SHEABUTTER

EXTRACTION & REFINERY

Feasibility Study

HIGH TECH SHEABUTTER PLANT

A RESPONSIBLE, LOW RISK INVESTMENT

MAY/JUNE 2016

PREPARED FOR EQUATION INVESTMENT LIMITED

PREPARED BY CPRAXIS INTEGRATED SERVICES

INTRODUCTION

This document serves as the feasibility study of ESTABLISHING A SHEABUTTER PLANT in Sagamu, Sagamu L.G.A of Ogun State, Nigeria.

Its purpose is to act as yardstick for the decision to launch this venture, its financing requirements in order to initiate the Business, and as touchstone in the development of the business. This document is supported by its annexure, which contain the research, information and plans on which this document is based.

Agro-processing and more specifically value addition to Shea-nut has the potential to create jobs and economic growth of rural places. This study, undertaken by Cpraxis Integrated Services, explores the feasibility and viability of establishing a sheabutter plant in Sagamu, Ogun State Nigeria.

This project is recommended, based on the following aspects:

- **Local value-adding**
- **Final product manufacturing**
- **Bulk sales minimises transport costs**
- **Vast local employment opportunities**
- **Income generation for local small-scale farmers**
- **Increase in local revenue base.**
- **Skills development of local community**
- **Direct local employment**
- **Economic Viability**

The Feasibility is comprised of the following Sections:

- **Introduction**
- **Location**
- **Industry**
- **Funding**
- **Facility/Production**
- **Cost & Profit Analysis**
- **Operational Financing (10yrs)**
- **Transportation**
- **Marketing Strategies/Implementation**
- **Risk Analysis**
- **Recommendation**
- **Conclusion**

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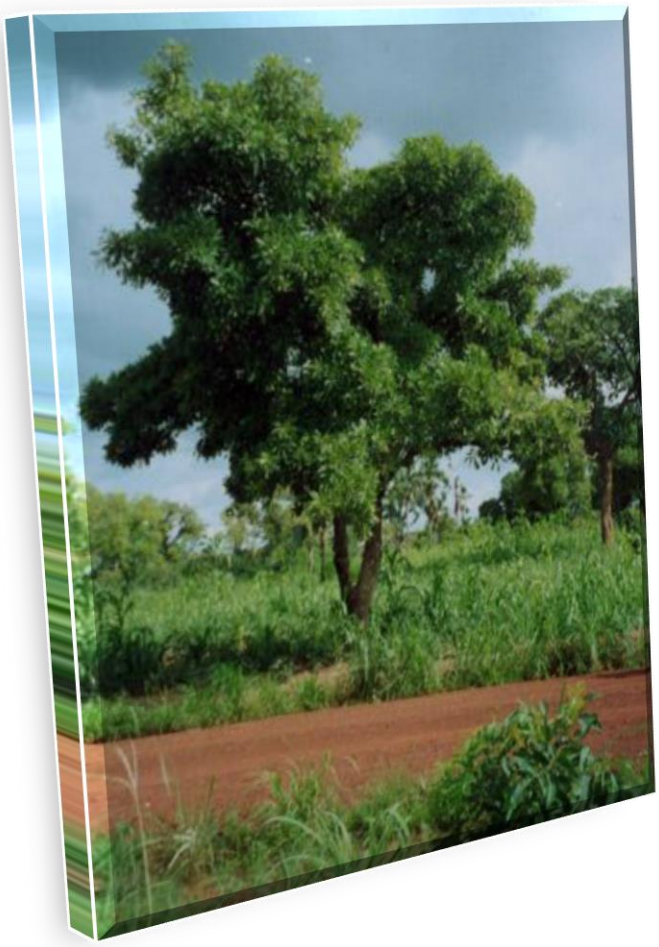
JUSTIFICATION

A large market exists for shea butter world-wide, particularly as it is organically produced. There is a growing interest in butter from Nigeria for use as ingredients in the cosmetics, pharmaceutical and confectionary industries, yet the commodity is in limited supply as much of it is processed by local women through crude and arduous means. Investment in the processing of the butter in large volume will not only be profitable, but will also create an avenue for employment to the youth in this part of the country and eventually protect and conserve the shea tree.

DESCRIPTION OF THE SHEA TREE

The shea tree is a member of the Sapotaceae family. It is a deciduous tree of medium size, with a spherical crown. It often reaches heights of 10-15m, with rare recorded occasions of up to 25m. It is a light demanding, slow growing tree, with a thick and rough bark. The flowers, which appear from December to March, are greenish yellow and occur in terminal groups of approximately 30 to 40. It is insect pollinated and, as such, is often associated with bees.



It thrives on dry sandy clay soils that have a good humus cover, but occurs on a variety of soil types. It has an extensive root system, which helps it to tolerate the extended dry season (up to eight months) and occasional droughts of the savanna. The mean annual rainfall requirement for shea ranges from 600-1,500 mm. It occurs mainly between elevations of 100-600 m. The seeds of shea have high moisture content and this makes storage of unprocessed seeds difficult. Viability is often lost by two to three weeks after fruit maturity. The fruit is yellow-green, elliptical, and about 5-8 cm long and 3-4 cm wide. Each fruit contains one large oval to slightly round, red brown to dark brown seed, which is usually referred to as the "shea nut".

The shell of this nut is shiny, smooth, and fragile. This seed comprises about 50% of the

weight of the fresh fruit, and is the part used in shea butter production. Fruit production usually starts when the tree is about 15 years old and often continues with longevity of 200 to 300 years. The fruit is harvested, depending upon the latitude, from May until September, which corresponds with the rainy season.

The fruit yields do not become optimum until the tree is 25-40 years of age, although there have been some attempts to shorten this period by genetic improvements and grafting, which have met with some success, resulting in major reductions in time to fruiting. The fruit is eaten by people from rural and urban areas, and is usually allowed to become slightly overripe to improve the sweet pear-like taste. People, as well as cattle, bats, birds, and a wide range of other animals reportedly disperse the seeds. Generally, the shea fruit reproduces naturally and, although it may be aided in its reproduction by being protected from fire or grazing livestock, it is not traditionally planted. Planted shea seedlings tend not to produce high quality nuts.

Characteristics Of Shea Butter.

Chemical and Physical Properties of Shea Butter and Cocoa Butter

Composition	Shea Butter	Cocoa Butter
Fat Content (%)	**52.1**	**53.4**
Ash Content (%)	**3.2**	**2.8**
Melting Point °C)	**38.0-39.5**	**34.3**
Slip Point (°C)	**36.7-37.4**	**33.5**
Iodine number	**64.2**	**36.1**
Acid number	**13.4**	**1.8**
Free Fatty Acid %	**6.8**	**0.9**
Saponification number	**179.6-190.0**	**190.6-195.0**
Unsaponifiable matter (%)	**7.3-9.0**	**0.1-0.3**
Solidification point (°C)	**26.5-30.3**	**28.0-28.6**
Linoleic acid (%)	**6.9**	**3.2**
Linolenic acid (%)	**1.6**	**1.2**
Degree of Unsaturation	**0.59**	**0.42**

The high iodine number, acid number and free fatty acids, result in the pungent odour or taste characteristic of shea butter within a short period during storage

Fatty acid composition of shea butter is an indication that palmitic, stearic, oleic, linoleic and linolenic acids are the main fatty acids in shea butter and that it has a relatively high degree of unsaturation.

Fatty acid characteristics of tallow fat, shea butter and cocoa butter.

Fatty Acids (%)	Tallow fat	Shea Butter	Cocoa Butter
Myristic	Nil	Nil	0.2
Palmitic	3.1	4.8	26.8
Pamitoleic	0.2	Nil	0.3
Stearic	45.5	45.5	36.1
Oleic	50.5	40.8	31.9
Linoleic	0.4	6.9	3.2
Linolenic	Nil	1.6	1.2
Degree of Unsaturation	0.51	0.59	0.42

2.8 Quality Standards Of Shea Butter

Individual companies specify their own quality standards for purchases of shea nuts. Here is the benchmark for the composition of the shea nut required for import:

Quality standards of Shea butter

Parameter	Value
Free Fatty Acids (FFA)	**Less than or equal to 6%**
Moisture Content	**Less than or equal to 7%**
Oil Content	**Greater or equal to 45%**
Latex	**4-10%**

GOAL OF THE PROJECT

To produce high quality shea butter in Nigeria for export to Europe, US, Asia etc. In year two, a breakeven point is attained with an estimated production capacity of 50 tons of shea butter per day, 1250 tons per month and 12,500 tons in a year projections will be realized.

Results

- **Result 1 : Business establishment.**
- **Result 2 : Establishing the factory.**
- **Result 3 : Capacity building.**
- **Result 4 : Project result.**

CSR aspects

This project provides a good possibility for rural women to get extra income. As the shea trees are in general not privately owned but communal property. The joint venture sees it as its responsibility to prevent this system to deteriorate by giving a higher value to this crop. Traditionally the gathering is

done by women and the partners state that they only buy from women's groups, again to avoid negative effects by the more profitable nut market.

Impact

- **Long term economic activity**
  The project partners have demonstrated a track record of developing new business initiatives. This project will set up an initial processing unit. Much advantage is expected of processing nuts locally instead of exporting the nuts for processing overseas. As the world market is very demanding, there is plenty of room for expansion in the sourcing and the sales of ready processed shea butter. According to a consulted independent expert working with one of the major chocolate producers, good shea butter is considered expensive and short in supply.
  On the gathering side, as only 30% of the nuts are actually collected there is also sufficient room for expansion of the factory.
  Instead of enlarging the projected plant, the partners will expand with more units in different regions of the country to avoid the transport of 60% of the weight, representing the press cake.

- **Employment and working conditions**
  A total of 37 employees will be hired by the joint venture.
  This project will offer it's employees a wage package including fringe benefits such as medical aid for employees and dependents, participation in a preventive health care programme for HIV/AIDS, and support school fees for underage children.

- **Transfer of knowledge**
  Only a few of large scale shea Butter plant exist in Nigeria. Some shea butter of moderate quality is exported actually.
  This project will set up a standard industrial shea processing plant. Technology transfer will take place internally and externally.
  Internal technology transfer: staff and manual labour will be trained in operational and management of an innovative processing plant for shea nuts.
  External technology transfer; a Good Shea Gathering Practices programme will link the project with the village gatherers to eliminate impurities and lower quality from the logistical system and the production chain.

- **Chain effects**
  This project will increase: local gathering of nuts and thereby increase also the income of rural women on the input side. On the output side, butter of good quality will be available at reasonable prices in the value chain. The use of shea butter in the European food industry can become a more important ingredient leading to more demand.
  The general move to start processing African commodities in Africa itself instead of processing in the countries that use the commodity will serve as an example to other, comparable, industries.

- **Environment**
  The shea belt includes one of the most delicate ecosystems along the South of the Sahara

desert where deforestation is a recognized problem.
Actually only a small percentage of the fruits are collected and by this the mere existence of the tree has no large priority. As the shea nut market becomes more interesting, the urgency of preserving those trees in the arable fields becomes more important.

When shea nuts are pressed the butter is largely separated from the residual cake. This shea cake still contains a considerable amount of shea butter.

Position of women

Shea nut trees are not planted as crops but are found indigenously in the shea belt. As a field is cleared from vegetation to grow arable crops like millet, the shea trees (and some other species) are left in the field. Although the field and the trees are owned by men, shea nut collection is a community activity dominated by women. By shortening the production chain and logistical costs this project can be competitive in the international shea nut market while still paying more to the original gatherers. Culturally it is known that shea money is considered woman's cash.
The improvement of the market for shea nuts will directly feed into this domestic privilege.
Some women will be hired for high-level positions in the joint venture.

How Shea Butter is Processed

How shea Butter is processed is at the top of every consumers mind these days. This makes sense. The many ways in which shea Butter can be manufactured has a significant impact on the final shea product. While the consumer may be aware of quality differences in the end product. It's valuable to understand mechanics of how Shea Butter get processed as well.

There are three major methods of processing Shea: Refined, Raw and Cold Pressed.

Refined: Refined Shea Butter is white in colour, odourless and hard and sometimes grainy in texture. It is one of the most popular and common kinds of Shea Butter available. The process that creates refined Shea butter starts with the raw product. During the refining process, raw Shea Butter is subjected to extremely high heat. The heating process induces a state change that allows the refined product to have a long shelf life. The heating process however also eliminate naturally occurring essential fatty acids and proteins.

Added preservatives like Sodium hydroxide and Sodium carbonate also help to keep Refined Shea Butter long lasting. Finally, to remove the earthy scent of raw Shea Butter, refiners uses hexane to strip the butter of its colour and nutty fragrance. This is necessary if one wants to use Shea Butter without all the variation in appearance and odour. However, it is less curative due to the lack of natural vitamins and other nutrients.

Raw: Raw Shea Butter ranges in colour from light beige to a more creamy yellow. It is smooth to the touch, absorbs easily and sometimes has a roasted fragrance to it. Interest in Raw Shea Butter is having a well deserved resurgence.

Raw Shea Butter is extracted and processed in the traditional way women of Africa have done for centuries. In Raw Shea Butter, the nuts of the wild growing Karite tree are hand harvested and brought back to the village. At the village, women hand shell the Karite nuts and uncover the raw nut that make up the butter. The nut is then grilled to open up its properties, pounded into a powder and boiled. During boiling, the potent oils in Shea Butter rises to the surface after which they are scooped into gourds and left to cool and set. The result is a miraculous beauty, anti aging and therapeutic lotion that is naturally high in vitamin A and E, has more antioxidant than Green Tea and boast of six different essential fatty acids. It's high nutrient content makes Raw Shea Butter useful for everything from hair care to reducing wrinkles.

Cold Pressed: Cold Pressed Shea Butter is a new way of processing and gaining popularity. Cold Pressed Shea Butter produces a final product that is lighter in Shea Scent and Colour but still as nutritive.

Cold Pressing involves extracting oil and nutrients from the Shea Nut using an expeller press or something similar. An expeller press is a machine that puts a great amount of pressure on oil bearing materials like olives, coconuts and in this case Shea. Heavy friction and continuous pressure releases oil from the Shea and the oil seeps through small openings that do not allow solid shea fibers to enter.

Although cold pressing does not extract every last trace oil in the same way that traditional processing does, the process does cut 3-5 hours off the extraction time. The result is somewhat similar to refined Shea Butter, but no chemicals or synthetics are used.

HOW SHEA- BUTTER IS PROCESSED		
REFINED	**RAW**	**COLD REFINED**
White in Colour, Odourless & Hard but Sometimes Grainy in texture	**Light beige to more creamy yellow, smooth to touch and absorb easily**	**Lighter in Shea scent but still nutritive**
Common type of Shea Butter available	**Having a well deserved resurgence**	**A new way of processing and gaining popularity**
Heating process is involved which can eliminate naturally occurring fatty Acids & Protein	**Retains its naturally vitamins A & E, higher anti oxidant than green tea**	**Heavy friction and continuous pressure. Reduces the extraction time by 5 hours**
Have longer shelf life	**Can stay longer if well preserved**	**Long shelf life**

LOCATION

The location for the Shea Butter processing facility is proposed to be located in Sagamu, Sagamu L.G.A of Ogun State, Nigeria near the Ibu River.

Coordinates: 6°50°N 3°39°E/ 6.833°N 3.650°E.

Total Area is 614km^2 (237 sq mi).

Population Total: 253,412 (2006 Census).

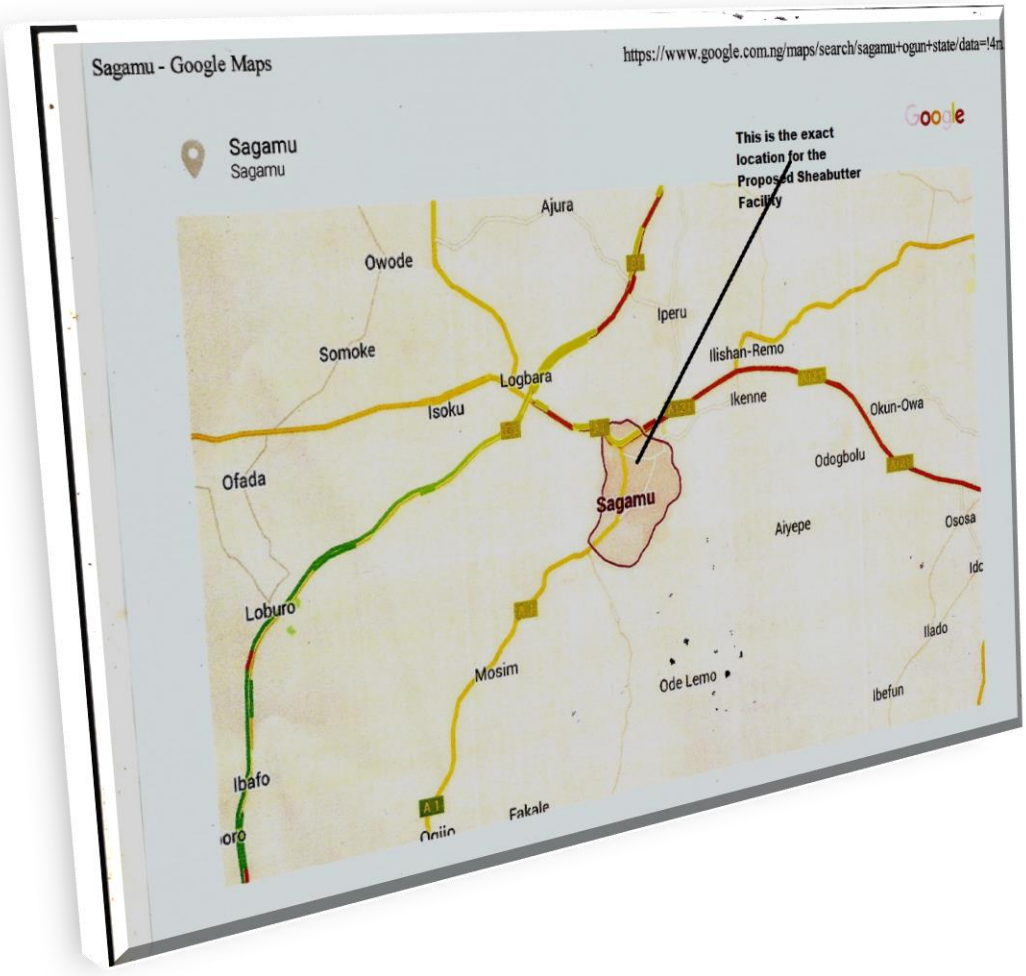
Time Zone: WAT (UTC+1).

Postal Code Prefix:

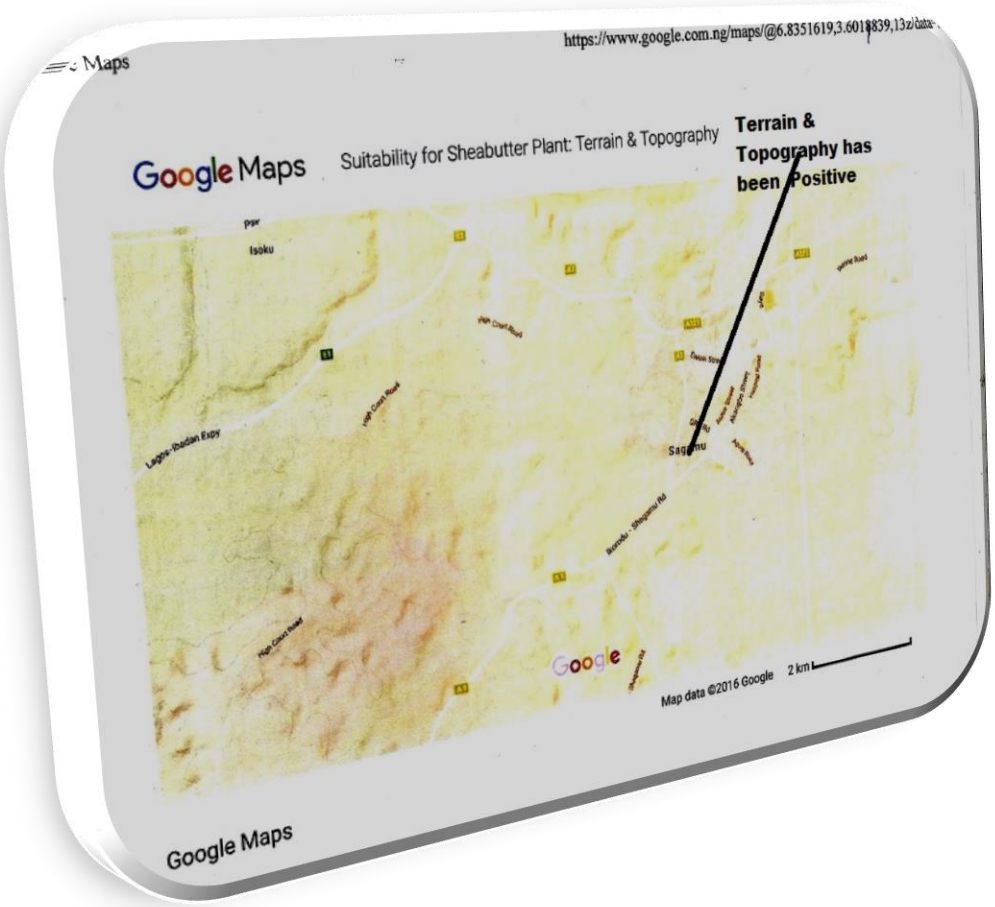
121.

The location for the shea butter facility should be of business concern. It will be perfect to be sited in an industrial zone with basic suitable amenities such as good roads, security, electricity and water. The roads should be smooth and accessible, linked to the nearby cities such as Lagos, Ibadan etc. The terrain and topography should be right to ensure efficient transportation.

Of much importance is closeness of the facility to the shea producing states where the shea nut for the factory could be sourced. From research, there are 21 states in Nigeria which can be called the shea states where shea nut is found but of the 21 states, only 4 states produces high quality shea nut ideal for export to foreign countries and in abundance quantities. These states includes Kwara, Niger, Oyo and Kebbi state.



NOTE: This is the exact location for the Proposed Shea Facility. Coordinates: 6°50°N 3°39°E/ 6.833°N 3.650°E with total land area of 614km^2 (237 sq mi).



