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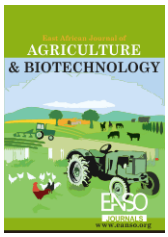

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Original Article

An Assessment of the Competitiveness of Shea Actors in the Shea Nut Value Chain of Northern Uganda

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Shea Nut Collectors, Market Share, Concentration Ratio, Shea Nut Actors, Uganda.

ABSTRACT

Shea nut is an economically important parkland tree species found in parts of northern and eastern Uganda. In northern Uganda, the shea nut value chain consists of collectors, traders, and processors. Whereas the collectors form the bulk of the actors in the chain, it is not clear whether the scale of operations of actors above the chain makes them less competitive. This study assessed the competitiveness of shea actors along the chain. Cross-sectional primary data was collected using a respondent-driven sampling approach. A total of 252 collectors, 51 traders, and 22 processors were included in the study. Results showed that the average market share of the collectors, traders, and collectors is 0.4%, 1.9%, and 4.5%, respectively. Using the concentration ratio (CR4) which measures the market share of the four largest players, results showed that for both collectors and traders, the CR4 was less than 40% (collectors =10%; traders=15%). This finding suggests that, individually, each collector and trader are too small to influence the outcome of the shea market transaction but can only do so collectively. However, for the processors, the CR4 was 65%, implying that for the processors, the 4 largest players control up to 65% of the market. This suggests an oligopolistic tendency among shea processors, with the few large processors able to individually influence both collectors and traders. These findings suggest the need to regulations to protect both the trader and the collectors from unfair competition that may come from the few processors.

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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 (Dubbert & 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 a global scale (Dubbert & Abdulai, 2022; Abdul-Rahaman & Abdulai, 2020; Dubbert, 2019). This competition is usually manifested in the global shea value chains with local actors being disadvantaged (Boffa, 2015; Adam & Abdulai, 2014). Within the local shea, it is not clear how market competitive forces affect the different actors.

Whether this competition 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 competition 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 competition 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 materials and 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.

METHODOLOGY

Study Area and Context

This study was conducted in northern Uganda. Specifically, the districts of Otuke, Lira, and Pader were selected purposive due to presences of shea value chain actors. Cross-sectional data was collected using structured questionnaires from a sample of value chain actors in the study area. The study employed respondent driven sampling where the actors at base, collectors were first identified and interviewed, and then requested to refer the team to those they supply. This led to identification of traders and processors who were later followed up and interviewed. This led to identification and interviewing of 252 collectors, 51 traders, and 22 processors (Figure 1). Prior to

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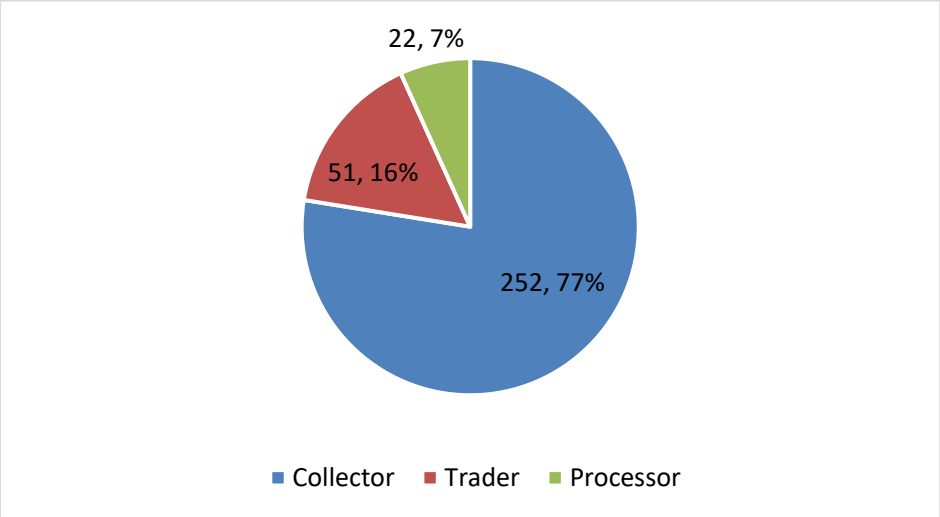
data collection, informed consent was sort and only those actors who willingly consented were interviewed. The data was collected by a team of component research assistants who all had a background in agribusiness value chain research. Prior to data collection, the research assistants were first trained on the research tools. A pre-test ensured they were well-versed with the research tools.

