

**EXPANDING EXPORT OF SESAME SEED AND SHEANUT/BUTTER
THROUGH IMPROVED CAPACITY BUILDING FOR PUBLIC AND PRIVATE
SECTORS**

**SOCIO-ECONOMIC CHARACTERISATION OF SHEA VALUE CHAIN
IN NIGERIA**

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1. SOCIO-ECONOMIC CHARACTERISATION OF SHEA VALUE CHAIN IN NIGERIA

EXECUTIVE SUMMARY

Shea is one of the agricultural commodities considered suitable for export in Nigeria. With plans to penetrate the European market, it is important to address all those issues that may become impediment to its exports from the country. The project STDF 172 was funded by World Trade Organisation/Standards and Trade Development Facilities (WTO/STDF) with major goal of expanding Nigeria's exports of Shea nuts and butter through improved quality control along the supply chain. The project as a whole has five main component activities. The main objective of the first component was to improve documentation for current practices of quality control for Shea products for exports with a focus on field level production, processing, storage, transport to ports of export and to make recommendations for improvement to meet importing country standards and cultivation and practices to ensure sustainable production.

Two reports are expected to be written on Shea value chain study based on the two phases in which the first component was undertaken as follows:

- i. Study of the Socio-economic characterization of Shea production and supply chain
- ii. Collection of Technical Data on Sheanuts/butter.

In this report the result of the first phase of the component is presented. The specific objectives were:

- i. to identify producing areas, volume produced, local consumption and export;
- ii. to determine current production and processing practices, organization of production and supply chain and
- iii. to identify critical hazard control points in the supply chain.

In order to accomplish these objectives, field surveys were conducted in four states in Nigeria, viz: Kebbi, Kwara, Niger and Oyo in April 2011. Information was collected through interview schedules with those involved in collection and processing of Shea nuts, local buyers and sellers and exporters in order to understand the process from collection through to the distribution and export of commodities.

Analysis of socioeconomic characteristics of respondents showed that Shea value chain activities are dominated by females in the study area. The average age of the respondents was 36 years. About three-quarter did not attend formal educational schools while 23 percent of the sample farmers have at least primary education. Average number of household member participating in Shea value chain activities was 7 persons. It was found from the study that most of the Shea nuts are produced mainly in the states located in the savanna zone of Nigeria. The quantity of Shea produced for both local consumption and for export is not officially documented. The method of Shea nuts collection was mainly through picking (98%) while only 2 percent pluck the Shea nut from the tree. Sample respondents pick an average of 1.3 tons of Shea nuts per season while an average of 2.2 tonnes were

bought and stored per season. The nuts are generally oval in shape. 75 percent of the nuts observed were light brown in colour before shelling. Sorting and cracking are manually carried out. The clean kernels are packed inside polypropylene bags and stored in the house.

Gross margin analysis indicated that Shea picking is profitable in the study area. The gross margin and the net income per season were N14, 100.00 and N12, 283 respectively. The returns per each invested Naira and the net cash per variable cost were 0.46 and 0.40 respectively revealing that the Shea nut picking is a cost-effective venture. An average of 13 bags is picked per person per season (of 54 days). Shea nuts are sold throughout the year either to processors, or to local traders (collectors and resellers). A larger proportion of Shea pickers sell their produce within the first three months after harvest (September to November). In general, Shea nuts were sold at the local market place closest to farm gate. Means of transportation of Shea to the market were generally by motorcycles or bicycles (50%), 27 percent of respondents transport on foot while 23 percent used vehicle. Prices of Shea nuts are set according to the season of the year. This ranges from N2,500 per 100kg bag during raining (July to September) to N5,000 per 100kg bag during dry season (February to May). The average price per bag per season in the study area was N3,500. Traders' margin was N7000 per ton. The return per naira invested in Shea marketing was 0.18, indicating slightly cost effectiveness. Both men and women participated in Shea nuts marketing. Local trading (collection and resell) are dominated by female, while men are more dominant in assemblage, transportation and export of Shea nuts.

At present there is no organised market for exportation of Shea products. Most of Shea nuts traders especially those who buy from Kebbi, Kwara and Niger sell in Benin Republic. This has been attributed to relatively higher prices offered in Benin Republic than Lagos due to international recognition of Benin Shea butter for high quality. For the Shea nuts, the result showed an export margin of N19, 500/ton. The return to variable cost was 0.35, indicating that the enterprise is cost effective. Similarly for the Shea butter, the result showed an export margin of N34, 500/ton. The return to variable cost was 0.16, indicating cost effectiveness. Problems usually observed by respondents on the kernel include: black-mould infestation (73%), insect infestations (26%) and mechanical damage (1%). The critical hazard control points are collection points and storage.

