are marketed domestically and internationally (Bello-Bravo *et al.*, 2015; Jibreel *et al.*, 2013; Pouliot & Elias, 2013) in liberalized markets. Despite their participation in local and international markets, the local small-scale actors including collectors, traders and processors are usually less competitive in the global Shea value chain (Boffa, 2015; Adam & Abdulai, 2014). This low competitiveness relative to larger national and international actors, implies that the majority of collectors, local traders as well as processors do not earn what they would have earned if they were competitive enough (Adekambi *et al.*, 2018; Rousseau *et al.*, 2015). This lack of competitiveness implies that the Shea actors at the bottom of the chain do not earn the incomes they should be earning thereby threatening the potential of Shea for poverty alleviation (Akrasi *et al.*, 2021; Adekambi *et al.*, 2018). In a typical Shea value chain, this competitiveness is largely associated with the size of the actor. At the bottom of the chain, the Shea collectors are the most uncompetitive as shown by individual share of the volume handled (Akatwetaba *et al.*, 2024).

The low competitiveness of the local Shea actors is partly attributed to reliance on marketing arrangements that do not pay the price premiums. In agribusiness, marketing arrangement which

are sometimes called institutional arrangements refer to how the actors relate to each other through either formal or informal arrangements (Adaku & Amanor-Boadu, 2022; Owot *et al.*, 2023). In the Shea value chain, common marketing arrangements include: spot marketing which refers to sale of products to any random buyer in the market; contracts which can either be written (formal) or verbal (un-written/informal) between two actors; and a hybrid of the different marketing arrangements including collective marketing (Adaku & Amanor-Boadu, 2022; Cheyo *et al.*, 2024; Trienekens, 2011). According to Akatwetaba *et al.* (2023), over 60% of Shea collectors in northern Uganda, sold their Shea products through spot markets.

The type of marketing arrangement chosen by a given actor influences their business performance including profits and sustainability required for long term performance (Ma *et al.*, 2024; Royer *et al.*, 2016). In other words, each of the marketing arrangements provide some benefits and disbenefits for the actors. For instance, studies have shown that whereas farmers usually earn less profits when transacting through formal contracts (Mwambi *et al.*, 2016; Kiwanuka-Lubinda, Ng'ombe, & Machethe, 2021), they are vital in improving input access for producers (Ruml & Qaim, 2020), as well as providing sustained market access across seasons (Royer, Bijman, & Bitzer, 2016; Zhang *et al.*, 2023). Similarly, whereas collective marketing which is also referred to as group marketing has been associated with reduced transaction cost, improved bargaining power and higher revenues for participants (Cheyo *et al.*, 2024; Trejo-Pech, Servín-Juárez, & Reyes-Duarte, 2023; Abdul-Rahaman & Abdulai, 2020), there efficiency and effectiveness requires addressing the challenges associated with group participation (Ochieng *et al.*, 2018). Additionally, collective marketing has also been shown to improve incomes of small value chain actors in addition to providing other benefits such as better access to support services (Adekambi *et al.*, 2018; Elias & Arora-Jonsson, 2017; Tita *et al.*, 2011). Both contract and collective or group marketing are associated with relatively larger volumes of produce handled as well as lower transaction cost. As opposed to contracts and collective marketing, spot marketing is usually associated with significantly lower volumes of produce handled, high transactions cost and overall lower revenue and profits for small value chain actors including producers and collectors of non-timber agro-forest product (Dubbert & Abdulai, 2022; Abdul-Rahaman & Abdulai, 2020; Dubbert, 2019).

Based on the discussion above, it can be said that each of the existing marketing arrangements present Shea actors with some incentive as well as disincentives. This is why actors choose one arrangement over the other. In essence, preference for the different marketing arrangement is largely determined by the existing attributes of the arrangements (Ola & Menapace, 2020). The choice of which market arrangement to undertake thus follows the utility maximization theory (UMT) which postulates that, an actor would choose that course of action for which the expected and/or perceived utility is highest (Aleskerov *et al.*, 2007). In reality this choice is usually subject to a set of constraints (Rahm & Huffman, 1984). In the Shea value chain, these constraints relate to social, economic and institutional factors (Akatwetaba *et al.*, 2023). Whereas Shea actors would choose from among the different marketing arrangements, the perceived benefits cannot be measured directly, but is a function of these constraints that vary depending on the circumstance. Consequently, despite the benefits associated with each of the existing marketing arrangements, an understanding of what drives actor's choice of one marketing arrangement over the other is paramount in developing strategies to improve Shea actor's competitiveness. Choosing the most appropriate marketing arrangement is vital in fostering the competitiveness of the Shea actors. This is especially true due to the current globalization of the Shea value chain (Rousseau *et al.*, 2015; Elias & Arora-Jonsson, 2017). The choice of a given marketing arrangement is driven by several factors which usually vary across locations and products (Dubbart & Abdulai, 2022; Abdul-Rahaman & Abdulai, 2020; Dubbert, 2019) and is expected to vary across actors (Akite *et al.*, 2023). In the Shea value chain of northern Uganda, information on such factors that drive the choice among the different marketing arrangements is empirically lacking. Studies on the Shea value chain in northern Uganda have focused on value addition and marketing channels (Akatwetaba *et al.*, 2023; Ecuru & Lating, 2014; Ferris *et al.*, 2001), but not on marketing arrangements. To augment these studies, a study on Shea marketing arrangement with focus on factors influencing choice of marketing arrangement would provide evidence required for encouraging Shea actors to take up those marketing arrangements that would maximize their returns. The purpose of this study was therefore to fill this knowledge void, by assessing the factors associated with choice of the different marketing arrangements in the marketing of Shea and Shea products in northern Uganda.

6.2. Methods

The study area, sample size, sample design as well as data collection approaches used for this chapter are presented in Chapter 3. This section presents the data analysis approaches specific to this chapter. Specifically, data analysis involved both descriptive and econometric methods. The descriptive analysis was used to present the summary statistics of the variables in the study. Cross tabulations with test for significance were also performed for specific categorical variables (i.e. marketing arrangements, actor type and district). An econometric approach was used to assess the factors associated with choice of each of the marketing arrangements used by Shea actors in Shea marketing. The marketing arrangement variable which formed the dependent variable for the econometric analysis is choice variable in that a Shea actor can choose one option over the other. This means that the ordinary least squares (OLS) regression was inappropriate for such analysis (Wooldridge, 2016). The study focused on spot marketing (Sale through spot markets included sale by individual actors or group of actors through the spot market. This was so given both spot marketing and sale through the group failed the IAA assumption. The two categories were this identical and thus treated as one.), informal contracts and formal contracts as the marketing arrangements used by Shea actors in the study area. Given that there were more than two marketing arrangements being investigated, the binary regression models (probit and logit), were also inappropriate. Similarly, marketing arrangement is a nominal variable and the categories do not have any natural order of numbering, thus, the ordered multinomial models were also inappropriate for the econometric analysis (Cameron & Trivedi, 2005). The study therefore opted for the multinomial model. Specifically, the multinomial logistic regression model was used due to its robustness. Kropko (2007) observed that the multinomial logit usually nearly provides more accurate results than the multinomial probit model. Empirically, a Shea value chain actor's choice of marketing arrangement can be analysed following equation (6.1).

$$y_i = \alpha + X'_{ij}B_j + \varepsilon_{ij} \quad (6.1)$$

Where: y_i is the categorical dependent variable representing the different marketing arrangements from which a Shea actor can choose an alternative from. In this study, three different marketing arrangements including spot markets, informal contracts, and formal

contracts were identified. The option of spot markets includes both individuals selling through spot markets as well as groups selling through spot markets. Following Meraner and Finger (2019), y_i can be presented as in equation (6.2).

$$y_i(\text{marketing arrangement}) = \begin{cases} 1 & \text{if } y_i^* = \text{Spot marketing} \\ 2 & \text{if } y_i^* = \text{Informal Contract} \\ 3 & \text{if } y_i^* = \text{Formal Contract} \end{cases} \quad (6.2)$$

Where: X_{ij} represents a vector of explanatory variables including both Shea actor's characteristics and institutional factors that can potentially influence choice of the different marketing arrangements. Table 6.1 presents the description of these explanatory variables together with their *a priori* expectations. While estimating the model, spot marketing was treated as the base outcome and consequently, the *a priori* expectations have been presented for the other options in relation to spot marketing.

In practice, the marketing arrangement used in Shea marketing are without any obvious ordering. This is because, whereas the several options lead to different outcomes, depending on the circumstances at play, each of them can actually lead to the best outcome for the actor. Consequently, a Shea actor selects a single alternative marketing arrangement (j) from a number of alternatives based on the expected utility level (U_{ij}) as specified in equation (6.3).

$$U_{ij} = X'_{ij}\beta_j + \varepsilon_{ij} \quad (6.3)$$

In this case, ε_{ij} is the unobserved error term with the normal distribution assumption across Shea actors and available alternatives. In essence, a Shea actor only chooses an alternative marketing arrangement if it has the highest utility (Aleskerov *et al.*, 2007). The parameters of the multinomial logistic model were estimated using the method of maximum likelihood. Since the coefficient of the multinomial logit do not depict changes in the probability of choosing an alternative j attributed to changes in the explanatory variable, the marginal effects following each alternative were estimated following specification in equation (6.4). Each β_j represents the effect of a given explanatory variable on the probability of choosing the respective alternative j to m .

$$\frac{\partial P_{ij}}{\partial X_i} = P_{ij} - \sum_{m=1}^{j-1} P_{im} \beta_{mk} ; j = 1, \dots, j-1 \quad (6.4)$$

Table 6.1: Description of variables used in the model and their apriori expectation

Variable	Measurement/Description of variable	Apriori expectation in relation to spot marketing	
		Informal contracts	Formal contracts
Dependent variable			
Marketing arrangement	Categorical variable for market arrangement from which farmers can choose from (1=spot marketing, 2=informal contracts, 3=formal contracts)		
Explanatory variables			
Male	Male gender dummy (1=male, 0=female)	+/-	+/-
Experience	Shea actor's experience in years	-	+
Education	Shea actor's level of education in years of formal schooling	-	+
Processing income	Income from Shea trade and processing in Uganda Shillings (UGX) (United States Dollar (USD) 1 was equivalent to UGX 3650 at the time of data collection)	-	+
Non-processing income	Income from non-Shea processing in UGX	+	-
Extension	Access to extension services (1=yes, 0=no)	-	+
Receive trainings	Actor received training on Shea processing (1=yes, 0=no)	-	+
Receive information	Actor received Shea market information (1=yes, 0=no). Focus was on receiving information on product price	+	-
Means of transport	Main mode of transport (1=head portage, 0=motorized means)	-	+
Aware of institutions	Shea actor is aware of the presence of those institutions that support Shea processing (1=yes, 0=no).	-	+
Credit	Access to credit (1=yes, 0=no)	-	+
Practice value addition	Shea actor changes form of the product (1=yes, 0=no)	-	+
Farmer	Farming is the main occupation of Shea actor (1=yes, 0=no)	-	+
Collector	Shea actor is collector (1=yes, 0=no)	+	-
Processor	Shea actor is processor (1=yes, 0=no)	-	+
Trader	Shea actor is trader (1=yes, 0=no)	-	+
Otuke	District of Shea actor is Otuke (1=yes, 0=no)	+/-	+/-
Lira	District of Shea actor is Lira (1=yes, 0=no)	+/-	+/-
Pader	District of Shea actor is Pader (1=yes, 0=no)	+/-	+/-
Distance to market point	Distance to the nearest Shea marketing point	+	+/-

Prior to the estimation of the multinomial logistic regression model, a pair wise correlation of explanatory variables with the aim of removing any variable with very high correlation was performed. This was necessary so as not to include variables which are collinear. All the correlation coefficients for the final explanatory variables in the model were less 0.6 (Appendix 4). According to Dormann et al. (Dormann *et al.*, 2013), correlation coefficient less than 0.7 are usually not associated with the problem of multicollinearity. This was confirmed by the variance inflationary factor (VIF) test which showed that the maximum VIF values from this model was 1.98, while the mean was 1.47, indicating no problem of multicollinearity. To control for any potential heteroskedasticity, the robust option of STATA was used to estimate robust standard errors. After estimating the model, model fit diagnostics showed good model fit, while, the tests of Independence of Irrelevant Alternatives (IIA) assumption showed that in the final model, this assumption was not violated (Appendix 4). Both the model fit diagnostics and the IIA assumption test followed the procedures presented by Long & Freese (2006).

6.3 Results

6.3.1 Socio-demographic and Economic Characteristics

This study found that women constituted the biggest proportion of Shea nut actors (59%) while males constituted only 41% of the actors, with an average of six years of formal education. On average, the Shea nut actors had an experience of 10 years, and were staying approximately about 5.7 kilometres away from the Shea nut marketing points. The average income generated from processed Shea nut products was found to be higher (UGX 310,667) compared to that got from non-processed Shea nut (UGX 274,038). Only 14% of the respondents had access to extension services, while, 23% received training, 14% received information, 11% were aware of institutions that supported Shea nut processing, 8% had access to credit, and 61% of the respondents practiced Shea value addition. About 49% used head portage as their main mode of transporting Shea and/or its products to the market. Most (89%) of the Shea actors had farming as their main occupation. There were 78% Shea collectors, 16% were Shea traders, and 7% Shea processors. Thirty four percent of the actors were from Otuke district, 33% from Pader district and another 33% from Lira district (Table 6.2).

Table 6.2: Summary statistics for demographic characteristics

Variable	Mean	Std. Dev.
Male	0.41	0.49
Experience	10.26	8.49
Education	6.24	2.64
Processing income	310,667.70	448,934.80
Non-processing income	274,038.50	479,789.80
Extension	0.14	0.35
Receive trainings	0.23	0.42
Receive information	0.14	0.35
Means of transport	0.49	0.50
Aware of institutions	0.11	0.31
Credit	0.08	0.27
Practice value addition	0.61	0.49
Farmer	0.89	0.32
Collector	0.78	0.42
Processor	0.07	0.25
Trader	0.16	0.36
Otuke	0.34	0.47
Lira	0.33	0.47
Pader	0.33	0.47
Distance to market	5.69	8.77

Note: In the case of dummies, the mean values represent and proportion attributed the category coded as 1: These were multiplied by 100 are reported as percentages

6.3.2 Marketing Arrangements for Shea nuts and/or products

From the study, results show that at least 65% of the respondents used spot marketing in the marketing Shea nut and its products, while, 23% used informal contracts and 12% used formal contracts (Table 6.3). The chi-square test of association reveals that there was a significant association between marketing arrangement and Shea nut value chain actor type. Specifically, the use of spot marketing in Shea marketing was most common (73%) among Shea collectors and least common (36%) among Shea processors. Similarly, the use informal contracts in Shea marketing was most common (45%) among Shea processors and least common among Shea collectors (17%). The use of formal contracts in Shea marketing was highest (18%) among processors and lowest (10%) among collectors.

Table 6.3: Comparing marketing arrangements by player type

Market Arrangement	Percent (%)			
	Overall (n=325)	Collectors (n=252)	Trader (n=51)	Processor (n=22)
Spot markets	65.54	72.62	43.14	36.36
Informal contract	22.77	17.06	41.18	45.45
Formal contract	11.69	10.32	15.69	18.18
Pearson Chi ² (4) = 26.7502; p-value = 0.000				

Similarly, the chi-square test of association also revealed that there was a significant association between marketing arrangement and district of the Shea value chain actor (Table 6.4). Specifically, the use of spot marketing in Shea marketing was most common (86%) among actors in Pader district and least common (55%) among Shea actors in Lira district. Conversely, the use informal contracts in Shea marketing was most common (33%) among Shea actors in Lira district but least common (10%) among Shea actors in Pader district. The use of formal contracts in Shea marketing was highest (19%) among Shea actors in Otuke district but least common (4%) among Shea actors in Pader district.

Table 6.4: Comparing marketing arrangement by district

Market Arrangement	Percent (%)			
	Overall (n=325)	Otuke (n=109)	Lira (n=108)	Pader (n=108)
Spot	65.54	55.96	54.63	86.11
Informal contract	22.77	24.77	33.33	10.19
Formal contract	11.69	19.27	12.04	3.70
Pearson Chi ² (4) = 34.7100 p-value = 0.000				

6.3.3 Factors influencing choice of Shea nut marketing arrangement

The results for the multinomial logistic regression model for factors driving the choice of the different marketing arrangements are presented in Tables 6.5 and 6.6. Results show that choice of informal contracts in Shea marketing had significant association with Shea actor's experience, both Shea processing and non-Shea processing income, receiving training, practicing value addition, main occupation of actor, actor type, location of the farmer and distance to the market. Similarly, the choice of formal contracts in the marketing of Shea had significant association with actor's level of education, income from Shea processing, access to extension services, receiving information, means of transport, awareness of institution supporting Shea, access to credit, practicing value addition and location of actor (Table 6.5).

Table 6.5: Multinomial regression results for factors influencing choice of Shea nut marketing arrangement

Market arrangement	Coefficient (SE)	
	Informal contract	Formal contract
Male	0.007 (0.382)	-0.111 (0.449)
Experience	0.128 (0.024) ***	0.031 (0.033)
Level of education	-0.096 (0.077)	0.197 (0.100) **
Log processing income	0.582 (0.325) *	0.622 (0.278) **
Log non-processing income	-0.334 (0.193) *	0.530 (0.215)
Extension services	0.150 (0.809)	3.186 (0.964) ***
Receive trainings	2.023 (0.539) ***	-0.210 (0.886)
Receive information	0.476 (0.761)	-2.331 (0.964) **
Means of transport	-0.358 (0.463)	-2.351 (0.793) ***
Aware of institutions	-0.993 (0.764)	2.071 (0.645) ***
Credit	-0.688 (1.144)	-3.630 (1.649) **
Practice value addition	0.867 (0.489) *	1.426 (0.682) **
Farmer	1.487 (0.761) *	0.607 (0.646)
Collector	-2.280 (0.637) ***	-1.258 (0.769)
Lira	0.675 (0.496)	0.301 (0.595)
Otuke	-3.302 (0.752) ***	-2.878 (0.757) ***
Distance to market point	0.074 (0.021) ***	0.064 (0.024)
Constant	-5.531 (3.947)	-17.491 (3.813) ***
Number of obs		325
Log pseudolikelihood		-169.961
Pseudo r-squared		0.395
Chi-square		130.131
Prob > chi2		0.000

Note: Base category is spot marketing; SE=Standard error in parentheses; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Following the multinomial logistic regression model, the study estimated the marginal effects so as to understand the changes in the probability of choosing each marketing arrangement with respect to changes in each of the explanatory variables. The marginal effects results presented in Table 6.6 shows that actor's experience in the Shea value chain had a negative and significant influence on the decision to choose spot marketing, but a significant positive influence on the decision to choose informal contracts. The findings suggest that, an increase in Shea actor's experience in years reduced the probability of selling Shea through spot markets by 1.5%, but increased the probability of selling Shea through informal contracts by 1.4%. Results on actors' level of education shows that actor's level of education had significant positively influence on decision to sell Shea through formal contracts. This suggests that, an increased in actor's level of

education increased the probability of selling Shea through formal contracts by 0.7%. Results on income from Shea processing shows that income from Shea processing significantly negatively influenced actor's decision to choose spot markets, but significantly positively influenced their decision choose informal contracts. This finding suggests that, a percentage increase in Shea processing income reduced the probability of selling Shea through spot markets by 8%, but increased the probability of selling Shea through informal contracts by 6.3%. On the other hand, results on non-Shea processing income shows that non-Shea processing income significantly negatively influenced the decision to choose informal contracts. The findings suggest that, a percentage increase in income from non-Shea processing reduced the probability of selling Shea through informal contracts by 4%, but increased the probability of selling Shea through formal contracts by 1.9%.

