

## Shea Butter Processing Activities of Rural Women in Niger State

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### Abstract

*The study assessed shea butter processing activities of rural women in Niger State. Specifically, it examined the demographic status of the Shea butter processors, examined the improved method of shea butter processing technologies, determined factors that affect the output of the processors, determined the profitability of Shea butter processing, examined the trading chain and volume of shea butter sold and identified problems faced by the Shea butter processors. Three Local Government Area (LGA's), from each of the three agricultural zones of the State were purposively selected. A total of 24 villages were randomly sampled from these LGA's based on the preponderance of Shea butter processors. respondents were randomly selected to give a total of 105. Findings show that majority (89%) of the respondents were within the age range of 21-40 and majority (96%) were married while only few (29%) of them had formal education. More so majority (76%) of the respondents had house hold size ranging from 6-15 and (86%) of the respondents had between 11-20 years processing experience. Furthermore only few (23.8%) of them were a member of cooperative and majority (85.7%) were full-time processors. The study revealed that all (100%) of the respondents combined traditional and mechanical methods of shea butter processing and do not refine their Shea butter. Semi-log was chosen as lead equation with the  $R^2$  .49 and F-value 17.04. The analysis of costs and returns indicated that, Shea butter processing is profitable with gross margin of ₦9,641.11 per 100 liters of shea butter. The gross income was ₦16,000.00 which is greater than total cost of ₦6,391.39, gross ratio of 0.40 with return per capital invested of 1.52. The major buyers of shea butter are local consumers and mechanical shea butter processors with purchasing power of 10% and 90% respectively. The major problems faced by the processors were lack of modern processing equipment and inaccessibility to laboratory for quality control. It was recommended that, Shea butter processors should be sensitized by extension workers to optimally harness shea nuts potential to meet global demand; respondents should form co-operative societies and sustain existing ones. Also practical lessons on the Shea butter grade specifications should be organized for the Shea butter processors in form of adult education. It was advocated that, Shea butter village (SBV) be established in three agro-ecological zones of the state in order to enjoy the benefit of common facilities, such as power, processing equipment and laboratory for quality control.*

**Keywords:** Carcinogenic, cluster, processing, and shea butter.

## INTRODUCTION

As with most other states in Nigeria, majority of the population of Niger State reside in rural areas where agriculture is the principal means of their livelihood. One important agricultural activity of the state's rural women is shea nut collection and processing as well as marketing of shea butter. Shea nut is a seed obtained from shea butter tree, *Vitellara paradoxa*, which grows wild in many parts of West and East Africa. In Nigeria, Niger state ranks first in terms of density and distribution of shea butter trees (FAO, 1999). Today shea trees produce the second most important oil crop in Africa after oil palm (Poulsen, 1990). Farmers extract varieties of non-timber products from forest to consume or to generate income. The level of income received is relatively low when compared with the potentials. This is attributable to several factors. First, the handling and processing method often adopted result in low quality nuts and butter which fetch low price and reduce access to international market. Secondly, most of the processors operate in small, scattered and remote units which make access to market difficult, resulting in low price. More so, they lack bargaining power as individuals. This frequently places them at the mercy of middle men who usually go in to rural areas to purchase the nuts and/or butter.

The butter tree is economically important (Abbot, 1993), the fruits are used as a source of vegetable fats because the seed contains up to 50% oil. In all, the demand for shea nut products will keep increasing with population and industrial growth thereby widening the gap between demand and supply. Therefore in order to transform shea butter processing from marginal economic activities in the state into a veritable vehicle for poverty alleviation and women employment, there is need to give insight into shea butter processing with a view to show potential profitability to citizenry who might be willing to invest in shea nuts production. For Nigeria shea butter farmers to make the maximum benefit from shea butter business, extension workers will certainly have a significant role to play in this direction.

The broad objective of the study is an assessment of shea butter processing among rural women in Niger State. The specific objectives are to:

- (i) describe the socio-economic characteristics of shea butter processors;
- (ii) examine various improved shea butter processing technologies;
- (iii) examine factors affecting the output of the shea butter processed;
- (iv) determine the profitability of shea butter processing;
- (v) examine the trading chain and volume of shea butter sold; and
- (vi) identify the major constraints to shea butter processing.