1.1. INTRODUCTION

1.2.1. Background Information

Shea plant (*Butyrospermum parkii*, *Vitellaria paradoxa*) grows in the wild agro-forestry parklands across the semi-arid region of Africa. The major producing countries are Nigeria, Togo, Benin, Ghana, Uganda, Mali, Burkina Faso and Central African Republic. FAO (2004) estimated the total African production of Shea nut at approximately 1,760,000mts. West Africa and Nigeria account for 600,000mts and 372,000mts respectively making the largest producer of Shea products in the world. In Nigeria the Shea trees are found in thirteen states including: Adamawa, Benue, Borno, Kaduna, Katsina, Kebbi, Kogi, Kwara, Nasarawa, Niger, Ondo, Oyo, Sokoto and Taraba states while not large volume compared to other crops in the country, Shea is a very important cash crop for mainly rural women. The fruits are gathered during the rainy season (August to October) and the main processing steps involve collection, selection, washing, drying of the nuts and extraction of oil. The extraction process has an important socio-economic role in the producing areas since it generates employment and income to a significant proportion of rural population especially women who are, directly or indirectly involved in Shea nut collection and butter extraction for sale at the local markets.

Over the past five years, demand for Shea products has grown in the European Union and the United States. The growing demand for Shea products has motivated Nigeria and other West Africa countries to go into export of Shea products. The Shea is used in the production of Cocoa Butter Equivalents (CBE) or improvers (up to 5% content by weight is allowed under EU regulations) on chocolate, other confectionaries and margarine. Nigeria exports Shea butter mainly to the EU and US and this has increased in recent years as cosmetic and personal care companies have increased the use of Shea butter in their products. Being a recent export phenomenon, importing country quality requirements for Shea products vary widely and need to be studied. In Nigeria the Shea trees grow in large numbers in several states. However the inferior quality of the butter amongst other issues has so far prohibited the full exploitation of Nigeria's otherwise favorable conditions. Till date the majority of collectors and processors are women.

The Shea butter is mainly used for home consumption. Only a fraction is collected by local buying agents and enters the large domestic and international markets. Processing of the nuts is done so far still the traditional way which often yields a product of inferior quality. Therefore, the opportunity to expand export of Shea butter exists, if technical, quality and shipping constraints are resolved in a cost competitive manner. The current price per metric ton of Shea butter exceeds that for Shea kernels so that expanding Shea butter exports will contribute proportionally more to export earnings than greater levels of Shea kernel exports. Value addition is the major focus of the transformation agenda of current Federal government of Nigeria.

1.1.2. Objectives of study

The main objective of the study was to improve documentation for current practices of quality control for Shea nuts and butter for export with a focus on field level production, processing, storage, transport to ports of export.

The specific objectives of the study were:

- to identify producing areas, volumes produced, local consumption and export
- to determine current production practices, organization of production and supply chain.
- to identify critical hazard control points in the supply chain.

1.2. RESEARCH APPROACH

1.2.2. Data Source and Collection

Data were collected in March 2011 through a survey of Shea nut collectors and marketers in four states, namely: Kebbi, Kwara, Niger and Oyo. The main instruments for primary data collection were well structured questionnaires (Plate 1, see Annex 1). The data collected covered only production, processing and marketing activities for 2010 cropping season. These include: farm inputs, quantity and value of Shea outputs and prices of various inputs used by Shea pickers, collectors, processors, local traders and exporters. The socioeconomic and demographic variables such as age, education level, household size, gender were also collected.

1.2.3. Sampling Techniques

The study employed a multistage sampling technique to select the respondents. The first stage involved selection of four states from the list of states where Shea trees are found in the country. In the second stage, Local Government Areas (LGAs) were randomly selected from the states based on probability proportionate to size. The third stage involved random selection of respondents from the villages selected.

To ensure proportionate representation, the questionnaires were divided in proportion to the number of respondents in each village. Shea processors and traders were interviewed in the villages selected based on the size available. A total of 262 respondents provided data used for this study (Table 1).

