Assessment of Shea Nut Processing Among Rural Households In Fakai Local Government Area of Kebbi State, Nigeria

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Abstract: This study aimed at assessing Shea nut processing among rural households in Fakai Local Government Area of Kebbi State, Nigeria. Proportionate random sampling technique was used to select one hundred and two (102) Shea nut processors. Primary data were collected with aid of interview schedule and data analysis was carried out using descriptive statistics. Result revealed that 91.2% of Shea nut processors are mainly females, 49% aged 51 and above years, 73.5% of the processors are married, while 37.3% had no formal education. About 35.3% of the processors are farmers, while majority (60.8%) of the processors had between 16 – 20 years' experience in Shea nut processing. However, the processing techniques are manual, time consuming, and highly demanding. There are limited market opportunities for the product. Besides, inadequate credit facilities, processing drudgery and inadequate storage facilities were the most severe constraints of the processors. It could be concluded that processing techniques are manual, time consuming, and highly demanding. There are limited market opportunities for the product. It is recommended that Federal Government should curb importation of products of Shea nut/butter origin to stimulate the establishment local industries that will use Shea nut/butter as raw materials. This will lead to mechanisation and commercialisation of the sub-sector. Extension should help locate Shea butter markets and motivate processors to meet specifications.

Key words: Shea nut, Processing, Rural, Households, Fakai.

1.0 Introduction

Scientifically, shea tree is known in the past as 'Butryospermum paradoxum', but is now called 'Vitellaria paradoxa'. It is widely spread across the savannah regions of Nigeria. The Shea tree grows very well on a wide range of soils, including highly degraded, arid, and semi-arid and rocky soil. (Dogbevi, 2007). Shea fruits consist of a thin *epicarp* and a soft *mesocarp* enclosing a single seed (occasionally two to four seeds). The *epicarp* and *mesocarp* together make up 33–75% of the fresh fruit weight, with an average of 55% (Elias, *et al.,* 2006). Shea tree is the most prevalent arboreal species of West African parklands, which provide vital products and ecological services to the semi-arid region. The resource's main traditional role associated with its oil (Shea butter), extracted from Shea kernels, that represents the primary source of fat in local diets. Shea also contributes to the generation of crucial foreign exchange revenues in many countries of the sub-region, ranking third among exports from Burkina Faso in the 1980s (Lamien *et al*., 2007).

Traditionally, African women involve in collection of Shea nuts which are transformed into a pure, pale yellow butter after a long conditioning and cooking process. While nut gathering and processing were formerly exclusively rural activities, many factors have led to the expansion of urban Shea projects. It is widely known and used as a skin ointment and for skin care and hair care, as well as for hydrating, protecting and massaging babies. The roots, leaves, and bark of the tree are also used medicinally for treating mouth sores, boils, burns, diarrhoea, as a vermifuge, and as eyewash against spitting cobra venom (Lamien *et al*., 2007). Large *Vitellaria* trunks may be used to make mortars for pounding grain. The wood is also used in building construction and is made into charcoal. The Shea tree constitutes an important source of raw material for gum and rubber industries. The Shea fruit also serve as a source of food to many people and as an income generating activity for most of the women that gather the fruits as the ripening of the fruits coincide with the lean season of food crops production. The Shea tree can be used to combat the problem of desertification. Men, women, and children eat and appreciate the pulp. Fresh fruits are also sold in local markets. However, despite the economic and environmental benefits of the tree, efforts have not been made to propagate its production by the farmers as the Shea tree still grows in the wild state. Another worrisome development is the people's habit of destroying the trees for charcoal production which may eventually lead to environmental degradation, deforestation and loss of vegetative cover and resulting to water and soil erosion. Non-replacement or domestication of the Shea trees may lead to its extinction in the nearest future (Dogbevi, 2007).