NOTE: THE Terrain and the topography of the area will be suitable for the Project

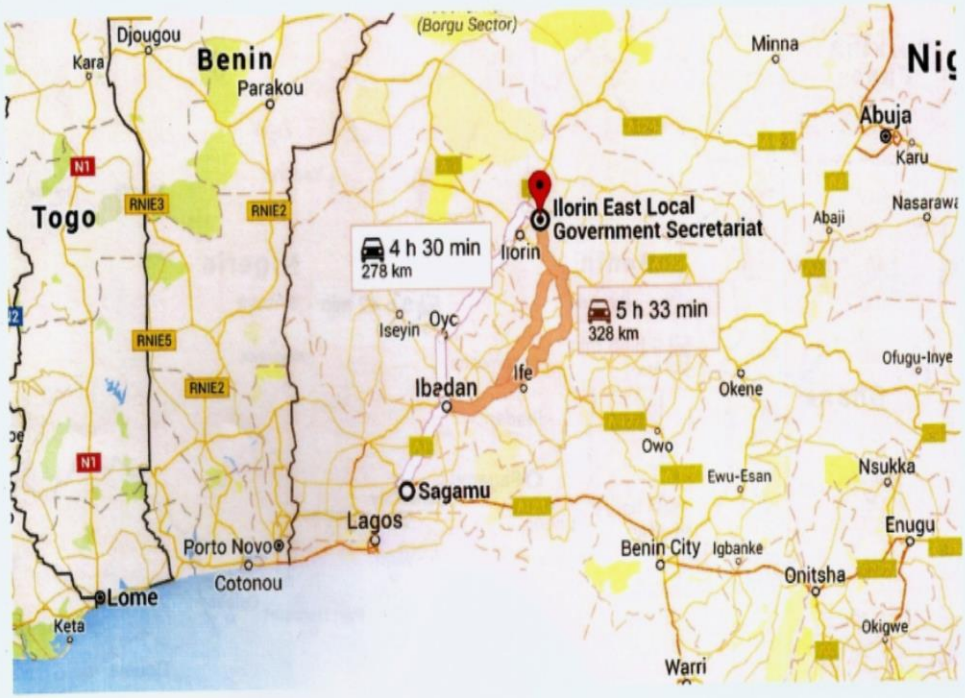
NOTE: Traffic situation has not been much in comparison to the neighboring state of Lagos where access to the port can witness a traffic gridlock.

NOTE: **The Shea communities of Niger State is closer to the Proposed Shea butter facility in Sagamu. It is an 8hrs 42 minutes Journey without traffic and 9 hrs 58 mins with traffic.**

NOTE: **The Shea producing communities of Kwara State especially in Ilorin east local government area is even much closer to the Proposed Shea butter facility in Sagamu. It is an 4hrs 30 minutes Journey without traffic and 5 hrs 33 mins with traffic.**

Directions from Sagamu to Ilorin East Local Government Secretariat

Google



Sagamu

Continue to GRA Rd/Oba Erinwole Road/A1

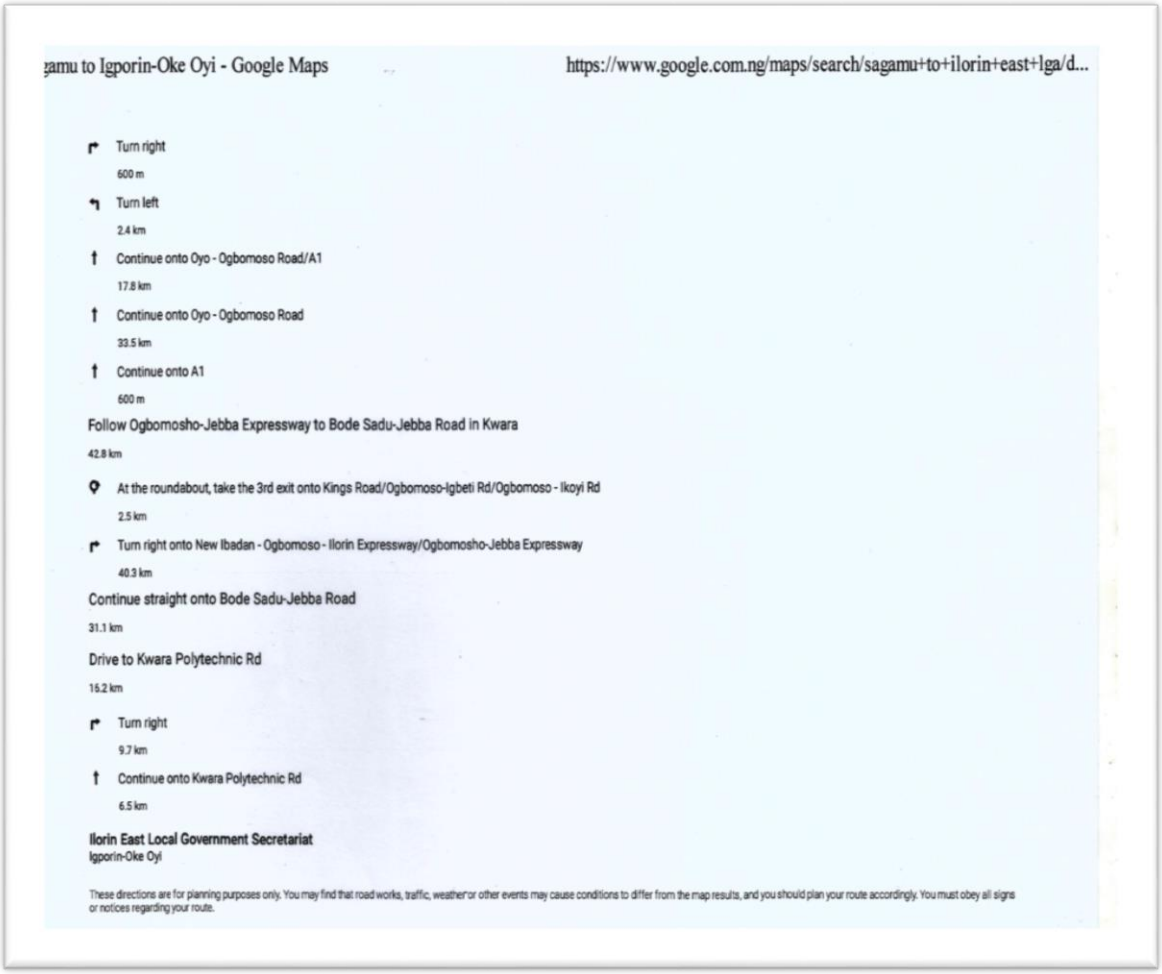
1.4 km

- Head northwest on Deeper Life S
  240 m
- Turn right
  550 m
- Turn left onto GRA Rd
  600 m

Follow E1, Ibadan-Oyo Rd/A1 and Oyo - Ogbomoso Road to Kings Road/Ogbomoso-Igbeti Rd/Ogbomoso - Ikoyi Rd in Ogbomosho

187 km

- Turn right at Jisoro Cool Spot onto GRA Rd/Oba Erinwole Road/A1
  2.1 km
- Turn left onto Shagamu - Benin Expressway/A1
  3.6 km
- Continue onto Shagamu - Benin Expressway
  2.6 km
- Take the exit onto E1
  83.8 km
- Continue onto Ibadan-Oyo Rd/A1
  39.0 km
- Turn right
  74 m
- Turn left
  550 m



gamu to Igporin-Oke Oyi - Google Maps https://www.google.com.ng/maps/search/sagamu+to+ilorin+east+lga/d...

Turn right
600 m

Turn left
2.4 km

Continue onto Oyo - Ogbomoso Road/A1
17.8 km

Continue onto Oyo - Ogbomoso Road
33.5 km

Continue onto A1
600 m

Follow Ogbomosho-Jebba Expressway to Bode Sadu-Jebba Road in Kwara
42.8 km

At the roundabout, take the 3rd exit onto Kings Road/Ogbomoso-Igbeti Rd/Ogbomoso - Ikoyi Rd
2.5 km

Turn right onto New Ibadan - Ogbomoso - Ilorin Expressway/Ogbomosho-Jebba Expressway
40.3 km

Continue straight onto Bode Sadu-Jebba Road
31.1 km

Drive to Kwara Polytechnic Rd
15.2 km

Turn right
9.7 km

Continue onto Kwara Polytechnic Rd
6.5 km

Ilorin East Local Government Secretariat
Igporin-Oke Oyi

These directions are for planning purposes only. You may find that road works, traffic, weather or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

NOTE: The Shea producing communities of Kwara State especially in Ilorin east local government area is even much closer to the Proposed Shea butter facility in Sagamu. It is an 4hrs 30 minutes Journey without traffic and 5 hrs 33 mins with traffic.

Directions from Sagamu to Niger

Google

Sagamu

Continue to GRA Rd/Oba Erinwole Road/A1

1.4 km

- Head northwest on Deeper Life S
  240 m
- Turn right
  550 m
- Turn left onto GRA Rd
  600 m

Follow E1, Ibadan-Oyo Rd/A1 and Oyo - Ogbomoso Road to Kings Road/Ogbomoso-Igbeti Rd/Ogbomoso - Ikoyi Rd in Ogbomosho

187 km

- Turn right at Jisoro Cool Spot onto GRA Rd/Oba Erinwole Road/A1
  2.1 km
- Turn left onto Shagamu - Benin Expressway/A1
  3.6 km
- Continue onto Shagamu - Benin Expressway
  2.6 km
- Take the exit onto E1
  83.8 km
- Continue onto Ibadan-Oyo Rd/A1
  39.0 km
- Turn right
  74 m
- Turn left
  550 m

Sagamu to Niger - Google Maps https://www.google.com.ng/maps/search/sagamu+to+niger+state/data...

Turn right
600 m

Turn left
2.4 km

Continue onto Oyo - Ogbomoso Road/A1
17.8 km

Continue onto Oyo - Ogbomoso Road
33.5 km

Continue onto A1
600 m

Follow Ogbomosho-Jebba Expressway to Bode Sadu-Jebba Road in Kwara
42.8 km

At the roundabout, take the 3rd exit onto Kings Road/Ogbomoso-Igbeti Rd/Ogbomoso - Ikoyi Rd
2.5 km

Turn right onto New Ibadan - Ogbomoso - Ilorin Expressway/Ogbomosho-Jebba Expressway
40.3 km

Follow Bode Sadu-Jebba Road to A1 in Niger
254 km

Continue straight onto Bode Sadu-Jebba Road
69.7 km

Continue onto A1
22.3 km

At the roundabout, take the 1st exit onto Ilorin Junc-Tion-Bode Sadu-Jebba Road/Jebba - Mokwa Rd/A1
2.4 km

Turn right onto Ilorin Junc-Tion-Bode Sadu-Jebba Road
50 m

Turn right onto Ilorin Junc-Tion-Bode Sadu-Jebba Road/Jebba - Mokwa Rd/A1
45.4 km

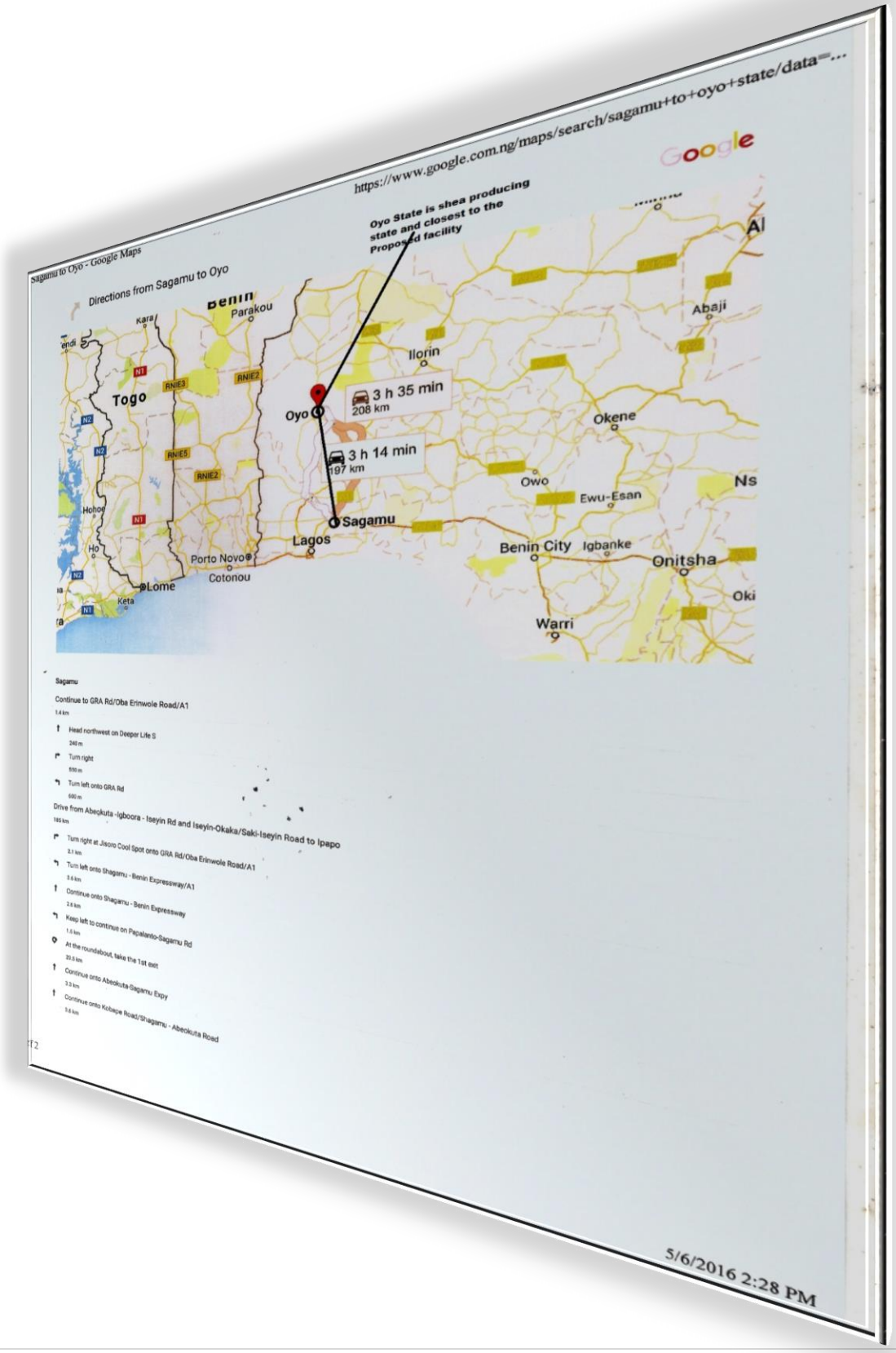
Turn left onto Mokwa-Bokani-Kotangora Road/A1
51.6 km

Turn left to stay on A1
62.0 km

Niger

These directions are for planning purposes only. You may find that road works, traffic, weather or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

NOTE: The Shea butter communities of Niger State is closer to the Proposed Shea butter facility in Sagamu. It is an 8hrs 42 minutes Journey without traffic and 9 hrs 58 mins with traffic.


https://www.google.com.ng/maps/search/sagamu+to+oyo+state/data=...
Sagamu to Oyo - Google Maps
Oyo State is shea producing state and closest to the Proposed facility
Directions from Sagamu to Oyo
Google
Benin
Parakou
Kara
Togo
Ilorin
Abaji
Oyo
3 h 35 min
208 km
3 h 14 min
197 km
Okene
Owo
Ewu-Esan
Sagamu
Lagos
Benin City
Igbanke
Onitsha
Porto Novo
Cotonou
Lome
Keta
Ho
Hohoe
Warri
Sagamu
Continue to GRA Rd/Oba Erinwole Road/A1
1.4 km
Head northwest on Deeper Life S
240 m
Turn right
550 m
Turn left onto GRA Rd
600 m
Drive from Abeokuta -Igboora - Iseyin Rd and Iseyin-Okaka/Saki-Iseyin Road to Ipapo
Turn right at Jisoro Cool Spot onto GRA Rd/Oba Erinwole Road/A1
2.1 km
Turn left onto Shagamu - Benin Expressway/A1
3.4 km
Continue onto Shagamu - Benin Expressway
2.6 km
Keep left to continue on Papalanto-Sagamu Rd
1.0 km
At the roundabout, take the 1st exit
20.6 km
Continue onto Abeokuta-Sagamu Expy
3.3 km
Continue onto Kobape Road/Shagamu - Abeokuta Road
1.6 km
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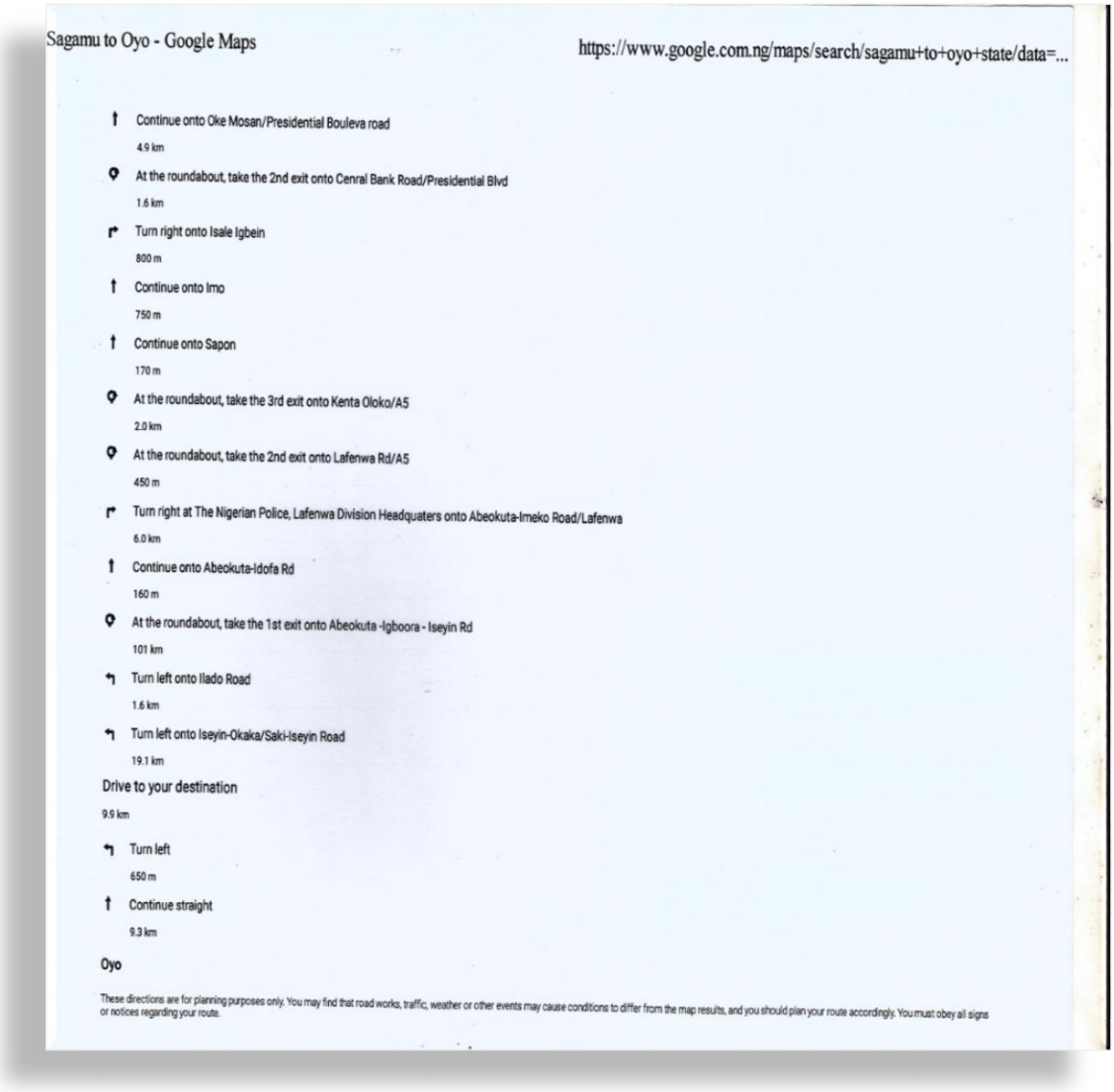


Sagamu to Oyo - Google Maps https://www.google.com.ng/maps/search/sagamu+to+oyo+state/data=...

Continue onto Oke Mosan/Presidential Bouleva road
4.9 km

At the roundabout, take the 2nd exit onto Cenral Bank Road/Presidential Blvd
1.6 km

Turn right onto Isale Igbein
800 m

Continue onto Imo
750 m

Continue onto Sapon
170 m

At the roundabout, take the 3rd exit onto Kenta Oloko/A5
2.0 km

At the roundabout, take the 2nd exit onto Lafenwa Rd/A5
450 m

Turn right at The Nigerian Police, Lafenwa Division Headquaters onto Abeokuta-Imeko Road/Lafenwa
6.0 km

Continue onto Abeokuta-Idofa Rd
160 m

At the roundabout, take the 1st exit onto Abeokuta -Igboora - Iseyin Rd
101 km

Turn left onto Ilado Road
1.6 km

Turn left onto Iseyin-Okaka/Saki-Iseyin Road
19.1 km

Drive to your destination
9.9 km

Turn left
650 m

Continue straight
9.3 km

Oyo

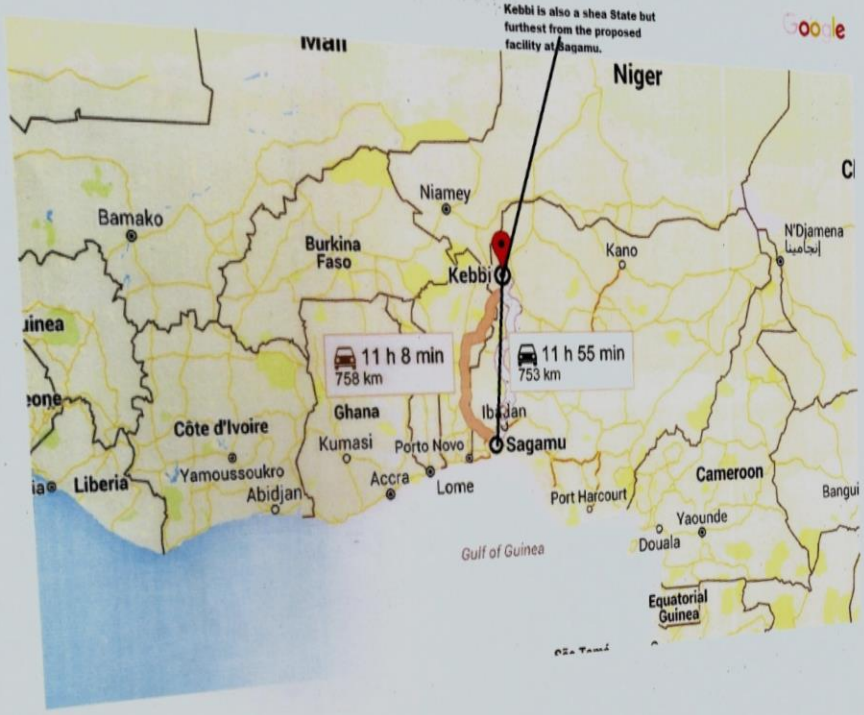
These directions are for planning purposes only. You may find that road works, traffic, weather or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

NOTE: Closest to the Shea facility is neighboring state of Oyo which also produce shea nut. Oyo state is a 3 hrs 14 mins journey without traffic and 3 hrs 35 mins on traffic.