Results also shows that receiving extension visits had a significant negative influence on the decision to choose spot marketing, but a significant positive influence on the decision choose formal contracts (Table 6.6). The findings suggest that, receiving extension visits decreased the probability of selling Shea through spot markets by 29%, but increased the probability of selling Shea through formal contracts by 32%. With respect receiving training on Shea value addition, results show that receiving training significantly negatively influence the decision to choose spot marketing, but significantly positively influenced the decision to choose informal contracts. Specifically, the findings suggest that, receiving training decreased the probability of selling through spot markets by 31%, but increased the probability of selling Shea through informal contracts by 33%.

The findings on receiving information on Shea marketing and price shows that receiving such information had a significant negative influence on the decision to choose formal contracts (Table 6.6). Specifically, receiving market and price information reduced the probability of selling Shea through formal contracts by 4.2%. Results also show that use of head pottage as a means of transport significantly positively influenced the decision to choose spot markets and significantly negatively influenced the decision to choose formal contracts. Specifically, use of head pottage as a means of transport increased the probability of selling Shea through spot markets by 11.3%, but decreased the probability of selling Shea through formal contracts by 8.6%. On the other hand, awareness of institutions that support Shea value addition significantly

negatively influenced decision to choose informal contracts, but significantly positively influenced the decision to choose formal contracts. Specifically, being aware of institutions supporting Shea processing reduced the probability of selling Shea through informal contracts by 9.4%, but increased the probability to sell Shea through formal contracts by 16.6%. Access to credit had a negative and significant influence on actor's decision to choose formal contracts. The findings suggest that, accessing credit reduced the probability of selling Shea through formal contracts by 4.2%.

Table 6.6: Marginal Effects of factors influencing choice of Shea nut marketing arrangement

Variable	Marginal effects (SE)		
	Spot marketing	Informal contract	Formal contract
Gender (Male)	0.002 (0.047)	0.001 (0.042)	-0.004 (0.015)
Experience	-0.015 (0.003) ***	0.014 (0.003) ***	0.001 (0.001)
Education	0.005 (0.010)	-0.012 (0.008)	0.007 (0.004) *
Log processing income	-0.080 (0.037) **	0.063 (0.037) *	0.018 (0.011)
Log non-processing income	0.021 (0.022)	-0.040 (0.020) **	0.019 (0.009) **
Extension	-0.293 (0.161) *	-0.030 (0.067)	0.323 (0.144) **
Received training	-0.311 (0.105) ***	0.329 (0.107) ***	-0.018 (0.019)
Received information	-0.025 (0.111)	0.067 (0.109)	-0.042 (0.018) **
Means of transport	0.113 (0.058) *	-0.028 (0.050)	-0.086 (0.029) ***
Aware of institutions	-0.071 (0.086)	-0.094 (0.036) **	0.166 (0.079) **
Credit	0.101 (0.084)	-0.058 (0.082)	-0.042 (0.016) ***
Practice value addition	-0.125 (0.054) **	0.086 (0.048) *	0.039 (0.023) *
Farmers	-0.123 (0.041) ***	0.110 (0.036) ***	0.013 (0.016)
Collectors	0.393 (0.121) ***	-0.367 (0.121) ***	-0.026 (0.036)
Lira	-0.088 (0.070)	0.081 (0.067)	0.007 (0.020)
Pader	0.339 (0.054) ***	-0.278 (0.052) ***	-0.061 (0.032) *
Distance to market point	-0.010 (0.002) ***	0.008 (0.002) ***	0.002 (0.001)

*Note: SE=Standard error in parentheses; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$*

Results from this study also show that practicing value addition had a significant negative influence on actor's decision to choose spot markets, but a significant positive influence on actor's decision to choose informal and formal contracts. The findings suggest that practicing Shea value addition reduced the probability of selling Shea through spot markets by 12.5%. On the other hand, practicing value addition increased the probability of selling Shea through informal and formal contracts by 8.6% and 3.9%, respectively. With respect to actor's main occupation, being a farmer was significantly negatively associated with actor's decision to choose spot markets, but significantly positively associated with actor's decision to sell through

informal contracts (Table 6.6). The findings suggest that, being a farmer as opposed to other main occupations, reduced the actor's probability of selling Shea through spot markets by 12.3%, but increased the actor's probability of selling Shea through informal contracts by 11%.

Results from this study also show that, being a Shea collector had a significant positive influence on the decision to choose spot marketing, but a significant negative influence on the decision to choose informal contracts as opposed to being a trader or processor (Table 6.6). The findings suggest that, being a Shea collector, as opposed to being a Shea trader or processor, increased the probability of selling Shea through spot markets by 39.3%, but reduced the probability of selling Shea through informal contracts by 36.7%. Choice of marketing arrangements also varies across actor's geographical location. Results show that being located in Pader district, as opposed to Otuke district had a significant positive influence on the choice of spot marketing, but a significant negative influence on the choice of informal and formal contracts. The findings suggest that, being located in Pader district increased the probability of selling Shea through spot markets by 34%, but reduced the probability of selling Shea through informal and formal contracts by 28% and 6%, respectively, relative to being located in Otuke district. With respect to distance to the market point, results show that distance to the market point had a significant negative influence on the decision to choose spot markets, but a significant positive influence on the decision to choose informal contracts (Table 5). Specifically, an increase in the distance to the market point reduced the probability of selling Shea through spot markets by 1%, but increased the probability of selling Shea through informal contracts by 0.8%.

6.4 Discussions

This study assessed the choice of Shea marketing arrangements used by Shea actors. It has demonstrated that different actors prefer different marketing arrangements in the marketing of Shea and Shea products in northern Uganda. Specifically, the use of spot marketing was more common among the collectors, who, are at the base of the Shea value chain. This was expected given that spot marketing is usually more common for among actors at the bottom of the chain (Adekambi *et al.*, 2018; Akite *et al.*, 2021) such as Shea collectors. Tijani (2018) made similar observations reporting that over 86% of the Shea actors in Tanzania preferred to sell their Shea or Shea products to local hawkers and consumers. According to Kaimba *et al.* (2020), collectors

of non-timber forest products usually prefer market channels that are nearer to them. Consequently, majority of Shea collectors prefer spot markets that are usually near their localities. On the other hand, findings from this study has shown that traders and processors preferred informal contracts. The low proportional of actors preferring contracts is attributed their dissatisfaction with contract. This is because such actors are usually too small to negotiate better contract terms (Ndiritu, 2024).

The choice of Shea marketing arrangement also varied significantly across location with spot marketing being more common in Pader district, while, formal contracts were more common in Lira district. Differences in choice of marketing arrangements are expected across geographic locations due to differences in transaction costs and information on the different marketing arrangements (Escobal & Caverro, 2012; Kaimba *et al.*, 2020; Wangu, Mangnus, & van Westen, 2021; Akatwetaba *et al.*, 2023). These locational differences are linked to the availability of market support functions such as roads (in terms of distance and quality) that influence transaction cost. In this study for instance, Lira district which relatively closer to Lira city had actors with more formal contracts. This could be attributed to Lira city harbouring larger actors who are usually able and willing to provide contracts to small scale Shea actors.

A number of factors were identified to be responsible for the observed choice of marketing arrangements used by Shea actors in this study. In the Shea value chain, there are gender differences in most aspects (Kent, 2018), including in the choice of marketing arrangements. In this study, more experienced Shea actors preferred informal contracts, while, less experienced Shea actors preferred spot markets. A study by Nwafor (2021), reported similar findings in the marketing of cocoyam in south Africa. Kaimba *et al.* (2020) also reported similar findings in marketing of Baobab pulp in Kenya. With experience, comes an understanding of the merits and demerits of each of the Shea marketing arrangement. Thus, more experienced Shea actors are more likely to prefer marketing arrangements that offer them some stability and flexibility. Generally, more experienced actors already know the marketing arrangements which are associated with higher efficiency (Olugbire *et al.*, 2021). This higher efficiency usually translates into better incomes for the actors. Additionally, more experienced actors also tend to be more flexible, since through experience, they have learnt what works and what does not. This flexibility may involve having the courage to involve in side-selling which tend to be less likely

with formal contracts. Consequently, informal contracts provide these benefits including the possibility of side selling (Veldwisch & Woodhouse, 2022) which is a major hindrance to formal contracts (Bijman *et al.*, 2020). This is partly attributed to differences in risk preferences and actors experience. According to Mishra *et al.* (2018), adoption of contracts varied by risk preferences but was higher for more experienced actors.

Shea actor's levels of education is also influenced their decision on which market arrangement to choose. Findings from this study has shown that an increase in Shea actors' level of education was linked to increased likelihood of selling Shea and Shea products through the formal contracts. Similar findings were reported by Tijani (2018) and Kangile *et al.* (2020). Specifically, Tijani (2018) reported level of education was positively related to the Shea actor's likelihood of participating in Shea contract marketing, while, Kangile *et al.* (2020) reported that an increase in actor's education reduced the likelihood of selling to outside villages. Shea actors who are more educated are more likely to understand the terms of the formal contract. This explains, why, in this study, more educated farmers preferred formal contracts.

In this study, an increase in income generated from Shea processing, was associated with lower likelihood of participating in the spot markets, but a higher likelihood of using informal contracts. A study by Tijani (2018) also reported that income had a positive influence on Shea market participation. This finding can be attributed to the volume of trade associated with each marketing arrangements. Spot marketing usually consist of small traders who can only buy relatively smaller quantities of unprocessed Shea, on a given market day. Similarly, actors who want to earn more income from Shea would adopt strategies that give them the flexibility they need including selling to multiple actors. This is why, in this study, higher Shea processing incomes are associated with higher likelihood of informal contracts. On the other hand, an increase in non-Shea processing income, was associated with lower likelihood of selling through informal contracts and higher likelihood of selling through formal contracts. Non-Shea income shows income diversifications of Shea actors. With diversified income, Shea actors can afford to sell through formal contracts which sometimes requires them to wait for some time before payments are made. This income diversification which is link to diversification of livelihood activities also implies that such actors having less time negotiating new informal contracts every time. Formal contracts thus present a time-saving options for such actors.

Support to farmers in form of extension, training and provision of information has been shown to impact on the decisions made by actors (Adekambi *et al.*, 2018; Tijani, 2018; Mgale & Yunxian, 2020). In this study, Shea collectors who received extension were less likely to sell through spot markets, but, more likely to sell through formal contracts. Extension agents usually act as linkages between contracting companies and Shea actors. Such linkages would involve provision of information and creating awareness on the benefits of such marketing arrangements and providing the much-needed information. Similarly, access to information is important for actor's decision making. In this study, results have shown that, Shea actors who have access to information were more likely to sell through contracts. Before deciding on a given marketing arrangement, an actor needs to be aware of all the terms and conditions involved (Bellemare & Lim, 2018). Thus, if Shea actors have access to information, they are more likely to abandon formal contracts for other marketing arrangements for which they find would benefit them more such as informal contracts that has been reported to provide options for side selling without grave penalties (Veldwisch & Woodhouse, 2022; Nyamamba, Ayuya, & Sibiko, 2022). Most actors have been discouraged from taking contracts after understanding all the necessary terms and conditions (Ndiritu, 2024). Results of this study have also shown that Shea actors who received training on Shea processing were less likely to sell through spot markets, but more likely to sell through informal markets. A study by Panda and Sreekumar (2012), reported a positive relationship between training and both formal and informal contracts, although access to training increased the likelihood of formal market participation more than it did for informal market participation. Such training programs would make Shea actors more competitive, choosing to try new marketing arrangements that may be different from what they have been using before.

Shea actors usually require support in order to attain better market outcomes. This may come in the form of support for value adding activities (Pouliot & Elias, 2013), which in part requires Shea actors to be aware of innovations and institutions that support such value adding activities. In this study, Shea actors who were aware of institutions that support value addition were most likely to sell through formal contracts, but less likely to sell through informal contracts, as opposed to those who were not aware. Additionally, Shea actors who were practicing value addition were more likely to sell through spot marketing, but less likely to sell through informal

contracts. This finding suggests that when actors expect some value adding activities, they would prefer marketing arrangements that allows them to negotiate prices which may translate into higher income than when they had used arrangement with relatively fixed terms.

In marketing of agricultural products, availability of transport is one determining factors to the choice of market channels and subsequently marketing arrangement (Negi *et al.*, 2018; Mgale & Yunxian, 2020; Nwafor, 2021; Sori & Adugna, 2022). Transport has great implications on the transaction cost. In this study, transport was proxied using two the mode of transport and the distance to the market. Specifically, Shea actors who used head pottage as their means of transport where less likely to sell through the formal contracts, but more likely to sell through spot markets, as opposed to those who use motorized means of transport. Similarly, Shea actors who were living nearer the market point were more likely to sell through spot markets but more likely to sell through informal and formal contracts. This finding suggests that use of head pottage in transporting Shea and/or Shea products to the market was more feasible for shorter market distances. Spot marketing have a characteristics short market distance. In most cases, spot markets are located within shorter distances from the actor's residence, making it easy for actors who want sell their products fast such as in the case of side selling (Nyamamba *et al.*, 2022). This is why, in this study, use of head pottage was associated with selling through spot markets. Additionally, contract marketing was associated longer distance markets. This is so given that in most contracting arrangements, the contracting company are usually found in more urbanized areas, which are far away from the rural areas where collection and local level processing takes place. In this study, most of farmers who used formal contracts were from Lira district, which is more developed that both Otuke and Pader districts.

Access to credit has been shown to improve Shea market participation (Tijani, 2018) and processing decisions (Pouliot & Elias, 2013). In this study, access to credit significantly influenced choice of market arrangements of the Shea actors. Specifically, Shea actors who had accessed credit were less likely to sell through formal contracts. This finding suggests that, Shea actors in this study relied on short-term credits usually obtained from villages savings and loan associations. Such credit facilities usually require that the borrower pay within a short time. Consequently, spot marketing provides an immediate solution to the cash requirements for

paying such short-term loans. In case of default, such loans usually have grave penalties (Abaho *et al.*, 2022) that Shea collectors would want to avoid.

6.5 Conclusions

Shea nuts are collected from Shea trees (*Vitellaria paradoxa*), a naturally occurring parkland tree species. This study assessed the choice of marketing arrangements used by Shea collectors, traders and processors in northern Uganda. Results showed that in this study, Shea collectors were the majority with most of them preferring to sell their Shea products through spot marketing. On the other hand, Shea traders and Shea processors preferred formal and informal contracts in marketing their Shea products. Several factors were identified to be influencing Shea actor's choice of marketing arrangement. These factors were both socio-economic and institutional in nature. Efforts to improve Shea actors market performance can be achieved by harnessing some of the identified factors. For instance, provision of extension services and creating awareness about institutions that support value addition, would increase Shea actor's participation in formal contracts. Similarly, addressing challenges associated with market access by improving transport services would influence choice of certain marketing arrangements over others. On the other hand, provision of training on value addition to Shea actors would encourage use of informal contracts, while, providing information to Shea actors would discourage use of formal contracts, suggesting the need to improve on the contracting terms if farmers are to take it up. This study recommends the need to customized approaches to promoting uptake of priority marketing arrangements by geographic locations and actor types.

CHAPTER SEVEN

ACTORS, CHALLENGES AND OPPORTUNITIES IN THE SHEA VALUE OF NORTHERN UGANDA

This chapter explores the Shea value chain in northern Uganda with the aim of mapping the actors, as well as existing opportunities for each actor in the Shea value chain. The Chapter also identifies the governance in the Shea value chain.

The chapter investigated the following research questions:

1. Who are the actors in the Shea value chain of northern Uganda?
2. What are the challenges affecting each Shea value chain actor in northern Uganda?
3. What opportunities exist for the actors in the Shea value chain of northern Uganda?

7.1 Introduction

Existing evidence has shown that the Shea, *Vitellaria paradoxa* supports livelihoods of millions of people where it exists (Naughton *et al.*, 2015; Adekambi *et al.*, 2018). The multipurpose tree indigenous to Sub-Saharan Africa (SSA) is naturally occurring in the dry savannas covering an estimated one million square kilometres between Senegal in West Africa and Uganda in East Africa (Okullo *et al.*, 2012; Kabiru & Ayanfunke, 2018; Orwa *et al.*, 2009; Tijani & Sanusi, 2020; Hatskevich, Jenicek, & Darkwah, 2011; Tom-Dery *et al.*, 2018). In Uganda, the tree is found existing in the dry parkland areas of eastern and northern Uganda (Okullo *et al.*, 2012).

The tree is important for several economic values including food, pharmaceutical and cosmetic uses (Rousseau *et al.*, 2015; Adekambi *et al.*, 2018). Given the importance of the tree and its associated products, there is currently an increase in its demand both locally and globally. This is manifested by the increased competitiveness of Shea products globally (Dubbart & Abdulai, 2022; Abdul-Rahaman & Abdulai, 2020; Dubbert, 2019). This increased global competitiveness increases the potential of Shea and its associated products for poverty eradication in communities where it exists. This includes smallholder women who dominated the base of the Shea value chain (Hammond *et al.*, 2019; Sanou, Bazié, & Bayala, 2019).

Given the importance of the tree, there have been efforts to conserve the tree that is facing a number of threats including being cut down for charcoal (Atalla, 2015; Acema *et al.*, 2021; Ogwok, Alele, & Kizza, 2019). In essence, the increased of the Shea value chain is expected to foster conservation efforts for this endangered savannah parkland tree species (Adekambi *et al.*, 2018). However, this requires an understanding of the local context of the Shea value chain. With the many uses of the trees, both traditional or otherwise, this local context is thus expected to vary across the Shea belt of SSA. Consequently, the structure of the Shea value chain as well as associated governance framework which influences the competitiveness at the local level also varies across the Shea belt. For instance, in northern Uganda, a region that is recovering from the over two decades of the Lord's Resistance Army insurgency (Day, 2019; Dubal, 2018; Dunn, 2010), an understanding of the current status of the Shea value chain is even more critical. This is because, reconstruction efforts for the regions is currently focused on promoting viable enterprises that can lead to increase incomes of smallholder. Shea tree is among the highly value enterprises in the region (Byakagaba *et al.*, 2021).

Despite the importance of information on the current status of Shea value chain in northern Uganda, such information is currently lacking. This study addresses this gap by exploring the actors, governance and opportunities that exists in the Shea value chain of northern Uganda. This information is important for two main reasons. First, with the need to conserve the tree, information on the actors, governance as well as existing opportunities can support the development of sustainable conservation strategies for this endangered tree species. Secondly, the findings of study can also be utilized in improving the competitiveness of the local Shea actors in the Shea value chain of northern Uganda. Specifically, by identifying existing opportunities, it is possible for the Shea actors to harness these opportunities to improve their profitability. This will in the long bring out the pro-poorness of the Shea tree (Hammond *et al.*, 2019; Sanou *et al.*, 2019). Similarly, an understanding of the governance relations will help in fostering relations between actors. These better relations will eventually improve the competitiveness of the actors involved.

7.2 Methods

7.2.1 Data Collection

The study area for this study follows the description in section 3.1. Primary data for this study was collected using qualitative approaches. Specifically, focus group discussions (FGDs) and key informant interviews (KII) to identify actors, map the opportunities as well as explore the governance systems in the Shea value chain in northern Uganda. The participants of the FGDs were actors of the Shea value chain, while, the key informants were identified as those who play a supporting role to the Shea value chain. The FGD and KII guides are presented in appendix 1.

7.2.2 Study Participants

Three focus groups comprising of collectors, traders and processors was conducted. The FGDs participants were purposively selected to have a representation of all primary actors. In each district, one focus group discussion was conducted. According to Hennink & Kaiser (2022), the number of focus groups to be conducted depends on the level of saturation. Consequently, following saturation of the information from the three FGDs, there was no need to for additional FGDs. The number of participants for the FGDs is presented in Table 7.1

Table 7.1: Number of FGD participants by actor type

FGD Number	FGD Location	Number of participants			Total number of participants
		Collectors	Traders	Processors	
FGD1	Pader	4	4	2	10
FGD2	Lira	4	3	3	10
FGD3	Otuke	4	3	3	10

In total, the FGDs had 30 participants, with 12 collectors, 10 traders and eight processors. The gender distribution of the participants is presented in Table 7.2. It shows that of the 30 FGDs participants, 17 were female, while, 13 were males. Majority of the collectors and traders were females, while, majority of the processors were males.