Traditionally, Shea nut processing into butter involves knowledge that has been passed on from generation to generation. Only women are involved in the traditional extraction business, which is hard work, time consuming and labour intensive. The wide variability in Shea butter quality has been mainly attributed to the various traditional processing methods used (Kapseu *et. al.,* 2005; Womeni *et. al*., 2006). Despite the huge and wide usage, Shea butter being processed in Nigeria is characterized by low quality and quantity. The inefficiency of the processing techniques lowers the quantity of Shea butter available in the market. Shea butter processing in West Africa involves minimum mechanical input, heavy drudgery and high input of firewood, which has a direct effect on the quality of Shea butter (Carette *et. al.,* 2009). The low quality of Shea butter is thus a concern, as it falls below international standard. Consequently, demand is decreasing and the potentials of Shea butter in alleviating rural poverty is dwindling, necessitating an assessment of the processing techniques.

2.0 Methodology

Fakai Local Government Area (LGA) is one of the twenty one Local Government Areas (LGAs) of Kebbi State. The Local Government Area was carved out of the old Zuru Local Government Area and is located within latitude $11^{o}50'$ and longitude $5^{o}11'$ E of the equator approximately (Augie and Lawal, 1990). Fakai LGA is geographically located in the south-eastern part of the state. The estimated population of the LGA is 121,212 people (NPC., 2006). The weather is marked by a single rainy season and long dry season, the average rainfall is 1025mm/annum, the rainy season is between May to October, the rainy season last for four – five months. The climatic condition of the area is characterized by hot and wet season as in the tropics; the month of November to January is the harmattan period. The soil type is sandy loam and rich, which makes it suitable for agriculture (Augie and Lawal, 1990). Fakai Local Government Area comprises of four administrative districts namely; Bajida, Birnin Tudu, Fakai and Marafa. Multi-stage sampling technique was used for the study. The first stage involves selecting two villages in all the districts purposively; this is because of the concentration of Shea nut processors in this villages. The second stage involves selecting Shea nut processors using proportionate random sampling from a sampling frame. Thus, a total of one hundred and two (102) Shea nut processors constitute the sample size for the study. Data were analysed using descriptive statistics such as frequency count and percentage.

3.0 Results and Discussion

3.1 Socio-economic Characteristics of Shea Nut Processors

Age is a crucial factor in agricultural production, as young, active and virile farmers are expected to be more productive than old farmers. Table 4.1 shows that 49.0% of the processors are between ages 51 and above, implying that weak labour and probable laggards dominate Shea nut processing. On the other hand, the productive activities of males and females in agriculture are very important and must be taken into consideration. Majority (91.2%) of the processors are female, corroborating Cocoa Research Institute of Ghana (2007) that women are more involved in the processing of Shea nut. Majority (73.5%) of the processors are married indicating that they have responsibilities of their households to meet.

Table 1: Socio-economic Characteristics of Shea Nut Processors

Parameters	Frequency	Percentage
Age		
20 – 30	12	11.7
31 – 40	29	28.4
41 - 50	11	10.9
51 and above	50	49.0
Total	**102**	**100**
Sex		
Male	9	8.8
Female	93	91.2
Total	**102**	**100**
Marital Status		
Married	75	73.5
Single	27	26.5
Total	**102**	**100**
Educational Background		
No formal education	38	37.3
Primary education	29	28.4
Secondary education	34	33.3
Tertiary education	1	1.0
Total	**102**	**100**
Primary Occupation		
Civil Servant	13	12.7
Trading	33	32.4
Farming	36	35.3
Shea Butter Processing	20	19.6
Total	**102**	**100**
Shea Nut Processing Experience		
1 – 5	5	4.9
6 – 10	9	8.8
11 – 15	26	25.5
16 – 20	62	60.8
Total	**102**	**100**

Source: Field Survey Data and Computation by the Researcher, (2014).

