

SHEA BUTTER PRODUCTION AND MARKETING EFFICIENCY IN KWARA STATE, NIGERIA

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Abstract

The study was conducted to determine the effectiveness of the marketing chain of shea-butter in Kwara State, Nigeria. A multi-stage sampling technique was adopted to select respondents for the study. Data were collected using three different sets of questionnaires administered on producers, wholesalers and retailers of shea-butter. Descriptive statistics, profit analysis, marketing margin and marketing efficiency tools were used for the study. Results show that shea-butter production in the study area is based on the traditional method. Total cost and revenue were highest for the producers compared to wholesalers and retailers (Producers- N31,360.00; N81,150.00, Wholesalers- N23,400.00; N54,550.00, Retailers- N10,300.00; N28,550.00). The wholesalers received the highest net profit (N31,150.00 per week), while the retailers received the lowest (N18,250.00). The rate of return on investment was highest for the producers (28.10), while the lowest was the retailers (16.70). Conversely, the benefit-cost ratio was highest for the retailers (2.77) and lowest for the producers (1.41). Estimates of marketing efficiency showed that efficiency of wholesaler (961.54%) was more than that of the retailer (436.90%). The production and marketing of shea-butter in the study area is profitable with some levels of market efficiency in the trade. Nevertheless, to enhance production of shea-butter in the study area, improved production methods should be adopted. The level of supply of shea nut must also be enhanced by focusing on domestication of the shea tree. Furthermore, there is need for product differentiation through innovative concepts among the wholesalers and retailers so as to increase their share of the gross marketing margin in the trade.

Keywords: Shea-butter, Value Chain, Profit Analysis, Marketing Efficiency

1. INTRODUCTION

Trade in shea-butter is one of the most vibrant traditional business in many rural communities of West and Central Africa (Kodua, Ankamah & Addae, 2018). Several studies have revealed the contributions of this trade to rural livelihoods in the regions

(Olugbire, Aremu & Adeniran, 2014; Ibrahim, Adeniji, Olaleye, & Umar, 2016). According to the United States Agency for International Development (USAID, 2010), trade in shea-butter employs an estimated three million women across West Africa, generates between USD 90 million and USD 200 million a year from exports and promotes economic activity in rural communities. Adams, Issahaku, and Motin (2016) reported that about 93.7% of women in the Wa Municipality, Ghana are engaged in the shea value chain as a main source of livelihood strategy with the average annual income per person being around GH¢846.85. In Burkina Faso, shea sector contributes to women's economic well-being with an average of CFA 530 000 (USD 892) per actor per year (Chen, 2017). There has been an increasing international interest in shea-butter trade owing to its numerous potentials (Nde, Boldor, Astete, Muley, & Xu, 2016).

The fruit pulp of shea tree is an important source of vitamins and minerals, particularly for young children in rural areas who snack on the fruit (Akoma, Nma, Musa & Salihu, 2017). Shea-butter derived from the nut is used for cooking and serves as a crucial nutritional resource for millions of rural households within its range. The butter is heavily demanded, both locally and internationally (Boffa, 2000). It is used as skin moisturizer and in the treatment of wounds. It is also used as cocoa-butter substitute for the production of chocolate as well as in confectioneries, pharmaceutical and cosmetic industries (Olaoye, 2012).

Nigeria is reputed as the largest producer of shea-butter in the world, with a production capacity of about 600,000 metric tons per year (Lovett, 2004). However, the economic potentials of shea-butter trade in sustaining income generation for rural dwellers and the country at large has not been fully tapped. According to Garba and Sanni (2015), processing of shea-butter from the shea-nuts in many rural communities in Nigeria, is largely characterized by minimum mechanical input, heavy drudgery and high input of firewood. These have been implicated as factors leading to low technical efficiency, productivity and profitability of shea-butter production in the country (Godfried, Osamu, & Kazuhiko, 2015). While shea-butter production and marketing provide an economic incentive to conserve shea tree- the resource on which it is based, low profitability is a disincentive to entry into the business.