Table 7.2: Distribution of Focus Group Participants by Gender

FGD	Number of participants							
	Collectors		Traders		Processors		Overall	
	Male	Female	Male	Female	Male	Female	Male	Female
FGD1	1	3	2	2	1	1	4	6
FGD2	2	2	0	3	3	0	5	5
FGD3	3	4	1	0	0	2	4	6
Total	6	9	3	5	4	3	13	17

The selection of the Key Informants was purposive to include private and public extension workers, traditional leaders as well as local council leaders (Table 7.3). The extension workers included: district forestry officers, district commercial officers, and agricultural officers from the study districts.

Table 7.3: Distribution of Key Informants by Gender and category

Category of Key informant	Number		
	M	F	Total
Government Extension Workers	9	3	12
Non-Government Organizations extension workers	7	0	7
Traditional Leaders	3	2	5
Local Council leader	5	1	6
Total	24	6	30

7.2.3 Data Analysis

Data analysis for the FGDs and KIIs started while in the field. During field work, the FGDs was assessed for completeness so as to know if saturation had been reached. After data collection, the FGDs and KII were analysed using qualitative content analysis following procedures described by Cho & Lee (2014). In this study, data analysis started by creation of themes, following, Muggaga *et al.* (2017) and Aliro *et al.* (2022). The themes were guided by the objectives of the study study which was to map the actors and their roles, assess governance approached as well identify opportunity for upgrading. Analysis then involved scrutinizing the field notes and transcripts for mentions of the themes and sub-theme from the FGDs and KIIs. Analyzed results was presented in tables for better presentation and understanding.

7.3 Results

7.3.1 The Shea Value chain actors and their conduct

In the Shea value chain of northern Uganda, the main actors include: Collectors, traders, processors and supporting agencies including non-governmental organizations (NGOs), local government, local council leaders as well as traditional leaders. The roles of the actors are varied. Shea collectors, traders and processors are those that deal directly with the different forms of Shea and/or Shea products. Local government as well as NGOs play a critical role in providing the necessary advisory services for the Shea value chain actors. They also help create the necessary linkages in addition to supporting conservation efforts for this endangered Shea tree. Results from both FGD and KII observed that the lower local government leaders as well traditional leaders are most important in championing conservation efforts for the Shea tree. Whereas the primary actors (collectors, trader and processors) largely relied on their own finances to facilitate their operations, Shea value chain support actors relied on either government funding or external funding from donors. The external funding from donors was through time-bound projects that were being implemented in the project area. The projects targeted value addition as well as creating awareness about conservation of the Shea tree. Whereas, study participants agreed that traditional leaders and as well lower local government leaders play a critical role in supporting the Shea value chain, there was no mention of their source of funding for their role in the Shea value chain. Findings from this study suggests that the actors in the Shea are aware of the existence of most of the actors and their roles. For instance, an interview with the chairperson local council of the districts noted that he was aware of the two Shea nut factories in the district.

The Shea nut business is organized in such a way that all actors have their distinct roles to play. These roles range primary value chain roles to secondary supporting roles. For instance, a key informant who is an NGO extension worker noted that they participate in Shea nut value chains through several efforts including exhibitions and trade shows. In essence, the role of the actors is important in the marketing of Shea and its products. The Shea products dealt in include: Shea nuts, Shea butter, Shea lotion, soap, among others. The general view from the study participants suggests that value addition to Shea products was the only way of getting money from Shea.

From the FGDs, the key issues in relation to the conduct and performance of Shea nut actors were identified (Table 7.4). These issues range from those that are supporting to those that are inhibiting. For instance, study participants noted that in the Shea value chain, there are always free entry and exit, especially at the bottom of the chain. This was mentioned in all the three FGDs. To emphasize this, a collector and an FGD participant said: —*Every person has a right to pick and sell Shea nuts except when the Shea trees are not in his or her garden or not in his homestead*”.

The only notable restrictions are related to conditions imposed by some buyers on the specifications of what they require. A trader and a FGD participant observed that:

There is no restrictions or processing except for buyers who want organic Shea nuts that require you to have a contract with them as well as adhere to certain conditions in the contract. Such companies are usually found in urban areas including Lira city

These companies that were relatively large had the powers to impose prices for the products that met their specifications. These observations were shared by key informants who noted that prices in the Shea value chain of northern Uganda usually depended on the product specifications, location of products as well as buyer. Thus, the prices charged for the products are not normally the same.

The imposition of such marketing conditions seems to have limited the formal marketing of Shea and Shea products. Key informants noted the limited involvement of actors in the formal channels. The FGD participants also noted that in the Shea value chain, there are many agencies that provide support to the actors. However, given the socio-cultural and economic relevance of the tree, these agencies most times compete to reach the primary actors. These views were also shared by Key informants. For instance, the district forestry officer of one of the study districts said that: “*In my district, we have so many NGOs that work to support the share value chain Our biggest problem however is that these agencies are sometimes duplicating efforts which makes it hard to attributed the successes to individual agencies.....*”

In two of the three FGDs, participants noted that market information sharing was a challenge among actors. This was largely attributed to the lack of information and communication

technology (ICT) facilities hampered their full participation in the Shea value chain. This observation was contrary to key informant views that revealed some information on Shea value addition as well as marketing are usually disseminated through radio stations. However, it appears the primary actors in the Shea value chain are not aware of the information disseminated through radio and other media. Participants also noted the seasonality of the Shea nuts as limiting their full participation. A collector and cooperative leader who participated in the FGD said: *“Whereas the processors are involved in processing the products, we the collectors don’t have enough Shea nuts”*.

The views from the FGDs were largely shared by most key informants. Most of key informants noted that they supported the marketing and promotion of Shea products, although they agree that it was the individual actors who were responsible for the marketing of the Shea and Shea products.

Table 7.4: Key issues for actors conduct and performance in the Shea value chain

Issue	Mentions			Total Mentions
	FGD1	FGD2	FGD3	
Presences of Competing agencies				3
Participation in Shea nut marketing and promotion				2
Free market entry and exit, no restrictions				3
Companies determine the price of their products				3
Market information sharing a challenge among actors				2
Presence of policy or legal frame work				2
Shea marketing majorly informal				2
Collaboration for different Shea nut actors				3

Note: Mentioned; Not mentioned

7.3.2 Governance, power relations and challenges in Shea value chain of northern Uganda

In the Shea value chain of Uganda, actors relate to each other in a number of ways. These governance and power issues were identified and are presented in Table 7.5. Some of these relations are related to the need to conserve this endangered tree as well as ensure quality. For instance, Shea actors are only allowed to collected those nuts on the ground, but a fine of a goat existed for those who try to climb the Shea to pick the Shea nuts. The rule was largely enforced by traditional leaders who valued the Shea tree for its cultural importance. Without this rule, Shea collected would be picking unripe Shea nuts and this would lower the quality of the

products. These rules also extended to prohibition of cutting of Shea trees for charcoal and other uses.

Discussions with key informants revealed that these rules were largely based on district and sub-county level bye-laws that were enacted to enhance the sustainability of the Shea value chain actors. Given that they were largely bye-laws, quality standards were largely absent and varied from actors to actors. For instance, there are companies who have specification for organic Shea nuts.

Study participants noted the lack of coordination and feedback among Shea actors. One FGD participants noted that: —*Most organizations came and picked information from us but have never come back to share information instead, they make their own projects this has hampered the Shea nut industry*l. This was related to the duplication of efforts by the secondary actors who work to support the primary actors. In practices, the project approach to supporting the Shea value chain some time comes with its challenges that limits them from sustainably supporting the value chain. According to key informants, the projects usually have limited funds to fully support their activities. The limited support was attributed to the reliance on donor funds for the conservation of Shea tree. This according to key informants was partly because the Shea tree is not among the priority agricultural enterprises supported through the mainstream agricultural extension efforts.

For some Shea value actors, the sole reliance on Shea nut was seen as a hindrance to formal marketing. A key informant noted that: —*not having alternative sources of income usually forces Shea collectors to sell their Shea through uncompetitive channels including spot market*”. Study participants also identified the lack specific market, lack of standardization of price, lack of transport from where nuts are collected to the factories, lack of streamlined Shea nut value chain structure, lack of processing equipment, and limited collecting marketing as other issues affecting governance and power relations in the Shea value chain of northern Uganda (Table 7.5). Participants also mentioned that organizations were also not professionally organized. Each held their own system of operation and this affected them to have a collective bargaining ability and standardization for the price.

Table 7.5: Issues related to governance and power relations in the Shea value chain of northern Uganda

Governance, power relations and challenges in the Shea value chain	Mentions			Total Mentions
	FGD1	FGD2	FGD3	
Contract marketing among actors available				2
Traditional beliefs (Shea nut trees should not be climbed) smearing young ones with Shea oil				3
Coordination among actors				1
Rules and regulations; No harvesting raw Shea nut, Cutting of Shea nut tree is prohibited				2
No feedback from organization who collect data from them				3
Lack of coordination among Sheanut actors, traditional clan leader their role not				3
No specific market for Shea nuts, products and functions				3
Lack of streamlined Shea nut value chain structure				2
Innovations involved in improving Shea nuts				3
Shea value addition and diversity of Shea products				3
No feedback from organizations on their activities				3
Lack of coordination among Shea nut actors				2
No storage facilities for Shea nut collectors				3
No specific Market				3
Lack of streamlined Shea nut structure				3
Limited machinery for Shea nut production				3
Innovations involved in improving Shea nuts				2
Shea nut products like pancakes, Biscuits, Butter Vaseline				2
High demand for Shea nut charcoal by neighboring countries				2
No rewards for protection by cultural leaders				2

Note: Mentioned: Not mentioned

Many factors like lack of ICT facilities, organized Shea nut markets hamper the development of Shea nut value chain. Similarly, poor record keeping among Shea actors was also mentioned as a factor affecting Shea nut upgrading. Additionally, lack of proper legislation and legal frame work is hampering our development. One FGD participant noted: —Ever since we started involving in Shea nut, the product has never been certified by Uganda National Bureau of standards. This is affecting recognition of our efforts by the government”.

It was also mentioned that lack of training in post-harvest handling techniques is affecting the Shea nut collectors in improving the quality of Shea. —*The Shea nut collectors have never been involved in post-harvest handling techniques and this is affecting the quality of the products*¶. This was re-echoed by some other key informants who noted that since the nuts are perishable, it has to be marketed in its raw form within the shortest possible time. Without an immediate market, the lack of post-harvest handling skills usually hampers efforts. Limited post-harvest skills are also related to the lack of processing equipment required to add value as well as extend the shelf life of the Shea nuts. This was noted by both FGD participants and key informants. A key informant traditional leader noted that: —*We as the community are lacking the processing equipment. If the government can provide us with one, may be the services can improve*¶. Other participants suggested that there is need to advocate for common market to improve output, in addition to enhancing Shea value chain research. Specifically, participants noted the need for collaborative efforts between all relevant stakeholders. These collaborative efforts also need to include collaborative research activities which would provide solutions to the problem of the cutting Shea trees for charcoal among others.

7.3.3 Existing opportunities in the Shea value chain

During the FGD, participants were asked to mention existing opportunities that can improve competitiveness of the Shea nut and the Shea value chain. A number of opportunities were identified as available. This includes opportunities of processing and value addition, collective marketing, advisory services, intersectoral linkages, financial support, input use, as well as availability of contracts and Information and Communication facilities (Table 7.6). Following the identified opportunities, FGDs were asked to rank how important each opportunity is for each actor. The results of this ranking are presented in Table 7.6. It shows that processing and value addition was ranked number one for all actors. This was followed by presence of advisory services and collective marketing in the case of collectors. The least ranked opportunity for collectors was intersectoral linkages, while, the least ranked opportunity for traders was availability of inputs. In the case of processors, the least ranked opportunity was availability of information and communication technologies. The rest of the rankings are as presented in Table 7.6.

Table 7.6: Existing opportunities in the Shea value chain and their ranking of importance for each actor

Opportunity	Ranking of importance for the actor		
	Collectors	Traders	Processors
Processing and Value addition	1	1	1
Collective marketing	3	2	2
Group Organizations	4	3	3
Advisory services	2	6	4
Intersectoral linkages	9	5	5
Financial facilitation	5	4	6
Input Use	8	9	7
Availability of contracts	6	7	8
Availability of ICT	7	8	9

Note: Rank 1=Most important, 9=least important

7.4 Discussion

This study explored the Shea value chain in northern Uganda with the aim of identifying the key actors, the functioning of the value chain as well as identifying existing opportunities for improving the functionality of the Shea value chains. The qualitative approaches were suited for thus exploratory study. The gender distribution of this study participants depicts a typical Shea value chain where women dominate the lower part of chain while the supporting functions are played by largely male dominated extension agents (Friman, 2023). Women have for long dominated the collection of Shea nut from the parklands in addition to being involved in its processing at household level (Rousseau *et al.*, 2017; Rousseau *et al.*, 2019; Elias & Arora-Jonsson, 2017). The Shea value chain in northern Uganda consists of primary actors who are directly involved in the collection, processing and marketing of Shea nuts and secondary actors who play a supporting role. The primary actors consist of collectors, traders and processors, with the collectors at the bottom of the chain, while, the processors are higher in the chain. The local value chain involves collectors, gathering the season's Shea nuts. After gathering, they have a range of options including primary processing, before selling to traders, who link up with urban processors. There are some collectors who sell the Shea nuts the way they are. Similarly, there are those that sell their products directly to processors without passing through traders. Majority of the processors are located in urban areas. The secondary actors were largely relevant for enforcing conservation efforts of the Shea tree.

The findings of this study reveal that, the transactions Shea value chain in northern Uganda are largely informal (Akatwetaba *et al.*, 2023). This finding corroborates earlier findings in the Shea value of northern Ghana (Opoku-Mensah *et al.*, 2024). This observation was partly driven by lack of alternative livelihood options for the actors. In essence, the female dominated actors usually prefer selling the seasons immediately to get quick cash to support their households. According to Katsekpor *et al.* (2024), female Shea value chain actors are using the least empowered. Despite being the least empowered, they play an important role in the Shea value chain including supporting conservations (Pienaah *et al.*, 2024) This explains why in this study, results have shown that the collectors where the female actors dominate preferred spot marketing. Spot marketing is usually preferred where the bargaining power of actor is limited.

Although coordination mechanisms exist in the share value chain of northern Uganda, qualitative results from FGDs and KII have showed that the value chain is faced with several challenges. These challenges range from infrastructural inadequacies to limited knowledge and skills of the actors, with respect to Shea value addition, among others. Among the challenges, includes a notable absence of financial institutions among the actors identified in the Shea value chain. This absence is reflected in the challenges identified as facing the Shea value chain of northern Uganda. For instance, resource-constraint collectors are also unable to access value addition equipment. These findings are in line with those of prior studies that suggest existence of economically unempowered actors (Katsekpor *et al.*, 2024; Garba & Muhammad-Lawal, 2020).

Despite the challenges, this study identified opportunities available. Top among the opportunities is the unexploited potential for processing and value addition. Study participants generally agreed that although the level of processing and value addition is still low, there is a huge unexploited potential. There other opportunities relate to presences of collectives, availability of ICT infrastructure, advisory services as well as improving intersectoral linkages. These opportunities present an unexploited potential for the Shea value chain in northern Uganda. The low level of value addition has also previously been reported elsewhere (Opoku-Mensah *et al.*, 2024; Tapsoba *et al.*, 2022). Exploiting these opportunities would be important for thee increasing globalization of the Shea value chain (Rousseau *et al.*, 2017; Elias & Arora-Jonsson, 2017; Carsan *et al.*, 2021). However, exploiting these opportunities requires multi-stakeholder involvement of actors for better results. This multi-stakeholder involvement needs should not

only focus on marketing and processing but also on research as well as other social dynamics surrounding the Shea value chain including the gendered value chain.

7.5 Conclusions

The Shea tree is appreciated for its socio-cultural and economic importance. This study identified actors, mapped the opportunities and explored the governance systems in the Shea value chain of northern Uganda. The primary actors which include collectors, traders and processors play important roles in handling and transforming the Shea nuts into several important products. The secondary actors played a crucial role in conservation of the Shea tree which is considered endangered. In northern Uganda, Shea tree charcoal is the most valuable. This study identified challenges and opportunities in the Shea value chain. The challenges include infrastructural challenge with respect to marketing and local level value addition. Addressing these challenges requires that Shea value chain actors find ways of exploiting the existing opportunities. Effective exploitation of the existing opportunities, requires multi-stakeholder involvement along the gendered value chain.

CHAPTER EIGHT

SUMMARY, CONCLUSIONS AND RECOMMENDATION

This chapter presents a summary of key findings, conclusions as well as actionable recommendations for practice and for further studies.

8.1 Introduction

The increasing local and global demand for Shea nuts and its associated products presents a huge opportunity for the local Shea nut value actors. To benefit from this increased demand, an understanding of the current status of the local Shea value chain is very vital. This study assessed the following with respect to the Shea value chain in northern Uganda:

- i). The level of competitiveness among Shea actors (Chapter 4)
- ii). Factors that influence upgrading in the Shea nut value chain (Chapter 5)
- iii). Factors that influence choice of market arrangement used in the marketing of Shea products (Chapter 6)
- iv). Challenges and opportunities that can be exploited in the Shea nut value chain (Chapter 7)

The study adopted a cross-sectional study design to achieve the objectives. Specifically, primary cross-sectional data was collected using questionnaire survey, focus group discussions and key informant interviews. Collected data was analysed using descriptive statistics, econometrics approaches as well as qualitative content analysis. The chapter summaries the key finding from this study, the conclusion, recommendations as well as limitations of the study.

8.2 Research objectives revisited

8.2.1 The level of competitiveness among Shea actors

The first objective of this study assessed the level of competitiveness among Shea actors. The findings are presented in chapter 4. Results showed that the average market share for collectors, traders and processors was 0.4%, 1.9% and 4.5%, respectively. The concentration ratio of the for processors was 65%, while, that of traders and collectors were all below 40%, suggesting

oligopolistic tendencies among processors. The level of market share was significantly influenced by several factors including: actor's location (district), distance to the output market, distance to the Shea source, actor's experience as well as marketing arrangement. The findings of this chapter suggest that these informal relationships favour higher market share.

8.2.2 Factors that influence upgrading in the Shea nut value chain

The second objective of this study assessed the factors influencing the level of upgrading among Shea collectors. The findings are presented in chapter 5. Results showed that the proportion of Shea allocated to value addition was low with about 15% of Shea collectors, not adding any value to the Shea nuts. Only 11% of the Shea collectors added value to 100% of the Shea collected. The proportion of Shea allocated to value addition was significantly influenced by several factors including gender of the actor, actor's age, non-Shea income, Shea income, access to information on Shea marketing, membership to an association, engaging in spot marketing and land area under Shea tree. Results also showed that 49% of the collectors had no value-added product, while about 12% had three or more value added products. The number of value-added products was significantly influenced by several factors including: actor's age, actor's geographical location, access to Shea marketing information, formal and informal marketing arrangements, household size, access to extension services, membership of an association, and use of both spot and informal marketing arrangements. The findings of this objective present a case for improving the level of value addition among Shea collectors in the Shea value chain of northern Uganda.