The predominance of married processors suggests that they are deriving some form of support from family members. Chalfin (2004) opined that education is a variable that determines the ability of a respondent to access and understand information. Result shows that 37.3% have no formal education, inferring illiteracy and difficulties in accepting innovation. About 35.3% of the processors have their primary occupation to be farming, indicating that the study area is rural based.

Result also revealed that majority (60.8%) of the processors had experience in processing between 16 – 20 years, 25.5% had experience of 11 – 15 years, and 8.8% had experience of about 6 – 10 years, while 4.9% of the processors had experience between 1 – 5 years. Years of experience in agricultural production helps in determining the accuracy in decision making and in allocation of scarce resources wisely. Oluwatayo *et. al.* (2008) reported that farmers with more experience would be more efficient, have better understanding of the environment and market situations.

3.2 Shea nut Processing Techniques

The processing techniques in table 4.2 are the ones found in practice in the study area. Majority (95.8%) of the processors pick fruits once in a week The hygiene practices in the processing is low, as the processors have little hygienic attitude, with 96.1% of them not washing the fruits before eating/de-pulping. Drying of seeds take a number of days, as majority (87.9%) of the processors always have seeds being dried every day. Only the healthy seeds should be used in processing, but 58.0% of the processors do not select the best of seeds, but use all. About 97.6% of the processors do not crack the seeds with machine, showing the low level of mechanization in the process. Roasting, milling, boiling, and cold water mixing are done averagely either twice a month or once a week. Majority (89.5%) of the processors do not do cold water separation, meaning that there is unacceptable moisture content in the finished product. Filtration, solidification, packaging, and standardization are fairly done once a week, twice a month, or once a month. Result shows the tedious nature of Shea butter processing, corroborating (Carette *et. al.,* 2009).

Table 2: Distribution of Shea Nut processors According to processing techniques

Processing Techniques	No (%)	Yes (%)				
		OM	TM	OW	TW	Daily
Picking of fruits	-	-	0.9	95.8	1.7	1.6
Washing of fruits	96.1	-	0.8	1.6	1.5	-
De-pulping	3.3	-	4.2	21.7	57.5	13.3
Drying of seeds	0.3	-	0.7	3.0	8.1	87.9
Seed selection	58.0	2.5	14.2	11.7	7.8	5.8
Seed cracking by hand	5.8	9.2	23.3	43.3	10.8	7.5
Seed cracking by machine	97.6	2.4	-	-	-	-
Roasting of kernels	-	26.7	32.5	35.8	3.3	1.7
Milling of kernels	-	27.5	35.8	38.5	0.8	-
Boiling of grounded kernels		7.5	25.0	31.7	34.2	1.6 -
Kneading into dough	-	29.2	33.3	36.7	0.8	-
Cold water mixing	1.7	27.5	35.0	35.0	0.8	-
Cold water separation	89.5	5.0	5.5	-	-	-
Filtration	-	29.2	36.7	33.3	0.8	-
Solidification	-	29.2	36.7	33.3	0.8	-
Packaging	-	33.3	29.2	36.7	0.8	-
Standardization	-	29.2	33.3 36.7	0.8	-	

Source: Field Survey Data and Computation by the Researcher, (2014).   *Multiple Responses   OM = Once in a Month, TM = Twice in a Month, OW = Once in a Week and TW = Twice in a Week.

3.3 Marketing Outlets of Shea nut Processors

Table 4.3 revealed that marketing to wholesalers and retailers occur majorly (87.9% and 74.3%, respectively) once a week. Consumers in the community hardly constitute part of the market, as Shea butter processing is an art known to almost all in the community; those that do not produce for the market produce for personal consumption. Also, there is little direct trade of the product as 67%, 99.3%,

85.8% of the processors do not sell to consumers outside their communities, food companies in cities, and cosmetics companies in cities respectively. None of the processors sell to traditional hospitals because the latter produces what it requires and they neither sell internationally. There is either little sensitization of the public and industries of the efficacy of Shea butter or distrust in its quality, as also opined by (Hayes and Lence, 2004).