Sagamu to Kebbi - Google Maps

https://www.google.com.ng/maps/search/directions+from+sagamu+to...

Directions from Sagamu to Kebbi



Sagamu

Continue to GRA Rd/Oba Erinwole Road/A1
1.4 km

Head northwest on Deeper Life S
240 m

Turn right
550 m

Turn left onto GRA Rd
600 m

Drive from E1, Ibadan-Oyo Rd/A1, Oyo - Ogbomoso Road, Ogbomoso-Igbeti Rd, ... and Agwara Tungar Jatau Swate Maje Road to Shafaci
621 km

Turn right at Jisoro Cool Spot onto GRA Rd/Oba Erinwole Road/A1
2.1 km

Turn left onto Shagamu - Benin Expressway/A1
3.6 km

Continue onto Shagamu - Benin Expressway
2.6 km

Take the exit onto E1
83.6 km

Continue onto Ibadan-Oyo Rd/A1
39.0 km

Turn right
74 m

Turn left
550 m

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of 2

Sagamu to Kebbi - Google Maps https://www.google.com.ng/maps/search/directions+from+sagamu+to...

Turn right
600 m

Turn left
2.4 km

Continue onto Oyo - Ogbomoso Road/A1
17.8 km

Continue onto Oyo - Ogbomoso Road
33.5 km

Continue onto A1
600 m

At the roundabout, take the 3rd exit onto Kings Road/Ogbomoso-Igbeti Rd/Ogbomoso - Ikoyi Rd
73.7 km

Turn left onto Igbeti-Ogbomoso Rd/A 7
9.3 km

Slight right onto Igbeti-Kisi Rd/A 7
112 km

Continue straight onto Kaiama-Bode Sadu
36.4 km

Continue onto Wawa - Kajama Rd
30.2 km

Wawa - Kajama Rd turns slightly left and becomes Wawa - Babana Rd/Yelwa-Mokwa Road
130 km

Turn left onto Agwara Tungar Jatau Swate Maje Road
42.3 km

Take Koko - Dakingari Rd to Dakingari - Bunza Rd in Dakingari
127 km

Turn right
46.1 km

Turn right
43.7 km

Turn left onto Koko - Dakingari Rd
1.0 km

Continue straight to stay on Koko - Dakingari Rd
14.4 km

Continue onto Koko - Dakingari Rd
21.6 km

Continue onto Dakingari - Bunza Rd
1.2 km

Slight right
2.4 km

Kebbi

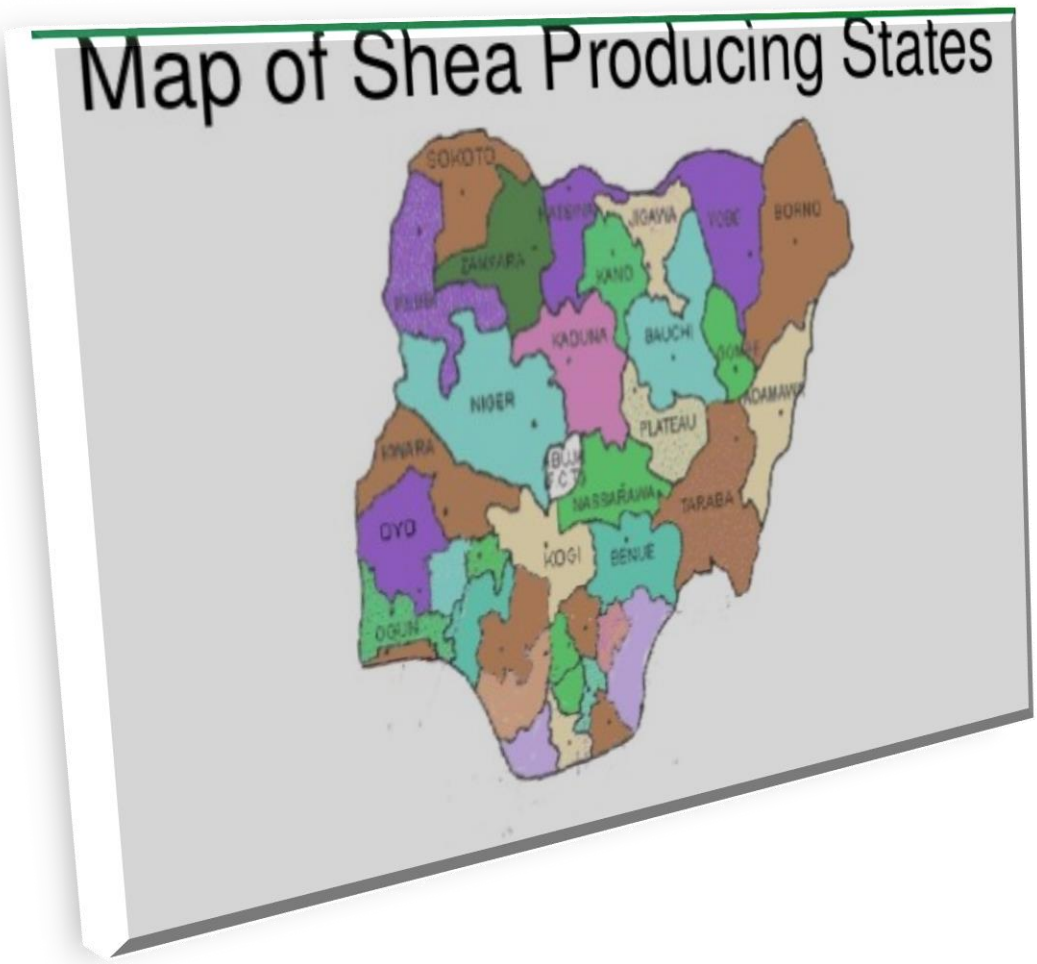
These directions are for planning purposes only. You may find that road works, traffic, weather or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

2 of 2 5/6/2016 2:30 PM

NOTE: Kebbi State of Nigeria is also a Shea producing state and it is the furthest to the Shea facility at Sagamu. It is an 11 hrs 8 mins journey without traffic and 11 hrs 55 mins on traffic


Shea Production Zone in West Africa


MOROCCO
ALGERIA
LIBYA
EGYPT
MAURITANIA
MALI
NIGER
CHAD
SUDAN
NIGERIA
SOMALIA
KENYA


Map of Shea Producing States
SOKOTO
ZAMFARA
KANO
JIGAWA
YOBE
BORNO
KADUNA
BAUCHI
NIGER
PLATEAU
TARABA
OYO
KOGI
BENUE
OGUN

INDUSTRY

The Raw Material

The entire Shea Trees in Africa produces about 6,760,000 tons of raw shea nuts. 30% which is about 2,028,000 tonnes is been collected, picked or gotten annually from its wild trees, mainly in the Savannah and Sahel regions, but producers harvest and process only a fraction, about 35% (2,028, 000 tons) (about 709,800 tons), for exportation as butter or nuts. The West African variety of shea, Vitellaria Paradoxa, has been traditionally processed and locally used, as cooking oil or as butter for the skin and hair. A subspecies Nilotica, found in northern Uganda and southern Sudan produces superior quality oil for the cosmetics industry, but is not found in food preparation or as a food ingredient.

Processing Potential

The shea tree grows naturally in the wild Savannah belt of West Africa, from Senegal in the west to Sudan in the east, and into the foothills of the Ethiopian highlands, as well as in 20 countries across the African continent: Benin, Ghana, Chad, Burkina Faso, Cameroon, Central African Republic, Ethiopia, Guinea Bissau, Cote D'Ivoire, Mali, Niger, Nigeria, Senegal, Sierra Leone, Sudan, Togo Uganda, Zaire, Guinea and The Gambia. Seven West African countries (Ghana, Burkina Faso, Benin, Cote d'Ivoire, Nigeria, Mali and Togo) produce about 1,000,000 tons of shea nuts, of which an estimated 540,000 tons are exported as raw nuts. Processors converted the remaining 460,000 tons into roughly 150,000 tons of crude shea butter, half of which is then exported.

Rural-based women, using manual traditional methods, process about 60% of all the crude butter produced in West Africa at a relatively low extraction rate of about 20%. Mechanized processing, increasing seen in the region, yields 30-40% shea butter from raw nuts. Together a processing plant has the capacity to convert 162,000 tons of nuts into about 70,000 tons of shea butter, assuming on average estimated extraction rate of 35%. However, most of the West African plants produce at less than 30% of their installed capacity, perhaps because the plants operate for only 6 months of the year to offset the high cost of storing raw nuts throughout the year.

Shea Butter Industry

The Shea sector, has excellent prospects. Shea is an important input to the high-end cosmetics sector, which is expected to see continued strong growth for years to come. Shea is very much a self-contained industry, which could scale very quickly with little investment.

You will see many Shea Butter anti-aging products, that you can find pretty much anywhere. Because people everywhere are seeking it because of the high amounts of vitamin A and E found in Shea Butter. Vitamin A and E help keep the skin healthy and flexible. It also helps prevent the signs of wrinkles, none of us want. Shea Butter also contains vitamin F, which works as a rejuvenating agent. Rough skin is healed and soothed as the Shea butter easily absorbs into the skin while not clogging your pores. As you can see, it can scale very quickly with investment in processing machinery and skills training, in addition to organizational restructuring of the supply chain.

Markets for certified commodity

Shea butter consumption globally is increasing. The cosmetic industry alone takes up 10 percent of the market, and is only foreseen to grow. In addition, if the US lifts the ban on using cocoa butter alternatives (as is in the EU, which allows up to 5 percent of Shea butter), then consumption in this sector will also increase. The demand for certified product is essential, especially if you factor in the availability of good quality Shea butter that companies and buyers are searching for. As you can see, when it comes to Shea Butter Products such as bar soap, there are abundant benefits to using this wonderful, naturally absorbing, conditioning homemade soaps. Shea butter is not toxic, and soaps containing Shea butter as a primary ingredient are perfect for those who suffer from skin conditions such as eczema or dermatitis. Shea butter does not get destroyed or dissolved, when making soap bars, and that's why you should use a soap that contains a very high percentage of Shea butter. In this case, more is better.

Factors Driving World Demand for Shea

Shea is in high demand in several sectors and world markets. Principal factors driving demand include: Continued rising demand for cocoa butter equivalents (CBEs) due to rising world consumption of chocolate, high prices for cocoa, and strong demand for natural cosmetics and soaps. In Europe, North America, and Japan Shea butter is highly sought-after for its superior healing and moisturizing properties and is a desired ingredient in creams, sunscreens soaps, shampoos and conditioners. Commercial interest in Shea mostly centers on its use as a substitute for cocoa butter (CBE) in the confectionary industry. This demand comes principally from the EU where Shea butter is approved as a CBE in chocolate up to 5%. India is also an important edibles market for Shea butter. Shea and other CBEs have not yet been approved for use in food in the U.S market. The U.S. and Europe are the main markets for Shea butter use in cosmetics and natural products. The primary factor driving demand for Shea butter is rising demand for CBEs as an alternative to cocoa butter in the manufacturing of chocolate. Chocolate and confectionery products account for 90% of Shea butter demand, with only

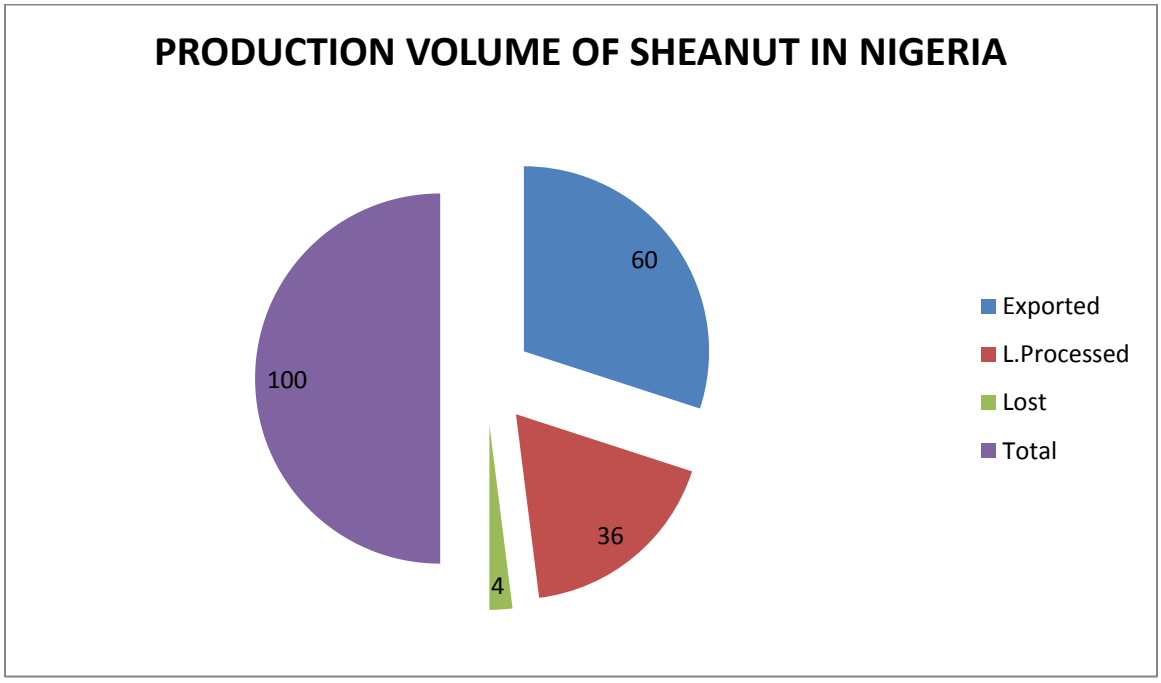
10% percent currently used for cosmetics and pharmaceuticals. Regulatory changes are the factors likely having the strongest impact on European demand for Shea use in CBEs where various European countries have allowed greater use of CBEs in chocolate and other foods.

Asia is also an important growth market for CBEs as most Asian countries do not have any regulations against using CBEs in chocolate. Together, Western Europe and Asia consume about two thirds of global CBE production(2/3) (66%). World chocolate consumption is increasing overall, especially in the growing economies of Latin America and Eastern Europe where disposable incomes are rising. Despite the relative maturity of the Western European market, chocolate consumption is still strong.

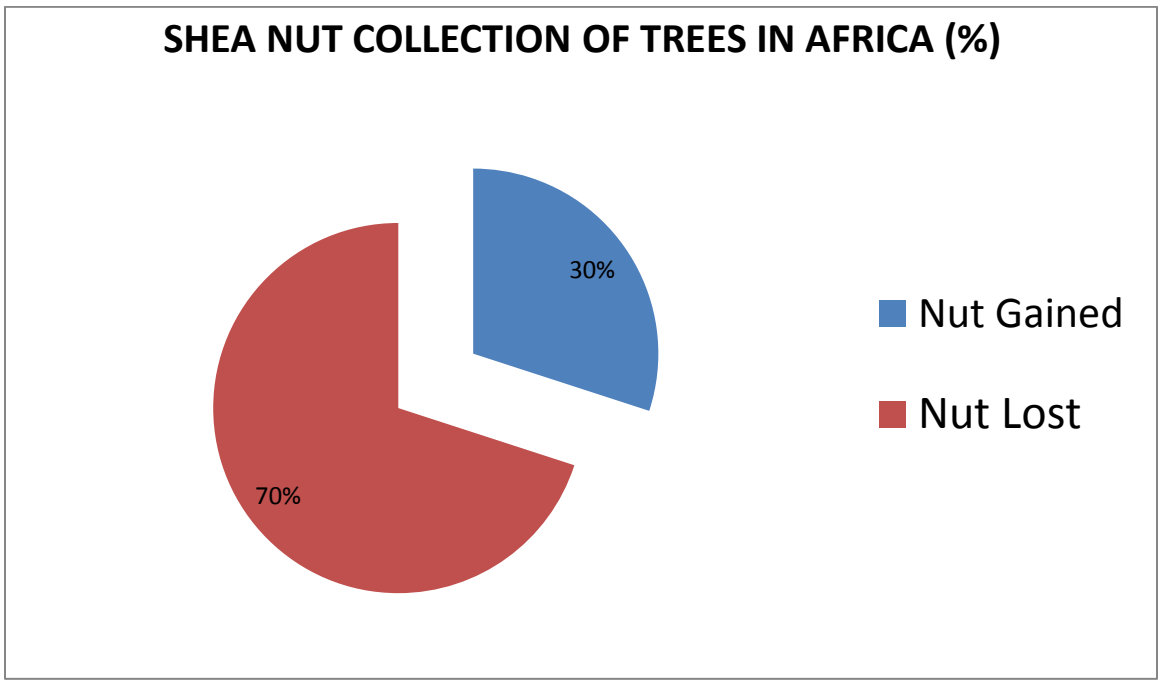
SHEA INDUSTRY IN NIGERIA

The Shea Industry in Nigeria is huge and continues to witness growth over the years. And Nigeria has a comparative advantage in the growth, production and processing of shea butter. Apart from Hydrocarbon, Nigeria has a comparative advantage in the agricultural sector where a variety of products are produced due to the favourable climatic conditions, good soil condition and the fact that over 70% of the entire land mass of the country is suitable for agriculture.

Again, Nigeria has a comparative advantage in the cultivation, processing and export of crude shea butter, raw nut and can key into the opportunity in refining of the nuts into refined shea butter. This is because we have got the arable land available for the growth, production and the conducive climatic condition.

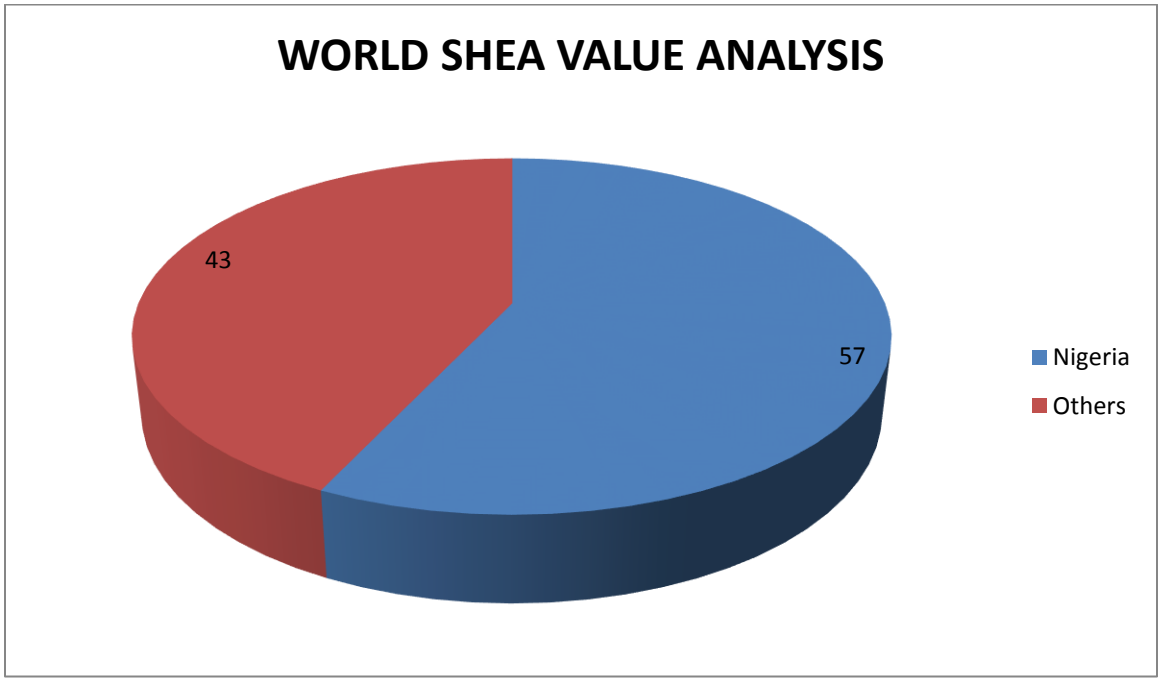


Presently, Nigeria is the leading producer of shea nut in the world. Of the over 1 700 000tons of shea kernel nuts the tree yields, only about 25-30% are been collected by the village and women groups who hand pick it all over. The rest about 70% are lost which represent about 1 200,000 tons. On the positive side, 25-30% which are being collected represents about 500,000 tons. Hence Nigeria produces about 500,000 tons of raw nuts from its vast wide trees stretching in over 20 states in Nigeria. Of the 500, 000 tons, about 300,000 tons which represent about 60% are being exported out of the country in raw form to the Europeans, American and Asian country where they are further processed into shea butter and other finished products derivatives as in confectionery and cosmetic industries. Of the 200 000 tons left, only about 180,000 tons are locally processed by the women groups in clusters in the producing states majorly whom has formed a cooperative society and the few major producers who use the raw nut in their mechanized large scale production. This represent about 90% of the raw shea kernel left for the local production of shea butter. About 20,000 tons which represent about 10% is lost due to poor storage and quality issues.



On the financial level, Nigeria represent a total shea value estimated at $2billion dollars. The total industry shea value is estimated to be at $3.8billions. This represent over 50% of the entire world shea trade industry. Unfortunately, Nigeria due to economic and leadership issues is yet to tap from the opportunities to process and export shea butter. Majority of its processed shea butters are smuggled

out of the country and exported from the neighboring country in Benin and Cameroun. It is estimated that it exports partly over 60,000 tons of shea butter per annum.