8.2.3 Factors that influence choice of marketing arrangements for marketing of Shea products

The third objective of this study assessed the factors influencing choice of marketing arrangement used in Shea marketing by Shea actors. The findings are presented in chapter 6. Results showed that spot marketing was most common overall, as well as among collectors and traders. On the other hand, informal contracts were the most common among processors. Formal contracts were the least common among all actors. Marketing arrangement was significantly associated with actor's district. The probability of choosing spot market was significantly

influence by actor's experience, income from Shea processing, access to extension, receiving training, means of transport, practicing value addition, main occupation, actor type, district and distance to the market point. The probability of choosing informal contracts was significantly influenced by actor's experience, income (both processing and non-processing), access to training, awareness of institutions, practicing value addition, main occupation, actor type, district and distance to the market point. Lastly, the probability of choosing formal contracts was significantly influenced by actor's level education, non-processing income, access to extension, receiving market information, transport means, awareness of institution, access to credit, practicing of value addition and district. These findings present a case for influencing the choice of more competitive marketing arrangements in Shea marketing.

8.2.4 Challenges and opportunities that can be exploited in the Shea nut value chain

The fourth objective of this study assessed challenges and opportunities that can be exploited in the Shea nut value chain. The findings are presented in chapter 7. From the FGDs and KIIs actors identified the following as key issues affecting actor's relations in the Shea value chain of northern Uganda: Competing agencies, Shea marketing and promotion, absence of market entry restrictions, availability of market information, presence of policy and regulatory frameworks and collaboration among actors. The chapter also identified key challenges affecting the Shea value chain. This includes lack of specialized markets, lack of standardisation of price, lack of transport from where nuts are collected to the factories, lack of streamlined Shea nut value chain structure, lack of processing equipment, and limited collective marketing. Several opportunities that can be exploited by addressing the challenges do exist in the Shea value chain. These include opportunities for processing and Value addition, collective marketing, group organizations, advisory services, intersectoral linkages, financial facilitation, input use, contracts and availability of ICTs. The findings of this objective presuppose that addressing the existing challenges in the Shea value chain would contribute to harnessing the existing opportunities.

8.3 Conclusions

In this study, the primary actors of the Shea value chain which include collectors, traders and processors play important roles in handling and transforming the Shea nuts into several

important products. The secondary actors played a crucial role in conservation of the Shea tree which is considered endangered. From this study, it can be seen that unfair competition manifested by higher-than-normal market share exists in the Shea value chain with the processors, have the potential to exercise oligopolistic power. The traders and collectors on the other side of the continuum, are however, individually, too small to influence market outcomes in the Shea market value chain.

The findings of this study also point to the need to support older farmers in enhancing their capacity for value addition, since they were less likely to participate in value and product upgrading. For instance, results showed gendered participation in value addition with females more likely to engage and allocate more of the collected to value addition. The study also shows the importance of access to marketing information and extension services in enhancing Shea value addition. Focus on provision of market information for the raw Shea has been seen to hinder value addition. Dissemination of such information to Shea actors belonging to their various associations would enhance uptake and lead to better value addition outcomes.

This study has also shown that Shea collectors who were the majority of actors preferred to sell their Shea products through spot marketing. On the other hand, Shea traders and Shea processors preferred formal and informal contracts in marketing their Shea products. Several factors were identified to be influencing Shea actor's choice of marketing arrangement. These factors were both socio-economic and institutional in nature. Efforts to improve Shea actors market performance can be achieved by harnessing some of the identified factors. For instance, provision of extension services and creating awareness about institutions that support value addition, would increase Shea actor's participation in formal contracts. Similarly, addressing challenges associated with market access by improving transport services would influence choice of certain marketing arrangements over others. On the other hand, provision of training on value addition to Shea actors would encourage use of informal contracts, while, providing information to Shea actors would discourage use of formal contracts, suggesting the need to improve on the contracting terms if farmers are to take it up. This study identified challenges and opportunities in the Shea value chain. The challenges include infrastructural challenge with respect to marketing and local level value addition. Addressing these challenges requires that Shea value

chain actors find ways of exploiting the existing opportunities. Effective exploitation of the existing opportunities, requires multi-stakeholder involvement along the gendered value chain.

8.4 Recommendations

Based on the findings, this study recommends the following:

- Addressing the observed differences in market share partly requires harnessing the potential of the factors that influence the market share of these actors. Contracting for instance, would improve the market share of collectors and traders making able to compete favourably with the processors. The findings suggest the need to tackle the inefficiencies in the market that is manifested has extremely high market share of some actors and extremely low market share among some actors. Collectors should be encouraged to negotiate contracts that allow for value addition options if they are to increase their level of value addition.
- There is need to encourage participation of men in Shea value addition activities to enhance sustainability of Shea value addition.
- There is need to package vital value addition message together with market information to enhance value addition activities.
- This study also recommends the need to customized approaches to promoting uptake of priority marketing arrangements by geographic locations and actor types.

8.5 Limitations and suggestions for further research

This study was set out to explore and gain understanding of the influencers of overall functioning and performance of the Shea nut value chain in Northern Uganda. In doing so, the study utilized primary cross-sectional primary data. The applicability of the findings of this study are thus limited to cross-sectional context as well as geographical locations with similar characteristics such as the study area of this study.

Despite the significant findings, there are a number of issues which were not within the scope of this study, but could supplement the findings of this study. These are presented as suggestions for further research. Specifically, future research should focus on:

- The role of actors in Shea nut conservation and promotion and utilization in other areas of the country
- Analysis of nutritional and medicinal properties and benefits of Shea tree and Shea nut products
- Opportunities and challenges of Shea producers and processors in east African region
- Shea nut harvesting mechanisms in Africa Shea belt basin

REFERENCES

- Abaho, E., Mindra, R., Agasha, E., & Balunywa, A. (2022). Alternative business finance: insights from selected informal savings groups in Uganda. *African Journal of Economic and Management Studies*, 13(2), 268-283. <https://doi.org/10.1108/AJEMS-11-2021-0490>
- Abdul-Rahaman, A., & Abdulai, A. (2020). Farmer groups, collective marketing and smallholder farm performance in rural Ghana. *Journal of Agribusiness in Developing and Emerging Economies*, 10(5), 511-527. <https://doi.org/10.1108/JADEE-07-2019-0095>
- Abdul-Rahaman, A., & Abdulai, A. (2020). Vertical coordination mechanisms and farm performance amongst smallholder rice farmers in northern Ghana. *Agribusiness*, 36(2), 259-280. <https://doi.org/10.1002/agr.21628>
- Acema, D., Byakagaba, P., Banana, A. Y., & Turyahabwe, N. (2021). Local Institutions and the Governance of Tree Resources: The Case of the Shea Tree (: *Vitellaria paradoxa*: CF Gaertn.) in West Nile Region of Uganda. *Conservation and Society*, 19(1), 44-56.
- Adaku, A. A., & Amanor-Boadu, V. (2022). Typology and performance of inter-organizational relationships among Ghanaian farmers. *International Food and Agribusiness Management Review*, 25(3), 379-392. <https://doi.org/10.22434/IFAMR2020.0170>
- Adam, A. W., & Abdulai, A. M. (2014). Towards Addressing the Challenges in the Shea Nut Industry in the Savelugu/Nanton District of Northern Region, Ghana. *International Journal of Economics, Commerce and Management*, 2(10), 1-12.
- Adams, A. M., Abudulai, I., & Bashiru, M. (2016). The Shea industry and rural livelihoods among women in the Wa Municipality, Ghana. *Journal of Social Science Studies*, 3(2), 40-56. <http://dx.doi.org/10.5296/jsss.v3i2.8706>
- Adégbidi, A., Aoudji, A. K., Avocevou-Ayisso, C., Gbénou, C., & Lebailly, P. (2017). Upgrading opportunities in agricultural value chains: Lessons from the analysis of the consumption of processed pineapple products in southern Benin. *African Journal of Science, Technology, Innovation and Development*, 9(6), 729-737. <https://doi.org/10.1080/20421338.2016.1163472>

- Adekambi, S. A., Ingenbleek, P. T., & van Trijp, H. C. (2018). Integrating Bottom-of-the- Pyramid Producers with High-Income Markets: Designing Institutional Arrangements for West African Shea Nut Butter Producers. *Journal of Public Policy & Marketing*, 37(2), 327-341. <https://doi.org/10.1177/0743915618813117>
- Agúndez, D., Nouhoheflin, T., Coulibaly, O., Soliño, M., & Alía, R. (2020). Local preferences for Shea nut and butter production in Northern Benin: Preliminary results. *Forests*, 11(1), 13. <https://doi.org/10.3390/f11010013>
- Akatwetaba, D., Mugonola, B., Kasharu, A., & Egeru, A. (2024). An Assessment of the Competitiveness of Shea Actors in the Shea Nut Value Chain of Northern Uganda. *East African Journal of Agriculture and Biotechnology*, 7(1), 361-369. <https://doi.org/10.37284/eajab.7.1.2076>
- Akatwetaba, D., Mugonola, B., Kasharu, A., Okello, D. M., & Egeru, A. (2023). Drivers of value addition and product upgrading to Shea nuts by collectors in northern Uganda. *African Journal of Science, Technology, Innovation and Development*, 15(3), 349-361. <https://doi.org/10.1080/20421338.2022.2115602>
- Akatwetaba, D., Okello, D. M., Kasharu, A., Egeru, A., & Mugonola, B. (2024). Determinants of Shea nut marketing arrangements in northern Uganda. *Discover Agriculture*, 2(1), 61. <https://doi.org/10.1007/s44279-024-00085-4>
- Akite, I., Okello, D. M., Kasharu, A., & Mugonola, B. (2023). Smallholder Farmers' Contextual Ingredients of Process, Functional and Product Upgrading Strategies for Improved Competitiveness in Uganda's Rice Markets. *Journal of International Food & Agribusiness Marketing*, 1-25. <https://doi.org/10.1080/08974438.2023.2206817>
- Akite, I., Okello, D. M., Lamo, J., Kasharu, A., & Mugonola, B. (2021). Determinants of non-technological upgrading strategies for rice market improvements in Uganda. *Scientific African*, 14, e01030. <https://doi.org/10.1016/j.sciaf.2021.e01030>
- Akrasi, R., Egyir, I. S., Wayo Seini, A., Awo, M., Okyere, E., & Barnor, K. (2021). Food Security in Northern Ghana: Does Income from Shea Based Livelihoods Matter? *Forests, Trees and Livelihoods*, 30(3), 169-185. <https://doi.org/10.1080/14728028.2021.1948922>

- Aleskerov, F., Bouyssou, D., & Monjardet, B. (2007). *Utility maximization, choice and preference* (2nd ed., Vol. 16). Berlin: Springer Science & Business Media.
- Alex, A., Jeremia, M., George, T., & Anna, S. (2015). Assessment of innovative market access options for banana value chain in Uganda. *Journal of Development and Agricultural Economics*, 7(10), 323-331. <https://doi.org/10.5897/JDAE2015.0644>
- Aliro, T., Chenais, E., Odongo, W., Okello, D. M., Masembe, C., & Ståhl, K. (2022). Prevention and control of African swine fever in the smallholder pig value chain in northern Uganda: Thematic analysis of stakeholders' perceptions. *Frontiers in veterinary science*, 8, 707819. <https://doi.org/10.3389/fvets.2021.707819>
- Amanor, K. S. (2019). Global value chains and agribusiness in Africa: Upgrading or capturing smallholder production? *Agrarian South: Journal of Political Economy*, 8(1-2), 30-63. <https://doi.org/10.1177/2277976019838144>
- Atalla, J. A. (2015). *A review of institutional frameworks for conservation of the Shea nut tree in Uganda*. Reykjavik, Iceland: United Nations University Land Restoration Training Programme.
- Awo, M. A., & Anaman, K. (2015). Political economy analysis of the production and marketing of Shea nut products by women in the Northern Region of Ghana. *Research in World Economy*, 6(4), 1-17. <http://ugspace.ug.edu.gh/handle/123456789/24754>
- Bailey, T. (1998). Multivariate statistical analysis for geographers. *Journal of Regional Science*, 38(4), 682–686.
- Barrett, C. B., Reardon, T., Swinnen, J., & Zilberman, D. (2022). Agri-food value chain revolutions in low-and middle-income countries. *Journal of Economic Literature*, 60(4), 1316-1377.
- Bellemare, M. F., & Lim, S. (2018). In all shapes and colors: Varieties of contract farming. *Applied Economic Perspectives and Policy*, 40(3), 379-401. <https://doi.org/10.1093/aep/ppy019>
- Bello-Bravo, J., Lovett, P. N., & Pittendrigh, B. R. (2015). The Evolution of Shea Butter's "Paradox of paradoxa" and the Potential Opportunity for Information and Communication

- Technology (ICT) to Improve Quality, Market Access and Women's Livelihoods across Rural Africa. *Sustainability*, 7, 5752-5772. <https://doi.org/10.3390/su7055752>
- Bijman, J., Mugwagwa, I., & Trienekens, J. (2020). Typology of contract farming arrangements: a transaction cost perspective. *Agrekon*, 59(2), 169-187. <https://doi.org/10.1080/03031853.2020.1731561>
- Biurrun, A., Castilho, M. D., Marín, R., & Quirós, C. (2022). Upgrading and inequality in global value chains: Challenges for inclusive and sustainable development. *African Journal of Science, Technology, Innovation and Development*, 14(4), 1117-1128. <https://doi.org/10.1080/20421338.2021.1936889>
- Boffa, J. M. (2015). *Opportunities and challenges in the improvement of the Shea (Vitellaria paradoxa) resource and its management*. Nairobi: World Agroforestry Centre.
- Bup, D. N., Mohagir, A. M., Kapseu, C., & Mouloungui, Z. (2014). Production zones and systems, markets, benefits and constraints of Shea (*Vitellaria paradoxa* Gaertn) butter processing. *OCL*, 21(2), D206.
- Byakagaba, P., Okullo, J. B., Eilu, G., & Mwavu, E. N. (2021). The role of fallowing in the restoration of woody species in the Woodlands of Northern Uganda. *African Journal of Ecology*, 59(4), 1033-1046. <https://doi.org/10.1111/aje.12895>
- Cameron, A., & Trivedi, P. (2005). *Microeconometrics: methods and applications*. New York: Cambridge University Press.
- Carsan, S., Koech, G., Mausch, K., Oduol, J., Arinloye-Ademonla, D., & Bourne, M. (2021). *Eight steps for developing local tree value chains. A short guide with lessons on starting profitable and sustainable tree product businesses*. Nairobi, Kenya: World Agroforestry (ICRAF).
- Cheyo, E. J., Nyuyki Mainimo, E., Okello, D. M., Odongo, W., & Kalule, S. W. (2024). Participation and commercialization in producer cooperatives: Insights on the role of cooperative functioning and equity strategies. *Annals of Public and Cooperative Economics*, 95(3), 815–834. <https://doi.org/10.1111/apce.12462>

- Cho, J. Y., & Lee, E. H. (2014). Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *Qualitative report*, 19, 64. <http://www.nova.edu/ssss/QR/QR19/cho64.pdf>
- Clay, P. M., & Feeney, R. (2019). Analyzing agribusiness value chains: A literature review. *International Food and Agribusiness Management Review*, 22(1), 31-46.
- Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). New York: John Wiley & Sons.
- Cottray, O., Miles, L., & Newton, A. (2003). *African forests and livelihoods*. Cambridge, UK: UNEP-WCMC.
- Day, C. R. (2019). —Survival model: rebel resilience and the lord's resistance army. *Terrorism and political violence*, 31(5), 966-986. <http://dx.doi.org/10.1080/09546553.2017.1300580>
- Donkor, E., Onakuse, S., Bogue, J., & de los Rios Carmenado, I. (2018). Promoting value addition among farmers in the cassava food value chain in Nigeria. *British Food Journal*, 120(9), 2047-2065. <https://doi.org/10.1108/BFJ-01-2018-0030>
- Dormann, C., Elith, J., Bacher, S., Buchmann, C., Carl, G., Carré, G., . . . Münkemüller, T. (2013). Collinearity: a review of methods to deal with it and a simulation study evaluating their performance. *Ecography*, 36(1), 27-46. <https://doi.org/10.1111/j.1600-0587.2012.07348.x>
- Dubal, S. (2018). *Against humanity: lessons from the Lord's resistance Army*. Oakland: University of California Press.
- Dubbert, C. (2019). Participation in contract farming and farm performance: Insights from cashew farmers in Ghana. *Agricultural Economics*, 50(6), 749-763. <https://doi.org/10.1111/agec.12522>
- Dubbert, C., & Abdulai, A. (2022). Does the contract type matter? Impact of marketing and production contracts on cashew farmers' farm performance in Ghana. *Journal of Agricultural & Food Industrial Organization*, 20(2), 119-134. <https://doi.org/10.1515/jafio-2020-0040>

- Dunn, K. C. (2010). The Lord's Resistance Army and African International Relations. *African security*, 3(1), 46-63. <https://doi.org/10.1080/19362201003608797>
- Ecuru, J., & Lating, P. O. (2014). A technological innovation systems perspective on the emerging Shea butter cluster in Uganda. *International Journal of Technoscience and Development*, 1(1), 39-52.
- Elias, M., & Arora-Jonsson, S. (2017). Negotiating across difference: Gendered exclusions and cooperation in the Shea value chain. *Environment and Planning D: Society and Space*, 35(1), 107-125. <https://doi.org/10.1177/0263775816657084>
- Elias, M., & Saussey, M. (2013). The Gift that keeps on giving': unveiling the paradoxes of fair-trade Shea butter. *Sociologia Ruralis*, 53(2), 158-179. <https://doi.org/10.1111/soru.12007>
- Escobal, J. A., & Cavero, D. (2012). Transaction costs, institutional arrangements and inequality outcomes: potato marketing by small producers in rural Peru. *World Development*, 40(2), 329-341. <https://doi.org/10.1016/j.worlddev.2011.07.016>
- Ferris, R. S., Collinson, C., Wanda, K., Jagwe, J., & Wright, P. (2001). *Evaluating the marketing opportunities for Shea nut and Shea nut processed products in Uganda*. Chatham, UK: Natural Resources Institute.
- Fessehaie, J. (2013). The impact of privatisation on technological upgrading: a case study. *African Journal of Science, Technology, Innovation and Development*, 5(6), 499-509. <http://dx.doi.org/10.1080/20421338.2013.820456>
- Fontaine, C., Lovett, P. N., Sanou, H., Maley, J., & Bouvet, J. M. (2004). Genetic diversity of the Shea tree (*Vitellaria paradoxa* CF Gaertn), detected by RAPD and chloroplast microsatellite markers. *Heredity*, 93(6), 639-648. <https://doi.org/10.1038/sj.hdy.6800591>
- Friman, J. (2023). Challenging Shea as a woman's crop—masculinities and resource control in Burkina Faso. *Gender, Place & Culture*, 30(10), 1437-1456. <https://doi.org/10.1080/0966369X.2022.2078282>
- Garba, I. D., & Muhammad-Lawal, A. (2020). The Economic and Constraints to Shea Tree Conservation Among the Shea Value Chain Actors in the North-Central, Nigeria. *International Journal of Business Policy and Strategy Management*, 7(1), 1-16.