Table 3: Distribution of Shea Nut Processors According to marketing outlets

Marketing Outlets	No (%)	Yes (%)				
		OM	TM	OW	TW	Daily
Wholesalers	5.0	6.8	-	87.9	-	0.5
Retailers	2.5	20.7	1.7	74.3	0.8	-
Consumers within community	89.2	3.3	0.8	4.2	-	2.5
Consumers outside communities	67.0	8.2	-	24.8	-	-
Food companies in cities	99.3	-	-	0.7	-	-
Cosmetics companies in cities	85.8	9.8	4.3	-	-	-
Traditional hospitals	100.0	-	-	-	-	-
Exports	100.0	-	-	-	-	-

Source: Field Survey Data and Computation by the Researcher, (2014).   *Multiple Responses   OM = Once in a Month, TM = Twice in a Month, OW = Once in a Week and TW = Twice in a Week.

3.4 Quantity of Shea Butter Produced

Table 4: Distribution of Shea Nut processors' According to Quantity of Shea Butter Produced

Quantity (kg)	Frequency	Percentage
1 – 10	36	35.3
11 – 20	25	24.5
21 – 30	14	13.7
31 – 40	11	10.8
41 – 50	9	8.8
Above 50	7	6.9
Total	**102**	**100**

Source: Field Survey Data and Computation by the Researcher, (2014).

Table 4.4 revealed that 35.3% of the processors produced between 1 - 10kg of Shea butter a month, 24.5% produced 11 – 20kg per month, 13.7% produced 21 – 30kg per month, 10.8% produced 31 – 40kg per month, 8.8% produced 41 – 50kg per month and 6.9% of the processors produced above 50kg per month. This implies that there is a large room for increase in production, reinstating Bonkoungou (2005) that it cost too much to produce because of drudgery involved, so only little can be produced, even though that Shea nut are in abundant supply in the study area.

3.5 Constraints Faced by Shea nut Processors

Majority of the processors responded that inadequate of credit facility is a very severe constraint in Shea butter production as it is often the case among rural practitioners as submitted by Oyesola *et. al.* (2010). Table 4.5 also indicated that Shea nuts are in abundant supply in the area, but drudgery in Shea nut processing is a constraint that limits both quality and quantity of Shea butter available for the market. Transportation problem is not a constraint, because is easily transported to the market; and labour is also not a constraint, as household labour is sufficient.

Table 5: Distribution of Shea Nut processors According to constraints Faced

Constraints	No (%)	Yes (%)		
		NS	S	VS
Inadequate credit facilities	2.1	4.7	10.3	82.9
Limited supply of nuts	91.4	5.7	2.9	-
Transportation problem	63.8	29.0	7.2	-
Low demand of Shea butter	46.3	27.5	19.8	6.4
Limited labour supply	89.2	10.8	-	-
Inadequate storage facilities	4.8	12.3	26.1	56.8
Processing drudgery	1.7	2.9	18.8	76.6
Lack of information on Shea butter processing	45.7	32.4	16.3	5.6
Increase competition among processors	79.2	17.0	3.8	-

Source: Field Survey Data and Computation by the Researcher, (2014).   *Multiple Responses. Note NS = Not Severe, S = Severe and VS = Very Severe.

4.0 Conclusion and Recommendations

It could be concluded that the Shea nut processors are mainly females, aged, married, with no formal education and have farming as their primary occupation. The processing techniques are manual, time consuming, and highly demanding. There are limited market opportunities for the product. Moreover, inadequate credit facilities, processing drudgery and inadequate storage facilities were the most severe constraints of the processors. It could also be concluded that Shea butter production in the area is lower than expected, and its quality is questionable.

Federal government should curb importation of products of Shea nut/butter origin to stimulate the establishment local industries that will use Shea nut/butter as raw materials. This will lead to mechanisation and commercialisation of the sub-sector. Extension should help locate Shea butter markets and motivate processors to meet specifications.

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