## METHODOLOGY

The study was conducted in Niger State, Nigeria. It is located in Guinea Savannah region. The area has population of about 3,950,249 people (National Population Commission (NPC), 2006). The state experiences distinct dry and wet season with annual rainfall ranging from 1,100mm -1600mm south, temperature ranges between 20°C-25°C, it lies between 6°8'1"-6°31' E and 8°29'1"-8°44'1" longitude. The soil is light, grey and light brown in colour. The vegetation is mainly short grass and shrubs with scattered trees. Multi- stage sampling technique was used. The state was stratified into three in accordance with three agricultural zones. One local government area (LGA) was purposively selected from each of the agricultural zones, namely: Katcha, Paiko and Wushishi because of the preponderance of processors in the areas. Four districts with two villages each were selected randomly from zone A and B while zone C had only two district and eight villages. Then, 105 respondents were randomly selected with the number of respondents sampled from each of the twenty-four villages depending on the relative size in the proportion to the total. Data were collected using interview schedule. Data were analyzed with descriptive statistics (frequency and percentages) and profitability model. Chi-square was used to test hypothesis.

## RESULTS AND DISCUSSION

### *Demographic status of the respondents*

Majority (88%) of respondents were within the age range of 21-40 years. This means that the processors still possess physical strength for shea butter processing when provided with necessary incentives needed to carry out the operations. Only (10%) of respondents were within the age of 41-50 years. About 96% of respondents were married. This is in-line with the finding of Ojo and Mohammed (2008) who reveal that more than 96 per cent of their respondents were married. The implication is that the respondents were more likely to have children to support them in their processing of shea butter. The study reveals that majority (76%) of the respondents had household size ranging from 6-15. This almost agrees with finding of Adeoti (2001) and Ndanitsa (2005) who in their separate studies found average family size of 10 and 11, respectively. The study shows that only 28.6% had formal education. This is in line with the findings of Ndanitsa (2005) and Tsoho (2005) who in separate studies reported that rural farmers are characterized by low level of literacy.

Further more, about 86 per cent of the respondents had between 11-20 years of processing experience.

**TABLE 1: Demographic and socio economic status of the shea butter processors**

Age	Frequency	Percentage
>20	3	3
21-30	56	53
31-40	37	35
41-50	9	9
<50	0	0
<b>Marital status</b>		
Married	100	95.2
Single	5	4.8
<b>House hold size</b>		
1-5	5	5
6-10	24	28
11-15	51	48
16-20	20	19
<b>Educational level</b>		
Qura'nic education	10	9.5
Primary education	25	23.8
Secondary education	5	4.8
Tertiary education	0	0
"Illiterate"	65	61.9
<b>Processing experience</b>		
1-10	10	9.5
11-20	90	85.7
21-30	5	4.8
<31	0	0
<b>Membership of cooperative</b>		
Member	25	23.8
Non-member	80	71.2
<b>Occupation</b>		
Full-time processors	90	85.7
Part time processors	10	9.5
Civil servant	0	0
Other business	5	4.8
<b>Total</b>	<b>105</b>	<b>100</b>

Source; Field Survey, 2010

**Method of Shea butter processing;** Processing of shea nut into butter is done by one of the following method or combination of both. The methods are traditional, mechanical and solvents. However, the method used by the processors depends on; the use of the extracted oil, availability of the equipment and technical know-how.

**TABLE 2: Distribution of respondents by method of Shea butter processing**

Methods	Frequency	Percentage
Traditional only	0	0
Mechanical only	0	0
Chemical only	0	0
Traditional and Mechanical	105	100
<b>Total</b>	<b>105</b>	<b>100</b>

*Source: Field Survey, 2010*

Table 2 reveals that all (100%) the respondents used the combination of traditional and mechanical method. This study goes contrary to findings of Adgidzi (1999). In his study he found that traditional method of shea butter processing was the only method used at village level. The implication of this is that processors of Shea butter have started responding to modern way of processing shea butter.