In the light of the above, it is important to continuously undertake economic investigation of shea-butter production and marketing in different areas of the shea-butter production region. Marketing efficiency is the ratio of market output (satisfaction) to marketing input (cost of resources). An increase in this ratio represents improved efficiency and a decrease denotes reduced efficiency (Kohls & Uhl, 1980). Marketing efficiency involves consumer services, profitability of sellers,

volume of sales, volume of supply, middle man cost etc. Efficient marketing system ensures remunerative prices to the producers and motivates them to go in for higher investment and production. The increase in earning of producers will result in increase in productivity with the help of higher investment and quality inputs and modern or improved technology. A healthy and efficient marketing system always yield a fair amount of return to the producers and quality products to the welfare of consumers. The efficiency of a market structure can be known through: (i) whether it fulfils the objectives assigned to it or expectations from the system at minimum possible cost or maximizes the fulfilment of objectives with given level of resources (or costs), or (ii) whether it is responsive to impulses generated through environmental changes and whether impulses are transmitted at all level in the system.

Marketing efficiency of shea-butter trade is crucial to the overall performance of the shea sector. Analysis of revenues, costs and margins of value chains in shea-butter trade is important in order to determine profitability and the potential for scaling up. It will also help to identify how revenues and margins are currently distributed over the actors in the value chain in order to make the chain more effective. Therefore, this study was conducted to investigate shea-butter production and marketing efficiency in Kwara State, Nigeria. This is important in order to identify possible forms of intervention in production and marketing of the product.

2. MATERIALS AND METHODS

Study Area

The study area is Kwara State (Figure 1). It is located in North-central Nigeria. It shares administrative boundary with Oyo, Ekiti and Osun States in the South, Niger State in the North, Kogi State in the East and Benin Republic in the West. It lies between Latitude $8^{\circ}5'$ and $10^{\circ}4'$ N and Longitude $4^{\circ}55'$ and $6^{\circ}5'$ E with a landmass area of 36,825 km². It has a temperature range of between 30°C - 35°C with two distinct climatic seasons (rainy and dry seasons). The amount of rainfall ranges from 1000 – 1500 mm per annum (Fakayode, Ogunlade, Ayinde, & Olabode, 2010). The vegetation of the State is a mix of guinea and derived savanna, with riparian forest along the river courses. Agriculture is the predominant occupation of the people, especially in the rural areas. Different varieties of annual crops such as maize, yam, sorghum, groundnut, cowpea, millet, etc., are cultivated in association with scattered trees such as *Adansonia digitata*, *Parkia biglobosa*, *Prosopis africana* and *Vitellaria paradoxa*. The State comprises sixteen (16) Administrative Local Government Areas (LGAs), divided into four agricultural zones by the Kwara State Agricultural Development Project (KWADP) in consonance with ecological characteristics,

cultural practices and project administration (KWADP, 1998).

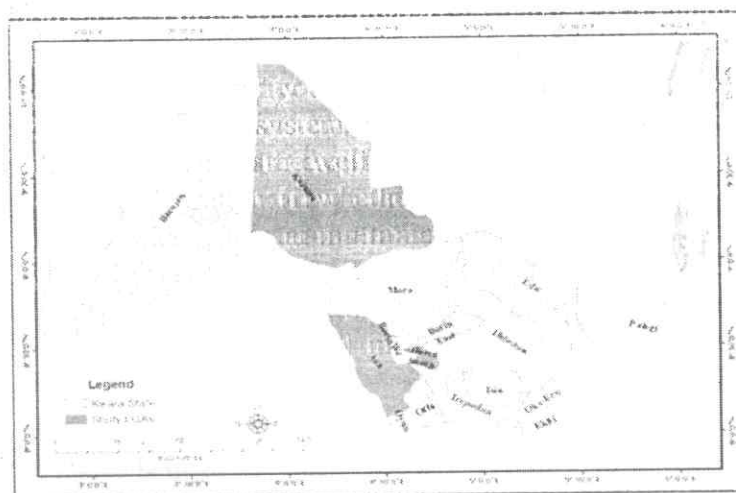


Figure 1: Map of Kwara state showing the study areas

Sampling Technique and Sample Size

A multi-stage sampling technique was adopted for the study. In the first stage of sampling, three Local Government Areas (LGAs); Ilorin South, Kaiama and Asa were purposefully selected within the State based on the preponderance of shea-butter production. At the second stage of sampling, two communities were randomly selected from each of the three LGAs to make a total of six communities for the study. These included: Apa-Ola and Fufu communities from Ilorin South; Tinga Aboki and Apagi from Kaiama and; Ogele and Oniyere from Asa. Further, a simple random sampling was used to select equal number of respondents (ten shea-butter producers) from each of the six communities to give a total of 60 respondents for the producers. Additionally, purposive sampling was used to select the major market in each of the three LGAs in order to sample the wholesalers and retailers of shea-butter. These markets were: Oja-Oba (Ilorin South LGA), Kaiama (Kaima LGA), and Alapa (Asa LGA). These markets have the majority of shea-butter wholesalers and retailers in the LGAs. A simple random sampling was further used to select 10 wholesalers and 10 retailers in each market to give total of 30 respondents each for the wholesalers and retailers. Table 1 shows the distribution of sample size among the different categories of respondents.