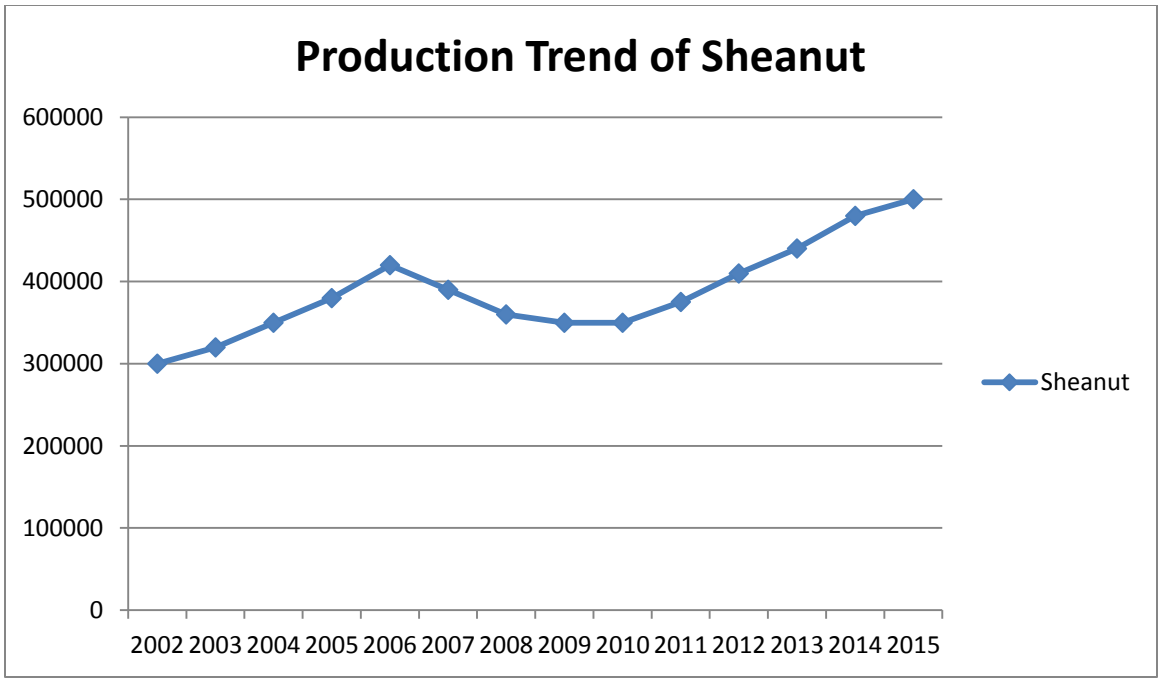


HISTORICAL TREND OF SHEANUT PRODUCTION IN NIGERIA

YEARS	2002	2003	2004	2005	2006	2007	2008
VOLUME (TONS)	300 000	320 000	350 000	380 000	420 000	390 000	360 000

YEARS	2009	2010	2011	2012	2013	2014	2015
VOLUME (TONS)	350 000	350 000	375 000	410 000	440 000	480 000	500 000

Note: **The figures are roundly estimated figures of the yearly productivity volumes.**

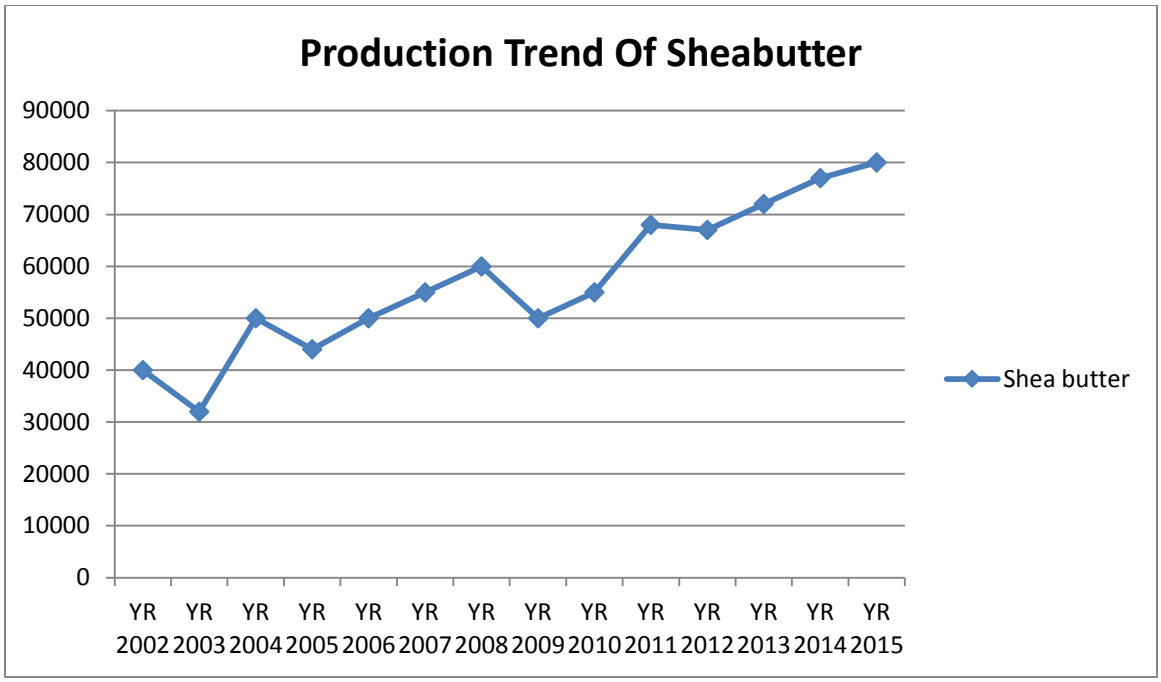


HISTORICAL TREND OF SHEABUTTER PRODUCTION IN NIGERIA

YEARS	2002	2003	2004	2005	2006	2007	2008
VOLUME (TONS)	40 000	32 000	50 000	44 000	50 000	55 000	60 000

YEARS	2009	2010	2011	2012	2013	2014	2015
VOLUME (TONS)	50 000	55 000	68 000	67 000	72 000	77 000	80 000

Note: **The figures are roundly estimated figures of the yearly productivity volumes.**

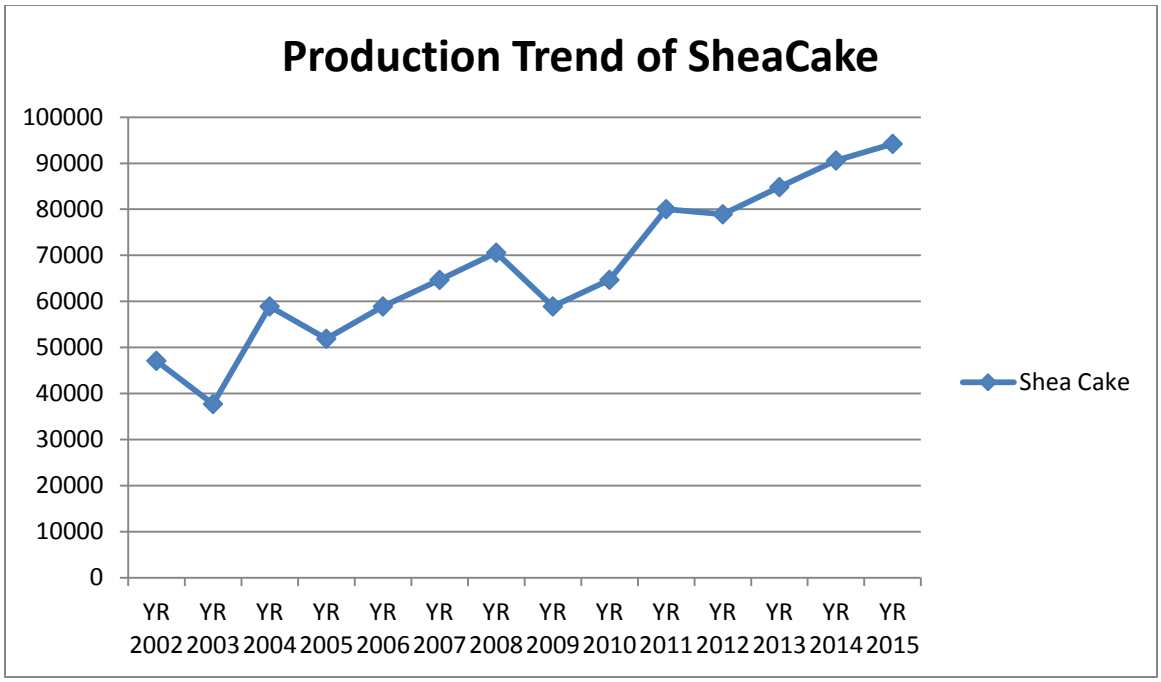


HISTORICAL TREND OF SHEANUT CAKE PRODUCTION IN NIGERIA

YEARS	2002	2003	2004	2005	2006	2007	2008
VOLUME (TONS)	47 100	37 700	58 900	51 900	58 900	64 700	70 600

YEARS	2009	2010	2011	2012	2013	2014	2015
VOLUME (TONS)	58 900	64 700	80 000	78 900	84 800	90 600	94 200

Note: **The figures are roundly estimated figures of the yearly productivity volumes.**

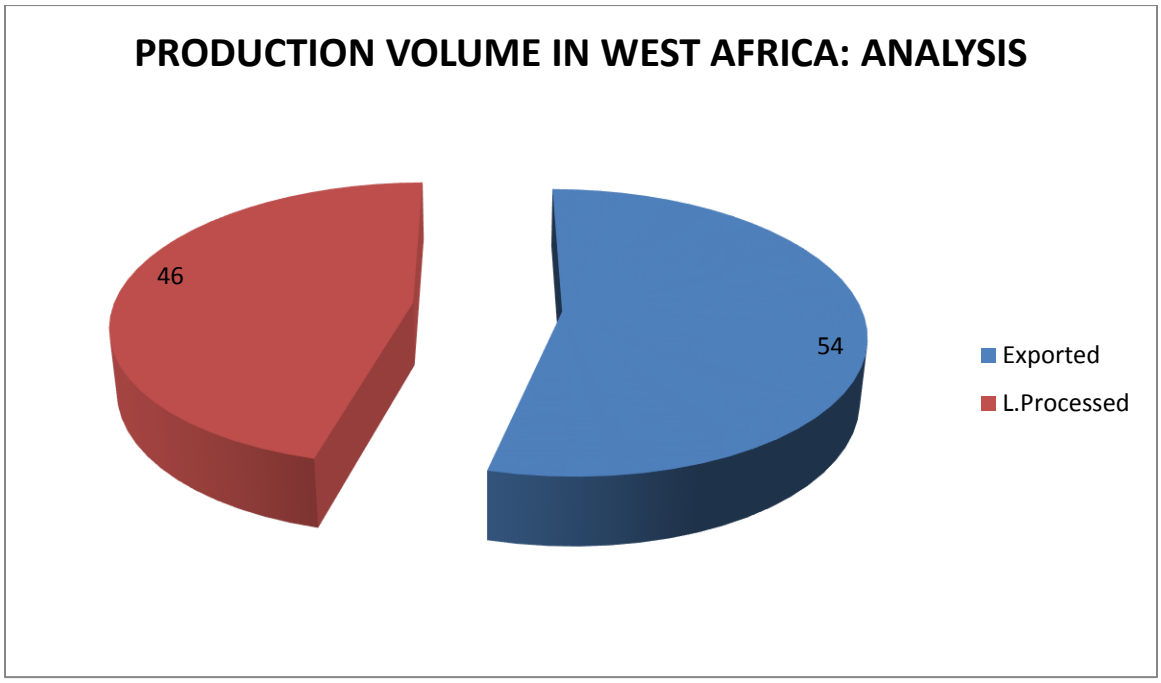


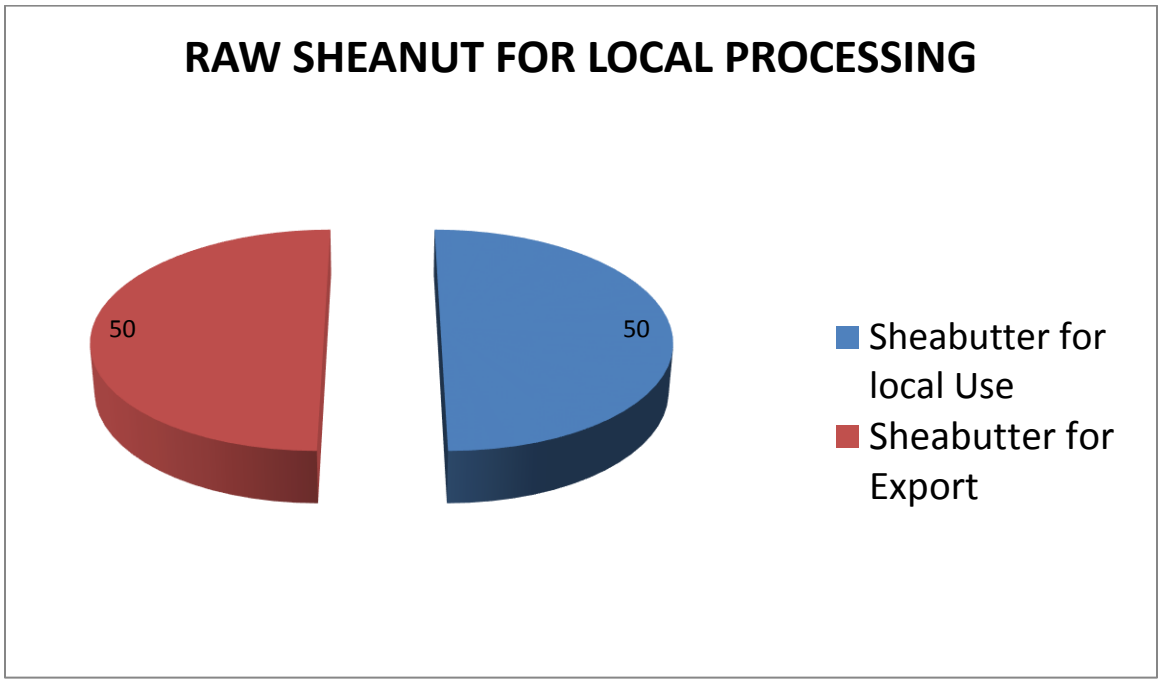
SHEA BUTTER INDUSTRY IN WEST AFRICA

The Shea Industry in West Africa is still at the tail end of the beginning phase of development, but in the coming years, it will become one of the major industries in West Africa, similar to the Cocoa Industry. The Shea tree has been instrumental in providing employment and help to alleviate poverty for the rural populace of the countries of West Africa. In recent times the industry has attracted the attention of policymakers and private investors especially with the introduction of the Savannah Accelerated Development Authority (SADA). All efforts are being made to give the attention accorded to cocoa production to shea nut production as well. Also a shea nut factories has sprang in the various Countries of West Africa to add value to the crop. Several other factories are on the drawing board. These initiatives are undertaken under the assumption that shea nut picking and shea butter production are profitable.

On the numerical level, Seven West African countries (Ghana, Burkina Faso, Benin, Cote d'Ivoire, Nigeria, Mali and Togo) has its numerous shea trees produce over 3,000,000 tons of the shea nut but only a fraction(about 30%) could be collected or picked. This represent about 1,000,000 tons. Hence West Africa produce about 1,000,000 tons of shea nuts, of which an estimated 540,000 tons representing 54% are exported as raw nuts. Processors converted the remaining 460,000 tons into

roughly 150,000 tons representing partly (33%) into crude and refined shea butter, half of which is then exported. This is 75,000 tons representing 50%.





Industry	Production Volume (MT)	Percentage (%)
Total Production (West Africa)	3,000,000	100
Actual Total Production (collected)	1,000,000	30
Exported as Raw Nuts	540,000	54
Available for local processing	460,000	46
Actual Processed into crude and refined butter	150,000	33
Processed for Export	75,000	50
Available for Local Consumption	75,000	50

On the local side, Rural-based women, using manual traditional methods, process about 60% of all the crude butter produced in West Africa at a relatively low extraction rate of about 25%. Currently, the production of Shea butter are often done manually in semi industrial and small 100% industrial scale in West Africa. There are more demand for Shea butter than is currently produced. One constraint to shea production in West Africa is quality issues. Because West Africa has not enough factories to produce a high grade quality of Shea butter, the opportunities in export is yet to be adequately tapped. The African entrepreneur has too little access to financing for trade and investment, hence 80% of the Shea butter production is done in Europe and Asia by multinational companies.

Hence, and on the business level, there is a market gap. A gap to specialize in producing a high grade quality of Shea Butter (grade A) .Shea Tree grows only in West Africa and lesser extent in Central Africa, And nowhere else in the world. A disadvantage of processing Shea Nuts into Shea Butter in Europe or Asia is the transport costs. To produce 1 kg of Shea Butter, you need 2.2 kg Shea Nuts, so as you understand, it is much cheaper to produce Shea Butter in West Africa. Staff costs here are also lower.

Shea Butter is produced with technical equipment specially designed for the production of Shea Butter and an entrepreneur in the shea business should continue to adapt its equipment to the need of the market.

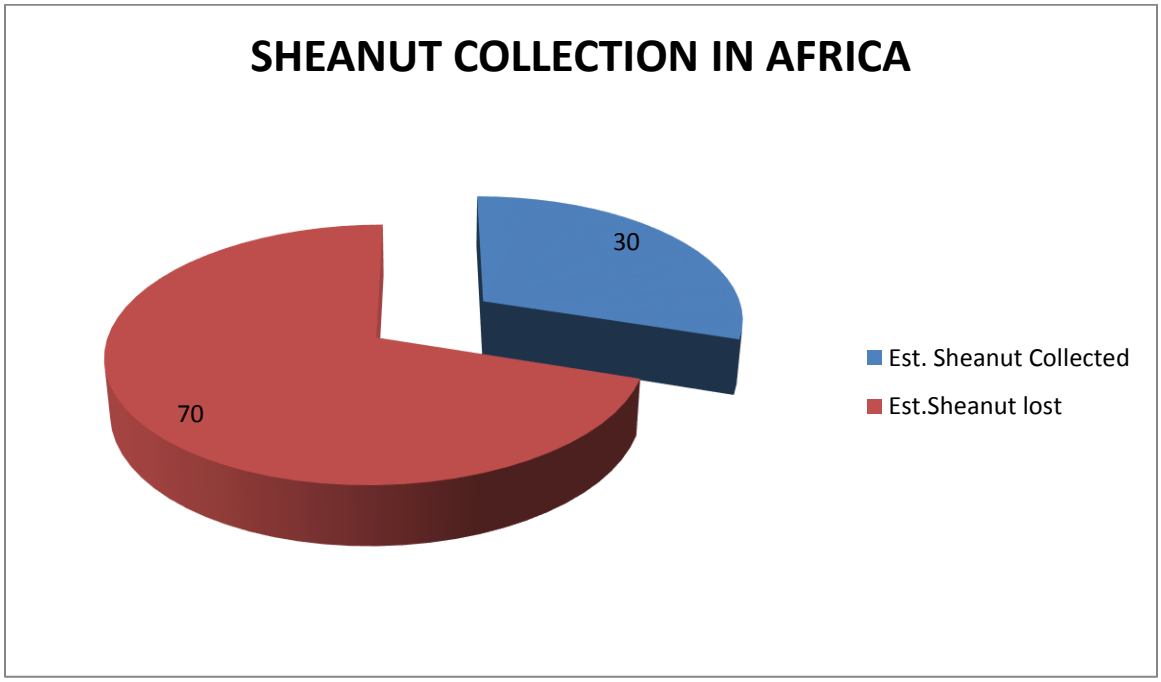
Overall, the industry in West Africa has a potential to increase its general output with a more positive government and fiscal policies, improvement and sustainability of advancement in technology, social welfare schemes, information technology, credit schemes etc. A considerable step need to be taken to encourage investors to key into the opportunities in the shea business by creating an enabling environment and incentives for them to establish shea butter plants to process this raw nuts into high grade quality shea butter.

SHEABUTTER INDUSTRY IN AFRICA

Shea nut production is an Africa business while shea butter production is a world business. All shea nut used by the world all over to produce shea butter are gotten from the shea trees of Africa. The nuts are shipped to large industrial processors in Western Countries where they are converted to value added products. However, Africa, which is a larger circle and trade environment have a comparative advantage in the shea business.

The entire Shea Trees in Africa produces about 6,760,000 tons of raw shea nuts. 30% which is about 2,028,000 tons is been collected, picked or gotten annually from its wild trees, mainly in the Savannah and Sahel regions, but producers harvest and process only a fraction, about 35% (2,028, 000 tons) (about 709,800 tons), for exportation as butter. In addition, it grows naturally on parklands in 21 African Countries stretching from Senegal to South Sudan providing source of livelihood to over 16,000,000 rural women.

Shea	Volume (MT)	Percentage (%)
Est. Entire Shea nut in Africa	**6, 760,000**	**100**
Est. Volume Collected	**2,028,000**	**30**
Est. Volume Lost	**4,732,000**	**70**
Est. Volume Produced as Shea butter	**709,800**	**35**
Est. Volume lost in Production	**1,318,200**	**65**



For example, Antoine Turpin of IOI Loders Croklaan, a global producer of edible oils, told The New York Times that "Shea (butter) is an important source of revenue to millions of women and their families across Africa. Empowering this women economically is the key to the Industry Sustainability in Africa.

The New York Times says Turpin's Company alone purchases an estimated 25% of all shea nuts picked by women in West Africa. Also, a survey conducted by USAID in Burkina Faso stated that for every $1000 of shea nuts sold, an additional $1,580 in economic activities such as reinvesting the money in other trades was generated in the village. Shea butter from Africa garners between over $400million dollars a year. The demand comes not only from major corporations but also from millions of entrepreneurs who hope to make a fortune in the distribution of this so called "women's gold".

Now, with high demand come ethical issues , which often arise with products originating from the developing world including Africa. Because of shea's newfound popularity, the number of shea fair trade cooperatives and associations seeking a fair deal for Africa women has increased. There is now increased consumers awareness believing that an educated consumer may be willing to pay more for goods if the producer gets a fair deal.