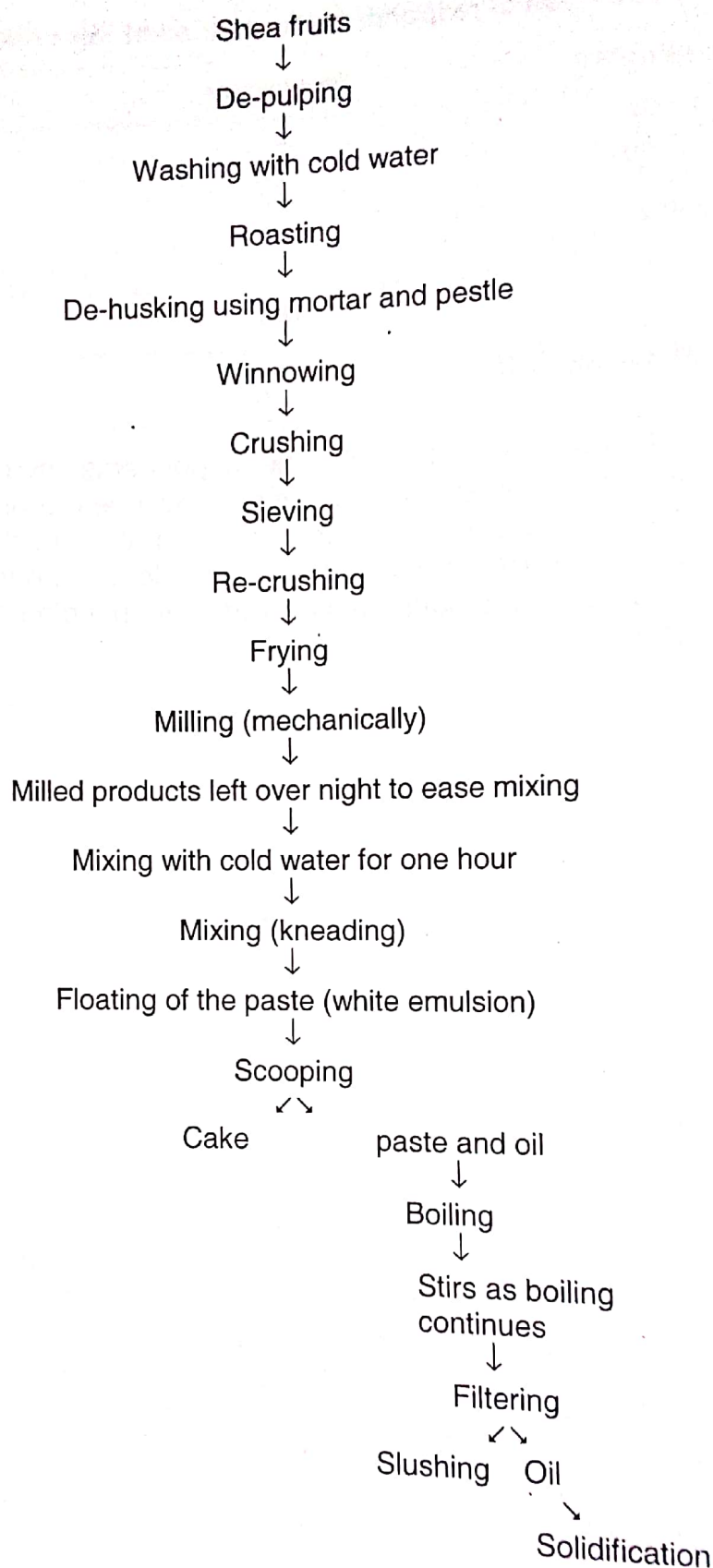


Figure 1: Shea butter value chain  
Source; Field survey, 2010

### Factors affecting output

Table 3 shows semi-log production function was chosen as the lead equation on the basis of the values of  $R^2$  values, t-value, as well as the sign of estimated parameters; The results gave the  $R^2$  0.49; F-value was 17.04 and significant at ( $p < 0.01$ ) which implies that the independents variables adequately explained the dependents variable.

The regression co-efficient of  $X_5$  membership of cooperative,  $X_8$  quantity of the nuts;  $X_9$  labour  $X_{10}$  firewood and  $X_{11}$  Cost of capital were positive and statistically significant indicating that increment in these factors holding other factors constant will lead to an increase in the gross output specifically the shea nuts  $X_8$ , labour  $X_9$ ; fire wood  $X_{10}$  and capital  $X_{11}$  which had coefficient of 1413.15; 1142.26; 583.51 and 1042.43 were positive and statistically significant at 1 percent which implies that there is positive and statistically significant relationship between those variables and the quantity of butter.