Table 1: Distribution of sample size among the different categories of respondents

Respondents Category	Local Government Area	Communities Sampled	Number of Respondents Sampled
Producers	Ilorin south	Apa-Ola	10
		Fufu	10
	Kaiama	Tinga Aboki	10
		Apagi	10
	Asa	Ogele	10
		Oniyere	10
		Total	60
Respondents Category	Local Government Area	Markets Sampled	Number of Respondents sampled
Wholesalers	Ilorin south	Oja-oba	10
	Asa	Alapa	10
	Kaiama	Kaiama	10
		Total	30
Respondents Category	Local Government Area	Markets Sampled	Number of Respondents sampled
Retailers	Ilorin south	Oja-oba	10
	Asa	Alapa	10
	Kaiama	Kaiama	10
		Total	30
Total Number of Respondents			120

Data were collected using three different sets of questionnaires that were administered to shea-butter producers, wholesalers and retailers. Data collected from producers include: source of shea-nuts, seasonality of shea-nuts, shea-nut collection/procurement, quantity of shea-nuts collected per day, methods used in producing shea-butter, and quantity of shea-butter produced weekly. Further information sourced from the respondents include cost incurred in the production of shea-butter, that is the fixed cost, variable cost (labour, cost of shea-nuts, firewood), and revenue generated.

The questionnaires for wholesalers and retailers focused on value addition through marketing including selling price and cost price, sources of capital, fixed costs,

variable costs, revenue generated, transportation costs, prices at various locations within the study area, packaging costs, input prices and constraints associated with marketing of shea-butter.

Data Analysis

Descriptive statistical tools, profit analysis, marketing margin and marketing efficiency tools were used to analyse the data generated for the study. Descriptive statistics were used to present the production variables of the actors involved in the production and marketing of shea-butter in the study area.

Profit analysis tools were used to examine the cost and return of the producers and marketers (wholesalers and retailers) of shea-butter in the area. These include:

I. Net Profit – This is a measure of the profitability of a venture after accounting for all costs. It is calculated using the formula below:

$$NP = TR - (TFC + TVC)$$

Where; **NP** = Net Profit, **TR** = Total Revenue, **TFC** = Total Fixed Cost, and **TVC** = Total Variable Cost

II. Rate of Return- This is a measure of the profit of an investment over a period of time expressed as a proportion of the original investment. It is calculated using the formula below:

$$ROR = NP/TC \times 100$$

Where; **ROR** = Rate of Return, **NP** = Net profit, and **TC** = Total cost

III. Benefit-Cost Ratio- This is used to measure the amount of monetary gain realized from the production of a product. It is mathematically expressed thus:

$$BCR = \frac{TC}{TR}$$

Where; **BCR** = Benefit cost Ratio, **TC** = Total cost, **TR** = Total revenue

The market performance was analysed using the marketing margin and the marketing efficiency tools as follows:

(V) Marketing Margin (MM)- This is a measure of the performance of a marketing system. It is used to analyse differences in price at different stages of time, form and place as it moves from the primary producer to the ultimate consumer.

$$MM = \frac{\text{Selling price} - \text{Purchase price}}{\text{Consumer price}} \times 100$$

(VI) Marketing Efficiency (ME)- This is defined as the maximization of the

ratio of output to input in marketing. It is used to ascertain the performance of a product in the market.

$$ME = \frac{\text{Value added through marketing}}{\text{Cost of marketing services}} \times 100$$

4. RESULTS AND DISCUSSION

Shea-butter production variables and technique in the study area

The shea tree produces fruits between May and August in the study area and this is period when shea nuts are collected or procured by producers. More than half of the producers (58.33%) sourced their fruits by collecting in fallow and farm lands, while 41.67% of them combined gathering and buying of the fruits. None of the producers had any modern equipment used in shea-butter production activities except the grinding machine employed in crushing the nuts. More than half of the producers (58.33%) uses plastics as their packaging material, while 36.67% and 3.00% use polythene bags and papers respectively. Production processes are often carried out on weekly basis (Table 2).