- Garba, I. D., Sanni, S. A., & Adebayo, C. O. (2015). Analyzing the structure and performance of Shea butter market in Bosso and Borgu local government areas of Niger state, Nigeria. *International Journal of u-and e-Service, Science and Technology*, 8(2), 321-336.
- Gashaw, B. A., Habteyesus, D. G., & Nedjo, Z. S. (2018). Determinants of coffee value addition by smallholder farmers in Jimma Zone, Ethiopia. *The International Journal of Business Management and Technology*, 2(4), 112-123.
- Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The governance of global value chains. *Review of international political economy*, 12(1), 78-104.
- Glew, D., & Lovett, P. N. (2014). Life cycle analysis of Shea butter use in cosmetics: from parklands to product, low carbon opportunities. *Journal of Cleaner Production*, 68, 73-80. <https://doi.org/10.1016/j.jclepro.2013.12.085>
- Gwali, S., Okullo, J. B., Eilu, G., Nakabonge, G., Nyeko, P., & Vuzi, P. (2012). Traditional management and conservation of Shea trees (*Vitellaria paradoxa* subspecies *nilotica*) in Uganda. *Environment, development and sustainability*, 14(14), 347-363. <https://link.springer.com/article/10.1007/s10668-011-9329-1>
- Gyau, A., Franzel, S., Chiatoh, M., Nimino, G., & Owusu, K. (2014). Collective action to improve market access for smallholder producers of agroforestry products: key lessons learned with insights from Cameroon's experience. *Current Opinion in Environmental Sustainability*, 6, 68-72. <https://doi.org/10.1016/j.cosust.2013.10.017>
- Hammond, J., Wijk, M. V., Pagella, T., Carpena, P., Skirrow, T., & Dauncey, V. (2019). Shea butter: a pro-poor, pro-female route to increased income. In T. Rosenstock, A. Nowak, & E. Girvetz, *The Climate-Smart Agriculture Papers* (pp. 215-226). Cham: Springer.
- Hans, T., Taruvinga, A., & Mushunje, A. (2018). Honey value addition initiatives selection choices among smallholder beekeepers: Case of the Eastern Cape province, South Africa. *Journal of Advanced Agricultural Technologies*, 5(3), 215-221.
- Hatskevich, A., Jenicek, V., & Darkwah, S. A. (2011). Shea industry—a means of poverty reduction in Northern Ghana. *Agricultura Tropica et Subtropica*, 44(4), 223-228.

- Heckathorn, D. D. (1997). Respondent-driven sampling: a new approach to the study of hidden populations. *Social problems*, 44(2), 174-199.
- Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292, 114523. <https://doi.org/10.1016/j.socscimed.2021.114523>
- Honfo, F. G., Akisoe, N., Linnemann, A. R., Soumanou, M., & van Boekel, M. A. (2014). Nutritional composition of Shea products and chemical properties of Shea butter: a review. *Critical reviews in food science and nutrition*, 54(5), 673-686. <https://doi.org/10.1080/10408398.2011.604142>
- Honfo, G. F., Linnemann, A. R., Guo, M., Akisoe, N., Soumanou, M. M., & van Boekel, M. A. (2017). Influence of roasting of Shea kernels on their fat content and some quality characteristics of Shea butter. *International Journal of Food Studies*, 6(1), 66-80. <https://doi.org/10.5296/jfs.v6i1.10881>
- Jibreel, M., Mumuni, E., Al-Hassan, S., & Baba, N. (2013). Shea butter and its processing impacts on the environment in the Tamale Metropolis of Ghana. *International Journal of Development and Sustainability*, 2(3), 2008-2019.
- Kabiru, S. M., & Ayanfunke, T. S. (2018). Utilisation of modern processing technologies among Shea butter processors in Niger State, Nigeria. *Journal of Agricultural Extension*, 22(2), 97-109. <https://dx.doi.org/10.4314/jae.v22i2.9>
- Kaimba, G. K., Muendo, K. M., & Mithofer, D. (2020). Marketing of baobab pulp in Kenya: Collectors' choice of rural versus urban markets. *African Journal of Agricultural and Resource Economics*, 15(3), 194-212.
- Kangile, R. J., Mgeni, C. P., Mpenda, Z. T., & Sieber, S. (2020). The determinants of farmers' choice of markets for staple food commodities in Dodoma and Morogoro, Tanzania. *Agriculture*, 10(5), 142. <https://doi.org/10.3390/agriculture10050142>
- Kaplinsky, R., & Morris, M. (2000). *A handbook for value chain research*. Vol. 113. Brighton: University of Sussex, Institute of Development Studies.

- Karambiri, M., Elias, M., Vinceti, B., & Grosse, A. (2017). Exploring local knowledge and preferences for Shea (*Vitellaria paradoxa*) ethnovarieties in Southwest Burkina Faso through a gender and ethnic lens. *Forests, Trees and Livelihoods*, 26(1), 13-28. <https://doi.org/10.1080/14728028.2016.1236708>
- Katsektor, J. T., Adom-Asamoah, G., & Morgan, A. K. (2024). Economic empowerment among female Shea actors: the case of Savelugu District, Ghana. *Cogent Social Sciences*, 10, 2299105. <https://www.tandfonline.com/doi/pdf/10.1080/23311886.2023.2299105>
- Kent, R. (2018). —Helping or —appropriating? Gender relations in Shea nut production in northern Ghana. *Society & Natural Resources*, 31(3), 367-381. <https://doi.org/10.1080/08941920.2017.1382626>
- Kent, R., Bakaweri, C., & Poole, N. (2014). Facilitating entry into Shea processing: a study of two interventions in northern Ghana. *Food Chain*, 4(3), 201-224. <https://doi.org/10.3362/2046-1887.2014.022>
- Khoza, T. M., Senyolo, G. M., Mmbengwa, V. M., & Soundy, P. (2019). Socio-economic factors influencing smallholder farmers' decision to participate in agro-processing industry in Gauteng province, South Africa. *Cogent Social Sciences*, 5(1), 1664193. <https://doi.org/10.1080/23311886.2019.1664193>
- Kiwanuka-Lubinda, R. N., Ng'ombe, J. N., & Machethe, C. (2021). Impacts of interlocked contractual arrangements on dairy farmers' welfare in Zambia: a robust Bayesian instrumental variable analysis. *Agrekon*, 60(1), 10-30. <https://doi.org/10.1080/03031853.2021.1875854>
- Kodua, T. T., Ankamah, J., & Addae, M. (2018). Assessing the profitability of small-scale local Shea butter processing: Empirical evidence from Kaleo in the Upper West region of Ghana. *Cogent Food & Agriculture*, 4(1), 1453318. <https://doi.org/10.1080/23311932.2018.1453318>
- Kombiok, E., & Agbenyega, O. (2017). The characteristics of financing arrangements for the production and marketing of Shea (*Vitellaria paradoxa*) butter in Tamale in the Northern

- Region of Ghana. *Southern Forests: a Journal of Forest Science*, 79(2), 153-160.
<https://doi.org/10.2989/20702620.2016.1255403>
- Krause, J., Croft, D. P., & James, R. (2007). Social network theory in the behavioural sciences: potential applications. *Behavioral Ecology and Sociobiology*, 62, 15-27.
- Kropko, J. (2007). *Choosing between multinomial logit and multinomial probit models for analysis of unordered choice data*. Chapel Hill: The University of North Carolina at Chapel Hill.
- Lee, J., Gereffi, G., & Beauvais, J. (2012). Global value chains and agrifood standards: Challenges and possibilities for smallholders in developing countries. *Proceedings of the National Academy of Sciences*, 109(31), 12326-12331.
<https://doi.org/10.1073/pnas.0913714108>
- Liu, W., Sidhu, A., Beacom, A. M., & Valente, T. W. (2017). Social network theory. *The international encyclopedia of media effects*, 1, 1-12.
- Long, J. S., & Freese, J. (2006). *Regression models for categorical dependent variables using Stata* (2nd ed., Vol. 7). Texas: Stata Press.
- Lovett, P. N. (2015). Shea butter: Properties and processing for use in food. In G. Talbot, *Specialty oils and fats in food and nutrition: properties, processing and applications* (pp. 125-158). London: Woodhead Publishing.
- Ma, W., Sonobe, T., & Gong, B. (2024). Linking farmers to markets: Barriers, solutions, and policy options. *Economic Analysis and Policy*, 82, 1102-1112.
<https://doi.org/10.1016/j.eap.2024.05.005>
- Maku, M., Kitambo, E., & Mugonola, B. (2023). Drivers of youth participation in maize value addition in Gulu district, Uganda. *African Journal of Science, Technology, Innovation and Development*, 15(1), 45-58. <https://doi.org/10.1080/20421338.2021.2015171>
- Meraner, M., & Finger, R. (2019). Risk perceptions, preferences and management strategies: evidence from a case study using German livestock farmers. *Journal of Risk Research*, 22(1), 110-135. <https://doi.org/10.1080/13669877.2017.1351476>

- Mgale, Y. J., & Yunxian, Y. (2020). Marketing efficiency and determinants of marketing channel choice by rice farmers in rural Tanzania: Evidence from Mbeya region, Tanzania. *Australian Journal of Agricultural and Resource Economics*, 64(4), 1239-1259. <https://doi.org/10.1111/1467-8489.12380>
- Ministry of Agriculture, Animal Industry and Fisheries. (2015). *Agriculture for Food and Income Security. Agriculture Sector Development Strategy and Investment Plan: 2015/16– 2020/21*. Kampala, Uganda: Ministry of Agriculture, Animal Industry and Fisheries (MAAIF).
- Mishra, A. K., Kumar, A., Joshi, P. K., & D'souza, A. (2018). Production risks, risk preference and contract farming: Impact on food security in India. *Applied Economic Perspectives and Policy*, 40(3), 353-378. <https://doi.org/10.1093/aepp/ppy017>
- Muggaga, C., Ongeng, D., Mugonola, B., Okello-Uma, I., Kaaya, N. A., & Taylor, D. (2017). Influence of sociocultural practices on food and nutrition security in Karamoja subregion of Uganda. *Ecology of food and nutrition*, 56(5), 424-447. <https://doi.org/10.1080/03670244.2017.1366318>
- Mugonola, B., Deckers, J., Poesen, J., Isabirye, M., & Mathijs, E. (2013). Adoption of soil and water conservation technologies in the Rwizi catchment of south western Uganda. *International journal of agricultural sustainability*, 11(3), 264-281. <https://doi.org/10.1080/14735903.2012.744906>
- Mwambi, M. M., Oduol, J., Mshenga, P., & Saidi, M. (2016). Does contract farming improve smallholder income? The case of avocado farmers in Kenya. *Journal of Agribusiness in Developing and Emerging Economies*, 6(1), 2-20. <https://doi.org/10.1108/JADEE-05-2013-0019>
- Naughton, C. C., Lovett, P. N., & Mihelcic, J. R. (2015). Land suitability modeling of Shea (*Vitellaria paradoxa*) distribution across sub-Saharan Africa. *Applied Geography*, 58, 217-227. <https://doi.org/10.1016/j.apgeog.2015.02.007>

- Ndiritu, S. W. (2024). Smallholder farmers' dissatisfaction with contract farming: a gendered perspective. *Development in Practice*, 1-12. <https://doi.org/10.1080/09614524.2024.2344526>
- Negi, D. S., BIRTHAL, P. S., Roy, D., & Khan, M. T. (2018). Farmers' choice of market channels and producer prices in India: Role of transportation and communication networks. *Food Policy*, 81, 106-121. <https://doi.org/10.1016/j.foodpol.2018.10.008>
- Ngenoh, E., Kurgat, B. K., Bett, H. K., Kebede, S. W., & Bokelmann, W. (2019). Determinants of the competitiveness of smallholder African indigenous vegetable farmers in high-value agro-food chains in Kenya: A multivariate probit regression analysis. *Agricultural and Food Economics*, 7, 2. <https://doi.org/10.1186/s40100-019-0122-z>
- Nwafor, C. U. (2021). Marketing channel preference among smallholder cocoyam farmers in South Africa. *Journal of Agribusiness and Rural Development*, 62(4), 407-414.
- Nyamamba, J. S., Ayuya, O. I., & Sibiko, K. W. (2022). Determinants of side selling behaviour in emerging sorghum supply chains in Kisumu County, Kenya. *Cogent Economics & Finance*, 10(1), 1986932. <https://doi.org/10.1080/23322039.2021.1986932>
- Ochieng, J., Knerr, B., Owuor, G., & Ouma, E. (2018). Strengthening collective action to improve marketing performance: evidence from farmer groups in Central Africa. *The journal of agricultural education and extension*, 24(2), 169-189. <https://doi.org/10.1080/1389224X.2018.1432493>
- Ogwok, G., Alele, P. O., & Kizza, S. (2019). Influence of Shea tree (*Vitellaria paradoxa*) on maize and soybean production. *Plos one*, 14(4), e0201329. <https://doi.org/10.1371/journal.pone.0201329>
- Okullo, J. B., Omujal, F., Agea, J. G., Mulugo, L. W., Namutebi, A., Okello, J. B., & Nyanzi, S. A. (2012). Ethno-nomenclature of the Shea tree (*Vitellaria paradoxa* CF Gaertn.) and its products in the Shea zones of Uganda. *Global J Res. Med. Plants & Indigen. Med.*, 1(10), 477-484.

- Ola, O., & Menapace, L. (2020). Smallholders' perceptions and preferences for market attributes promoting sustained participation in modern agricultural value chains. *Food Policy*, 97, 101962. <https://doi.org/10.1016/j.foodpol.2020.101962>
- Olife, I. C., Onwualu, A. P., & Jolaoso, M. A. (2013). Developing the Shea value chain for wealth creation in Nigeria. *Journal of Biology, Agriculture and Healthcare*, 3(5), 45-53.
- Olorunfemi, O. D., Adesiji, G. B., Oladipo, F. O., Adisa, R. S., Daudu, A. K., & Suweba, G. (2015). Determinants of value addition initiatives use by fish farmers in Kwara and Kogi States, north central Nigeria. *Science, Technology and Arts Research Journal*, 4(2), 316-323. <http://dx.doi.org/10.4314/star.v4i2.44>
- Olugbire, O. O., Fakunle, A. J., Oguntoye, T. O., & Obafunsho, O. E. (2021). Structure, Conduct and Performance Analysis of Sheabutter Marketing in Oyo State, Nigeria. *Journal of Applied Sciences and Environmental Management*, 25(4), 655-661.
- Opoku–Mensah, S. (2023). An assessment of the structure of Shea global value chain in Ghana and implication for policy development. *Heliyon*, 9(10), e20219. <https://doi.org/10.1016/j.heliyon.2023.e20219>
- Opoku-Mensah, S., Mahama Al-Hassan, R., & Awo, M. (2024). Relationship, governance, and upgrading opportunities in the Shea value Chain: a descriptive analysis from Northern Ghana. *Forests, Trees and Livelihoods*, 33(2), 158-178. <https://doi.org/10.1080/14728028.2024.2314126>
- Orwa, C. A., Mutua, R., Kindt, J. R., & Simons, A. (2009). *Agroforestry Database: a tree reference and selection guide. Version 4*. Nairobi: World Agroforestry Centre.
- Owot, G., Olido, K., Okello, D., & Odongo, W. (2023). Farmer–trader relationships in the context of developing countries: a dyadic analysis to understand variations in trust perceptions. *Journal of Agribusiness in Developing and Emerging Economies*, 13(4), 613- 630. <https://doi.org/10.1108/JADEE-11-2021-0303>
- Panda, R. K., & Sreekumar. (2012). Marketing channel choice and marketing efficiency assessment in agribusiness. *Journal of international food & agribusiness marketing*, 24(3), 213-230. <https://doi.org/10.1080/08974438.2012.691812>

- Parsons, R. A. (2015). The impact of age on innovation. *Management Research Review*, 38(4), 404-420. <https://doi.org/10.1108/MRR-10-2013-0241>
- Pienaaah, C. K., Baruah, B., & Luginaah, I. (2024). Women's perspectives on addressing the decline of Shea trees in Northern Ghana. *GeoJournal*, 89(1), 9. <https://doi.org/10.1007/s10708-024-11023-8>
- Pouliot, M., & Elias, M. (2013). To process or not to process? Factors enabling and constraining Shea butter production and income in Burkina Faso. *Geoforum*, 50, 211-220. doi:<https://doi.org/10.1016/j.geoforum.2013.09.014>
- Rahm, M. R., & Huffman, W. E. (1984). The adoption of reduced tillage: the role of human capital and other variables. *American journal of agricultural economics*, 66(4), 405-413.
- Rousseau, K., Gautier, D., & Wardell, D. A. (2015). Coping with the upheavals of globalization in the Shea value chain: The maintenance and relevance of upstream Shea nut supply chain organization in western Burkina Faso. *World Development*, 66, 413-427. <https://doi.org/10.1016/j.worlddev.2014.09.004>
- Rousseau, K., Gautier, D., & Wardell, D. A. (2017). Renegotiating access to Shea trees in Burkina Faso: Challenging power relationships associated with demographic shifts and globalized trade. *Journal of Agrarian Change*, 17(3), 497-517. <https://doi.org/10.1111/joac.12198>
- Rousseau, K., Gautier, D., & Wardell, D. A. (2019). Socio-economic differentiation and Shea globalization in western Burkina Faso: integrating gender politics and agrarian change. *The Journal of Peasant Studies*, 46(4), 747-766. <https://doi.org/10.1080/03066150.2017.1401612>
- Royer, A., Bijman, J., & Bitzer, V. (2016). Linking smallholder farmers to high quality food chains: Appraising institutional arrangements. In J. Bijman, & V. Bitzer, *Quality and innovation in food chains: Lessons and insights from Africa* (pp. 359-381). Wageningen: Wageningen Academic Publishers.

- Ruml, A., & Qaim, M. (2020). Effects of marketing contracts and resource-providing contracts in the African small farm sector: Insights from oil palm production in Ghana. *World Development*, 136, 105110. <https://doi.org/10.1016/j.worlddev.2020.105110>
- Sanou, J., Bazié, H. R., & Bayala, J. (2019). Treating Shea trees as crops improves women's livelihoods in Burkina Faso. In E. Simelton, & M. Ostwald, *Multifunctional Land Uses in Africa* (pp. 47-60). (pp. 47-60). London: Routledge.
- Seghieri, J. (2019). Shea tree (*Vitellaria paradoxa* Gaertn. f.): From local constraints to multi-scale improvement of economic, agronomic and environmental performance in an endemic Sudanian multipurpose agroforestry species. *Agroforestry Systems*, 93(6), 2313-2330. <https://doi.org/10.1007/s10457-019-00351-1>
- Sori, O., & Adugna, M. (2022). Determinants of groundnut producers' market channel choice in Western Oromia region, Ethiopia. *Journal of Agriculture and Food Research*, 7, 100277. <https://doi.org/10.1016/j.jafr.2022.100277>
- Tanko, M. (2017). Profit efficiency and constraints analysis of Shea butter industry: northern region of Ghana. *Korean Journal of Agricultural Science*, 44(3), 424-439. <https://doi.org/10.7744/kjoas.20170031>
- Tanzile, R., Domapielle, M. K., & Fielmua, N. (2023). Empowering women for sustainable development through semi-mechanized Sheabutter processing in rural North-Western Ghana. *Scientific African*, 21, e01790. <https://doi.org/10.1016/j.sciaf.2023.e01790>
- Tapsoba, A., Wardell, D., Zida, M., & Elias, M. (2022). *Insecurity and COVID-19 in Burkina Faso: Opportunities and Risks for Women in the Shea Value Chain*. Bogor, Indonesia: CIFOR.
- Teklehaimanot, Z. (2004). Exploiting the potential of indigenous agroforestry trees: *Parkia biglobosa* and *Vitellaria paradoxa* in sub-Saharan Africa. In P. Nair, M. Rao, & L. Buck, *New Vistas in Agroforestry* (pp. 207-220). Dordrecht: Springer.
- Tiamiyu, S. A., Adagba, M. A., & Shaahu, A. (2014). Profitability analysis of Shea nuts supply chain in selected states in Nigeria. *Journal of Agricultural and Crop Research*, 2(12), 222-227.