**TABLE 3: Estimated semi-log production function (lead equation)**

Variables	Regression coefficient	Standard error	T-Value
Constant	-23356.66	3140.77	-7.43***
Age $X_1$	-166.09	561.64	-.30NS
House hold size $X_2$	-113.11	271.47	-.42NS
Education $X_3$	-989.17	389.54	-.2.5**
Yrs of experience $X_4$	-115.03	320.47	-0.36NS
Member of coop $X_5$	305.64	541.49	0.56*
Extension contact $X_6$	3.81	640.31	.006NS
Personal income $X_7$	30.46	171.19	0.18NS
Quantity of nut $X_8$	1413.15	260.96	5.42***
Labour $X_9$	1142.26	349.19	3.27***
Fire wood $X_{10}$	583.51	174.61	3.34***
Fixed inputs $X_{11}$	1042.43	194.38	5.36***
$R^2$	.49		
Adjusted $R^2$	.46		
F- Value	17.04***		

N.B \*\*\*= Significant at 1%  
 \*\*= Significant at 5%  
 \*= Significant at 10%  
 NS= Not significant.

Source: Field survey data, 2010

### Costs and returns analysis

Table 4 shows the average costs and returns structure of shea butter processors in the study area. Results indicates that family labour costs accounted for about 25.69% and mechanical labour costs accounted for 21.90% of the total costs of shea butter processing while total variable costs accounted for overwhelming 99.48% of the total costs of shea butter processed. The net income was ₦9,608.61 with gross margin of ₦9,641.11 and Returns on capital invested stood at ₦1.52k. Also gross ratio was 0.40.

**TABLE 4: Costs and returns structure of the respondents**

Items (N)	Cost /100liters of shea butter	Percentage of total costs
<b>Variable costs</b>		42.24
Cost of shea nuts	2,700.00	4.17
Cost of fire wood	266.67	3.13
Cost of transportation	200.00	25.69
Cost of family labour	1,642.22	21.90
Cost of mechanical labour	1,400.00	2.35
Cost of water	150.00	99.48
Total variable cost	6,358.89	
<b>Fixed Cost</b>		0.51
Depreciation on tools	32.50	100.00
<b>Total cost</b>	6,391.39	
<b>Returns</b>		
Gross income = NI+TC	16,000.00	
Net income = GI-TC	9,608.61	
Gross margin=GI-TVC	9,641.11	
Gross ratio = TC/GI	0.40	
Return per capital invested=GM/TVC	1.52	

Source: Computed from field survey, 2010

The net income was determined using average values of fixed cost, variable cost and revenue. The cost and return analysis in Table 4 shows the major components of variable cost in shea butter processing are shea nut, family labour and mechanical labour. Majority (90%) of the total cost of shea butter processing accounted for their variable cost. This finding agrees with those of Baba *et. al.*, (1998), Ibrahim *et.al.*, (2005) and Tsoho (2005) who in their separate studies found that variable cost accounted for 99%, 95.20% and 92.55% of the total cost, respectively. The total variable cost of shea butter processing was ₦28,669.18. Family labour ranked highest (36.65%) followed by mechanical labour (28.46%). Fixed cost on the other hand accounted for only (0.51%) of the total cost. This again confirms that fixed capital invested in the study area is low. The net income per annum for the processors was ₦34,722.73/annum, with the return on capital invested reaching 122% while gross ratio is 0.45. The entire ratio was less than 1, this indicates that shea butter processing is profitable and has great potentials for increasing rural income. This finding is in line with those of Idiong (2005), Erhabor and Kalu (1990), Baba (1993) and Baba and Etuk (1990) who recorded a high positive financial return to fadama farming.

The figure below shows trading chain and trading volume of traditional shea butter processing.