The production technique for shea-butter in the study area is still largely limited and imperfect. It involves collection of shea fruits from mother trees in farm and fallow lands. After collection, the sound fruits are separated from the bad ones. Thereafter, the good-quality ones are de-pulped by removing the fleshy pericarp. The nut is then shelled using a mortar and pestle. The shelled nuts are roasted in a pot using fuelwood as a major source of energy. The shelled roasted nuts are further milled using a grinding machine. The resultant paste is afterward mixed with water. The emulsion formed is boiled for two to three hours and the oil produced is collected over the residue. The oil is poured into a clean pot and boiled for about 30 minutes. The butter that is formed is left to cool for an average of 24 hours in order to solidify before packaging (Plates 1-10). Figure 2 shows the flow diagram of shea-butter production technique in the study area.

The above shows that the production technique for shea-butter in the study area is still largely traditional and limited. The production variables and techniques for shea-butter as reported in this study is similar to that found by Ademola, Oyesola and Osewa (2005) among shea-butter producers in Atisbo Local Government Area of Oyo State, southwest Nigeria. These variables and techniques as submitted by Hatskevich, Jenicek and Antwi-Darkwah (2011) often result in low shea-butter quality and quantity as well as low technical efficiency. The reason for using this local method could be that the modern technology is expensive and beyond the reach

of producers. Meanwhile, that a considerable proportion of producers (41.6%) combined gathering and buying of the shea-nuts, implies that it is possible for shea-nut collectors to sell to the producers within the value chain. This may help the producers to concentrate more on shea-butter production and thereby reducing stress. Moreover, inadequate shea-nuts is fast becoming a major constraint in shea-butter production (Amusa, Bada, Akinsanmi & Popoola, 2013). If shea-nuts are in low supply, optimum production of shea-butter cannot not be guaranteed. The implication is that the level of supply would remain low as demand for the product rises. Therefore, strategies to increase the supply of the nut should be put in place. This may include enforcing laws that will restrain the indiscriminate felling of shea trees, especially for charcoal production and other uses. A long-term solution would be to domesticate the shea-nut tree.

Table 2: Production variables of shea-butter in the Study Area

Variables	Frequency	Percentage
Seasonality of shea-nuts		
January – April	0	0.00
May – August	60	100.00
September – December	0	0.00
Source of shea-nuts		
Collection of Shea fruits under trees	35	58.33
Buying of Shea-nuts	0	0.00
Gathering and Buying of Shea-nuts	25	41.67
Packaging materials		
Plastics	35	58.33
Polythene bags	22	36.67
Others	3	5.00
Frequency of production		
Daily	2	3.33
Weekly	58	96.67
Monthly	0	0.00

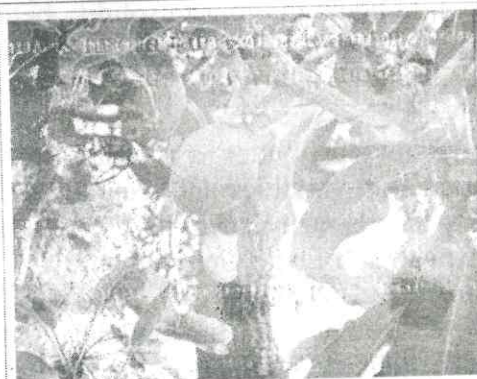


Plate 1: The shea tree (*Vitellaria paradoxa*, Gaertn)