- Tijani, S. A. (2018). Determinants of market participation among small scale Shea butter processors in Kwara State, Nigeria. *Tanzania Journal of Agricultural Sciences*, 17, 1-10.
- Tijani, S. A., & Sanusi, M. K. (2020). Determinants of Shea Butter Production among Processors in Niger State, Nigeria. *Journal of Agricultural Extension*, 24(4), 53-61.
- Tita, D. F., D'Haese, M., Degrande, A., Tchoundjeu, Z., & van Damme, P. (2011). Farmers' satisfaction with group market arrangements as a measure of group market performance: A transaction cost analysis of Non-Timber Forest Products' producer groups in Cameroon. *Forest Policy and Economics*, 13(7), 545-553. <https://doi.org/10.1016/j.forpol.2011.07.005>
- Tom-Dery, D., Eller, F., Reisdorff, C., & Jensen, K. (2018). Shea (*Vitellaria paradoxa* CF Gaertn.) at the crossroads: current knowledge and research gaps. *Agroforestry Systems*, 92(5), 1353-1371. <https://doi.org/10.1007/s10457-017-0080-y>
- Trejo-Pech, C. O., Servín-Juárez, R., & Reyes-Duarte, Á. (2023). What sets cooperative farmers apart from non-cooperative farmers? A transaction cost economics analysis of coffee farmers in Mexico. *Agricultural and Food Economics*, 11, 14. <https://doi.org/10.1186/s40100-023-00256-9>
- Trienekens, J. H. (2011). Agricultural value chains in developing countries a framework for analysis. *International food and agribusiness management review*, 14(2), 51-82.
- Uganda Bureau of Statistics. (2016). *The National Population and Housing Census 2014 – Main Report*. Uganda Bureau of Statistics: Kampala, Uganda.
- Veldwisch, G. J., & Woodhouse, P. (2022). Formal and informal contract farming in Mozambique: Socially embedded relations of agricultural intensification. *Journal of Agrarian Change*, 22(1), 162-178. <https://doi.org/10.1111/joac.12461>
- Wangu, J., Mangnus, E., & van Westen, A. C. (2021). Recognizing determinants to smallholders' market orientation and marketing arrangements: Building on a case of dairy farming in rural Kenya. *Land*, 10(6), 572. <https://doi.org/10.3390/land10060572>
- Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. London: The MIT Press.

- Wooldridge, J. M. (2016). *Introductory Econometrics: A modern Approach* (6th ed.). Boston: Cengage Learning.
- Yongabo, P. (2022). Technology and innovation trajectories in the Rwandan Agriculture sector: Are value chains an option? *African Journal of Science, Technology, Innovation and Development*, 14(3), 697-707. <https://doi.org/10.1080/20421338.2021.1889769>
- Zhang, W., Gao, L., Zolghadr, M., Jian, D., & ElHafsi, M. (2023). Dynamic incentives for sustainable contract farming. *Production and Operations Management*, 32(7), 2049-2067. <https://doi.org/10.1111/poms.13956>

APPENDICES

Appendix 1: Chapter 1-7 Appendices

Appendix 1.1: Research Tools

Appendix 1.1.1: Questionnaire for Shea nut collectors

This questionnaire is designed for a research on Governance and up grading of Shea nut value chain in Northern Uganda by Deborah Akatwetaba, geared towards attaining a PhD at Gulu University. The answers you provide shall therefore be used for academic purposes and will be treated confidentially.

Section A: GENERAL INFORMATION

1	Name of the respondent			
2	Name of the processing company			
3	Contact number			
4	Gender: (1=male, 0=female)	male		
		female		
5	Marital status: (1=single, 2=married, 3=other)	single		
		married		
		Other		
6	Age of the respondent	Years		
7	Household size	Number		
8	Number of years	Number		
	Distance to the nearest collection point and market (km)	Collection point		
		Market		
1	Means of transport used to transport Shea nut	1	Head portage	
		0	Motorized/bicycle	
1	District of residence			
1	Occupation of the respondent			

1	Processing income (Ushs)/per year	
1	Non-processing income (Ushs) per year	
1	Years in Shea nut collection business	

16. Please tell me something about the ownership of the area of harvest?

Total land owned in acres	Total land under Shea nut in acres	Who owns the lands on which the tree grows? Code1	Who owns the trees themselves? Code1	Who has the right to their harvest? Code1
---------------------------	------------------------------------	--	---	--

Code1 [1] My husband [2] My wife [3] My daughter [4] My sons [5] community [6] others

17. Do you remember any problems or conflicts regarding equity and ownership?

	Indicate [1] Yes [0] No
Is it easy to access the area of collection?	
Do you have to pay for collectors rights?	

SECTION B: MARKETING OF SHEA NUT

18. Do you sell your Shea nut?

Code		Tick appropriately
1	Yes	
0	No	

19. Do you have any contract market for the Shea kernels you produce?

Code		Tick appropriately
1	Yes	
0	No	

20. If yes, where do you sell your Shea nut?

Code	Sell where	Tick appropriately
1	Farm gate	
2	Village market	
3	Farmer group	
4	Processor	
5	Exporter	
6	Consumer	
7	Other specify	

21. Which actor do you sell Shea nut to?

Code	Sell Shea nut to	Tick appropriately	What quantity did they buy last season	What was the price per Kg	Mode of delivery	Modalities of payment
1	Other collectors					
2	Farmer group/cooperative					
3	Company agents					
4	Kernels traders/bulkers in the community					
5	Local kernels processing companies					
6	Individual kernels exporters/ traders					
7	Individual consumers					
8	Other specify.....					

Code = 1 procure from farm gate, 2=supplier delivers to trader 3=Middlemen delivers 4=Other (to specify)

Code = [1] Cash on delivery [2] less than 2 weeks after delivery [3] After a month of delivery [4] Beyond a month after delivery

22. What portion of your total output does the main buyer buy from you?

Code	Proportion	Tick appropriately
1	0- 25%	
2	26-50%	
3	51- 75%	
4	76-100%	

23. Is the major Shea nut market available? 1) Locally 0) Internationally

24. Did you know the market prices before you sold the Shea nut? 1) Yes 0) No

25. Do you discuss pricing other collectors? 1) Yes 0) No?

26. How are Sheanut prices set? 1) Based on other players 2) Negotiations 3) Forces of demand and supply 4) Cost of production 5)

Other(specify).....

27. Do you get pre-financed by your buyers?

Code		Tick appropriately
1	Yes	
0	No	

28. Which of the following kernels are you able to supply?

Code		Tick appropriately
1	Conventional kernels only	
2	Organic kernels only	
3	Both organic and conventional kernels	

29. Do you do collective marketing of your kernels?

Code		Tick appropriately
1	Yes	
0	No	

30. Do you have a store for your Shea nut? 1) Yes 0) No

31. If yes what is its capacity and utilized capacity
.....

32. What were the lowest and highest prices you sold Shea kernels and how many bags did you sell in each period?

Year	Lowest price sold/bag (Ugx)	No. of bags	Highest price sold/bag (Ugx)	No. of bags	Total no. of bags sold in the year
2015					
2016					
2017					
2018					

35. Do you require a production license to engage in Shea nut collection? 1) Yes 0) No

36. If yes, how much do you pay to acquire a collection license?
.....
.....

37. Are there restrictions imposed on unlicensed Shea nut collectors? 1) Yes 0) No

38. Are there any restrictions for entry and exit of the Shea nut? 1) Yes 0) No

39. How many Shea nut collectors do you think are in this area?.....

40. Are you a member of Shea nut collectors association?

Code		Tick appropriately
1	Yes	
0	No	

41. If you are a member, what is the name of your association?.....
42. Who facilitated the formation of this association?

Code		Tick appropriately
1	Self- help group (self initiative)	
2	NGO/ company; (provide name)	

46. Do you undertake the following activities collectively?

Code		Indicate
1	Purchase of inputs/ Shea kernel	
2	Processing	
3	Marketing of Shea butter	
4	Sourcing credit	
5	Saving part of profit	

SECTION C: SHEA NUT PROCESSING

52. Are you aware of some innovations in the Shea nut value chain?

Code	Response	
1	Yes	
0	No	

53. If YES, what innovation activities have you been involved in?

Code	Innovation activity	
1	Packing in sacks	
2	Crude butter	
3	Refined butter	
4	Chocolate	
5	Marketing/Organizational	
6	Advanced processing	
7	Other specify.....	
8	Other specify.....	
9	Other specify.....	
10	Other specify.....	
11	Other specify.....	

54. Do you know about Shea nut value addition?

Code	Response	
1	Yes	
0	No	

55. Do you do Shea nut value addition?

Code	Response	
1	Yes	
0	No	

56. If Q55 is yes, what value addition do you do?

Code	Type		Code	Type	
1	Kernel roasting		7		
2	Crude butter		8		
3	Fined butter		9		
4	Make products cosmetics		10		
5			11		
6			12		

57. If you do value addition, why do you do it?

Code	Response	
1	Extends shelf life	
2	Improves market access	
3	I get more returns	
4	It's the norm	

58. What percent of the Shea nut produced do you value add?

NO	Product category	Percent
A.	Not-value added	
B.	Value added	

30. If you do not do Shea nut value addition, why?

Code	Response	
1	No knowledge	
2	Is costly	
3	Low/No demand	
4	I do not know	

60. Have you been involved in value addition of other products (other than Shea nut)?

Code	Response	
1	Yes	
0	No	

62. What are major marketing arrangement do you have with the buyers of Shea nut? Tick the appropriate?

Code	Marketing arrangement	Tick the appropriate
1	Spot marketing	
2	Informal relationship with buyers	
3	Formal relationship with buyers	
4	Others	

63. Are there system of coordination is in place to meet commercial objectives related to quality, quantity and consistency and /or to ensure compliance with standards? 1) Yes 2) No

64. If yes, which are the lead or coordinating firms in ensuring the quality, quantity and consistency of Shea nut is compiled to?

Attributes	Coordinating firm	What the coordinating firm does for compliance
Quality		
Quantity		
Consistency of supply		

65. Is coordination mostly based on formalized arrangement (contracts) or coordination is informal? Tick the appropriate?

Formalized coordination	
Informal coordination	

67. Are there any institutions/organizations/platforms offering you support in the delivery of your products/services?

Code	Response	Tick appropriate
1	Yes	
0	No	

69. Does the inability to comply with these rules either due to lack of information or capacity, limit participation in higher value chain activities or prevent up grading of the value chain as a whole? 1) Yes 0) No

70. If Yes, how?.....

71. Are there any cultural beliefs or traditions in this areas that:

	Indicate Yes/No
Promote Shea nut	
Limit Shea nut	

73. Do you have any working relationship or linkages with other value chain actors? 1) Yes
2) No

74. If yes, please list them.

Value chain actors	Form of linkage/ relationship (1=Contract/Formal, 2=Verbal/Informal, producer organization)	Terms of the relationship (e.g. Quantity to be supplied)
Input dealers		
Fellow farmers		
Processors		
Village collectors/Brokers		
Transporters		
Wholesalers		
Retailers eg super markets		
Others		

75. Do you receive any information from other VC actors? 1=Yes....2=No

76. If yes, from whom and what kind of information (e.g. Markets, buyers, prices, pests and diseases, inputs, trainings, etc)

Category of actors	Indicate access to information as 1=Yes or 0=No from the different actors	Type of information received (1=Markets, 2=Prices, 3=Desired quality, 4=trainings, 5=Pests and diseases, 6=Other specify)	If information is provided at a cost, what amount is paid per visit of accessing information?	Level of satisfaction (1 to 5 Where 1 and 5 are lowest and highest satisfaction Respectively
Farmers				
Input supplier				
Collectors				
Middlemen				
Transporters				
Processors				

Individual consumers				
Others				

77. Have ever received training on Shea nut value addition? 1) Yes 0) No

78. If Yes, tick (√) which of the following aspects were you trained on and who provided the training?

79. How did you access the information 1) friends2) other actors3) radio4)others specify

Value addition training provided	Tick	Who provided the training
Conservation of Shea nut trees		
Harvesting or picking Shea nuts from the field		
Processing nuts into kernels		
Handling the nuts before processing		
Storage of kernels		
Grading or sorting kernels		
Others		

80. Do you have access to extension services regarding Shea nut/ value addition? 1) Yes 0) No

81. If yes, how many times in a year do they visit you?.....

82. Have you ever received any credit/loan for use in Shea nut collection in the last 2 years?
1) Yes 0) No

84. If No to 25, why ? (Tick where appropriate)

[1] Business is unregistered

[2] Don't have collateral

[3] I am not interested

[4] High interest rate

[5] Others (Specify) _____

85. Would you be willing to get into contracts/formal arrangements with other Value chain actors?

[1]Yes, [2] No

86. If Yes to Question 18, what are the conditions for contracting?

Value Actor	Conditions for contracting (Code 1)
Input suppliers	
Processors	
Village collectors/Brokers	

Transporters	
Wholesalers	
Retailers eg supermarkets	
Others	

Code 1: [1] Higher than market price [2] Willingness of the buyer to collect from your farm [3] Pays promptly on delivery [4] Others, Specify

END

Appendix 1.1.2: Questionnaire for Shea nut Traders

This questionnaire is designed for a research on Governance and up grading of Shea nut value chain in Northern Uganda by Deborah Akatwetaba, geared towards attaining a PhD at Gulu University. The answers you provide shall therefore be used for academic purposes and will be treated confidentially.

Section A: GENERAL INFORMATION

This questionnaire is designed for a research on Governance and up grading of Shea nut value chain in Northern Uganda by Deborah Akatwetaba, geared towards attaining a PhD at Gulu University. The answers you provide shall therefore be used for academic purposes and will be treated confidentially.

Section A: GENERAL INFORMATION

	Name of the respondent		
2	Name of the processing plant		
3	Contact number		
4	Gender: (1=male, 0=female)	male	
		female	
5	Marital status: (1=single, 2=married, 3=other)	single	
		married	
		Other	
6	Age	Years	
7	Household size	Number	
8	Highest level of education attained: (1=no formal education, 2=primary 3=secondary, 4=tertiary, 5=others specify.....)	No formal education	
		Primary	
		Secondary	
		Tertiary	
		Others specify.....	
9	Distance to the nearest producer and market (km)	Producer	
		Market	
1	Means of transport used to transport Shea nut	1	Head portage

		0	Motorized/bicycle		
1	District of residence				
1	Occupation				
1	Processing income (Ushs)/per year				
1	Non-processing income (Ushs) per year				
1	Years in Shea nut business				

SECTION B: MARKETING OF SHEA NUT

16. Where do you source your Shea nut products and in what quantities, what quantity do you buy and at what price?

Name the source	Shea nut product	Whom buy from	Mode of payment	Quantity sold in bags	Unit price charged	Total amount
-----------------	------------------	---------------	-----------------	-----------------------	--------------------	--------------

Shea nut product: 1= Shea nut 2=Shea oil 3=Wood 4=Barks 5=Fruit 6=Seed cake 7=Wax
8=Others specify.....

Whom buy from : 1=Company agent 2= Local trader 3=Exporter 4= Individual consumer 5=An organization 6=Fellow processors

Mode of payment = [1] Cash on delivery [2] less than 2 weeks after delivery [3] After a month of delivery [4] Beyond a month after delivery

17. Do you do collective purchasing of any your Shea nuts products?

Code		Tick appropriately
1	Yes	
0	No	

18. What portion of your total products does the main buyer buy from you?

Code	Shea nut product	Customer	Proportion
1			
2			
3			
4			
5			

Shea nut product: 1= Shea nut 2=Shea oil 3=Wood 4=Barks 5=Fruit 6=Seed cake 7=Wax
8=Others specify.....

Customer: 1=Company agent 2= Local trader 3=Exporter 4= Individual consumer 5=An organization 6=Fellow processors

Proportion: 1=0- 25% 2=26-50% 3=51- 75% 4=76-100%

19. Do you get pre-financed by your buyers?

Code		Tick appropriately
1	Yes	
0	No	

20. Which actor do you sell your Shea nut products to?

Code	Shea nut product	Sell Shea nut to	Tick appropriately	What quantity did they buy last season	What was the price per Kg	Mode of delivery	Modalities of payment
1							
2							
3							
4							
5							
6							
7							
8							

Shea nut product: 1= Shea nut 2=Shea oil 3=Wood 4=Barks 5=Fruit 6=Seed cake 7=Wax
8=Others specify.....

Sell Shea nut to: 1= Company agents 2= Other collectors 3= Farmer 4= group/cooperative 5= Local kernels processing 6= Individual consumers 7=Others specify.....

Mode of delivery: 1= I procure from farm gate, 2=supplier delivers to trader 3=Middlemen delivers 4=Other (to specify)

Modalities of payment = [1] Cash on delivery [2] less than 2 weeks after delivery [3] After a month of delivery [4] Beyond a month after delivery

21. Is the major Shea nut market available? 1) Locally 0) Internationally

22. Did you know the market prices before you sold the Shea nut ? 1) Yes 0) No

23. Do you discuss pricing other traders? 1) Yes 0) No?

24. How are Sheanut prices set? 1) Based on other players 2) Negotiations 3) Forces of demand and supply 4) Cost of production 5)

Other(specify).....

SECTION D: VALUE ADDITION IN SHEA NUT

25. Do you know about Shea nut value addition?

Code	Response	
1	Yes	
0	No	

26. Do you do Shea nut value addition?

Code	Response	
1	Yes	
0	No	

27. If Q22 is yes, what value addition do you do?

Code	Type		Code	Type	
1	Kernel roasting		7		
2	Crude butter		8		
3	Fined butter		9		
4			10		
5			11		
6			12		

28. If you do value addition, why do you do it?

Code	Response	
1	Extends shelf life	
2	Improves market access	
3	I get more returns	
4	It's the norm	

29. What percent of the Shea nut produced do you value add?

NO	Product category	Percent
A.	Not-value added	
B.	Value added	

30. If you do not do Shea nut value addition, why?

Code	Response	
1	No knowledge	
2	Is costly	
3	Low/No demand	
4	I do not know	

31. What is your perception of Shea nut value addition?

Code	Response	
1	Not important	
2	Important	
3	Very important	

32. Have you been involved in value addition of other products (other than Shea nut)?

Code	Response	
1	Yes	
0	No	

33. Do you have a store for your Shea nut? 1) Yes 0) No

34. If yes what is its capacity and utilized capacity

35. What were the lowest and highest prices of your Shea nut you sold and how many bags did you sell in each period?

Year	Lowest price sold/bag (Ugx)	No. of bags	Highest price sold/bag (Ugx)	No. of bags	Total no. of bags sold in the year
2015					
2016					
2017					
2018					

Do you require a production license to engage in Shea nut trading? 1) Yes 0) No

38. If yes, how much do you pay to acquire a trading license?

40. Are there restrictions imposed on unlicensed Shea nut trading? 1) Yes 0) No

41. Are there any restrictions for entry and exit of the Shea nut? 1) Yes 0) No

42. How many Shea nut traders do you think are in this area?.....

43. Are you a member of Shea nut trading or collector association?

Code		Tick appropriately
1	Yes	
0	No	

44. If you are a member, what is the name of your association?.....

45. Who facilitated the formation of this association?

Code		Tick appropriately
1	Self- help group (self-initiative)	
2	NGO/ company; (provide name)	

46. How long (years) have you been a member of this association?.....

48. Please rank in order of importance the areas you have benefitted by joining the group
(1= Most beneficial, 5= least beneficial)

Benefits enjoy as a group member	Rank				
	1	2	3	4	5
I sell at a better or higher price					
I get access to credit					
I save money through the group					
I get guaranteed market for the kernels					
I enjoy unity with fellow women/man in the community					
I receive training on Shea					
I get equipment support/ tools					
I get market information					

49. Do you undertake the following activities collectively?

Code		Indicate
1	Purchase of inputs/ Shea kernel	
2	Processing	
3	Marketing of Shea butter	
4	Sourcing credit	
5	Saving part of profit	

50. Why didn't you belong to a group?

Code		Tick appropriately
1	I was not there when the group was being formed	
2	Leaders of the group frustrates my effort to join	
3	My schedules will not allow me	
4	I am not aware of any group	
5	I do not see the need to join any group	
6	Other specify	

53. Are there development opportunities in Shea value chain?

Code	Response	
1	Yes	
0	No	

55. Are you aware of some innovations in the Shea nut value chain?

Code	Response	
1	Yes	
0	No	

56. If YES, what innovation activities have you been involved in?

Code	Innovation activity	
1	Packing in sacks	
2	Crude butter	
3	Refined butter	
4	Chocolate	
5	Marketing/Organizational	
6	Advanced processing	
7	Other specify.....	
8	Other specify.....	