Table 1: Selected Local Government Areas and sample size

States	Local Government Areas	Sample size
Kebbi	Fakai, Zuru	68
Kwara	Kaiama	36
Niger	Agaie, Borgu, Gbako, Katcha, Kontagora, Mashiegu	123
Oyo	Irepo, Orelope	35

Source: Survey of Sheanuts stakeholders, 2011

1.2.4. Data Limitations

Limitations of the data collected and used in this study arise from the fact that most of the respondents did not have written records of their activities, hence data obtained were mainly from memory and subjective estimates. For instance, the standardized quantity of a farm output was estimated by converting the output measured in local units, such as bags, into standard weights and measures using appropriate conversion factors provided by Shea Nuts merchants. It was also not possible to determine total nut collection per Shea nut tree per season.

1.2.5. Method of Data Analysis

Frequency and descriptive statistics were used to characterise households involved in Shea value chain. The gross margins of Shea production and processing were determined to evaluate the level of profitability. Shea nuts marketing in the study area was analysed using the structure-conduct-performance model. The structure of Shea markets was identified, including types of dealers, equipment, methods of transportation and storage facilities. The gross margins were evaluated for each channel.

1.3. RESULTS AND DISCUSSION

1.3.1. Socio-economic characteristics of respondents

The following socioeconomic characteristics were considered in this section:

- **Sex:** Ninety four percent of the sample respondents are female, implying that Shea nuts value chain activities are dominated by females. This is so because the Shea nuts collecting season overlaps the main cultivation season which keeps most of the adult male farmers engaged in other main farming activities. Manual processing of Shea butter was also a women's work (or occupation). The transportation to the marketplaces and the selling of the products is carried out by men.
- **Age:** The average age of the respondents was 36 years (Table 2). About 26 percent were above 40 years while 74 percent were not more than forty years indicating that the population of Shea producers in the study area was dominated by youth. This situation will have positive influence on increasing Shea nuts outputs. This is expected because younger ones are most capable of supplying labour required for Shea gathering and processing activities
- **Education:** About three-quarter did not attend formal educational schools while 23 percent of the sample farmers have at least primary education (Table 3). This implies that larger proportion of the respondents may not find it easy to access information on how to improve upon their various activities with modern technologies, since most of these technologies are written in a document. It will also be difficult to train them in English language without engaging interpreters.

Table 2: Age distribution of respondents (n=254)

Age interval (years)	Frequency	Percentage
≤20	22	9
21 – 30	89	35
31 – 40	75	29
41 – 50	39	15
51 – 60	23	9
61 – 70	5	2

Source: Field survey 2011

Table 3: Distribution of educational status of respondents (n=250)

Educational Levels	Frequency	Percentage
No formal education	94	38
Arabic education	98	39
Primary	31	12
Secondary	17	7
Tertiary	10	4

Source: Field survey 2011

- **Household labour:** The more the number of workers available in a household the less the requirement for hired labour. Average number of household member participating in farm activity was 7 persons. This is an indication that the need for hired labour will be minimal among the collectors thereby alleviating labour constraints.

1.3.2. Shea Nuts Production, consumption and export

Shea trees are found in the following states of Nigeria: Adamawa, Benue, Borno, Kaduna, Katsina, Kebbi, Kogi, Kwara, Nasarawa, Niger, Ondo, Oyo, Sokoto and Taraba. The total area under Shea trees and quantity of Shea nuts produced in all these states are not known. However, the FAO statistics indicated that a total of 372,000 metric tons of Shea nuts are produced in Nigeria (GT2, 2010). The area covered by Shea trees and quantity of Shea nuts collected from four states in 2010 by major Shea merchants are presented in Table 4. The actual quantity consumed and exported from each states are not available. This is largely due to the fact that most of the Shea nuts/butter is sold to traders through illegal route. However, the total export of Shea nuts from Nigeria was 2200 metric tonnes in 2010 (Table 5).