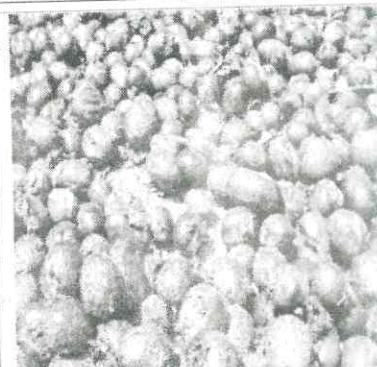


Plate 2: The shea-nuts

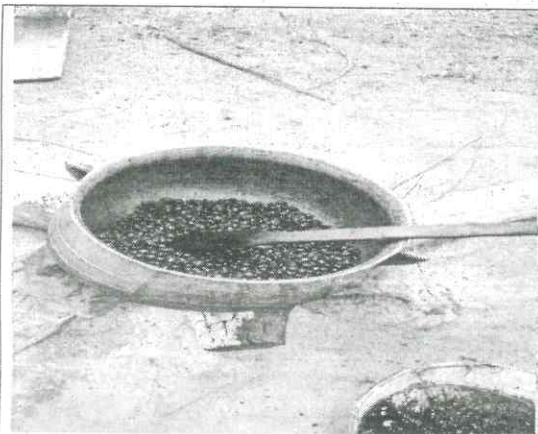


Plate 3: Roasting of shea-nuts

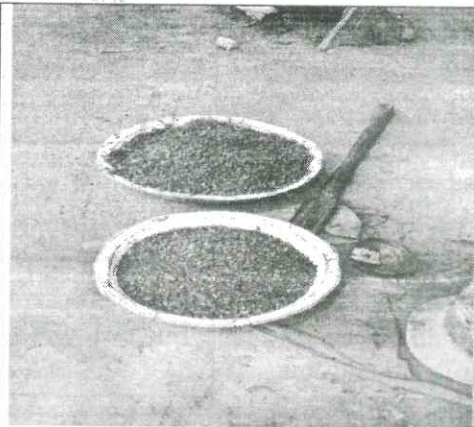


Plate 4: Crushed shea-nuts



Plate 4: Grinding machine for milling the nuts



Plate 6: Mixing of milled nuts/paste with water to form emulsion



Plate 9: Solidification Process



Plate 10: Shea-butter

Plates 1-10 showing production process of shea-butter

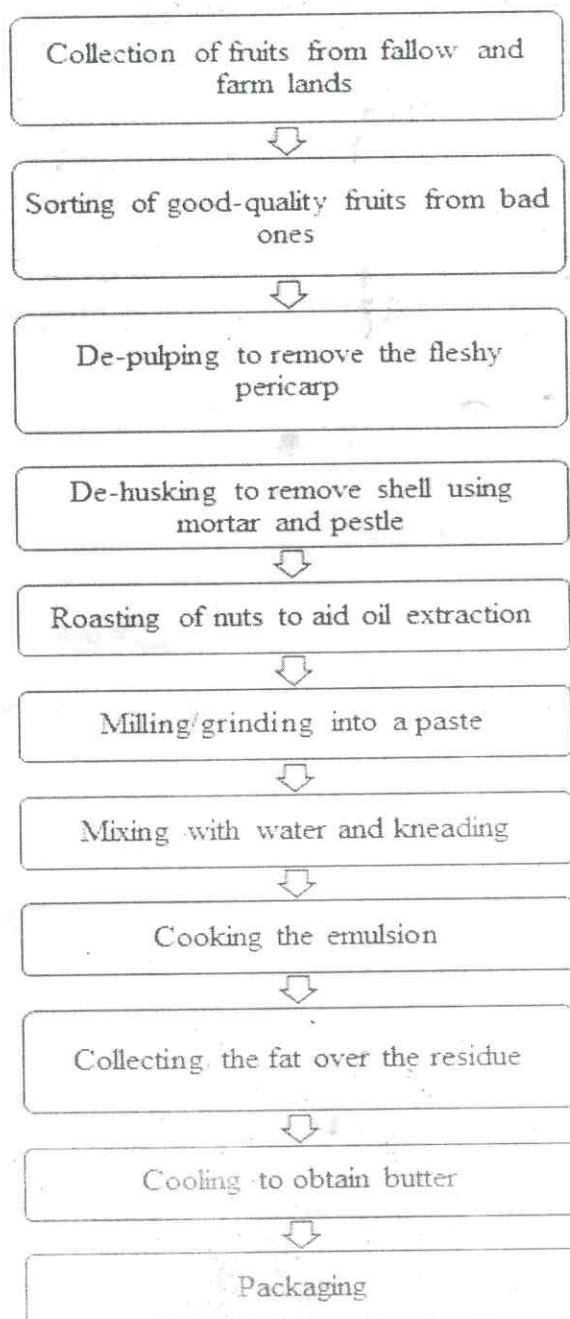


Figure 2: Flow Diagram of Shea-butter Production Technique in the Study Area

Average Cost and Returns of Shea-butter Among Producers, Wholesalers and Retailers