Figure 1: Distribution of shea actors included in this study



Data Analysis

Collected data was analyzed using SPSS v25 and STATA v15. 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 (1) while concentration ratio was calculated based on equation (2).

$$S_i = \frac{V_i}{\Sigma V_i} \quad (1)$$

Where S_i = Market share of buyer ί

V_i = Amount of shea products handled by buyer *i*

ΣV_i = Total amount of shea products handled by buyer

$$C = \sum_{i=1}^{m} S_i \qquad ί = 1, 2\ldots\ldots\ldots m \quad (2)$$

Where C = concentration ratio

Si = percentage share of the $ί^{th}$ firm

m = 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 Following Wooldridge (2002) and Cameron and Trivedi (2005), the Tobit regression model is specified as in equation (3)

$$Y_i^* = X_i\beta + u_i \quad (3)$$

Where, Y^* is the dependent variable that takes on values within specified limits, $\boldsymbol{X_i}$ is a vector of independent variables that have a potential influence on the dependent variable, $\boldsymbol{\beta}$ is a vector of parameters to be estimated by the Tobit model, while u_i is an error term that 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)

$$Y_i^* = X_i\beta + u_i \quad (4)$$

Where;

$$Y_i = 0 \; if \; Y_i^* < 0$$

$$Y_i = Y_i^* \; if \; 0 \leq Y_i^* \leq 0$$

$$Y_i = 1 \; if \; Y_i^* > 1$$

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Where; Y_i^* is a latent variable representing marketing margins 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 that can affect the market share. Table 1 presents a description of these explanatory variables and also presents their a priori expectations. $\boldsymbol{\beta}$ is a vector of parameters to be estimated associated with firm-specific attributes. The parameters of this Tobit model are estimated using the method of maximum likelihood.

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

RESULTS

Summary Statistics

Table 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 important for 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 had only attained primary level of education. 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.

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Table 2: Summary Statistics of explanatory variables used in the study

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 (Otuke=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.

Market Share of Shea Value Chain Actors

Table 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 3: Summary Statistics for market share of shea actors

	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

Concentration ratio of the four largest actors for each player

The concentration ratio (CR_4) 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 2). 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.

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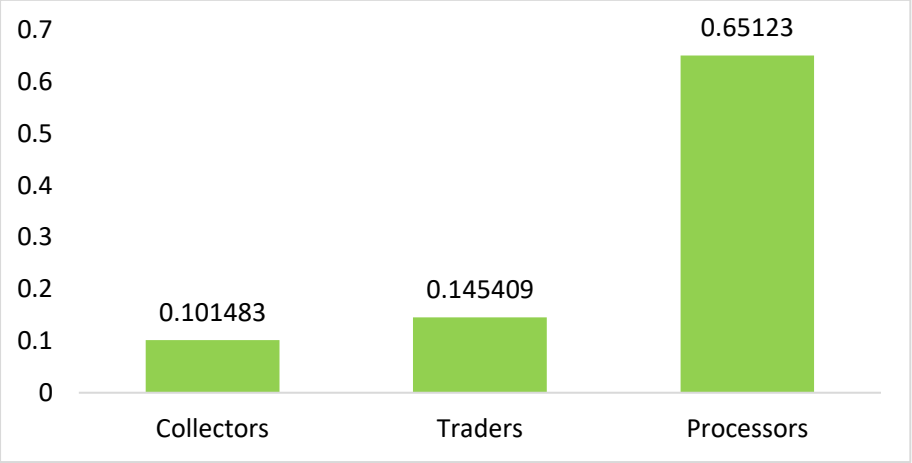
Figure 2: Concentration ratio of the four largest actors for each player



Factors Influencing Actors' Market Share

Tobit model regression results show that district 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. Results also showed that the less experienced shea actors had significantly ($p < 0.05$) higher market share than the more experienced 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). Other factors including gender of the actor, age, education level, and group membership did not have any significant influence on market share of actors.

Table 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		

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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., 2012). 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, 2013). 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 make it had 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 remote rural areas (Alex et al., 2015).

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 to 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.

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Data Availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethical Approval

This study was approved by Gulu University Research Ethics Committee (GUREC). Permission to conduct the research was obtained from the district local governments. Informed consent was obtained from all participants included in the study.

Conflicts of interest

None

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