Table 4: Shea land area and quantity produced in the study area

States	Land area of Shea trees (ha)	Quantity of Shea nuts produced (mt)
Kebbi	70.5	1870
Kwara	71.8	458
Niger	326.5	483
Oyo	66.1	390

Source: National Shea Producers Association of Nigeria, 2010

Table 5: Quantity of Shea nuts export in 2010

Exporting company	Quantity Exported (Mt)	Destination
MENA Agro Oil	400	Europe and USA
3F Nig. LTD	1500	Europe and USA
Agro Trader	300	United Kingdom

Source: Port Terminal Operator

1.3.3. Shea production practices

Shea nuts are not cultivated in the study area but they are found wild in the forest. The Shea fruit, when it is ripe, falls off the tree and is then collected by farmer's household member. Ninety eight percent of the respondents adopted picking methods while only 2 percent pluck the Shea nut from the tree. Sample respondents pick an average of 1.3 tons of Shea nuts per season while an average of 2.2 tonnes were bought and stored per season. The nuts are generally oval in shape. Round shape is not common in the study area. 75 percent of the nuts observed were light brown in colour before shelling; dark brown and black colours are not common. 81 percent of respondents wash their nuts before shelling.

After washing the nuts are generally boiled with water in large metal pot for about two hours. The boiled nuts are sun dried by spreading on concrete floor or polythene mat. Six percent of the respondents however, used oven to dry their nuts. Nuts are pounded using mortal to remove husks. Sorting and cracking are manually carried out. Two percent of respondents used mechanical device for sorting while five percent also cracked their nuts mechanically. The clean kernels are packed inside polypropylene bags and stored in the house before selling to the buyer. Problems usually observed by respondents on the kernel include: black-mould infection (73%), insect infestations (26%) and mechanical damage (1%).

1.3.4. Cost and Return Analysis of Shea nut picking enterprise

Shea nuts are picked mainly for sale in the study area. The gross margin per season was N14, 100.00 and the net income was N12, 283 (Table 6). Since the value of the two indicators were positive, Shea picking can be considered profitable in the study area. The gross margin per variable costs, representing the returns per each invested Naira was 0.46. The net cash per variable cost is 0.40 revealing that the Shea nut picking is cost-effective. According to responses from the sample pickers about one bag (100kg) of Shea nuts can be picked from a tree in a season. And currently an average

of 13 bags is picked per person per season (of 54 days), meaning that an equivalent of 13 trees are harvested per picker per season.

Table 6: Partial budget for Shea nut picking enterprise per season

Budget items	Unit price(N)	Quantity	Cost Value (N)
Sales of Nuts	35,000	1.3	45,500
Labour	500	54 man-days	27,000
Picking materials	100	13	1,300
Transportation	200	13	2,600
Total variable cost			30,900
Gross margin			14,100
Opportunity cost of capital (15% for six months)			2,317
Total cost of production			33,217
Net income			12,283

Source: Estimated from survey data, 2011

1.3.5. Shea butter processing practices

Shea nut is processed into butter using traditional manual process. Some of the processing inputs are presented in Plate 2. Kernels are crushed by pounding with mortars or grinding with stone. 11 percent of respondents used grinding stone. The dried kernels are roasted or fried in a large iron pots over open fire (Plates 3 & 4)). The resulting dried Shea kernels are usually milled into paste by commercial milling operators (Plate 5). Water is added to the paste and kneaded by hand-beaten for about one hour until fats form emulsion (Plates 6 & 7).

A larger proportion of respondents changed cold water more than three times while hot water is generally changed once while kneading. The paste is washed and removed into a boiling pot and heated (Plate 8). The extracted liquid is stirred and left to cool into a smooth cream (Plate 9). The processing yield rate (the percentage of the end product after processing compared to the input) ranges from 20 to 25 percent. The creamy butter is packaged by pouring into a metal or plastic container or calabash. 79 percent of the respondents usually pour it into metal containers while 21% used plastic containers or calabash.

1.3.6. Shea nut marketing pattern and supply

Shea nuts marketing systems function in a framework of a free-market. There were no restrictions for any economic agent to operate in this sub-sector. Both men and women participated in Shea nuts marketing. Local trading (collection and resell) are dominated by female, while men are more dominant in assemblage, transportation and export of Shea nuts.

Shea nuts are sold throughout the year either to processors, or to local traders (collectors and resellers). A larger proportion of Shea pickers sell their produce within the first three months after harvest. In general, Shea nuts were sold at the local market place closest to farm gate. Means of

transportation of Shea to the market were generally by motorcycle or bicycle (50%), 27 percent of respondents transport on foot while 23 percent used vehicle. This implies that good road is necessary for effective marketing of Shea nuts. The delivery distances vary from 100 metres to 54 km, with an average of 36 km. Transport cost ranges from N50 to 100 per bag from the household gate to the market place. Pricing for produce at the farm gate is based on bargaining, and varies from one market place to the other. Prices of Shea nuts are set according to the season of the year. This ranges from N2,500 per 100kg bag during raining (July to September) to N5,000 per 100kg bag during dry season (February to May). The average price per bag per season in the study area was N3,500.