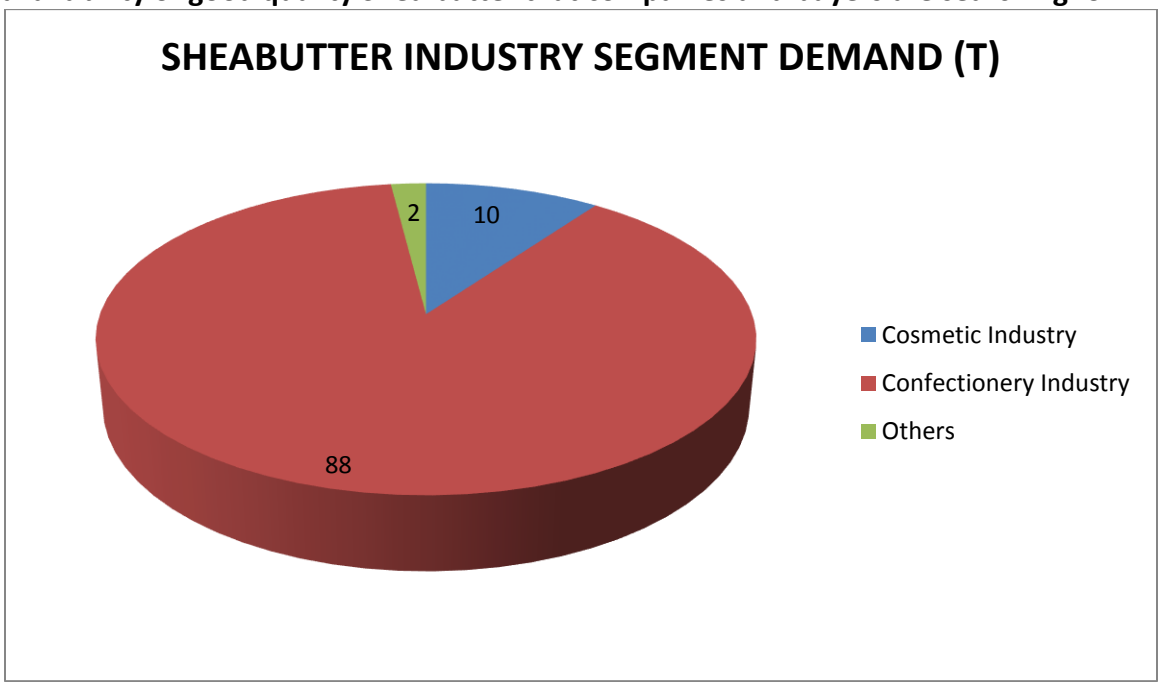
In order to receive fair prices for their products, commodity producers have to maintain certain level of environmental and labour standards recommended by fair trade certification organizations such as Fair-trade International, World Fair Trade Organization, Faire Trade USA and Fair Trade Federation to name but a few. Fair trade model appears to offer an improvement on the conventional trade model. Paying market prices for the commodity guarantees a minimum price to the producers. The industries usually associated with fair trade are coffee, cocoa, banana, flowers, gold and other exotic products. Shea butter was not one of the most sought after African commodities until recently.

Harriet Lamb of the Fair-trade Foundation says, "Fair trade addresses the injustices of conventional trade, which too often leave the poorest, weakest producers earning less than it cost them to grow their crops. It's a bit like a national minimum wage for global trade. Not perfect, not a magic wand, not a panacea for all the problems of poverty, but a step in the right direction."

Philip Booth from the Institute of Economic Affairs, a British Think Tank, sees things differently. He argues that "no clear evidence has been produced to suggest that farmers themselves actually receive higher prices under fair trade. There is an annual shea butter trade confluence that help to bring the industry stakeholders to galvanize and chart the way forward the industry.

WORLD SHEABUTTER INDUSTRY

The Shea butter Industry is huge. The Shea sector, in the world has excellent prospects. Shea is an important input to the high-end cosmetics sector, which is expected to see continued strong growth for years to come. Shea is very much a self-contained industry, which could scale very quickly with investment in processing machinery and skills training, in addition to organizational restructuring of the supply chain, Shea butter consumption globally is increasing. The cosmetic industry alone takes up 10 percent of the market, and is only foreseen to grow. In addition, the US lifts the ban on using cocoa butter alternatives (as is in the EU, which allows up to 5 percent of Shea butter), then consumption in this sector will also increase. The demand for certified product is essential, especially if you factor in the availability of good quality Shea butter that companies and buyers are searching for.



	FACTORS DRIVING WORLD DEMAND FOR SHEABUTTER
1.	**Continued rising demand for Cocoa butter Equivalent due to rising world consumption of Chocolate**
2.	**High Prices for Cocoa**
3.	**Strong demand for Natural Cosmetics**
4.	**Increasingly demand for Soaps**

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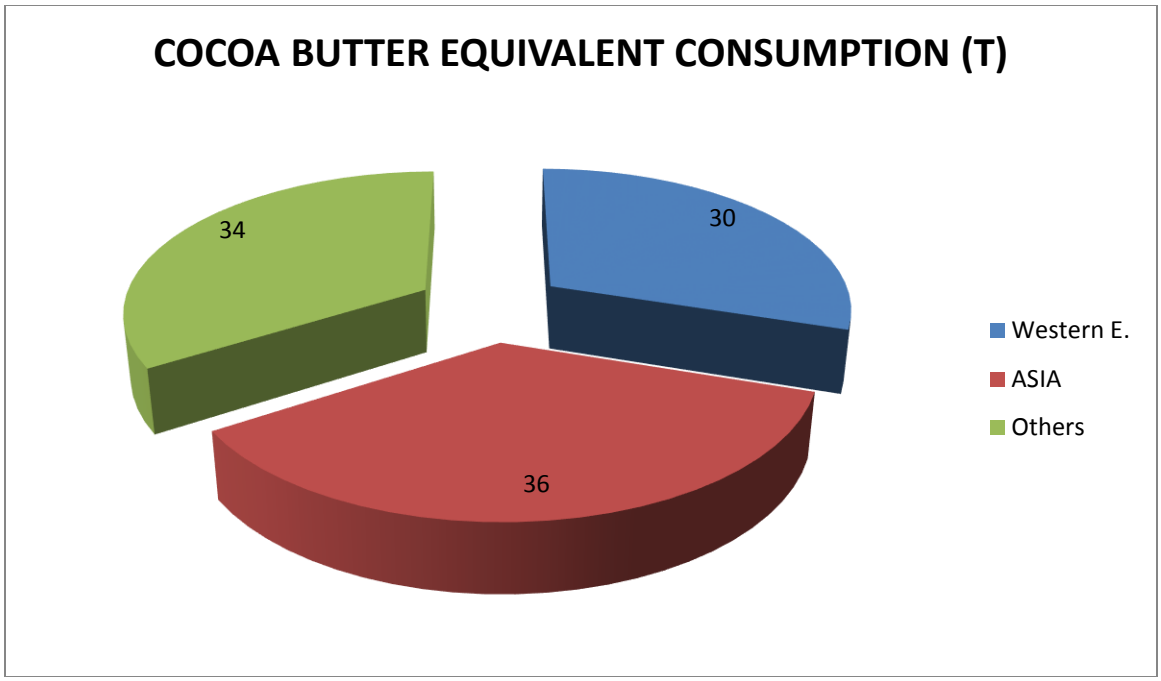
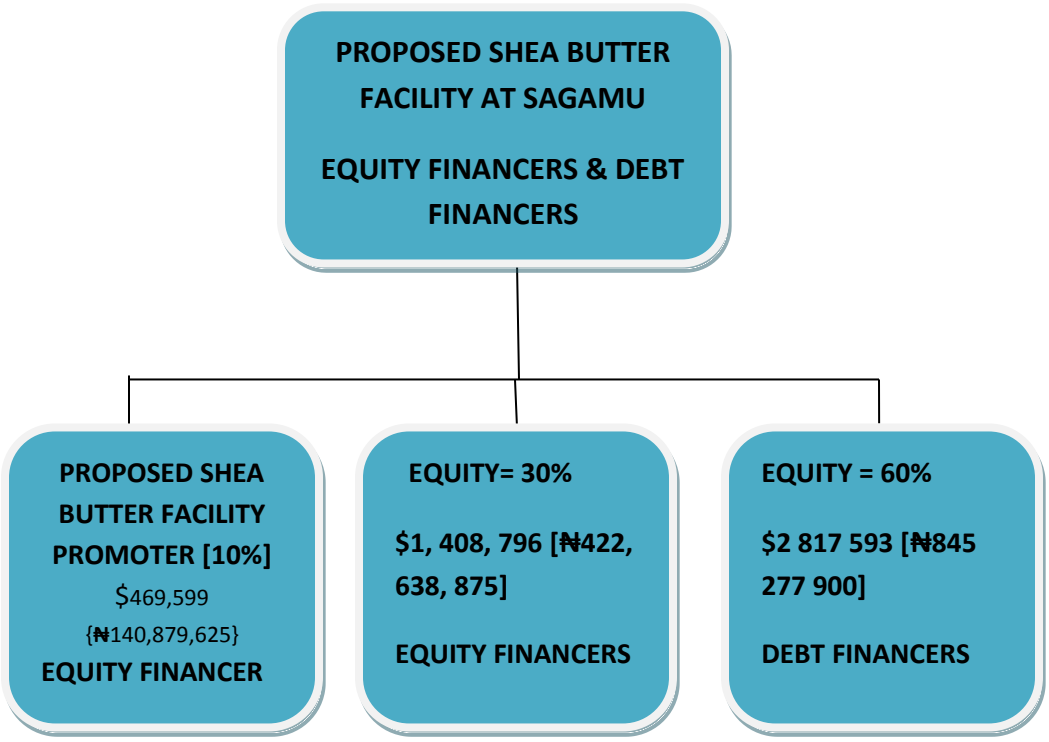


The Global Shea which is a world coordinating body for shea stakeholders has about 400 members from 26 different countries, including several heavyweights from the global confectionery industry such as the Hershey Company and Nestle. This is not as surprising as it may seem at first glance, as more than 90% of exported shea ends up in confectionery products. The Hershey Company is an active and supportive member of the Global Shea Alliance posited that being a member enables them to network with industry partners within the shea sector both from a sustainability and supply chain perspective.

FUNDING

CRUDE SHEABUTTER EXTRACTION

SUBJECT	AMOUNT ($)	AMOUNT (₦)	Percentage (%)
EQUITY	1 878 395	563 518 500	40
DEBT CAPITAL	2 817 593	845 277 900	60
TOTAL INVESTMENT	4 695 988	1 408 796 400	100

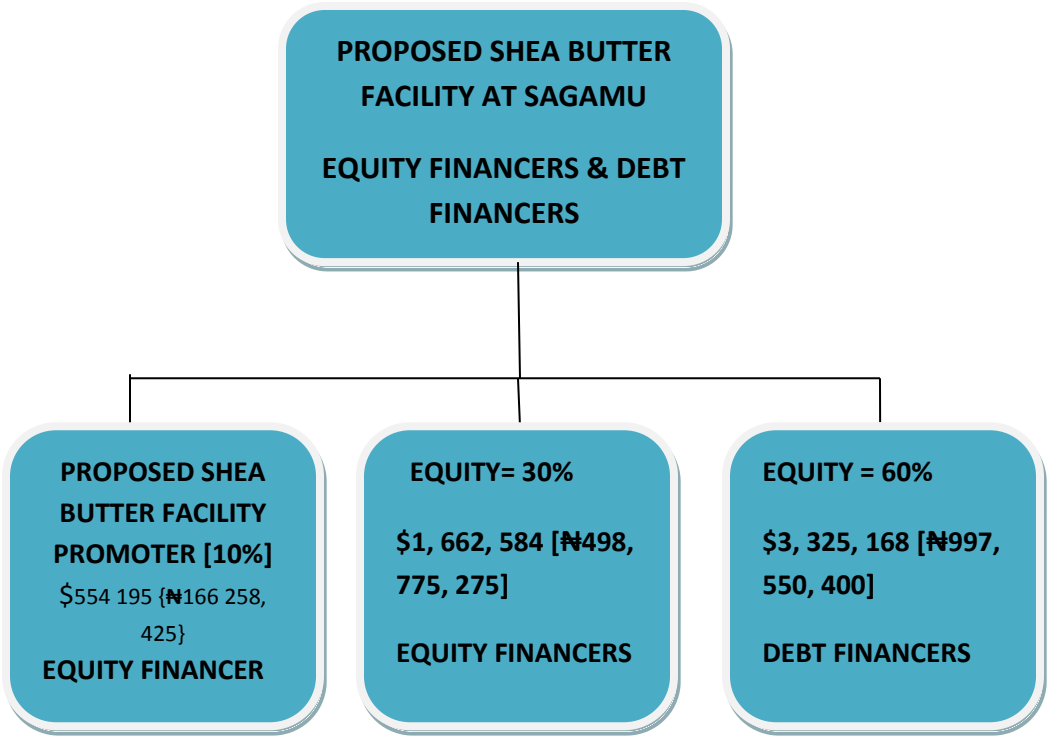


HYPOTHESIS: Funding should be sourced by 2 groups; equity financers and debt financers with the equity financing collapsing into 2; the promoter contributing 10% representing $469,599 or ₦140,879, 625 of the equity capital while the rest of the equity (30%) representing $1, 408, 796 or ₦422, 638, 875 be sourced by the equity financers. The debt capital of the project [60%] representing $2 817 593 or ₦845, 277, 900 will be funded by the debt financers.

Note: Exchange Rate Benchmark Pegged @ ₦300= $1

SHEA BUTTER EXTRACTION & REFINING

SUBJECT	AMOUNT ($)	AMOUNT (₦)	Percentage (%)
EQUITY	2 216 779	665 033 700	40
DEBT CAPITAL	3 325 168	997 550 400	60
TOTAL INVESTMENT	5 541 947	1 662 584 100	100



HYPOTHESIS: Funding should be sourced by 2 groups; equity financers and debt financers with the equity financing collapsing into 2; the promoter contributing 10% representing $554, 195 or ₦166, 258, 425 of the equity capital while the rest of the equity (30%) representing $1,

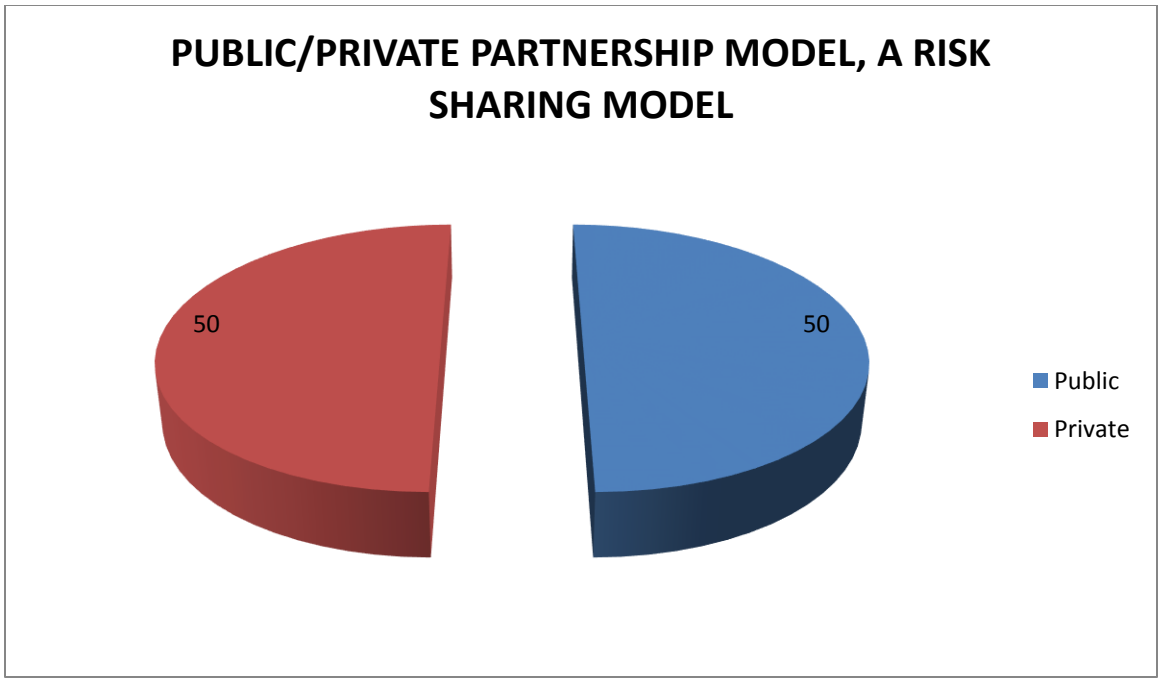
662, 584 or ₦498, 775, 275 be sourced by the equity financers. The debt capital of the project [60%] representing $3, 325, 168 or ₦997, 550, 400 will be funded by the debt financers.

Note: Exchange Rate Benchmark Pegged @ ₦300= $

It cannot be disputed that adequate financing is the single most important factor constraining the growth of many agro-based industries worldwide. The capital intensive nature of shea butter processing requires appropriate and holistic financing and marketing schemes to achieve the Investors end goals and propel the Industry. The shea industry in Africa is still at a peasant stage due to minimal government support and incentives for adequate processing and sales. Many NGOs are active in this industry but the NGOs turn to duplicate their activities due to poor networking, resulting in inefficiency of the industry. They provide more efficient and advanced technical processing equipments such as solar dryers, sun boilers, nut crushers and rosters as well as grants, loans and link shea butter producers to domestic and foreign markets. Inadequate support from government could affect the industry's promotion and development.

We recommend a Public Private Partnership Model for this Capital Intensive project. It is a collaborative project that are jointly planned, financed and implemented by public sector, private companies, civil society and development agencies towards a common objective that combines business interests with development policy goals.

Each partner contribute what they do best in a very coherent manner that benefits the interest of all sectors of the society. Public agencies may bring to the table the enabling environment while their private counterparts contribute their technology, innovation, capital, and expertise in a cost and risk sharing regime.



Sources of Finance

There are two major sources of finance for shea butter producers:

- ✓ **Formal**
- ✓ **Informal sources.**
- ✓

SOURCE OF FINANCE – SHEABUTTER PRODUCERS	
FORMAL	**INFORMAL**
❖ Commercial Banks	❖ Local Transaction among Friends
❖ Investment Banks	❖ Relatives
❖ Savings and Credit Banks	❖ Private Money Lenders
❖ Cooperative Banks	❖ Traders
❖ Rural Banks	❖ Rotation Credit and Saving Associations
❖ Government Funds	❖ Owners of Capital Assets
❖ Donor Agencies	❖ Credit from NGOs

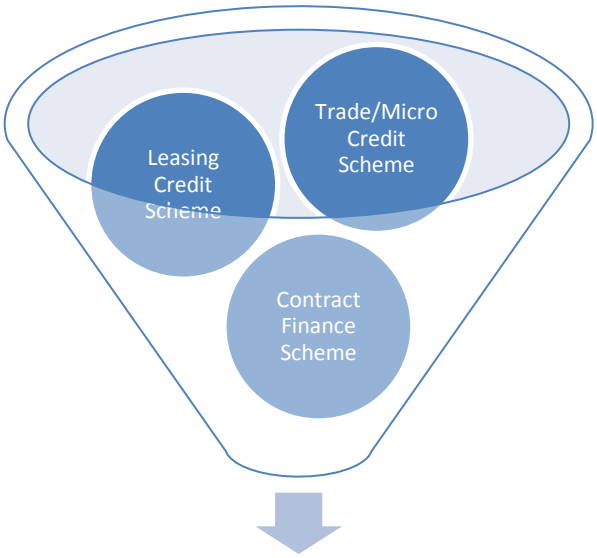
Formal sources of finance include Commercial Banks, Investment Banks, Savings and Credit Banks, Cooperative Banks and Rural Banks set up purposely to offer financial assistance to local entrepreneurs. Other formal sources are funds introduced solely by government or with the support of donor agencies. It is said that, high interest rates, collateral requirements and cumbersome documentation demanded by the formal financial institutions deter many clients such as shea butter producers from easily assessing formal fund.

Informal sources of finance comprise local transaction among friends, relatives, private money lenders, traders, Rotation Credit and Savings Associations (ROSCA‟s), owners of capital assets and credit from NGOs. Studies have shown that across Africa, informal financial units exhibit a lot of diversity. In spite of the diversity, there is no barrier to entry, deposit mobilization and lending are done on small scale with little or no record keeping and lending often takes place between people of the same locality. However, interest rates are high under informal credit systems.

Types of Financing Schemes

Various studies have established that the single most important factor constraining the growth of enterprises is lack of finance and inefficient financial products. As a result, many interventions have been launched to address the problem. This has led to the establishment of several financing arrangements to avert the situation. There are numerous financing products designed to serve clients under both formal and informal credit systems. For the purpose of this study, emphasis would be laid on shea butter related credit schemes. There are mainly three major types of credit systems accessed by shea butter producers. These are:

- ✓ **Contract financing Scheme**
- ✓ **Leasing Credit Scheme**
- ✓ **Trade/Micro Credit Scheme.**



CREDIT SYSTEM OF SHEA PRODUCERS

Contract Financing Scheme

In this arrangement, a Company establish a Sheabutter village equipped with improved shea butter processing methods, facilities such as drying and sorting platforms, equipment, raw shea nuts, transportation and packaging facilities that would not have been easily accessible to the local shea butter groups. The company then entered into contract financing agreement with groups of women who process butter, using the facilities and sell the butter to the company. The equipment and cash input cost after each processing cycle is subtracted from final butter output of each processing group and the remaining money is given to group members to share. The company besides, provides training for the women to empower them to produce the quantity and quality its clients spell out.

In another model under this scheme, a company A started by buying from the open market but soon realized the difficulties associated with the wide variation in quality. It then decided to enter into independent contract financing arrangements with a limited number of women groups who have their own processing facilities in place. The Company makes a commitment to buy from the groups, organizes training in both fruit and nut processing for the groups and by a group guarantee system, provides credit in the form of pre-financing for the groups. The groups in turn make commitments to sell their processed product to the company as a first priority and to attend the training offered. In this way, the buyer obtains the desired quality and quantity he wants while the groups are assured of a ready market.

Thirdly is a model where a Company C set up a mechanized shea butter processing factory at the shea nuts production zone with a high capacity e.g 50tpd. In order to ensure the supply of the quality of shea nuts it requires, it has linked up with rural communities near the factory. In order to support its training programme for pickers, the company will also initiate a training team with a status of NGO. The NGO provides relevant technical and organizational skills for pickers, develop strategies for nut among others. By this arrangement, inputs such as protective clothing, access to water, development of shea nut processing infrastructure and other relevant support is given to the communities and individuals involved and enhanced guarantee for pre-financing. The arrangement offers an opportunity for the company to contribute to investment in nut production and community welfare programmes.

Leasing Credit Scheme

Leasing is a medium-term financial instrument that covers investment needs of companies for logistics like, machinery, equipment, vehicles and other fixed asserts. Shea butter producers however access short term leasing arrangements. Equipments like big pots for boiling and the roaster is leased by wealthy colleague shea butter producers who have purchased the facilities for hiring purposes and also for their own processing activities. The hirer hires the equipment on daily basis. This enables producers with limited equipment to access the hired ones to facilitate processing of butter. A very efficient leasing system of credit could respond to the equipment requirements of the butter producers which could finally promote local development.