57. What value addition do you do on Shea nut?

Code	Type		Type	
1	Kernel roasting		Others specify.....	
2	Crude butter			
3	Fined butter			
4	Soap			
5	perfume			
6	Cooking oil			

58. Why do you do value addition?

Code	Response	
1	Extends shelf life	
2	Improves market access	
3	I get more returns	
4	It's the norm	

59. What percent of the Shea nut you purchased did you add value?

NO	Product category	Percent
A.	Not-value added	
B.	Value added	

60. For the proportion you did not added value to, why didn't you do?

Code	Response	
1	Consumption	
2	No knowledge	
3	Is costly	
4	Low/No demand	
5	Others and specify.....	

61. What is your perception of Shea nut value addition?

Code	Response	
1	Not important	
2	Important	
3	Very important	

62. Have you been involved in value addition of other products (other than Shea nut)?

Code	Response	
1	Yes	
0	No	

64. What major marketing arrangement do you have with the buyers of Shea nut? Tick the appropriate?

Code	Marketing arrangement	Tick the appropriate
1	Spot marketing	
2	Informal relationship with buyers	
3	Formal relationship with buyers	
4	Others	

65. Are there system of coordination is in place to meet commercial objectives related to quality, quantity and consistency and /or to ensure compliance with standards? 1) Yes 2) No

69. Are there any institutions/organizations/platforms offering you support in the delivery of your products/services?

Code	Response	Tick appropriate
1	Yes	
0	No	

71. Does the inability to comply with these rules either due to lack of information or capacity, limit participation in higher value chain activities or prevent up grading of the value chain as a whole? 1) Yes 0) No

72. If Yes, how?.....

76. Do you have any working relationship or linkages with other value chain actors? 1) Yes
2) No

77. If yes, please list them.

Value chain actors	Form of linkage/ relationship (1= Contract/Formal, 2=Verbal/Informal, producer organization)	Terms of the relationship (e.g. Quantity to be supplied)
Input dealers		
Fellow farmers		
Processors		
Village collectors/Brokers		
Transporters		
Wholesalers		
Retailers eg super markets		
Others		

78. Do you receive any information from other VC actors? 1=Yes....2=No

79. If yes, from whom and what kind of information (e.g. Markets, buyers, prices, pests and diseases, inputs, trainings, etc)

Category of actors	Indicate access to information as 1=Yes or 0=No from the different actors	Type of information received (1=Markets, 2=Prices, 3=Desired quality, 4=trainings, 5=Pests and diseases, 6=Other specify)	If information is provided at a cost, what amount is paid per visit of accessing information?	Level of satisfaction (1 to 5 Where 1 and 5 are lowest and highest satisfaction Respectively
Farmers				
Input supplier				
Collectors				
Middlemen				
Transporters				
Processors				
Individual consumers				
Others				

80. Have ever received training on Shea nut value addition? 1) Yes 0) No

81. If Yes, tick (✓) which of the following aspects were you trained on and who provided the training?

Value addition training provided	Tick	Who provided the training
Conservation of Shea nut trees		
Harvesting or picking Shea nuts from the field		
Processing nuts into kernels		
Handling the nuts before processing		
Storage of kernels		
Grading or sorting kernels		
Others		

82. Do you have access to extension services regarding Shea nut/ value addition? 1) Yes 0) No

No

83. If yes, how many times in a year do they visit you?.....

84. Have you ever received any credit/loan for use in Shea nut collection in the last 2 years?

1) Yes 0) No

86. If No to 25, why ? (Tick where appropriate)

[1] Business is unregistered

[2] Don't have collateral

[3] I am not interested

[4] High interest rate

[5] Others (Specify)_____

87. Would you be willing to get into contracts/formal arrangements with other Value chain actors?

[1]Yes, [2] No

88. If Yes to Question 18, what are the conditions for contracting?

Value Actor	Conditions for contracting (Code 1)
Input suppliers	
Processors	
Village collectors/Brokers	
Transporters	
Wholesalers	
Retailers eg supermarkets	
Others	

Code 1: [1] Higher than market price [2] Willingness of the buyer to collect from your farm [3] Pays promptly on delivery [4] Others, Specify

END

Appendix 1.1.3: Questionnaire for Shea nut Processors

This questionnaire is designed for a research on Governance and up grading of Shea nut value chain in Northern Uganda by Deborah Akatwetaba, geared towards attaining a PhD at Gulu University. The answers you provide shall therefore be used for academic purposes and will be treated confidentially.

Section A: GENERAL INFORMATION

1	Name of the respondent			
2	Name of the processing company			
3	Contact number			
4	Gender: (1=male, 0=female)	male	☐	
		female	☐	
5	Marital status: (1=single, 2=married, 3=other)	single	☐	
		married	☐	
		Other	☐	
6	Age	Years		
7	Household size	Number		
8	Number of years in education	Others specify.....		
9	Distance to the nearest producer and market (km)	Collection point	☐	
		Market	☐	
1	Means of transport used to transport Shea nut	1	Head portage	☐
		0	Motorized/bicycle	☐
1	District of residence			
1	Occupation			
1	Processing income (Ushs)/per year			
1	Non-processing income (Ushs) per year			
1	Years in Shea nut processing business			

SECTION B: SHEA NUT MARKETING

16. Where do you source, quantity and at what price the raw materials you use to produce your Shea nut?

Name of location	Quantity sources	Price per unit	Total
------------------	------------------	----------------	-------

17. Do you do collective purchasing of any your Shea nuts products?

Code		Tick appropriately
1	Yes	
0	No	

18. What Shea nut products do you produce and in what quantities, what quantity do you sell and at what price?

Shea nut product	Whom sell to	Mode of payment	Quantity sold	Unit price charged	Total amount
------------------	--------------	-----------------	---------------	--------------------	--------------

Shea nut product: 1= Shea nut 2=Shea oil 3=Wood 4=Barks 5=Fruit 6=Seed cake 7=Wax
8=Others specify.....

Whom sell to :1=Company agent 2= Local trader 3=Exporter 4= Individual consumer 5=An organization 6=Fellow processors

Mode of payment = [1] Cash on delivery [2] less than 2 weeks after delivery [3] After a month of delivery [4] Beyond a month after delivery

19. What portion of your total output does the main buyer buy from you?

Code	Shea nut product	Customer	Proportion
1			
2			
3			
4			

Shea nut product: 1= Shea nut 2=Shea oil 3=Wood 4=Barks 5=Fruit 6=Seed cake 7=Wax
8=Others specify.....

Customer:1=Company agent 2= Local trader 3=Exporter 4= Individual consumer 5=An organization 6=Fellow processors

Proportion: 1=0- 25% 2=26-50% 3=51- 75% 4=76-100%

20. Is the major Shea nut market available? 1) Locally 0) Internationally

21. Did you know the market prices before you sold the Shea nut? 1) Yes 0) No

22. Do you discuss pricing other processors? 1) Yes 0) No?

23. How are briquette prices set? 1) Based on other players 2) Negotiations 3) Forces of demand and supply 4) Cost of production 5) Other(specify).....

24. Do you get pre-financed by your buyers?

Code		Tick appropriately
1	Yes	
0	No	

26. Do you have a store for your Shea nut? 1) Yes 0) No

27. If yes what is its capacity and utilized capacity
.....

28. What challenges do you face during sale of Shea nut products?

Use the following to rank challenges (1= major,2=minor)

Code	Challenge	Rank	Code	Challenge	Rank
1	Inadequate human capital		9	Trading experience	
2	High transaction costs		10	Group/Cooperative membership	
3	Lack of processing infrastructure		11	Transportation problems	
4	Technological barriers		12	Lack of markets	
5	Market information		13	Regulatory barriers	
6	Demand level		14	Cultural barriers	
7	Frequency of payment				
8	Monetary capital				
15	Others specify.....				

29. What can be done to improve these challenges?

.....
.....
.....

30. Do you require a license to engage in Shea nut processing? 1) Yes 0) No

31. If yes, how much do you pay to acquire a processing license?
.....
.....

32. Are there restrictions imposed on unlicensed Shea nut processing? 1) Yes 0) No

33. Are there any restrictions for entry and exit of the Shea nut? 1) Yes 0) No

34. How many Shea nut processors do you think are in this area?.....

35. Are you a member of Shea nut processing or collector association?

Code		Tick appropriately
1	Yes	
0	No	

36. If you are a member, what is the name of your association?.....

37. Who facilitated the formation of this association?

Code		Tick appropriately
1	Self- help group (self initiative)	
2	NGO/ company; (provide name)	

38. How long (years) have you been a member of this association?.....

39. At the time you were joining the group, what were your expectations? Please rank by ticking the appropriate box (1= Most important, 2= More important; 3= important; 4=Less important; 5= Least important)

Reason	Rank				
	1	2	3	4	5
To sell at a better or higher price					
To get access to credit					
To encourage me to save money					
To get easy market for my Shea nut products					
Foster unity with other women in the community					
To receive training on Shea nut processing					
To get equipment support/ tools					
To get market information					

40. Please rank in order of importance the areas you have benefitted by joining the group (1= Most beneficial, 5= least beneficial)

Benefits enjoy as a group member	Rank				
	1	2	3	4	5
I sell at a better or higher price					
I get access to credit					
I save money through the group					
I get guaranteed market for the kernels					
I enjoy unity with fellow women in the community					
I receive training on Shea					
I get equipment support/ tools					
I get market information					

41. Do you undertake the following activities collectively?

Code		Indicate
1	Purchase of inputs/ Shea kernel	
2	Processing	
3	Marketing of Shea butter	

4	Sourcing credit	
5	Saving part of profit	

42. Why didn't you belong to a group?

Code		Tick appropriately
1	I was not there when the group was being formed	
2	Leaders of the group frustrates my effort to join	
3	My schedules will not allow me	
4	I am not aware of any group	
5	I do not see the need to join any group	
6	Other specify	
7		

43. What kind of collaboration do you have with the processor association in your community?

Code		Tick appropriately
1	Sometimes they buy Shea nut products from me	
2	They give me advice on what kind of Shea nut consumers want	
3	I have no collaboration with any processor association	
4	Other specify	

44. Apart from Shea kernels processing what else do you do for a living?

Code		Tick appropriately
1	Nothing else	
2	Trading in food stuff (grains)	
3	Petty trading	
4	Farming	
5	Charcoal burning	
6	Other specify	

45. Are there development opportunities in Shea value chain?

Code	Response	
1	Yes	
0	No	

46. What opportunities exist in for the Shea nut value chain?

NO	Opportunities	Tick appropriately
A.	Input use	
B.	Financial facilitation	
C.	Groups organizations	

D.	Processing and value addition	
E.	Using ICT	
F.	Collective marketing	
G.	Contract farming	
H.	Advisory services	
I.	Inter-sectoral linkages	
J.	Other specify	
K.	Other specify	

SECTION C: SHEA NUT PROCESSING

47. Are you aware of some innovations in the Shea nut value chain?

Code	Response	
1	Yes	
0	No	

48. If YES, what innovation activities have you been involved in?

Code	Innovation activity	
1	Packing in sacks	
2	Crude butter	
3	Refined butter	
4	Chocolate	
5	Marketing/Organizational	
6	Advanced processing	
7	Other specify.....	
8	Other specify.....	

49. What value addition do you do on Shea nut?

Code	Type		Code	Type	
1	Kernel roasting		7		
2	Crude butter		8		
3	Fined butter		9		
4			10		
5			11		
6			12		

50. Why do you do value addition?

Code	Response	
1	Extends shelf life	
2	Improves market access	
3	I get more returns	
4	It's the norm	

51. What percent of the Shea nut you purchased did you add value?

NO	Product category	Percent
A.	Not-value added	
B.	Value added	

52. For the proportion you did not added value to, why didn't you do?

Code	Response	
1	No knowledge	
2	Is costly	
3	Low/No demand	
4	I do not know	
	Limited processing capacity	

54. What is your perception of Shea nut value addition?

Code	Response	
1	Not important	
2	Important	
3	Very important	

Have you been involved in value addition of other products (other than Shea nut)?

Code	Response	
1	Yes	
0	No	

SECTION E: GOVERNANCE IN SHEA NUT

57. What major marketing arrangement do you have with the buyers of Shea nut? Tick the appropriate?

Code	Marketing arrangement	Tick the appropriate
1	Spot marketing	
2	Informal relationship with buyers	
3	Formal relationship with buyers	
4	Others	

58. Are there system of coordination is in place to meet commercial objectives related to quality, quantity and consistency and /or to ensure compliance with standards? 1) Yes 2) No

59. If yes, which are the lead or coordinating firms in ensuring the quality, quantity and consistency of Shea nut is compiled to?

Attributes	Coordinating firm	What the coordinating firm does for compliance
Quality		

Quantity		
Consistency of supply		

60. Is coordination mostly based on formalized arrangement (contracts) or coordination is informal? Tick the appropriate?

Formalized coordination	☐
Informal coordination	☐

62. Are there any institutions/organizations/platforms offering you support in the delivery of your products/services?

Code	Response	Tick appropriate
1	Yes	☐
0	No	☐

64. Does the inability to comply with these rules either due to lack of information or capacity, limit participation in higher value chain activities or prevent up grading of the value chain as a whole? 1) Yes 0) No

65. If Yes,how?.....

66. Are there any cultural beliefs or traditions in this areas that:

	Indicate Yes/No
Promote Shea nut	☐
Limit Shea nut	☐

68. Do you have any working relationship or linkages with other value chain actors? 1) Yes 2) No

69. If yes, please list them.

Value chain actors	Form of linkage/ relationship (1=Contract/Formal, 2=Verbal/Informal, producer organization)	Terms of the relationship (e.g. Quantity to be supplied)
Input dealers		
Fellow farmers		
Processors		
Village		

Value chain actors	Form of linkage/ relationship (1= Contract/Formal, 2=Verbal/Informal, producer organization)	Terms of the relationship (e.g. Quantity to be supplied)
collectors/Brokers		
Transporters		
Wholesalers		
Retailers eg super markets		
Others		

70. Do you receive any information from other VC actors? 1=Yes....2=No

71. If yes, from whom and what kind of information (e.g. Markets, buyers, prices, pests and diseases, inputs, trainings, etc)

Category of actors	Indicate access to information as 1=Yes or 0=No from the different actors	Type of information received (1=Markets, 2=Prices, 3=Desired quality, 4=trainings, 5=Pests and diseases, 6=Other specify)	If information is provided at a cost, what amount is paid per visit of accessing information?	Level of satisfaction (1 to 5 Where 1 and 5 are lowest and highest satisfaction Respectively)
Farmers				
Input supplier				
Collectors				
Middlemen				
Transporters				
Processors				
Individual consumers				
Others				

72. Have ever received training on Shea nut value addition? 1) Yes 0) No

73. If Yes, tick (✓) which of the following aspects were you trained on and who provided the training?

Value addition training provided	Tick	Who provided the training
Conservation of Shea nut trees		
Harvesting or picking Shea nuts from the field		
Processing nuts into kernels		
Handling the nuts before processing		
Storage of kernels		
Grading or sorting kernels		
Others		

74. Do you have access to extension services regarding Shea nut/ value addition? 1) Yes 0) No
75. If yes, how many times in a year do they visit you?.....
76. Have you ever received any credit/loan for use in Shea nut collection in the last 2 years?
1) Yes 0) No
78. If No to 25, why? (Tick where appropriate)
[1] Business is unregistered
[2] Don't have collateral
[3] I am not interested
[4] High interest rate
[5] Others (Specify)_____
79. Would you be willing to get into contracts/formal arrangements with other Value chain actors?
[1] Yes, [2] No
80. If Yes to Question 18, what are the conditions for contracting?

Value Actor	Conditions for contracting (Code 1)
Input suppliers	
Processors	
Village collectors/Brokers	
Transporters	
Wholesalers	
Retailers eg supermarkets	
Others	

Code 1: [1] Higher than market price [2] Willingness of the buyer to collect from your farm [3] Pays promptly on delivery [4] Others, Specify

END

Appendix 1.1.4: Focus Group Discussion guide for Key Value Chain Actors (Traders and processors researchers, district officials)

1. What is your understanding of Shea nut value chain?
2. Which categories of people do you know are involved in developing the Shea nut value chain?
3. How are these people important in the chain?
4. What innovation have you been involved in to improve the quality and efficiency of Shea nut production/trade in your area/market?
5. What innovation measures can be taken to ensure that there is an improved agribusiness sector and market access?
6. What Shea nut products (s) do you produce in your area?
7. What factors favour the production of that type?
8. How do you market Shea nut in your area?
9. What challenges do you face in marketing this agricultural product?
10. What do you think should be done to improve the marketing of the product?
11. What challenges do you face in the production?
12. What has been done to address these challenges?
13. What do you think should be done to address these challenges?
14. What challenges do you encounter in improving Shea nut innovations?
15. What opportunities do you have over other Shea nut actors involved in other agricultural products?
16. Do know any policy or legal framework in support of Shea nut value chain development directly and if yes give examples
17. Do see any impact or benefits as a result of the policy in place
18. Do see any gaps in existing policies and what do you suggest needs to be done?
19. What system of coordination is in place to meet commercial objectives related to quality, quantity and consistency and /or to ensure compliance with standards?
20. Which are the lead or coordinating firms in ensuring the quality, quantity and consistency of Shea nut is complied to?
21. Is coordination mostly based on formalized arrangement (contracts) or coordination is informal
22. What are the rules and standards, both official and commercial, that actors involved in the Shea nut value chain must comply with in order to participate?
23. Where do rules and regulations originate from?
24. How are the rules and regulations in the Shea nut value chain enforced?
25. What are the effect of each rule on the participation (Economic activities) of the different value chain particularly relating to the actors that enforce these rules and the systems in place to coordinate production?
26. How is the information about applicable rules, standards and services to support compliance transmitted through the value chain, particularly through the lead firm or its coordination systems?
27. Does the inability of producers to comply with these rules either due to lack of information or capacity, limit participation in higher value chain activities or prevent up grading of the value chain as a whole?
28. What are the most participating organisation? Gov't, NGOs, Lead Firms, Cooperatives.

Appendix 1.1.5: Key informant interviews guide for – Government/Local official.

1. In your area of operation do you have Shea nut?
2. How is the Shea nut business organized and. Who are the people involved?
3. Do you participate in the in the Shea nut programmes(marketing)?
4. When did you start promotion of market access among Actors?
5. What are the key issues considered before implementation and why?
6. Did you have data base of Shea nut gatherers already practicing processing as a business?
7. Who the actors involved this process?
8. How do you select beneficiaries under the extension service programme?
9. How do you ensure the selection of beneficiaries follow the standards and extension service guidelines?
10. How do you ensure Shea nut actors get the right markets and better prices?
11. Which supporting services do you provide to Shea nut actors and private sector?
12. Do you comment on the performance of extension delivery mechanism in place?
13. How do people participate in the Programmes?
14. What are the achievements so far?
15. What recommendations do you have for the programme?
16. What are the existing strategies for market access by Shea nut actors?
17. Outline some of the affiliations you have had with businesses, academic and research institutions?
18. Do you see any opportunities for Shea nut sub sector development in Uganda?
19. If so, outline key opportunities you foresee for the sector?
20. Is there any existing policy/legal framework that support the Shea nut sector?
21. Are there gaps in the policy to be addressed for Shea nut sector development?
22. What system of coordination is in place to meet commercial objectives related to quality, quantity and consistency and /or to ensure compliance with standards?
23. Which are the lead or coordinating firms in ensuring the quality, quantity and consistency of Shea nut is compiled to?
24. Is coordination mostly based on formalized arrangement (contracts) or coordination is informal
25. What are the rules and standards, both official and commercial, that actors involved in the Shea nut value chain must comply with in order to participate?
26. Where do rules and regulations originate from?
27. How are the rules and regulations in the Shea nut value chain enforced?
28. What are the effect of each rule on the participation (Economic activities) of the different value chain particularly relating to the actors that enforce these rules and the systems in place to coordinate production?
29. How is the information about applicable rules, standards and services to support compliance transmitted through the value chain, particularly through the lead firm or its coordination systems?
30. Does the inability of producers to comply with these rules either due to lack of information or capacity, limit participation in higher value chain activities or prevent up grading of the value chain as a whole?