1.3.7. Shea nuts marketing structure and conduct

Three structures of Shea marketing were identified during the survey. First, pickers supply directly to sellers. Secondly, Shea collectors procure the products from pickers and supply the sellers. The third structure is a combination of the two. Irrespective of the structure, Shea marketing is based on a certain confidence between the suppliers (picker, collector or both) and the sellers (retailers). Shea is procured from various locations and assembled in the local market for further processing into exportable products. According to the categories of Shea suppliers, different locations of Shea supply were identified.

The results indicate that most Shea sellers relied on suppliers located outside their locations. Shea nut is processed and packaged in these locations. The final packaged products are transported to Lagos or border towns of Benin Republic. Most of Shea traders especially those from Kebbi, Kwara and Niger sell in Benin. The reason is mainly due to higher cost of transportation involved in transferring the product to Lagos port. Also the price in Benin is relatively higher than Lagos price due to international recognition of Benin for high quality Shea nut. The Shea nuts from Nigeria are usually further processed in Benin before export to either UK or USA.

1.3.8. Economic performance of Shea marketing systems

The marketing cost structure and the gross margin analysis were based on the operation per unit (tonnes). Traders' margin was N7000 per ton (Table 7). The return per naira invested in Shea marketing was 0.18, indicating slightly cost effectiveness.

Table 7: Shea marketing costs structure and gross margin in the study area

Indicators	Mean
Quantity purchased (ton)	1
Price/ton (N)	35,000
Purchase cost (N/season)	35,000
Transport cost (N)	2000
Fees	1000
Sales value (N/ton)	45,000
Gross margin (N/ton)	7,000

Source: Estimated from survey data

1.3.9. Export margin of Shea nuts and butter

The export margin of Shea nuts and butter is presented in Table 8. For the Shea nuts, the result showed an export margin of N19, 500/ton. The return to variable cost was 0.35, indicating that the enterprise is cost effective. Similarly for the Shea butter, the result showed an export margin of N34, 500/ton. The return to variable cost was 0.16, indicating cost effectiveness.

Table 8 : Shea export costs structure and margin in the study area

		Shea nuts	Shea Butter
Budget items	Unit	Cost/Return	Cost/Return
Shea nuts	1 ton	35,000	200,000
Processing	1 ton	2,000	2,000
Packaging	10 bags	1,000	1,000
transportation	1 ton	6,500	6500
tax/other charges	1 ton	2,000	2,000
Forwarding	1 ton	3,000	3,000
Inspection	1 ton	1,000	1,000
Documentation	1 ton	3,500	3500
Port charges/levy	1 ton	1,500	1500
Total	1 ton	55,500	220,500
Fob price	1 ton	75,000*	255,000*
Export margin	1 ton	19,500	34.500

* Exchange rate of US\$1= N150

1.4. CONCLUSION AND RECOMMENDATIONS

Shea nuts are produced in commercial quantity in twelve states. Majority of the collectors and processors are women. Women process nuts mainly into butter using traditional way which often yields a product of inferior quality. The butter produced is generally for local consumption. Only a fraction is collected by local buying agents and enters the larger domestic and international markets. The bulk of Shea nuts collected are exported through illegal border trading. Consequently, export of Shea butter is not yet well organised in Nigeria. It is recommended that:

- Effort should be made to discourage illegal border trading by sensitising our producers on the alternative avenue to dispose their products legally through formation of cooperatives.
- Processors should be trained on how to produce Shea butter that will be acceptable in the international market using Agricultural Development Programs.
- Effective efforts to increase productivity along the Shea value chain should allow Shea processors to sustain those improvements on income and livelihoods. Thus, it is hoped if the right quality and quantity is made available prospects for large quantities of Nigerian Shea butter are good, making nut collection and processing an interesting incoming generating activities in rural areas.

Similarly high potentials exist for superior quality and higher quantities of Shea butter to be achieved in Nigeria with improved extractive techniques as demonstrated already in a few locations by GTZ. Also appropriate and regular training is necessary for organized stakeholders in order (i) to improve their skills in Shea processing and butter production, (ii) to facilitate changes in the institutional issues and transaction costs related to Shea collection, production/processing in order to upgrade capacity along the Shea value chain.