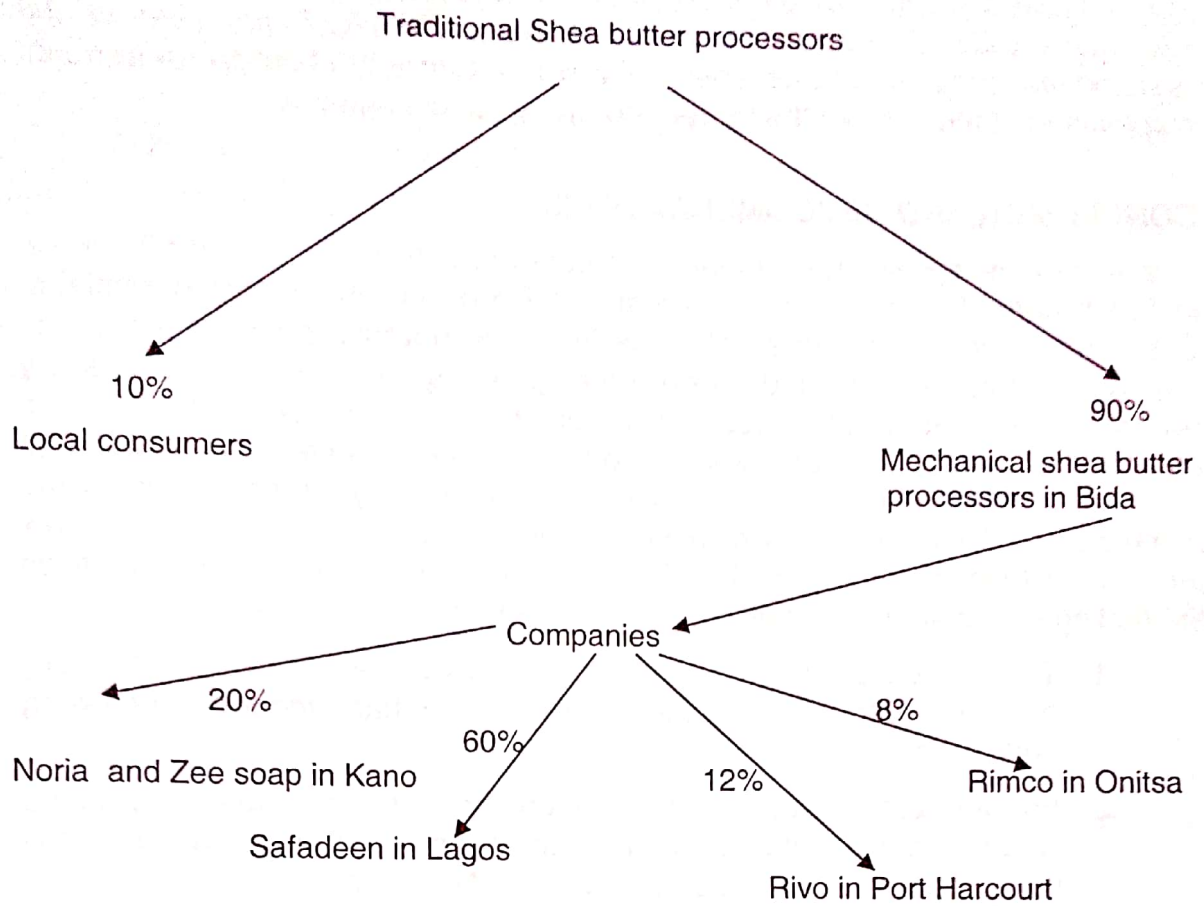


Figure 2: Shea butter trading chain and trading volume in the study area.

**TABLE 5: Distribution of respondents according to the problems n=210**

Problem	Frequency*	Percentage
Labour shortage	15	7.14
Price incentive	120	57.14
Quality of butter	25	11.90
Lack of processing machine	200	95.24
Distance from market	30	14.29
High cost of milling	170	80.95
Lack of credit facility	45	21.43
High cost of fire wood	15	7.14
In accessibility to laboratory	200	95.24

\*Multiple responses

N= Sample Size

Source: Field Survey, 2010

Table 5 shows that about 95.24 per cent of the respondents complain of non-availability of processing machines and only 28.57 per cent of the respondents complain of high cost of fire wood. Similarly about 57.14 per cent complained of the price of the butter offered by the consumers.

## CONCLUSION AND RECOMMENDATIONS

The study aimed at assessment of Shea butter processing among rural women in Niger state. The study revealed that in spite of the abundance potential of Shea butter trees in the state, the Shea fruit were not fully explored or tapped. The respondents in the study area were generally small scales. The study revealed that Shea butter processing is profitable. The average total revenue is greater than the average total cost of producing of shea butter. This means that the area has great potentials to increase the quantity of shea butter and processor's income, if offer are made for the widespread of adoption of new processing technologies and identifies constraints were addressed. Base on the finding of this study, the following recommendations were made.

1. The processors should form cooperative societies so that they can pool their resources together in other to purchase modern processing equipment,
2. Furthermore Shea butter association should be re-awakened and the Headquarter be situated in Niger state since the large portion of the nut that goes for export originated from Niger state.
3. Shea butter village be established in three agro-ecological zone in the state.

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