Trade/Micro Credit Scheme

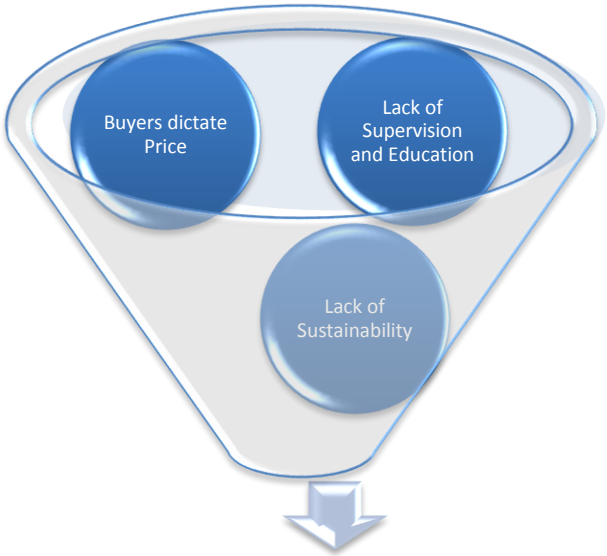
This is a cash credit provided by rural banks and credit savings institutions to shea butter producers. It is an attempt to respond to the capital requirements of butter producers. The financial institutions organize butter processors into solidarity groups where group members mutually guarantee each other loan amount. Each individual group member is responsible for repayment in case any member defaults. Example is Sinapi Aba Trust (loan company) where loan officers go to the field to recover loans and give education while Agricultural Development Bank (ADB) does not offer education to butter processing loan beneficiaries. Besides, shea producer loan beneficiaries under ADB repay loans themselves to the bank through the group account. This credit scheme when delivered efficiently could enable butter producers buy large quantities of raw shea fruits/nuts at cheaper prices especially during glut harvest

and may possibly sell processed shea butter at higher prices to boost income. Trade/micro credit scheme could however be limited by the level of interest rate charged by financiers.

Weaknesses of Shea Butter Related Schemes

Though the three major shea butter related credit schemes discussed above leads to an increase in the general level of skills in shea nut and butter processing; increases the capacity of processing groups to purchase and store shea nuts at cheaper prices for processing and thereby increasing profit margins; reduces the risk of market demand; promotes strong social link with the buyer, hence enhances mutual trust and confidence and finally gives room for some level of price negotiation, these credit schemes also have some shortfalls. These include:

- ✓ **Buyer Diction of Butter Prices**
- ✓ **Lack of Supervision and Education**
- ✓ **Lack of Sustainability**



Weakness of Sheabutter Credit Schemes

Buyer Dictate the Market

Contract financing services accessed by shea butter producers lead to price fixing by buyers because buyers negotiate prices of butter in favour of them. Producers on the other hand find it difficult to refuse prices that they are not in favour of because of the contract agreement which demands that producers sell to buyers who pre-finance production. Another reason that makes producers to accept unfavouable prices for butter from contract buyers is the fact that there are no other alternative financial services accessible to them. Contract financing does not facilitate the gaining of abnormal profits due to the mutual relationship nature of contract agreements and the fact that interest is not charged on the money given to butter producers.

Lack of Supervision and Education

Except Sinapi Aba Trust, other financial institutions like the Agricultural Development Bank do not incorporate support services such as continuous supervision and education in their micro finance delivery systems for shea butter producers. Credit without supervision and education therefore breeds high default rates. It is said that the reluctance of some credit beneficiaries to honor repayment is due to lack of coordination, supervision, and extension services like continuous education.

Lack of Sustainability

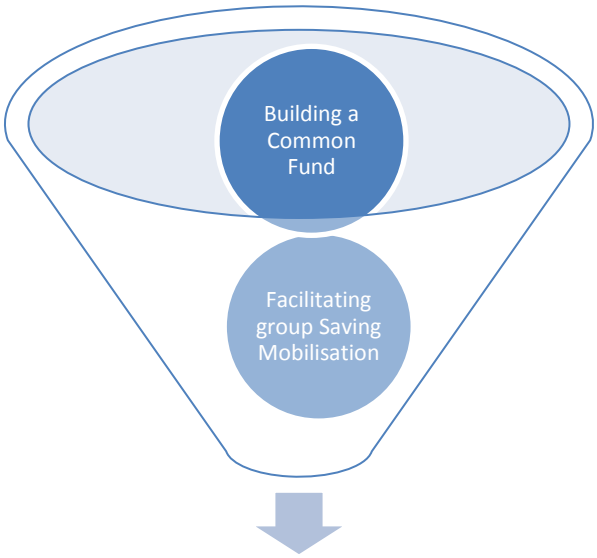
Both the contract financing and micro financing credit provided by marketing companies and financial institutions to shea butter producers seem not to be sustainable. This is because marketing companies do not incorporate measures to enable producers independently handle production but are given support by other external individuals who when absent could make the women unable to handle all the production and marketing chain processes single handedly. For instance most of the shea butter processors are illiterates and mechanisms are not in place to provide some sort of literacy training for the producers to enable them easily make simple calculations and documentations independently.

Also the contract financing approach opens the way for direct participation of foreign companies to operate at village and community levels. The same company may also be operating in other West African countries. For that matter, in case the policy environment becomes undesirable to the buyer, the company may move on to other countries, leaving the groups stranded with their skills and produce and may not be willing to receive loans in which interest is charged since the processors may be used to pre-financing in which they do not pay interest.

Improving Credit Schemes

Facilitation of Group Savings Mobilization

The use of groups for credit and savings intermediation is necessary to provide pressure as a way of ensuring loan repayment rates, to provide a suitable basis for organizing savings, and to foster solidarity and confidence among entrepreneurs. The financial institutions should support shea butter producers financially, to implement a compulsory saving scheme for the shea butter producers which would serve as source of funds for producers in times of unforeseen circumstances like sickness and defaults. This could avoid breach of contracts; reduce defaults rates for loans and at the same time enable processing group members to mobilize savings. Though group formation is an effective way of avoiding high default and a channel for good savings mobilization, ineffective supervision and extension services inhibit it.



Improving Credit Scheme

Building a Common Fund

The groups formed need to build a common fund (group fund) that could be used as guarantee for the granting of loans by credit institutions and for the management of the credit association.

The common fund must be built up through compulsory contributions from the group members on a weekly or monthly basis adjusted to cash flow patterns. These must be entered in individual passbooks and records of shea butter producers.

Regulating Groups through Appropriate Incentive System

Appropriate incentive systems need to be put in place to regulate the operation of shea butter credit and savings mobilization groups. The groups need to have a reason for their existence, and this calls for collective discipline right from the beginning. This requires that groups be formed voluntarily. Receipt of loans through the groups must be done on an individual basis. However, the repayment would be a corporate responsibility, involving all members. Monitoring of groups can be carried out though regular meetings fixed on weekly or monthly basis. Besides, a fine blend of punishment and reward need to be developed and applied to serve as incentive mechanisms.

Members who default repeatedly on regular savings could be sanctioned through eventual expulsion or through legal action in the form of fine or confiscation of their savings. At the same time, members could be eligible for larger amounts of credit in the next round of loans where earlier loans were paid very quickly, or savings were well above the average. This assertion is a perfect description of a good credit savings group for effective credit delivery and repayment; he however did not mention other necessary ingredients like timely disbursement and appropriate repayment arrangements which are also important in credit delivery systems.

Strengthening Entrepreneurial Competencies and Capabilities

Business management training is one of the basic requirements of a good credit delivery service. pointed out that more often than not it is found that receiving the credit is one thing and utilizing it effectively for the purposes for which it was acquired is another. It is common to find small scale entrepreneurs dissipating hard-earned profits from their investments and funds from external sources on unnecessary social obligations. Credit delivery and mobilization programme should be combined with improving personal entrepreneurial competence and capabilities. Part of the savings generated could be used to sponsor training sections in such managerial areas as basic book-keeping, inventory control, working capital control and general business planning principles for shea butter producers.

To ensure effective training, subjects should be carefully selected and taught at a time and lessons practiced under the supervision of the loan officer.

THE NIGERIA BANK OF INDUSTRY MODEL

The Nigeria Bank of Industry is a government owned Bank with mandate to assist entrepreneurs set up their business ventures. It is Nigeria's Oldest, largest and most successful development financing Institution. It is reconstructed in 2001 out of the Nigerian Industrial Development Bank (NIDB) Limited which was incorporated in 1964. Their services include Co-financing and Syndications, Equity financing, fund management, International trade financing, short, medium and long term financing, funds management etc.

Vision: To be Africa's leading Development Finance Institution operating under global best practices.

Mission: To transform Nigeria's Industrial sector by providing financial and business support services to enterprises.

Customer Care line: 0700-CALL-BOIM (07002255264)

Switchboard: (234)-1-2715070-71

Email: Customercare@boi.ng

WHO CAN BANK OF INDUSTRY ASSIST?

- **Small, medium and large enterprises, excluding cottage industries.**
- **New or existing companies, seeking expansion, modernization or diversification.**

- **Credit worthy promoters who will be required to prove their commitment to the project by contributing at least 25% of the project cost excluding land.**

- **Borrowers whose management capability, financial situation (including availability of collateral and guarantee), character and reputation are incontrovertible.**

- **Clients with demonstrable ability to meet loan repayments.**

- **Borrowers with no record of unpaid loans to erstwhile development finance institutions and other banks.**
- **The bank's emphasis is on prudent project selection and management; accordingly, it supports quality projects with potential developmental impact. BOI therefore, considers industries that meet the following criteria:**

- **Capacity to substantially add to industrial output.**

- **Projects that use largely domestic raw materials.**

- **Industry in which Nigeria's comparative advantages could be converted to competitive ones.**

- **Ability to promote the expansion of exports through the production of high quality products that are attractive to domestic and export markets.**

- **Niche projects that produce for worldwide consumption.**

- **Projects that create both forward and backwards linkages, with the rest of the domestic or regional economy.**

- **Ventures that promote inter-state or regional integration.**

- **Small and medium enterprises (SMEs) that have linkage with large firms, belong to clusters and operate under franchise.**

- **Enterprises with high employment generation capacity.**

- **The project must be technically feasible, commercially viable and economically desirable.**

- **Projects that are environmentally friendly.**

- **Enterprises that have good management set-up and proper accounting procedures.**

- **Enterprises promoted by women entrepreneurs.**

THE FOLLOWING INDUSTRIAL SUB-SECTORS ARE ALSO ACCORDED PRIORITY IN THE PROJECT SELECTION:

- **Agro-industries, textile and leather**
- **Polymer –based industries**
- **Solid minerals**
- **Foundries**
- **Information communication technology (ICT) services**

TO ACCESS THESE LOANS, THE BUSINESS NEEDS TO MEET CERTAIN CRITERIA.

- **Formal letter of Application**
- **Photocopy of Certificate of Registration or Incorporation**
- **Photocopies of the Certified True Copies of Forms C02 and C07**
- **A photocopy of the Certified True Copy of Memorandum and Articles of Association of the Company.**
- **Feasibility Study Report (4 copies)**
- **Quotations for items of equipment (at least 2 or 3 quotations from different sources), where applicable.**
- **Three (3) years most recent Audited Accounts of the company (for existing company).**
- **Organizational Structure and Management of the company.**
- **Declaration of total outstanding liabilities of the company.**
- **Statement of Account for the past six months from the company's bankers**
- **Acceptable Securities shall include a charge/security interest over all of applicant's assets, copyrights, rights etc. and on the equipment/ assets financed and/or the under-listed securities among others:**

- **Registered Intellectual Property/Proprietary Assets. Assignments of all agreements and Intellectual Property Rights (IPRs) to BOI. The Bank would have right in the negotiation of valuation of IPRs**

- **Joint and Several Guarantees of the Directors of applicant Company with Notarized Statement of Net worth.**

- **Provision of Guarantee cover issued by any financial institution acceptable to the bank.**

- **Insurance cover from any acceptable/reputable insurance company for short term lending of not more than one year.**

- **Marketable financial instruments.**

- **Assignment of receivables/lien on proceeds/deposits and the right of set-off.**

- **First hypothecation charge on all the tangible moveable assets under the project.**

- **Ordinary producers would be required to bring in at least 25 per cent of the project cost as promoters' contribution.**

- **Producers would be required to tie up the advances from the Distributors to cover 35 per cent to 40 per cent of the budget.**

A Trust and Retention Account (TRA) may be maintained for all capital as well as revenue inflows and outflows. Thus receivables on sale of all IPRs would be credited to TRA. The modalities of TRA would be worked out oncase-by-case basis to the satisfaction of the Bank, which will have first charge on the TRA.

Any other security that may be acceptable to the bank.
Three (3) years most recent Tax Clearance Certificate for the Company and two (2) Directors.
Eight recent Passport photographs of each of the two Directors and the Company Secretary.
Completed copy of BOI Questionnaire.

SECTION B – LIST OF INFORMATION EXPECTED IN THE BUSINESS PLAN

- **Information on the company's activities since incorporation.**
- **Biographies of shareholders of the company and their percentage shareholding.**
- **Projects concept, the need for the project and detail project description**
- **Details of the pre and post production cost as well as the proposed financing plan with realistic assessment and evidence of availability of funds from each source.**
- **Details of existing assets and the value as well as cost incurred on the proposed project till date.**
- **Detailed technical information covering technology, production process etc.**
- **Information on Technical Partners, if any.**
- **Details of utility requirements and availability of essential services such as water, power, transport around the project site.**
- **Comprehensive list of manpower requirements broken down into categories and salaries.**
- **Marketing of products and services including distribution arrangement.**

- **List, qualification and position and annual salary of existing management and staff (for expansion projects only).**
- **For on-going projects, give the existing, Expansion/Diversification and Consolidated projections covering Profit and Loss Accounts, Cash Flow Analysis and Balance Sheets for the period of five (5) years. Also provide the detailed information/data and assumptions used in the above projections.**

FACILITY/PRODUCTION

In this section, we will cover the facilities including the high tech automated production machineries for the shea nut oil press plant(crude butter) and the shea butter refining plant (Refined shea butter). In simpler terms, this is a large scale project and extraction and refining are combined to produce refined butter.
Establishing this project requires that all facilities which will ensure smooth operations are in place and they are all pre-requisite to efficient production of this golden commodity. The total production output and marketing success will also depend on the facilities in place to carry them out. This should be an important factor in planning for this project.
From research, the following are necessary facilities needed:

- ✓ **Spacious Land Space**
- ✓ **Built Factory**
- ✓ **Warehouse**
- ✓ **Water Facilities**
- ✓ **Road Network**
- ✓ **Electricity**
- ✓ **Staff Quarter**
- ✓ **Production Machineries**
- ✓ **Miscellaneous (Conveying Trucks, Vehicles etc)**

SPACIOUS LAND SPACE
Constructing a large scale production line requires the availability of land in which the factory would be sited and built on to ensure smooth operations. We recommend a land space of over 8 plots. This will accommodate the factory and warehouse and create a conductive environment for smooth operations.

BUILT FACTORY

Standard factory size of over 5000 square meters is recommended for this project. A factory that should house the shea butter production equipment should be spacious with corrugated roofs and ceilings. There should also be means of escape in case of fire outbreak. Also ventilation windows and doors should be fitted in the right places, In order to ensure good work condition and production stability. From best practices, it is advisable to construct lobby, landing corridor or passage included and its floor shall be of fire resistant materials and supported by fire resistant materials. The internal height of the work room shall not be less than 5m measured from the floor level to the lowest point in the ceiling.

WAREHOUSE

It is advisable to have a standard warehouse of over 2000square meters in dimension. The warehouse should be a standalone building different from the factory. On the other hand, the warehouse should be closer to the production line to ensure smooth operations. The warehouse will be used to store shea nut prior to production time. The shea nut should be preserved or stored in line with world best practices. This will ensure the production of high quality shea butter because the quality of shea nut has an effect on the end product of the production line. Poorly preserved product will have a detriment effect on the eventual output and won't be accepted into the warehouse. We want to produce high quality shea butter.

WATER FACILITIES

One of the inevitable facility needed in a shea butter manufacturing firm is a source of water. Water is a necessary item for production and every company should drill his own borehole to supply the production line and the entire premises. To ensure adequate availability of water, the company should procure and install a water storage facility. A water storage tank of over 10,000 liters of water is recommended. Adequate and efficient supply of water is important for the smooth operation of this business.

ROAD NETWORK

One don't need to take up the responsibility of government but good roads would ensure smooth operation by making movement of raw materials, finished goods and human resources in and out of the factory. Building of roads is the responsibility of the government but the accessory road leading to the factory will be of utmost concern to the company stakeholders. The accessory road should be constructed or maintained to enable transportation.
We recommend collaboration with the government in the Public Private Partnership Model/ Win-Win agreement structure or a risk sharing basis to boost and encourage the company to achieve its target goals. This is one way the government can encourage private investors to invest and create employment.

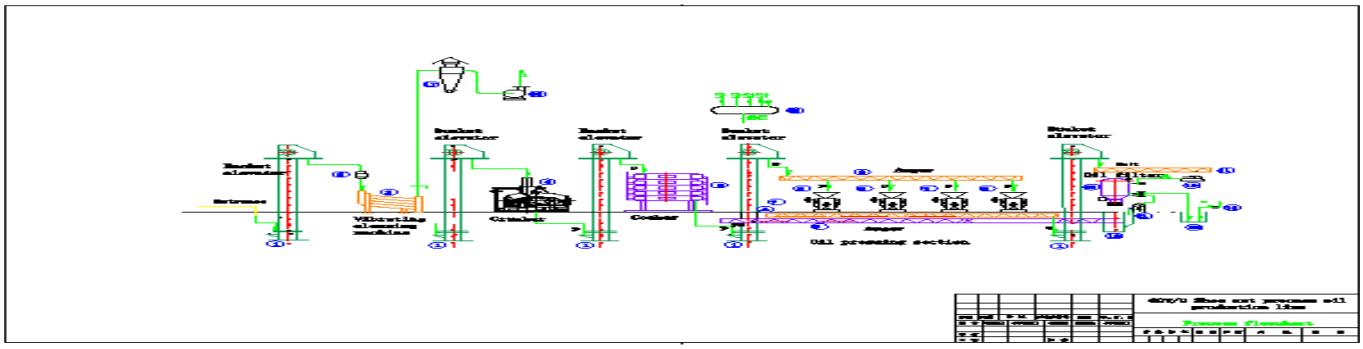
ELECTRICITY

The production line cannot be interrupted by Power cut. Constant power supply is necessary to achieve production target and achieve the goals of the company. The high tech production equipment and mechanized processes can only function with the aid of electricity.
In this regard, we recommend a standard standby power generating equipment to run the machineries. There is another option. One can install a solar powered equipment to supply power to the production line. This has been tested in developed countries and found to be efficient to run productive ventures.

STAFF QUARTERS

What is the big deal about staff quarters? The staff quarters is necessary to house the human resources. The Managers and worker of this company is going to be workforce who has technical and managerial competences. They should be accommodated to enable them work efficiently and carry out their functions effectively. Productivity and employee needs will also be of special concern to achieve targets and end goals.

PRODUCTION MACHINERIES



For the Production Machineries, We, CPraxis Integrated Services recommend Zhengzhou QI'E Grain &Oil Machinery Co.,Ltd. Telephone is +86 15093389825(Mobile and email oilmachinery02@qiemach.com.

Zhengzhou Qi'e Grain & Oil Machinery Co.,Ltd is a large-sized joint-equity enterprise which specialize in producing edible oil mechanical equipment and it is also a group enterprise integrating scientific research, manufacturing, sales as one. Research Institute of Machine Design Company and Henan, Henan University of Technology (formerly the Zhengzhou Grain College) school-enterprise cooperation in the oil equipment to carry out long-term, protein extraction, phospholipids extraction, etc. R & D and application of new technologies.

This company have set up Mechanical Design and Research institution, oil press machine department ,large-sized complete oil equipment department, International trade department, production department. Their business involve small-sized oil pressing series, Grain and oil engineering designing, equipment manufacturing and installing, project contracting, technical service, new product development, the intensive and deep processing for oil by-products and so on.

The corporation lies in the High-Technology Industrial Development Zone of Zhengzhou which is the capital city of Henan Province. It covers an area of 27000 ㎡ and contains 12 standardized production workshops, more than 100 sets all kinds of large and middle scale processing, plug welding and assembly equipment, more than 200 online employee, among them, there are exceed 60 administrative staff and engineering technical personnel who hold intermediate and senior professional titles.

In addition, it has passed ISO9001:2000 international quality management system certification successfully. It has the qualification of manufacturing for one and two types of pressure vessel, besides, it also has a number of national patents. Since founded in 1982, It has been awarded the "The quality-star enterprise of Henan province", "Model enterprise with High quality, and keeping promises ","3.15quality and reputation double promise enterprise " and so on. Its Body shape "Qi'E" mechanical products have been awarded with "Chinese famous brand products", "National Quality trusted consumer products" and many other honored titles. The pennants such as "High technical skills, reliable partners" from our customers are countless.

It has grown into Chinese grain and oil machinery production and export base with scientific management method, strives for perfection in the manufacturing process, innovative manufacturing idea rapidly, its production and the comprehensive economic indicators lies in the forefront of the same industry line, The products have been sold all over the country and exported to more than 30 countries and regions such as Russia, India, South Africa, Ukraine, Nepal, Indonesia and so on.

Part II Project quotation and Equipment List

The Total Price for the whole project is:

No.	Name	Price (FOB Qingdao)	Remarks
1.	**50TPD She aNut Oil Press Plant**	**$291,600.00**	**Attachment 1**
2.	**20TPD Shea butter Refining Plant**	**$350,000.00**	**Attachment 2**
	Total price(FOB Qingdao)	**$641,600.00**	

50TPD Shea Nut Oil Press Equipment list

NO.	Equipment Name	Model	Quantity（Set）	Power（KW）
1	Bucket Elevator	DTC36/13	5	1.5*5
2	Gas Distributor Pot	TFQ219	1	
3	Clean Sieve	PLC100	1	0.5
4	Fan	4—72—12NO4。5A	1	5.5
5	Cyclone Dedusting Machine	XCC60	1	
6		FXQ250	1	
	Magnetic Selector			
7	Tooth Roller Crusher	YPSG25	1	7.5
8	Cooker	YZCL210×5	1	37
9	Upper Auger	LSS30	1	3
10	Presser	ZX168	4	37*4
11	Oil Auger	LSS20	1	2.2

12		Cake Auger	LSS25	1	2.2
13		Slag Back Auger	LSS25	1	2.2

14	Clarifying Tank	CYZ200×80	1	3
15	Filtrate Oil pump	65-50	1	
16	Plate Filter	YL×65	1	
17	Air Compressor	V×0. 6/7	1	3
18	Underground Oil Tank	DYX×1.5	1	
19	Gear Pump	PSG25	1	2.2
20	Installation Material			
21	Insulation & Painting	100 USD D/P		
	Material			
22	Electric Distribution Control			
	Total Power			223.8

Attachment 2

20TPD Shea Butter Refining Equipment List

Item	Location No.	Equipment Name	Model	QTY	Unit Power (KW)	Subtotal Power	Specification
Degumming &Drying& Decoloration Section							
1	L-01a	Refining tank	LYY220	1	7.5	7.5	5.5/7.5 double speed, Carbon,steel,material, Stainless,steel,heating coil, special for edible oil degumming.