Appendix 1.1.6: Key informant interviews guide for - Research and development organizations

1. What is the name of your organization?
2. When did it start its operations?
3. Which services and products do you offer?
4. How do you develop your interventions?
5. Who are your main financial supporters?
6. Who are the target beneficiaries?
7. How do you select the beneficiaries?
8. How many people have you reached and supported since inception?
9. How do you develop your research and development agenda?
10. Which key actors that are involved in your work?
11. How do people access your products and services?
12. What extension approach and systems do you use?
13. What is your relationship like with farmers?
14. Do you find any challenges so far?
15. What strategies do you think can improve delivery?
16. How long is your programme or project?
17. What is your average annual budget in Uganda shillings
18. Are there deliberate efforts for public private sector partnership?
19. Are you affiliated to other research institutions, academic institutions and extension providers?
20. Are you aware of any policy/legal framework that is targeted towards R& D in Uganda?
21. What kind of opportunities do you see for agriculture development in Uganda
22. Do you know any policy in Shea nut value chain development?
23. If any, do you see gaps for improvement?
24. What system of coordination is in place to meet commercial objectives related to quality, quantity and consistency and /or to ensure compliance with standards?
25. Which are the lead or coordinating firms in ensuring the quality, quantity and consistency of Shea nut is complied to?
26. Is coordination mostly based on formalized arrangement (contracts) or coordination is informal
27. What are the rules and standards, both official and commercial, that actors involved in the Shea nut value chain must comply with in order to participate?
28. Where do rules and regulations originate from?
29. How are the rules and regulations in the Shea nut value chain enforced?
30. What are the effect of each rule on the participation (Economic activities) of the different value chain particularly relating to the actors that enforce these rules and the systems in place to coordinate production?
31. How is the information about applicable rules, standards and services to support compliance transmitted through the value chain, particularly through the lead firm or its coordination systems?
32. Does the inability of producers to comply with these rules either due to lack of information or capacity, limit participation in higher value chain activities or prevent up grading of the value chain as a whole?

Appendix 2: Approval documents

Appendix 1.2.1: GUREC Approval

GULU UNIVERSITY

P.O. Box 166 Gulu Uganda
Website: www.gu.ac
Email: guluuniversity.rec@gmail.com



Tel: +256-4714-32096
Fax: +256-4714-32913
Mob: +256772305621/776812147

RESEARCH ETHICS COMMITTEE

September 18, 2019

APPROVAL NOTICE

MS AKATWETABA DEBORAH
Gulu University,

Re: Application No. GUREC-087-19

Type of review:
☒ Initial review
☐ Amendment
☐ Continuing review
☐ Termination of study
☐ SAEs
☐ Other, Specify: _____

Title of Proposal: "GOVERNANCE AND OPPORTUNITIES FOR UPGRADING IN THE SHEA NUT VALUE CHAIN IN NORTHERN UGANDA"

I am pleased to inform you that at the 52nd convened meeting on 23rd May 2019, the Gulu University Research Ethics Committee (GUREC) voted to approve the above referenced application.

Approval of the research is for the period of 23rd May 2019 to 22nd May 2020

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

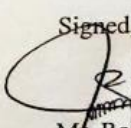
1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the GUREC for re-review and approval prior to the activation of the changes. The GUREC application number assigned to the research should be cited in any correspondence.



3. Any unanticipated problems involving risks to participants must be promptly reported to the **GUREC**. New information that becomes available which could change the risk: benefit ratio must be submitted promptly for the **GUREC** review.
4. Only approved and stamped consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The **GUREC** may conduct audits of all study records, and consent documentation may be part of such audits.
5. Regulations require review of an approved study not less than once per 12-month period. Therefore, a continuing review application must be submitted to the **GUREC** eight (8) weeks prior to the above expiration **date of 22nd May 2020** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely manner may result in suspension or termination of the study, at which point new participants may not be enrolled and currently enrolled participants must be taken off the study.
6. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following documents have been approved in this application by the **GUREC**:

	Document	Language	Version	Version Date
1	Protocol	English	Version 2.0	17 th September 2019
2	Data Collection Tools	English	Version 2.0	17 th September 2019
3	Informed consent Document	English/Luo	Version 2.0	17 th September 2019

Signed,  **APPROVED**
 ★ 18 SEP 2019 ★
 FACULTY OF MEDICINE
 Mr. Robert Kiduna Box 166, Gulu
 For; Chairperson
 Gulu University Research Ethics Committee

Appendix 1.2.2: Uganda National Council for Science and Technology Approval

 UNCST	Uganda National Council for Science and Technology <i>(Established by Act of Parliament of the Republic of Uganda)</i>
Our Ref: SS 5126	13 th December 2019
Ms. Deborah Akatwetaba Principal Investigator Bishop Stuart University Mbarara	
Dear Ms. Akatwetaba,	
Re: Research Approval: Governance and Opportunities for Upgrading in the Shea Nut Value Chain in Northern Uganda	
I am pleased to inform you that on 19/11/2019, the Uganda National Council for Science and Technology (UNCST) approved the above referenced research project. The Approval of the research project is for the period of 19/11/2019 to 19/11/2022.	
Your research registration number with the UNCST is SS 5126. Please, cite this number in all your future correspondences with UNCST in respect of the above research project. As the Principal Investigator of the research project, you are responsible for fulfilling the following requirements of approval:	
1. Keeping all co-investigators informed of the status of the research. 2. Submitting all changes, amendments, and addenda to the research protocol or the consent form (where applicable) to the designated Research Ethics Committee (REC) or Lead Agency for re-review and approval <u>prior</u> to the activation of the changes. UNCST must be notified of the approved changes within five working days. 3. For clinical trials, all serious adverse events must be reported promptly to the designated local REC for review with copies to the National Drug Authority and a notification to the UNCST. 4. Unanticipated problems involving risks to research participants or other must be reported promptly to the UNCST. New information that becomes available which could change the risk/benefit ratio must be submitted promptly for UNCST notification after review by the REC.	
LOCATION/CORRESPONDENCE	COMMUNICATION
Plot 6 Kimera Road, Ntinda P. O. Box 6884 KAMPALA, UGANDA	TEL: (256) 414 705500 FAX: (256) 414-234579 EMAIL: info@uncst.go.ug WEBSITE: http://www.uncst.go.ug

5. Only approved study procedures are to be implemented. The UNCST may conduct impromptu audits of all study records.
6. An annual progress report and approval letter of continuation from the REC must be submitted electronically to UNCST. Failure to do so may result in termination of the research project.

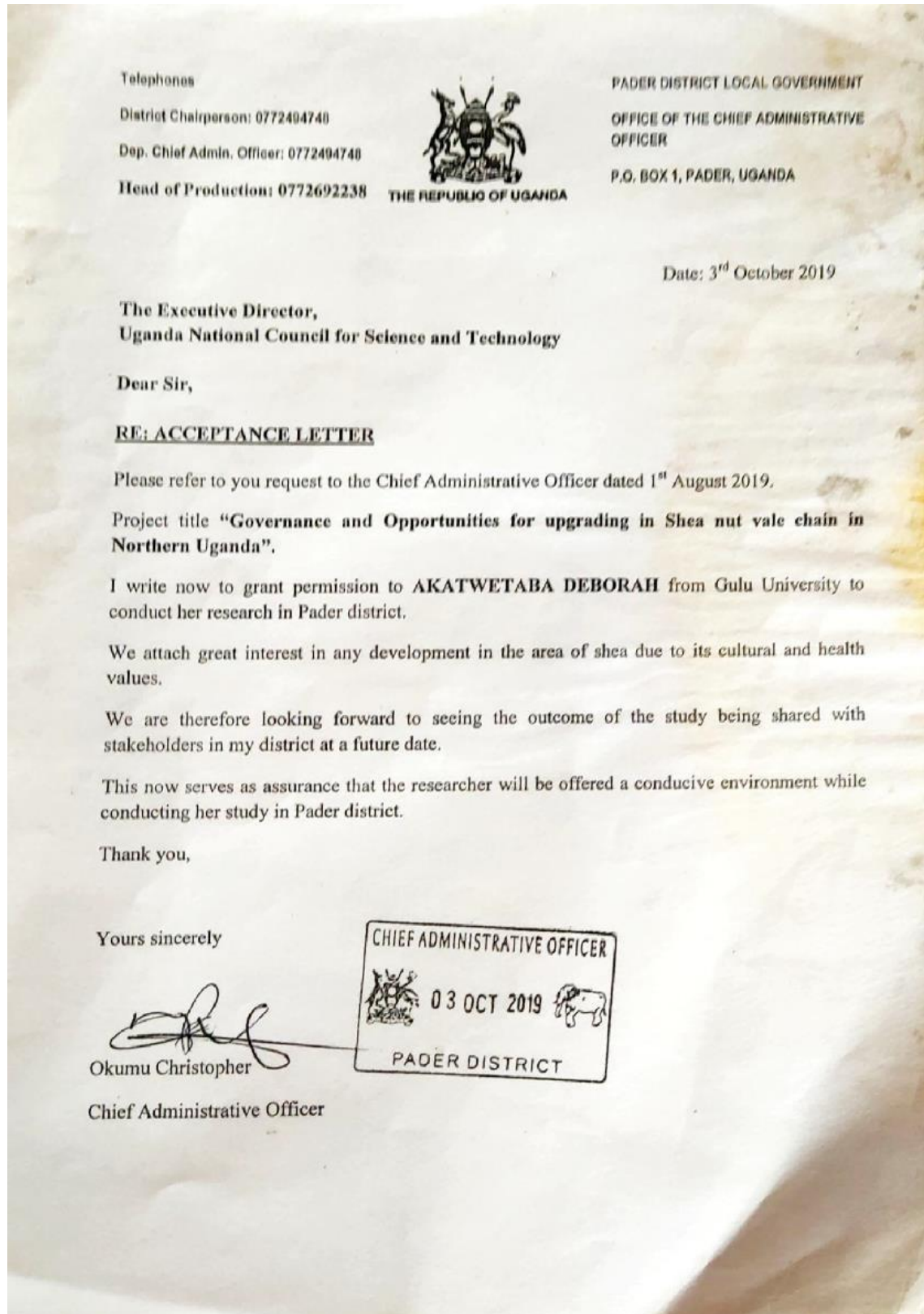
Please note that this approval includes all study related tools submitted as part of the application as shown below:

No.	Document Title	Language	Version Number	Version Date
1.	Research proposal	English	N/A	September 2019
2.	Questionnaires	English and Luo	N/A	N/A
3.	Key informant interview guides	English and Luo	N/A	N/A
4.	Informed consent forms	English and Luo	N/A	N/A
5.	Focus group discussion guide for key value chain actors (Traders and processors)	English	N/A	N/A


 BETH MUTUMBA
 For: Executive Secretary
 UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Copied: Chair, Gulu University, Research Ethics Committee

Appendix 1.2.4: District acceptance letters to carryout research





THE REPUBLIC OF UGANDA

In any
Correspondence on
this subject Please
Quote

Ref:CR/164/2

OFFICE OF THE CHIEF ADMINISTRATIVE OFFICER
LIRA DISTRICT LOCAL GOVERNMENT
P.O BOX 49, LIRA,
UGANDA.



Chief Administrative Officer.....0772- 410 633
Principal Assistant Secretary.....0777 -930411
Chief Finance Officer 0772 -562044
District Education Officer.....0780 -377277
District Health Officer.....0772 -577039
District Engineer.....0752 -578131
District Production Officer.....0772-345374
District Natural Resources Officer.....0772-453435
District Community Development Officer...0772672792

Email address

liradislocgov@gmail.com

Website: www.lirdistrict.com

Date: 29th October, 2019

The Executive Director
Uganda National Council for Science and Technology

Dear Sir,

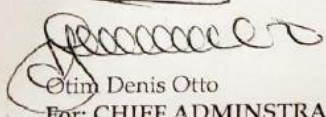
ACCEPTANCE LETTER

The purpose of this letter is to grant permission to AKATWEABA DEBORAH from Gulu University to conduct research in Lira District. The project title is "Governance and Opportunities for upgrading in the Shea nut chain in Northern Uganda". The outcome of the study after being shared will be useful in designing strategies for improving and upgrading Shea nut value chain in Uganda.

This also serves as assurance that the researcher will be offered conducive environment while conducting her study as highlighted above.

Yours sincerely,

29 OCT 2019


Otim Denis Otto

For: CHIEF ADMINSTRATIVE OFFICER, LIRA

Alternative Communication routes
District Chairperson.....0772586838/0701040404
Chief Administration Officer.....0772577793/0705577793
Chief Finance Officer.....0772654368

E-mail: otukedlg@gmail.com

IN CASE OF ANY CORRESPONDENCE ON THIS

SUBJECT PLEASE QUOTE REF: CR/220/1



THE REPUBLIC OF UGANDA

OTUKE DISTRICT LOCAL GOVERNMENT
OFFICE OF THE CHIEF ADMINISTRATIVE OFFICER
P. O. BOX 617
LIRA

29th October, 2019

The Executive Director
Uganda National Council for Science and Technology
PO Box 166
GULU

RE: ACCEPTANCE LETTER

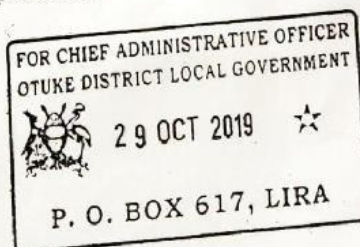
Reference is made to a letter unreferenced dated 1st August, 2019 requesting me to allow Ms Akatwetaba Deborah, a PhD student of Agricultural and Applied Biosciences in the Faculty of Agriculture and Environment at Gulu University to conduct research on Governance and Opportunities for upgrading in the shea nut value chain in Northern Uganda.

The purpose of this letter therefore, is to grant her permission as requested.

This also serves as assurance that the researcher will be offered conducive environment while conducting her study as highlighted above.

I wish her success in her research processes.


Mugoya Ssonny Mulembe
For Chief Administrative Officer



Copied: The Resident District Commissioner
The District Chairperson
The District Production Officer
The District Agricultural Officer

Appendix 3: Chapter 6 Appendices

Appendix 3.1: Correlation matrix for explanatory variables

```
. cor male Experience Education log_SY log_NSy Extension Receive_train Receive_info Means_TP Aware_instns Credit
> t Aware_innov farmer collector proccessor lira pader D_Mkt_point
(obs=325)
```

	male	Experi~e	Educat~n	log_SY	log_NSy	Extens~n	Receiv~n	Receiv~o	Means_TP	Aware_~s
male	1.0000									
Experience	0.0908	1.0000								
Education	0.0567	0.0430	1.0000							
log_SY	0.0706	-0.0026	-0.1785	1.0000						
log_NSy	0.0327	0.0086	0.0075	0.3063	1.0000					
Extension	-0.0123	-0.0935	-0.0040	0.1775	0.0501	1.0000				
Receive_tr~n	-0.0515	-0.0050	0.1017	-0.0886	-0.0038	0.1966	1.0000			
Receive_info	-0.0232	-0.0533	-0.0706	0.2052	0.1054	0.4506	0.2879	1.0000		
Means_TP	-0.2654	0.0136	0.0130	-0.1329	-0.0307	-0.0417	-0.0944	-0.0335	1.0000	
Aware_instns	0.0674	0.0598	-0.0436	0.1071	0.0516	0.0536	0.1092	0.3127	-0.0295	1.0000
Credit	0.0434	-0.0499	0.0390	0.1389	-0.0020	0.5453	0.0337	0.2186	-0.0498	0.1189
Aware_innov	0.0151	0.0377	0.0589	0.1234	0.0123	0.1963	0.0761	0.1362	0.0159	0.2406
farmer	-0.0981	0.0954	0.0550	-0.2181	-0.1847	-0.1324	-0.0106	-0.2209	0.1936	-0.1204
collector	-0.0203	-0.0004	0.4098	-0.4538	-0.1630	-0.0987	0.0673	-0.2325	0.1842	-0.1624
proccessor	0.0016	0.0193	0.2164	0.2543	0.1006	0.2068	0.0268	0.1757	-0.0170	0.1391
lira	0.0417	0.1343	-0.0847	0.0559	-0.0716	-0.2490	-0.3554	-0.2261	0.0326	-0.1657
pader	-0.2110	-0.1882	-0.0427	0.0743	0.0368	0.2757	0.4198	0.2846	0.2156	0.1048
D_Mkt_point	-0.0316	-0.0906	-0.2038	0.0480	0.0702	0.1514	0.0630	0.2161	-0.3354	-0.0097
	Credit	Aware_~v	farmer	collec~r	procce~r	lira	pader	D_Mkt_~t		
Credit	1.0000									
Aware_innov	0.1112	1.0000								
farmer	0.0308	0.0329	1.0000							
collector	-0.0936	-0.0802	0.3642	1.0000						
proccessor	0.2440	0.0636	-0.1348	-0.5006	1.0000					
lira	-0.1301	-0.2431	0.1089	0.0980	-0.1121	1.0000				
pader	0.1150	0.0787	0.0266	-0.0273	0.0179	-0.4977	1.0000			
D_Mkt_point	0.0266	-0.1019	-0.2965	-0.1764	-0.0465	-0.0480	0.1473	1.0000		

Appendix 3.2: VIF

```
. estat vif
```

Variable	VIF	1/VIF
pader	1.98	0.504025
Extension	1.91	0.522205
collector	1.77	0.565391
lira	1.66	0.602311
Receive_info	1.61	0.622849
log_SY	1.55	0.643209
Credit	1.53	0.654591
Means_TP	1.50	0.668298
Receive_train	1.46	0.686906
D_Mkt_point	1.45	0.690405
farmer	1.41	0.711437
Education	1.33	0.749442
Aware_instns	1.25	0.802664
Aware_innov	1.20	0.831364
log_NSY	1.15	0.872032
male	1.14	0.873945
Experience	1.09	0.918913
Mean VIF	1.47	

Appendix 3.3: Model fit indices

```
. fitstat
```

	mlogit
Log-likelihood	
Model	-169.961
Intercept-only	-281.059
Chi-square	
Deviance df=289	339.922
LR df=34	222.196
p-value	0.000
R2	
McFadden	0.395
McFadden adjusted	0.267
Cox-Snell/ML	0.495
Cragg-Uhler/Nagelkerke	0.602
Count	0.794
Count adjusted	0.402
IC	
AIC	411.922
AIC divided by N	1.267
BIC df=36	548.140

Appendix 3.4: IAA Assumption test results

```
. mlogtest, iia
```

Hausman tests of IIA assumption (N=325)

Ho: Odds(Outcome-J vs Outcome-K) are independent of other alternatives

	chi2	df	P>chi2
1	17.783	17	0.403
2	25.126	18	0.121
3	9.658	18	0.943

Note: A significant test is evidence against Ho.

suest-based Hausman tests of IIA assumption (N=325)

Ho: Odds(Outcome-J vs Outcome-K) are independent of other alternatives

	chi2	df	P>chi2
1	13.676	18	0.750
2	11.229	18	0.884
3	15.740	18	0.611

Note: A significant test is evidence against Ho.

Small-Hsiao tests of IIA assumption (N=325)

Ho: Odds(Outcome-J vs Outcome-K) are independent of other alternatives

	lnL(full)	lnL(omit)	chi2	df	
1	-25.523	-14.937	21.172	17	0.219
2	-23.662	-18.092	11.141	18	0.888
3	-50.950	-43.169	15.563	18	0.623

Note: A significant test is evidence against Ho.