Transportation, labour, collection and fuelwood costs represent the major costs incurred by actors in the production and marketing of shea-butter. Table 3 shows that transportation cost, labour cost, collection cost and fuelwood cost were 29.18%, 26.30%, 24.50% and 24.50% respectively for the producers. The total revenue generated by the producers was N81,150.00 while average revenue was N1,352.50. Total variable cost was N31,360.00 (average variable cost was N522.67), total fixed cost was N26,310.00 (average fixed cost was N54.17) and total cost of production was N57,670.00 (average cost of production was N961.16). *The total profit made was N23,480.00, while the average profit was N391.33 per week.* The rate of return and benefit cost ratio were 28.10 and 1.41 respectively.

Among the wholesalers, transportation cost was 39.10%, packaging cost was 35.25% and payment of local government tax was 25.64%. The total variable cost was N23,400.00 (average variable cost was N780.00), total revenue was N54,550.00 (average revenue was N1,818.33) and the net profit was N31,150.00 (average net profit was N1,038.33 per week). For this group of respondents, the rate of return and benefit cost ratio were 19.10 and 2.33 respectively (Table 4).

For the retailers, transportation cost was 40.29%, packaging cost was 30.58% and payment of local government tax was 29.12%. The total variable cost was N10,300.00 (average variable cost was N343.33), total revenue was N28,550.00 (average revenue was N951.67) and the net profit was N18,250.00 while the average net profit was N6,08.33 per week. The rate of return and benefit-cost ratio were 16.70 and 2.77 (Table 5).

The above findings show that transportation cost is the most important variable cost incurred by all the actors in shea-butter production and marketing (29.18%, 39.10%, 40.29%). This finding contrasts with that of Ibrahim *et al.*, (2010) who reported 65.11% for labour cost among producers in their work on assessment of shea-butter processing among rural dwellers in Niger State. This disparity may be attributed to the producers in this study deriving labour from their family members. Meanwhile, total cost and revenue were highest for the producers compared to wholesalers and retailers (N31,360.00; N81,150.00, N23,400.00; N54,550.00, N10,300.00; N28,550.00). The wholesalers received the highest net profit (N31,150.00 per week), while the retailers received the lowest (N18,250.00). The rate of return on investment was highest for the producers (28.10), while the lowest was the retailers (16.70). On the other hand, the benefit-cost ratio was highest for the retailers (2.77) and lowest for the producers (1.41). These findings indicate that revenue from shea-

butter business is able to cover the total cost. It also shows that the business is profitable and has great potentials for increasing the income of rural women, who are the major actors in the value chain.

Table 3: Average Cost and Return of Shea-Butter for Producers per Week (N=60)

Cost Items	Amount (₦)	Average Cost (₦)	Return	% Cost
Variable Cost				
1. Collection Cost	7,710.00	128.5	-	24.50
2. Fuel Wood	6,250.00	104.16	-	19.92
3. Labour	8,250.00	137.50	-	26.30
4. Transport to Market	9,150.00	152.50	-	29.18
Total Variable Cost of Production (TVC)	31,360.00	522.67	-	100
Fixed Cost				
1. Pots	12,510.00	208.50	-	47.55
2. Bowl	4,300.00	71.66	-	16.34
3. Bucket	6,250.00	104.16	-	23.75
4. Calabash	3,250.00	54.17	-	12.35
Total Fixed Cost (TFC)	26,310.00	438.50	-	100
Total Cost of Production	57,670.00	961.16	-	-
Total Revenue of Production	81,150.00	-	-	-
Net Profit of Production	23,480.00	-	-	-
ROR			28.10	-
BCR			1.40	-

Table 4: Average Cost and Return of Shea-Butter for Wholesalers per week N=30

Cost Items	Amount (N)	Average Cost (N)	Return	% Cost
Variable Cost				
1. Transport to Market	9,150.00	305.00	-	39.10
2. Packaging Cost	8,250.00	171.67	-	35.25
3. Local Government Revenue	6,000.00	200.00	-	25.64
Total Variable Cost	23,400.00	780.00	-	-
Total Revenue	54,550.00	-	-	-
Net Profit	31,150.00	-	-	-
ROR	-	-	19.10	-
BCR	-	-	2.33	-

Table 5: Average Cost and Return of Shea-Butter for Retailers per week (N=30)