2	L-01b	Washing tank	LYY220	1	7.5	7.5	5.5/7.5 double speed, Carbon,steel,material, Stainless,steel,heating coil, special for edible oil degumming.
3	L-03a	Oil distribution tank	FYX2.0	1		0	Carbon steel, used for sperate oil and soap, stock
4	L-03b	Inside Soap stock tank	ZJX3.0	1		0	Carbon steel, for storage soap stock
5	L-04	Soap stock tank	LZJ140	1	5.5	5.5	Carbon steel, Stainless steel heating coil inside, used for extract oil from soap stock
6	L-05	Alkali liquor tank	JYX2.0	1		0	SS304 Stainless steel, storage used for alkali liquor storage
7	L-06	Water tank	SX3.0	1		0	SS304Stainless temporary storage soft water
8	L-09	Clay box	BTX0.9	1		0	Carbon steel used for bleaching,clay temporary storage
9	L-10	Decolorizing pot	TSG220	1	7.5	7.5	Carbon steel material, stainless steel, heating coil inside, direct steam injection, for bleaching the mixture of clay and oil
10	L-11	Catcher	FY1	1		0	Carbon steel for collect vacuum catcher liquid
11	L-12	Water jet pump	ZZSP160	1		0	Carbon Steel, supply for bleachingVacuum system
12	L-13ab	Vibration filter	NYB15	2		0	Carbon Steel Shell, Stainless steel filter screen
13	L-14	Roily oil box	ZYX12	1		0	Carbon Steel Used for filtering Oil temporary

							Storage
14	L-15	Filtered oil box	GLYX12	1		0	Carbon Steel Used for filtering Oil temporary Storage
15	L-17a、b	Security filter	DL-1P2S-A	2	0	0	5μ used for bleaching oil deeply filtering bag type filter
16	L-18	Compressed air tank	YQG60	1		0	Carbon Steel, Pressure vessel
17	L-19	Air compressor	2V-0.3/7		5.5	5.5	Carbon Steel used for compressed air, temporary storage
18	L-20	Steam distribution cylinder	FQG0.3	1		0	Pressurevessel, saturated,steam distributionin workshop
19	V-01	Crude oil tank	MYX80	1		0	Carbon steel used for crude oil temporary storage in outside
20	P-01	Crude oil pump	KQWH40-160	1	2.2	2.2	
21	B-01	Gear oil pump	KCB83.3	2	1.5	3	Used for liquid soap stock transfer, touched part adopt stainless steel material
22	B-02	Alkali refining oil pump	KQWH40-160	1	2.2	2.2	Used for alkali refining oil transfer, touched part adopt stainless steel
23	B-04	Alkaline pump	ISWR40-160	1	2.2	2.2	Used for alkali liquor transfer, touched part adopt stainless steel
24	B-05	Filtering Oil Pump	IY32-50-160	1	5.5	5.5	Used for bleaching oil transfer, touched part adopt stainless steel
25	B-06	Decolourizing pure oil pump	KQWH40-160	1	0.4	0.4	Costing Iron
26	P-02	Water pump	IS80-65-160	1	7.5	7.5	Centrifugal Pump, mechanical seal
SUB TOTAL POWER				29		56.5	
Deodorization Section							
27	L-22	Deaerator	XQ80	1		0	Stainless steel material, SS Nozzles, used for deodorization Oil
28	L-23	Heat exchanger	I6B10-0.6/800-10	1		0	Stainless steel material, screw heat exchanger, used for heating deodorization oil

29	L-24	Heat exchanger	I6B15-0.6/800-10	2		0	Stainless steel material, screw heat exchanger, used for heating deodorization oil
30	L-25	Heat exchanger	I6B20-0.6/800-10	1		0	Stainless steel material, screw heat exchanger, used for heating deodorization oil and conduction oil final heating
31	L-26	Packing type deodorization tower	TSX140*3	1		0	Used for edible oil deodorization process, deodorizated gas, fatty acid catch, SS316 material, packing type combination deodorization, stainless steel corrugated plate packing
32	L-27	Fatty Acid temporary storage tank		1	CGC100	0	Stainless steel used for fatty acid storage
33	L-35	High efficiency energy saving pump	IIZP10/30-1	1		0	Used for supply deodorization tower vacuum system
34	L-28	Steam Super heater	YJRQ325	1		0	Pressure vessel, Overheating steam
35	L-30	Heat exchanger	I6T15-0.6/500-6	1		0	Carbon Steel, Screw plate heat exchanger
36	L-31	Polishing filter	YLJJ25	2		0	5μ, used for deodorization oil deeply filtering bag type filter
37	L-33	Deodorization oil tank	Φ1200×2500	1	0	0	Carbon steel
38	L-36	Water distribution device	SFPQ21.9	1	0	0	Carbon steel
39	B-08	Deodorization tower oil inlet pump	HP2.2-2	1	2.2	2.2	Used for deodorization oil transfer, high temperature, shield pump, SS304 Stainless steel structure
40	B-09	Deodorization toweroil output pump	HPG2.2-2	1	2.2	2.2	Used for deodorization oil transfer, high temperature, shield pump, SS304 Stainless steel structure

41	B-10	Fatty Acid Circulating Pump	HPG2.2-2	1	2.2	2.2	Used for deodorization oil transfer, high temperature, shield pump, SS304 Stainless steel structure
42	B-11	Deodorization Oil Pump	KQWH40 -160	1	2.2	2.2	Stainless Steel, (Pump Head)
SUBTOTAL POWER				18		8.8	
Outdoor Corollary Equipment							
43	L-37	Cooling tower	DNLN150	1	3	3	Outside glass steel cooling tower
44	L-39	Conduction Oil Furnance System	ZRL40-MH	1		0	Heat capacity 300000Kcal/h, Carbon steel material using for conduction oil heating, the heat source of disel.
45	B-13	Cooling water circulating pump	IS150-320	1	15	15	Centrifugal Pump, Mechanical seal
46	B-14	Cooling water Pump	IS100-80-160	1	22	22	Centrifugal Pump, Mechanical seal
47	L-40	Phosphoric Acid Pump	Φ500	1			SS 304 Stainless steel structure, used for phosphoric acid temporary storage
SUBTOTAL POWER						37	
		Install Material		1			Pipe, Profile,valve,flange,gasket
		Power distribution and control		1			
		Insulation Material and Paint		1			Rock wool outsourcing color plate
TOTAL POWER						102.3	

PART III: 50TPD SHEA NUT OIL PRESS PLANT INTRODUCTION

Large Oil Mill Exterior Built by the Company

Pressing Process Introduction:

1. Shea nut oil press flow chart:

Shea nut →Metering→Cleaning→Stone separator→magnetic separation → Crusher→Cooking→Press→Pressed cake

Crude oil filter→to the refining plant

Main Process Introduction:

1.Metering process: with special equipment, the stable measuring scale is used to regulate the flow and measure total production Moreover, it can achieve accumulated measurement, transient measurement and cost accounting, with accurate measurement and high precision. .

Metering process

2.Cleaning: In order to obtain high effective cleaning, ensure good work condition and production stability, high efficient vibration screen was used in the process to separate big and small impurity. Dust removing wind net is installed. The dedusting system uses single union cyclone and centrifugal fan to remove dust effectively, so as to to ensure workshop hygiene and clear light impurities.

MICELLANEOUS

Vibration Cleaning Sieve

3.Crushing Process

Crush：In order to ensure good softening and flaking effect, shea nut should be crushed, so that water can distribute uniformly and clearly during softening, and flake is thin and burliness.

Crushing Section

4.**Vertical cooker**:This process is heating and cooking for shea nut which is easy to separate of oil and can provide the oil quantity from press machine.It is easy to operate and has long life.

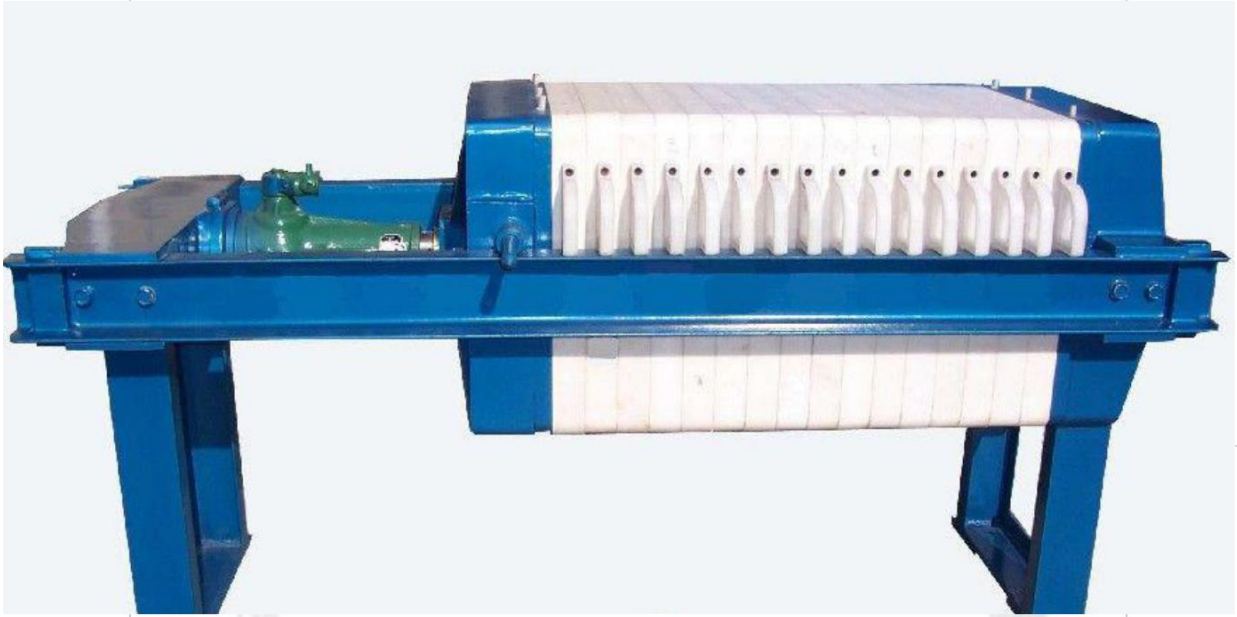
Vertical Cooker

They adopt the largest ZY168 oil press machine in China to squeeze out some of the oil from the high-oil materials, such as shea nut, sunflower seed etc., to meet the following cake requirements. The dry cake is loose-structured and not broken, easy for solvent premeability, with low residual oil and low running cost

Oil Press Equipment being Installed in Sudan

6.Crude Oil Filter

First, use clarifying oil tank for primary settlement and filtering, and then use vertical blade filter for fine filtration. Try to reduce the cake residue in crude oil to ensure the following degumming effect.



Part IV 40TPD Shea Butter Refining Line Introduction

Shea butter Refinery Process

1.The Flow Chart of Refinery

Alkali hot water

↓

Crude oil→filter→mix→reacto r→mix→reactor→separ ation→oil residue ↑ ↓

Phosphoric acid

degumming oil←cooler←dry←separation←mix←alkali liquor

↓ ↓

↓ vacuum steam jet pump←steam citric acid

↓ ↓

bleaching earth→mix→decoloring→filter→decoloring oil→mix→heat

↓

refined oil←filter←cool←deodorizing←vacuum

Outdoor Oil Refinery workshop

Main Processes Introduction

1. **Hydration Degumming & Alkali Refining Deacidification Process**

Neutralization: the crude oil is output by the oil feed pump from the oil tank, and next enters the crude oil heat exchanger to recover part of heat after metering and then is heated to the required temperature by the heater. After that, the oil is mixed with the metered phosphoric acid or citric acid from phosphate tank in the gas mixture (M401), and then enters the conditioning tank (R401) to make the non-hydratable phospholipids in oil change into the hydratable phospholipids. Add the alkali for neutralization, and the alkali quantity and alkali solution concentration depend on the quality of the crude oil. Through the heater, the neutralized oil is heated to the temperature (90℃) suitable for centrifugal separation to remove the phospholipids.

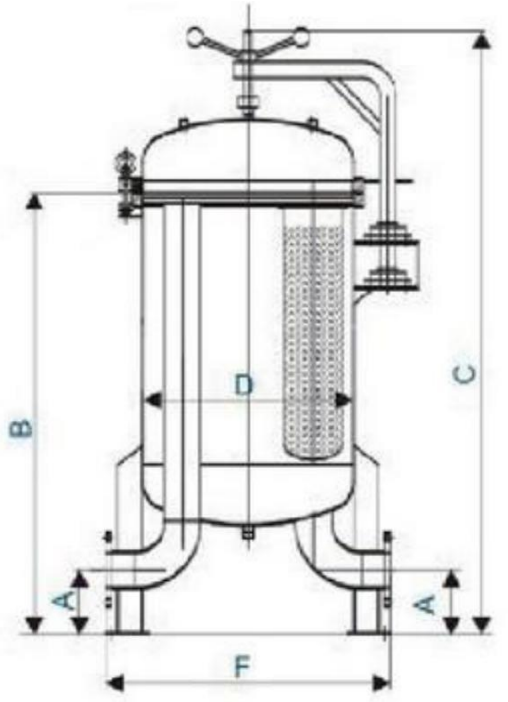
Washing: there is still about 500ppm soap in the neutralized oil from the separator. To remove the remaining soap, add into the oil about 5~8% hot water, with water temperature 3~5 ℃ higher than the oil generally. To achieve more stable washing effect, add phosphoric acid or citric acid when washing. The re-mixed oil and water in the mixer is heated to 90-95℃ by the heater, and then enters the wash separator to separate the remaining soap and most water. The water with soap and oil enters into oil separator to separate out oil in the water. Further catch the oil outside, and the waste water is discharged to the sewage treatment station.

2. Decoloring Process

The main function of decoloring process is to remove oil pigment, residual soap grain and metal ions. Under negative pressure, the mechanical mixing method combined with steam mixing will improve the decoloring effect.The degummed oil firstly enters into the heater to be heated to the appropriate temperature (110℃), and then goes to the bleaching earth mixing tank. The bleaching earth is delivered from the low bleaching box to the temporary tank by wind. The bleaching earth is added by automatic metering and is interlockingly controlled with the oil.

The oil mixed with the bleaching earth overflows into the decolorizer, which is stirred by non-powered steam. The decolored oil enters into the two alternate leaf filters to be filtered. Then the filtered oil enters the decolored oil storage tank through the security filter. The decolored oil storage tank is designed as the vacuum tank with the nozzle inside, so as to prevent the decolored oil contacting with the air and influencing its peroxide value and color reversion.

Decolorization section



Bag-style filter

3. Deodorizing Process

The qualified decolored oil enters into the spiral plate heat exchanger to recover most of the heat, and next goes to high pressure steam heat exchanger to be heated to the process temperature (240-260℃) and then enters the deodorization tower. The upper layer of combined deodorization tower is the packing structure which is mainly used to remove the odor producing components such as free fatty acid (FFA); the bottom layer is the plate tower which is mainly for achieving the hot decoloring effect and reducing the peroxide value of the oil to zero. Oil from the deodorization tower enters into the heat exchanger to recover most of the heat and makes further heat exchange with crude oil, and then is cooled to 80-85℃ through the cooler. Add the required antioxidant and flavor agent, and then cool the oil below 50℃ and store it. Such volatiles as FFA from the deodorizing system are separated by the packing catcher, and the separated liquid is FFA at low temperature (60-75℃). When the liquid level in the temporary tank is too high, the oil will be sent to the FFA storage tank.

\

Part of Deodorization Tower

Part of Deodorization Tower

Part V Public Work Specification

1) Circulating cooling water:

Water temperature	**feed water: <28℃， return water: 33℃ in general**
Hydraulic pressure	**>0.3Mpa**
Turbidity	**<10mg/l**
Salinity	**<365mg/l**
General hardness	**<3mgN/l**
Carbonate hardness	**<2.4mgN/l**
Ca2+	**<40.8mgN/l**
Mg2+	**<11.1mg/l**
FE2+Fe3+	**<0.9mg/l**
Cu2+	**<0.06mg/l**

CL～ < 50mg/l

SO42～ <55.5mg/l

Silicic acid (mainly SiO2) <36mg/l

PH value 7~8.5

Fouling resistance <0.0004m2h℃/kcal (0.000344 m2••K/W)

Corrosion rate carbon steel<0.1mm/a stainless steel<0.005mm/a

2) Project party is responsible to take over since 1 meter from the workshop

Pressure 0.8Mpa (saturated steam)

3) Instrument air (Project party is responsible to take over since 1 meter from the workshop)

Temperature ≤40℃

Pressure 0.4～0.7MPa(G)

Oil content 0.1mg/m³ (max)

Dew point ~45℃

Dust ≤1μm

4) Power supply (Project party is responsible to connect the main cable to the workshop power distribution cabinet)

Power supply voltage **380V±7%**

Frequency **50Hz±0.5Hz**

5) Auxiliary material specifications

8.5.1 solvent

n-hexane solvent **distillation range 68-75℃**

8.5.2paraffin oil: Model: Pharmaceutical white oil (edible)

Boiling point: ≥140℃

Flash point: ≤178℃

Ignition point: 188℃

Viscosity E20：5.2

Specific gravity d204：0.8452

Equipment Name	Lubricant Name, Model	Kinematic Viscosity	Flash Point (℃)	Remarks
Gear reducer gearbox	Gear oil L-CKC-68	61.2～74.8	180	Winter
Cycloidal reducer gearbox	L-CKC-100	90～110	180	Winter

Low speed and heavy-duty reducer	L-CKC-220(GB5903-1995	198～242	180	Summer
Open gear, link chain	L-AN22（GB443-89）	19.8～24.2	150	
Motor, fan pump gearbox	L-AN32（GB443-89）	28.8～35.2	150	Winter
	L-AN68（GB443-89）	61.2～74.8	160	Summer
	L-AN100（GB443-89）	90～100	180	Summer
Various instruments	No. 10 instrument oil CSH/T1038-94	9～11	130	All the Year

Part VI Buyer and seller's responsibility

1)Seller’s supply and service:

- **Whole set of equipment for production line；**
- **Motor and power control system；**
- **Installation material；**
- **Installation and commissioning；**
- **Drawing of process description, equipment layout, foundation and hole, construction；**
- **Drawing of power control；**
- **Isolation and painting for equipment；**

- **Water recycling and cooling system outside the plant (i.e. supplementary device)；**
- **Staff training and long-term technical service.**

◆Remarks: The service and supply mentioned above was limited by the following:(Except special statement in the contract)

- **Only Responsibility for starting to convey raw material or semifinished product from 1 meter place to the plant；**
- **Only Responsibility for finishing to convey final product 1 meter outside the plant；**

Only Responsibility for finishing to convey by- product 1 meter outside the plant

- **Only Responsibility for starting to sent inlet water from 1 meter place to the plant；**
- **Only Responsibility for finishing to sent outlet water 1 meter outside the plant；**
- **Assist material start has been sent to 1 meter place outside the plant；**
- **Power has been connected to the control panel in the plant；**
- **Steam has been sent to the steam header in the plant；**

◆Seller are not responsible for the following supply and services.(expected for the special statements in the contact).

- **Crude and refining oil tanks outside the supply area；**
- **Buildings, foundation, steel structure, platform, support facilities；**
- **Cleaning device inside the plant；**
- **Water seal pool for vacuum pump；**

- **Hanging device；**
- **General power control and high voltage transformation；**
- **Emergency power；**
- **Electricity switch and cable outside the control panel；**
- **Lighting and lighting cable；**
- **Lightning conductor(except the extraction plant).**

2) Engineering range taken by the buyer:

- **Responsible for the construction designing and construction；**
- **Responsible for the installation for the whole set of equipment**
- **Responsible for the freight and insurance outside China；**
- **Responsible for all utility engineering, pipe works and tanks outside the plants；**
- **Pay for technical service (for installation guide, single machine test-run, test run, examining), it is $100 everyday for each of engineers.**
- **Additional fee will be required to the construction drawing by the seller.**

Part VII Construction Period

Within 15 days after the contract comes into effect, all the workshop process design should be done.

- Equipment purchasing and production: 70 days after the contract comes into effect, equipment purchasing and production should be done.

Installation: All the engineering installation should be completed within 60 days after construction completion.

Engineering commissioning: 20 days.
Considering the crossover of construction and project period, the total project period is about:130 days.