At the moment Shea collection as well as Shea butter production is not organized. So that reliable information on Shea data is difficult to get. Consequently, it is desirable to create awareness so as to organize Shea collectors and processors. The illegal border trading of Shea nuts and Shea butter may also be monitored and reduced to the barest minimum. There is need to introduce information gathering on Shea nut/ butter in the country. The Federal and State ministries of Agriculture and the Nigerian Customs Service can be saddled with this responsibility.

The Shea collectors and processors are exposed to harsh conditions, untidy environment as well as stressful conditions. This is because the basic infrastructures like boreholes, sorting, cracking and milling machines for Shea butter production are non-existent. In addition majority of the artisanal processors of Shea butter lack the capacity to buy a large quantity of Shea nuts at harvest time. This creates room for the illegal border trade to flourish.

1.5. REFERENCES

- GTZ, 2010. "Shea nuts collection and processing in Nigeria". Training Manual, German Technical Cooperation.
- Somda, J., Kamuanga, M., Münstermann, S., Bittaye, A., 2003. *Socio-economic characterization of smallholder dairy systems in The Gambia: Milk production, marketing and consumption*. Socio-economic research Working Paper 1. ITC, Banjul, The Gambia, 61 pp.
- Peter Lovett 2004: "The Shea Butter Value Chain – Production, Transformation, and Marketing in West Africa" USAID/West Africa Trade Hub (WATH)

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This document presents *“The Socio-Economic Characterisation of Shea Value Chain in Nigeria”*

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This document is part of a set of documents developed under NEPC's coordination, involving all stakeholders, in its effort of contributing to the improvement of the quality and compliance with Sanitary and Phytosanitary measures (SPS) of sheanut butter and sesame seed from Nigeria.

Contact details of NCRI: www.ncri.gov.ng

For more information on STDF: www.standardsfacility.org

For more information on ITC: www.intracen.org

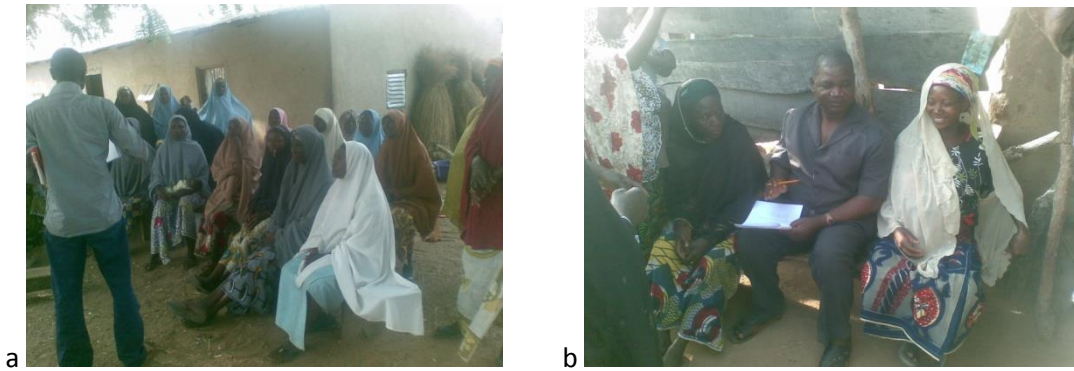


Plate 1: Group (a) and individual (b) interview session



Plate 2: Manual Shea butter processing inputs



Plate 3: Boiling of Shea nuts on fire with metal pot



Plate 4: Roasting of Shea kernel in iron pot over open fire



Plate 5: A sample of Shea kernels milled into paste



Plate 6: Mixing of milled kernels with water



Plate 7: Kneading of paste to form fat



Plate 8: Boiling of fat to form butter



Plate 9: Freshly processed Shea butter inside metal plate



Plate 10: Shea butter on display for sale

ANNEX 1: QUESTIONNAIRE USED FOR INTERVIEW

DIAGNOSTICS SURVEY/CHARACTERIZATION OF SHEA BUTTER VALUE CHAIN

PERSONAL DATA:

- 1. Name:**
- 2. VILLAGE:**
- 3. LGA:**
- 4. STATE:**
- 5. SEX: MALE/FEMALE**
- 6. AGE IN YEARS:**

7. EDUCATIONAL LEVEL:

- A) NO FORMAL EDUCATION
- B) QUORANIC
- C) PRIMARY EDUCATION
- D) WASC EQUIVALENT
- E) ABOVE SECONDARY EDUCATION

8. TOTAL NUMBER OF HOUSEHOLD MEMBERS PARTICIPATING IN FARM WORK FIELD DATA:

9. METHOD OF COLLECTION

- A) PLUCK FROM THE TREE
- B) ALLOW TO FALL

10. SHAPES OF SEEDS OBSERVED

- A) OVAL
- B) ROUND
- C) OTHER SHAPES

11. SEED COLOUR BEFORE DRYING (BEFORE SHELLING/CRACKING)

- A) LIGHT BROWN
- B) DARK BROWN
- C) BLACK

12. METHOD OF WASHING:

- A) BEFORE SHELLING
- B) AFTER SHELLING

13. METHOD OF DRYING:

- A) NATURAL SUN
- B) OVEN DRYING

14. WHAT QUANTITY DO YOU PICK/SEASON?.....Kg

15. WHAT QUANTITY DO YOU BUY/SEASON?.....Kg

16. WHAT QUANTITY DO YOU STORE/SEASON?Kg

17. METHOD OF SELECTION:

- A) MANUAL STONE OR MORTAR AND PESTLE
- B) MACHINE

18. METHOD OF CRACKING:

- A) MANUAL
- B) MECHANICAL

19. PROBLEMS OBSERVED ON THE KERNEL:

- A) BLACK-MOLD INFESTATION
- B) INSECT INFESTATION
- C) MECHANICAL DAMAGE
- E) OTHERS

20. METHODS OF STORAGE OF KERNEL:

- A) COLD ROOMS
- B) STORE ROOMS
- C) IN POLETHYNE BAGS
- D) IN JUTE BAGS
- E) PLASTIC CONTAINERS
- F) BASKETS
- G) HEAPED ON FLOOR

21. DURATION OF STORAGEDAYSMONTHSYEARS

22. METHOD OF MILLING ROASTED NUTS:

- A) MANUAL (MORTAR AND PESTLE)
- B) MANUAL (GRINDING STONE)
- C) MILLING (ENGINE)

23. HOW MANY TIMES DO YOU CHANGE COLD WATER WHILE KNEADING?

- A) ONCE
- B) TWICE
- C) THRICE
- D) UNTIL PASTE IS PURIFIED

24. HOW MANY TIMES DO YOU CHANGE HOT WATER WHILE KNEADING?.....

25. WHEN DO YOU USE COLD WATER TO SEPARATE OIL FROM SHAFT (DUSA)

- A) WHEN NUTS ARE PARBOILED
- B) WHEN NUTS ARE OVEN DRIED
- C) WHEN NUTS ARE SUN DRIED
- D) ANY OTHER

26. METHODS OF BOILING/DEHYDRATION/PURIFICATION:

- 1. PUT THE PASTE INTO BOILING WATER AND STIR
- 2. PUT THE PASTE INTO SMALL OIL AND FRY
- 3. ANY OTHER

27. METHOD OF FILTRATION:

- 1. USE MUSLIN CLOTH
- 2. USE SIEVE
- 3. ANY OTHER

28. METHOD OF PACKAGING:

- 1. POUR INTO PLASTIC CONTAINERS
- 2. POUR INTO METAL CONTAINERS
- 3. ANY OTHER

29. MODE OF TRANSPORTATION:

- A) ON FOOT
- B) ON MOTORCYCLE/BICYCLE
- C) MOTOR VEHICLE

FOR SHEA MERCHANTS.

1. DO YOU USE ANY PESTICIDE TO PRESERVE YOUR SHEA KERNELS PRIOR TO PROCESSING? YES/NO

- A) _____
- B) _____
- C) _____

2. DO YOU PROCESS SHEA NUTS INTO SHEA KERNELS? YES/NO.

3. HOW DO YOU SOURCE FOR YOUR RAW MATERIALS FOR PROCESSING?

- I PURCHASE FROM FARMERS
- II BUY DIRECTLY FROM OPEN MARKET
- III MIDDLE MEN
- IV ANY OTHER SOURCE

4. DURING PROCESSING OF KERNELS INTO SHEA BUTTER, DO YOU SORT THEM OR NOT? YES/NO.

IF YES, IS YOUR SORTING DONE ACCORDING TO THE PHYSICAL DEFECTS OF THE KERNELS?