Cost Items	Amount (N)	Average Cost (N)	Return	% Cost
Variable Cost				
1. Transport to Market	4,150.00	138.33	-	40.29
2. Packaging/Repackaging Cost	3,150.00	105.00	-	30.58
3. Local Government Revenue	3,000.00	100.00	-	29.12
Total Variable Cost	10,300.00	343.33	-	-
Total Revenue	28,550.00	-	-	-
Net Profit	18,250.00	-	-	-
ROR	-	-	16.70	-
BCR	-	-	2.77	-

Marketing Margin and Market Efficiency Among Producers, Wholesalers and Retailers

Table 6 shows the purchase, selling and consumer's price, as well as marketing margins of 1kg worth of shea-butter in the study area. The purchase prices were N19,500.00 and N25,500.00, while the selling prices were N25,500.00 and N27,000.00 for wholesalers and retailers respectively. The consumer's price was found to be N27,000.00. Based on the above, the estimated marketing margins for the wholesalers and retailers were 22.20% and 5.56% respectively, while the gross marketing margin was found to be 27.76%. The share of shea-butter producer was 72.24% of the consumer's price. Value added to shea-butter through marketing by the wholesalers was N7,500.00, while it was N1,500.00 for the retailers. This translates to marketing efficiency of 961.54% and 436.90% for the wholesalers and retailers respectively (Table 7). The marketing costs including marketing margin from the

producer to the point of sale by retailer was 27.78% of the price paid by the consumer. This was the maximum share of price-spread, and was received by the wholesaler as profit. Estimates of marketing efficiency showed that efficiency of wholesaler (961.54%) is more than that of the retailer (436.90%) owing to the fact that the wholesaler's margins are more than the marketing cost. It is obvious that producers had larger share of the gross marketing margin, which implies that the market performance of shea-butter business has a higher degree of profitability amongst the producers than the wholesalers and retailers within the study area. It also showed that there is a wide price variation along the marketing chain of shea-butter for producers compared to wholesalers and retailers. Nevertheless, since marketing efficiencies for all the actors were greater than 100%, it implies that there are certain degrees of market efficiency in the production of shea-butter in the study area, although wholesalers were more efficient than retailers. This agrees with the findings of Garba and Sanni (2015).

Table 6: Estimated Marketing Margin Among Producers, Wholesalers and Retailers

Price*	Wholesalers	Retailers	Producers
Purchase Price (₦)	19,500.00	25,500.00	
Selling Price (₦)	25,500.00	27,000.00	
Consumers Price (₦)	27,000.00	27,000.00	
Marketing Margin (MM)	0.2222 (22.20%)	0.0556% (5.56%)	0.7224% (72.24%)
Gross Marketing Margin (GMM) = 27.76%			

*1kg = ₦650

Table 7: Marketing Efficiency of Shea-Butter

Marketing Costs	Wholesalers	Retailers
Purchase Price (₦)	19,500.00	25,500.00
Consumer's Price (₦)	27,000.00	27,000.00
Value Added (₦)	7,500.00	1,500.00
Total Marketing Cost ((₦)	780.00	343.33
Marketing Efficiency (ME)	9.6154 (961.54%)	4.3690 (436.90%)

5. CONCLUSION

The production and marketing of shea-butter in the study area is profitable. It has great potentials for increasing the income of rural women, who are the major actors in the value chain. There are some levels of market efficiency in the trade of shea-butter in the study area, although wholesalers were more efficient than retailers. Despite this, the production technique for shea-butter in the study area is still largely limited and imperfect. Moreover, inadequate shea-nuts is fast becoming a major constraint in shea-butter production. Transportation, labour, collection and fuelwood

costs represent the major costs incurred by actors in the production and marketing of shea-butter.

6. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

- (i) In order to enhance production of shea-butter in the study area, improved production methods should be adopted. This will help in reducing cost and man hours involved. Reduction in cost will help increase profit margin among the producers, while reduced man hours will also help in lessening drudgery associated with shea-butter production using the traditional method.
- (ii) In order to guarantee optimum production of shea-butter, the level of supply of shea nut must be enhanced by focusing on domestication of the shea tree. This should also include enforcing laws that will restrain the indiscriminate felling of shea trees, especially for charcoal production and other uses.
- (iii) There is need for product differentiation through innovative concepts among the wholesalers and retailers. This will help increase their share of the gross marketing margin.

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