- A. MOULDY/DECAYED KERNELS
- B. SPROUTED/GERMINATED KERNELS
- C. SPLIT/BROKEN KERNELS
- D. SHRIVELED KERNELS
- E. BLACKENED KERNELS

IF NO, IT MEANS THE PROCESSING OF THE KERNELS IS DONE WITHOUT SORTING?

5. WHAT TYPE OF EXTRACTION TECHNOLOGY DO YOU EMPLOY?

- A. TRADITIONAL MANUAL EXTRACTION
- B. CONTINUOUS DUTY OIL EXPPELLER. (PRESS)
- C. BATCH TYPE OF OIL PRESS.

6. DO YOU BELONG TO ANY GROUP/ASSOCIATION? YES/NO.

A. IF YES, WHICH ONE?

- I. _____
- II. _____

7. DO YOU KNOW ANYTHING ABOUT THE GRADING OF SHEA BUTTER INTO GRADE I, II, III? YES/NO

8. DO YOU KNOW THE QUALITY PARAMETERS OF YOUR SHEA BUTTER IN TERMS OF?

- I. % MOISTURE CONTENT? YES/NO
- II. % FREE FATTY ACID. YES/NO
- III . RELATIVE DENSITY? YES/NO

IV. REFRACTIVE INDEX? YES/NO

V. SOAP CONTENT (%MM)? YES/NO

9. WHAT TYPE OF ADDITIVE (ANTI OXIDANTS) DO YOU USE TO KEEP YOUR SHEA BUTTER AGAINST SPOILAGE? NAME THEM

I.

II.

III.

10. ARE YOU AWARE OF THE PRESENCE OF PATHOGENIC MICRO-ORGANISMS IN SHEA KERNELS AND/OR SHEA BUTTER? YES/NO.

IF YES, WHAT CONTROL MEASURES DO YOU USE?

11. ARE YOU AWARE OF THE PROBLEM OF MYCOTOXIN SUCH AS AFLATOXIN SUBSTANCES IN SHEA BUTTER? YES/NO

IF YES, WHAT CONTROL MEASURES DO YOU USE? _____

12. DO YOU HAVE KNOWLEDGE OF THE PRESENCE OF POLY AROMATIC HYDROCARBON (PAHS) IN SHEA BUTTER? YES/NO.

IF YES, WHAT CONTROL MEASURES DO YOU USE?

13. IS YOUR GROUP AWARE OF THE PRSENCE OF HEAVY METALS IN SHEA BUTTER? YES/NO.

IF YES, WHAT CONTROL MEASURES DO YOU USE?

14. HOW DOES YOUR GROUP SOURCE FOR ITS FUND AND /OR MACHINERIES

I FROM FOREIGN DONOR AGENCIES

II GOVERNMENT INSTITUTIONS

III MEMBERS CONTRIBUTION

IV ANY OTHER (SPECIFY).

15. HOW MANY SPECIES OF TREES DO YOU KNOW OR GROW IN THE LOCATION?

A 1

B 2

C 3

16. IN RECENT TIMES, HAVE YOU DONE ANY TRAINING ON IMPROVED SHEA KERNELS HANDLING AND/OR PROCESSING? YES/NO.

IF YES, NAME SUCH LABORATORY/ORGANIZER AND ITS LOCATION.

17. HOW DO YOU HANDLE YOUR SHEA KERNELS CAKE?

I THROW AWAY AS WASTE

II USE AS FUEL ENERGY

III AS ANIMAL FEED

IV AS ORGANIC FERLIZER

18. ON IMPROVED PROCESSING TECHNIQUE OF SHEA BUTTER, IS YOUR GROUP READY TO COLLABORATE WITH SUCH SERVICE PROVIDER? YES/NO

19. HOW DO YOU DISPOSE – OFF YOUR SHEA BUTTER?

I FOR DOMESTIC CONSUMPTION

II TO PRIVATE FOOD INDUSTRIES (LOCAL INDUSTRY)

III LOCAL MARKET (DOMESTIC MARKET)

IV FOREIGN MARKET (INTERNATIONAL MARKET)

20. DO YOU DERIVE MAXIMUM ECONOMIC BENEFITS FROM YOUR PRESENT PROECSSING/POST-HARVEST HANDLING TECHNOLOGY YOU ARE USING? YES/NO

IF NO, WHY? GIVE REASONS.

I _____

II _____

III _____

IV _____