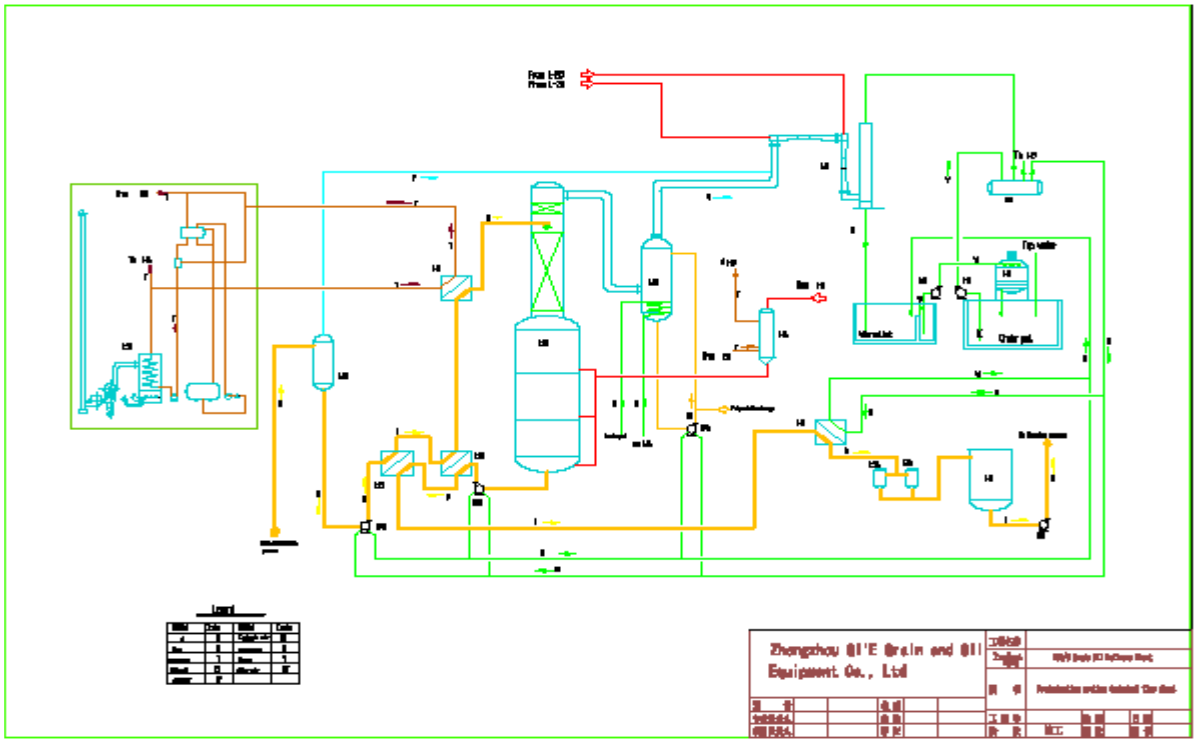
Part VIII Payment Terms

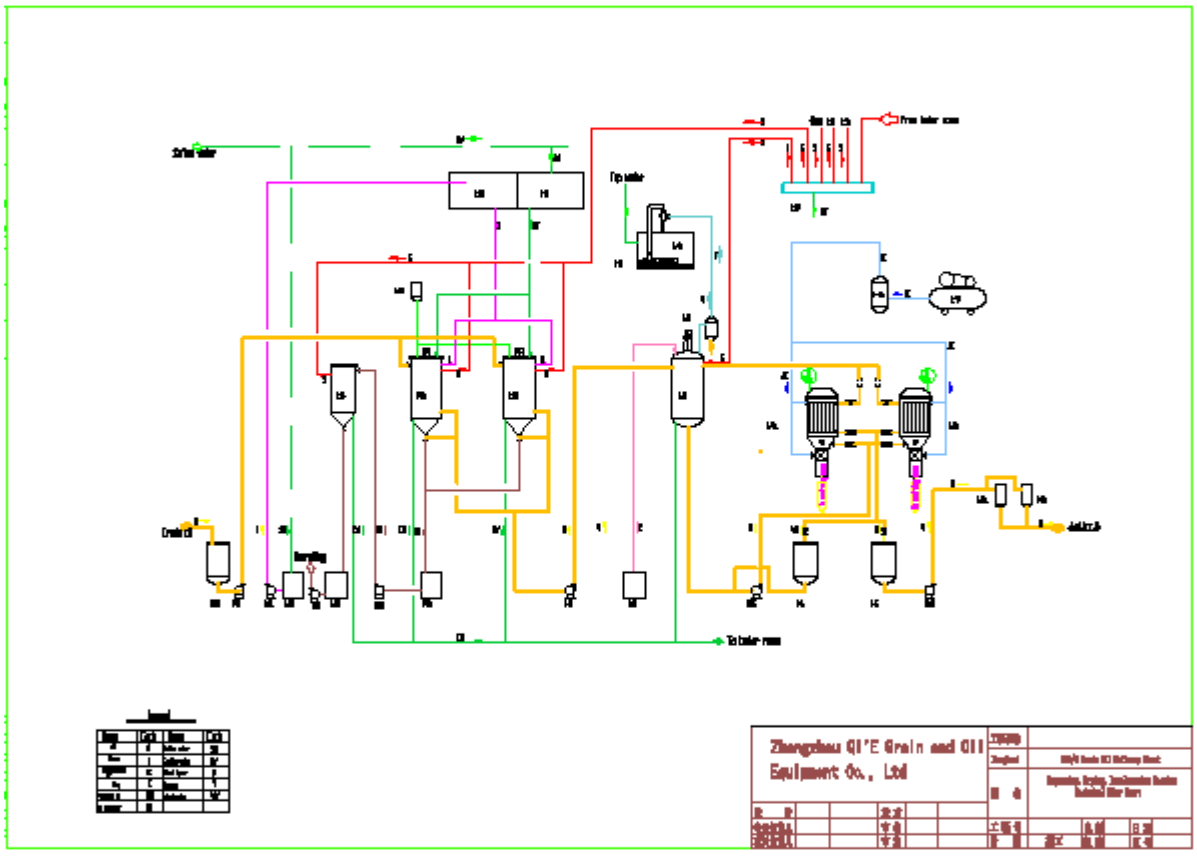
The Buyer will transfers the payment for the Equipment and Technical Service into the Seller's account as follows:

◆ **The sum equal to 30% of the total amount of the Contract must be transferred by the buyer to the Seller's account directly within Five (5) bank working days from the date when the Contract has been both signed as down payment.**

◆ **The sum equal to 70% of the total amount of the Contract will be transferred by the buyer to the Seller's account directly after checking and accepting the finished equipment in the seller's factory at five(5) bank working days .The goods are deemed accepted by the buyer after the signing of "The act of acceptance of the equipment"by the representatives of the seller and the buyer**.

SHEABUTTER OIL REFINERY FLOWCHART




Zhengzhou QI'E Grain and Oil Equipment Co., Ltd

MISCELLANEOUS

This include all other facilities that has not be listed but all plays a part in ensuring the smooth operations of the business. Specifically, this may include vehicles such as conveying trucks, company vehicles, recreational facilities, computers, security equipment etc that can play a part in the success of this venture. The achievement of the shared goals and targets will be of upmost concern to the stakeholders of this business.

HYPOTHESIS OF FINANCING OF THE PROPOSED SHEABUTTER FACILITY

(THE FIRST 10 YEARS)

In the hypothesis of financing 1, we have a set price for the Crude Shea butter in $2.5 per kg price level: the lower price.

In the hypothesis of financing 2, the higher price for the refined Shea butter is $5 per kg.

CRUDE SHEABUTTER

Hypothesis of Financing (Start level price=$2.5-$1=$1.5)

Equity Capital 40%	COST & PROFIT ACCOUNT ($)			
TITLES (YR)	Year 1 ($)	₦aira($1=₦300)	Year 2	₦aira
Revenues	0	0	9 000 000	2 700 000 000
Total Revenues	0	0	9 000 000	2 700 000 000
OPERATING CHARGES			3 974 388	1 192 316 400
Purchase Sheanuts	0	0	0	
Consumption Sheanuts	0	0	2 200 000	660 000 000
Spare Parts	1 000	150 000	80 000	24 000 000
Fuel & Engine Oil	2 000	600 000	60 000	18 000 000
Public Utilities	10 000	3 000 000	50 000	15 000 000
Rent & Lease Expenses	30 000	9 000 000	35 000	10 500 000
Insurance	3 000	900 000	55 000	16 500 000
Miscellaneous	150 000	45 000 000	125 000	37 500 000
Consultant fees	70 000	21 000 000	50 000	15 000 000
Salaries board, Advisory board & Staff	250 000	75 000 000	346 833	104 049 900
Depreciations	30 000	9 000 000	210 000	63 000 000
Depreciation Pre- Operating Expenses	0		762 555	228 766 500
FINANCING CHARGES	217 055	65 116 500	232 248	69 674 400
Loan Charges & Interest	217 055	65 116 500	232 248	69 674 400
TOTAL CHARGES	762 555	228 766 500	4 206 636	1 261 990 800
Profit	(1)		4 793 364	1 438 009 200
Tax on Profit 10%	0		479 336	143 800 800
Net Profit	0		4 314 028	1 294 208 400
Percentage profit (%)	0		92%	92%

HYPOTHEIS: For Oil press, the residue oil is 6-8% in the pressed cake. If the Oil content is 45-50%, 50MT Shea nut will yield around 20 tons of Oil.
Start Price of Sheanut= ₦40,000 [$133.33]
Benchmark Exchange Rate = ₦300 TO $1.

Equity Capital 40%	COST & PROFIT ACCOUNT ($)			
TITLES (YR)	Year 3 ($)	₦aira($1=₦300)	Year 4 ($)	₦aira
Revenues	9 600 000	2 880 000 000	10 200 000	3 060 000 000
Total Revenues	9 600 000	2 880 000 000	10 200 000	3 060 000 000
OPERATING CHARGES	3 362 833	1 008 849 900	3 495 833	1 048 749 900
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	2 310 000	693 000 000	2 420 000	726 000 000
Spare Parts	100 000	30 000 000	100 000	30 000 000
Fuel & Engine Oil	60 000	18 000 000	70 000	21 000 000
Public Utilities	50 000	15 000 000	60 000	18 000 000
Rent & Lease Expenses	35 000	10 500 000	35 000	10 500 000
Insurance	55 000	16 500 000	55 000	16 500 000
Miscellaneous	125 000	37 500 000	125 000	37 500 000
Consultant fees	65 000	19 500 000	67 000	20 100 000
Salaries board, Advisory board & Staff	350 833	105 249 900	352 833	105 849 900
Depreciations	212 000	63 600 000	211 000	63 300 000
Depreciation Pre- Operating Expenses	0	0	0	0
FINANCING CHARGES	248 505	74 551 500	265 901	79 770 300
Loan Charges & Interest	248 505	74 551 500	265 901	79 770 300
TOTAL CHARGES	3 611 338	1 083 401 400	3 761 734	1 128 520 200
Profit	5 988 662	1 796 598 600	6 438 266	1 931 479 800
Tax on Profit 10%	598 866	179 659 800	643 827	193 148 100
Net Profit	5 389 796	1 616 938 800	5 794 439	1 738 331 700
Percentage profit (%)	115%	115%	123%	123%

HYPOTHEIS: For Oil press, the residue oil is 6-8% in the pressed cake. If the Oil content is 45-50%, 50MT Shea nut will yield around 20 tons of Oil.
Start Price of Sheanut= ₦40,000 [$133.33]
Benchmark Exchange Rate = ₦300 TO $1.

Equity Capital 40%

COST & PROFIT ACCOUNT ($)

TITLES (YR)	Year 5 ($)	₦aira($1=₦300)	Year 6 ($)	₦aira
Revenues	10 800 000	3 240 000 000	12 000 000	3 600 000 000
Total Revenues	10 800 000	3 240 000 000	12 000 000	3 600 000 000
OPERATING CHARGES	3 514 833	1 054 449 900	3 643 833	1 093 149 900
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	2 475 000	742 500 000	2 585 000	775 500 000
Spare Parts	100 000	30 000 000	102 000	30 600 000
Fuel & Engine Oil	70 000	21 000 000	70 000	21 000 000
Public Utilities	65 000	19 500 000	67 000	20 100 000
Rent & Lease Expenses	35 000	10 500 000	38 000	11 400 000
Insurance	55 000	16 500 000	55 000	16 500 000
Miscellaneous	100 000	30 000 000	101 000	30 300 000
Consultant fees	50 000	15 000 000	60 000	18 000 000
Salaries board, Advisory board & Staff	355 833	106 749 900	360 833	108 249 900
Depreciations	209 000	62 700 000	205 000	61 500 000
Depreciation Pre- Operating Expenses	0	0	0	0
FINANCING CHARGES	284 514	85 354 200	304 430	91 329 000
Loan Charges & Interest	284 514	85 354 200	304 430	91 329 000
TOTAL CHARGES	3 799 347	1 139 804 100	3 948 263	1 184 478 900
Profit	7 000 653	2 100 195 900	8 051 737	2 415 521 100
Tax on Profit 10%	700 065	210 019 500	805 174	241 552 200
Net Profit	6 300 588	1 890 176 400	7 246 563	2 173 968 900
Percentage profit (%)	134%	134%	154%	154%

HYPOTHEIS: For Oil press, the residue oil is 6-8% in the pressed cake. If the Oil content is 45-50%, 50MT Shea nut will yield around 20 tons of Oil.
Start Price of Sheanut= ₦40,000 [$133.33]
Benchmark Exchange Rate = ₦300 TO $1.

Equity Capital 40%	COST & PROFIT ACCOUNT ($)			
TITLES (YR)	Year 7 ($)	₦aira($1=₦300)	Year 8 ($)	₦aira
Revenues	13 200 000	3 960 000 000	14 400 000	4 320 000 000
Total Revenues	13 200 000	3 960 000 000	14 400 000	4 320 000 000
OPERATING CHARGES	3 759 833	1 127 949 900	3 868 833	1 160 649 900
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	2 695 000	808 500 000	2 805 000	841 500 000
Spare Parts	103 000	30 900 000	102 000	30 600 000
Fuel & Engine Oil	71 000	21 300 000	65 000	19 500 000
Public Utilities	68 000	20 400 000	67 000	20 100 000
Rent & Lease Expenses	39 000	11 700 000	40 000	12 000 000
Insurance	55 000	16 500 000	55 000	16 500 000
Miscellaneous	100 000	30 000 000	102 000	30 600 000
Consultant fees	60 000	18 000 000	60 000	18 000 000
Salaries board, Advisory board & Staff	365 833	109 749 900	370 833	111 249 900
Depreciations	203 000	60 900 000	202 000	60 600 000
Depreciation Pre- Operating Expenses	0	0	0	0
FINANCING CHARGES	325 740	97 722 000	-	
Loan Charges & Interest	325 740	97 722 000	-	
TOTAL CHARGES	4 085 573	1 225 671 900	3 868 833	1 160 649 900
Profit	9 114 427	2 734 328 100	10 531 167	3 159 350 100
Tax on Profit 10%	911 443	273 432 900	1 053 117	315 935 100
Net Profit	8 202 984	2 460 895 200	9 478 050	2 843 415 000
Percentage profit (%)	175%	175%	202%	202%

HYPOTHEIS: For Oil press, the residue oil is 6-8% in the pressed cake. If the Oil content is 45-50%, 50MT Shea nut will yield around 20 tons of Oil.
Start Price of Sheanut= ₦40,000 [$133.33]
Benchmark Exchange Rate = ₦300 TO $1.

Equity Capital 40%

COST & PROFIT ACCOUNT ($)

TITLES (YR)	Year 9 ($)	₦aira($1=₦300)	Year 10 ($)	₦aira
Revenues	15 600 000	4 680 000 000	17 400 000	5 220 000 000
Total Revenues	15 600 000	4 680 000 000	17 400 000	
OPERATING CHARGES	3 985 833	1 195 749 900	4 387 833	1 316 349 900
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	2 915 000	874 500 000	3 300 000	990 000 000
Spare Parts	104 000	31 200 000	102 000	30 600 000
Fuel & Engine Oil	70 000	21 000 000	66 000	19 800 000
Public Utilities	68 000	20 400 000	69 000	20 700 000
Rent & Lease Expenses	35 000	10 500 000	38 000	11 400 000
Insurance	55 000	16 500 000	55 000	16 500 000
Miscellaneous	100 000	30 000 000	105 000	31 500 000
Consultant fees	60 000	18 000 000	70 000	21 000 000
Salaries board, Advisory board & Staff	375 833	112 749 900	380 833	114 249 900
Depreciations	203 000	60 900 000	202 000	60 600 000
Depreciation Pre- Operating Expenses	0	0	0	0
FINANCING CHARGES	-		-	
Loan Charges & Interest	-		-	
TOTAL CHARGES	3 985 833	1 195 749 900	4 387 833	1 316 349 900
Profit	11 614 167	3 484 250 100	13 012 167	3 903 650 100
Tax on Profit 10%	1 161 417	348 425 100	1 053 117	315 935 100
Net Profit	10 452 750	3 135 825 000	11 959 050	3 587 715 000
Percentage profit (%)	223%	223%	255%	255%

PROJECT INVESTMENT TABLE

CRUDE SHEABUTTER EXTRACTION

SUBJECT	AMOUNT ($)	AMOUNT (₦)	Percentage (%)
EQUITY	1 878 395	563 518 500	40
DEBT CAPITAL	2 817 593	845 277 900	60

TOTAL INVESTMENT	4 695 988	1 408 796 400	100

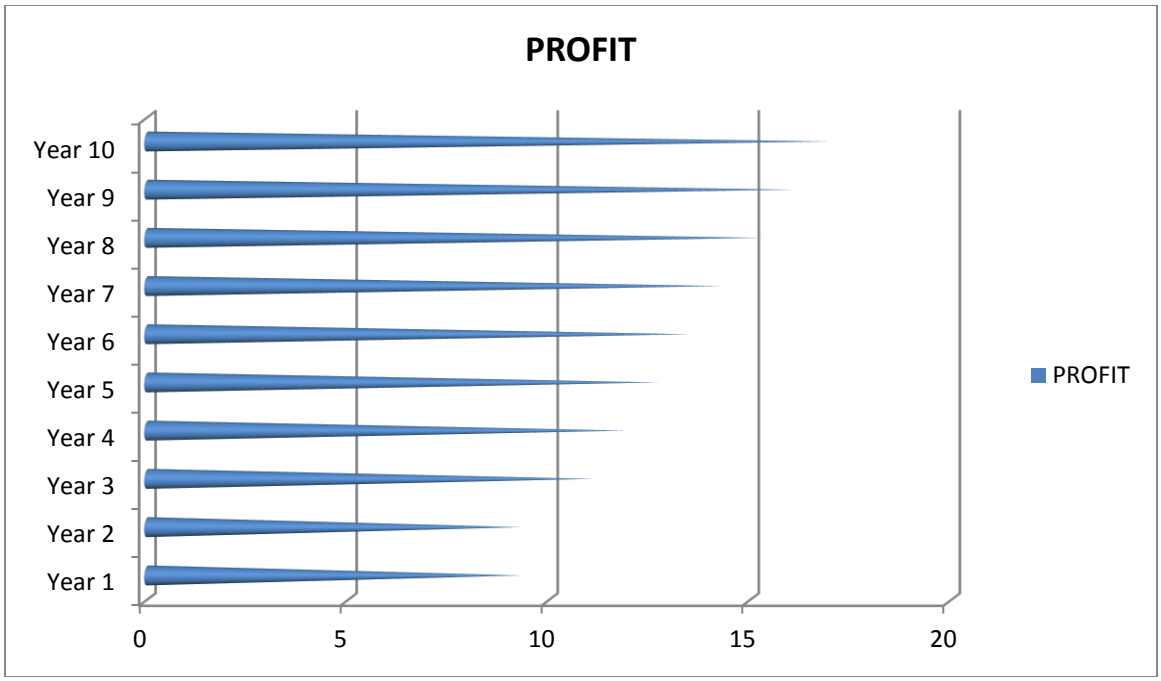
LOAN AMORTIZATION TABLE

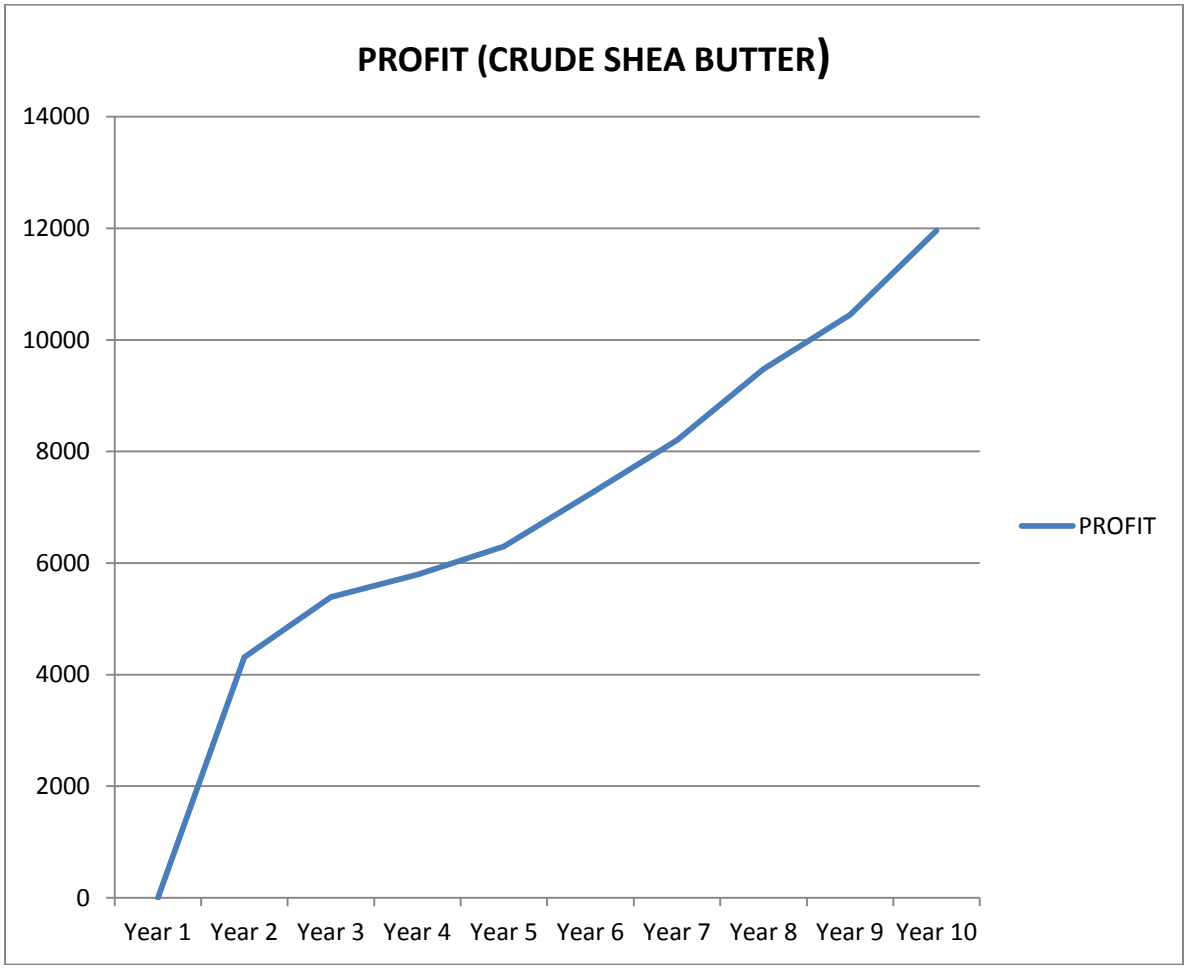
	AMOUNT	$348 542	₦104 562 600	
PRICE=$1.5	TOTAL	$2 439 796	₦731 938 800	INTEREST=7%
EQUITY= 40%	TOTAL (INTEREST)	$561 401	₦168 420 300	PERIOD=7%

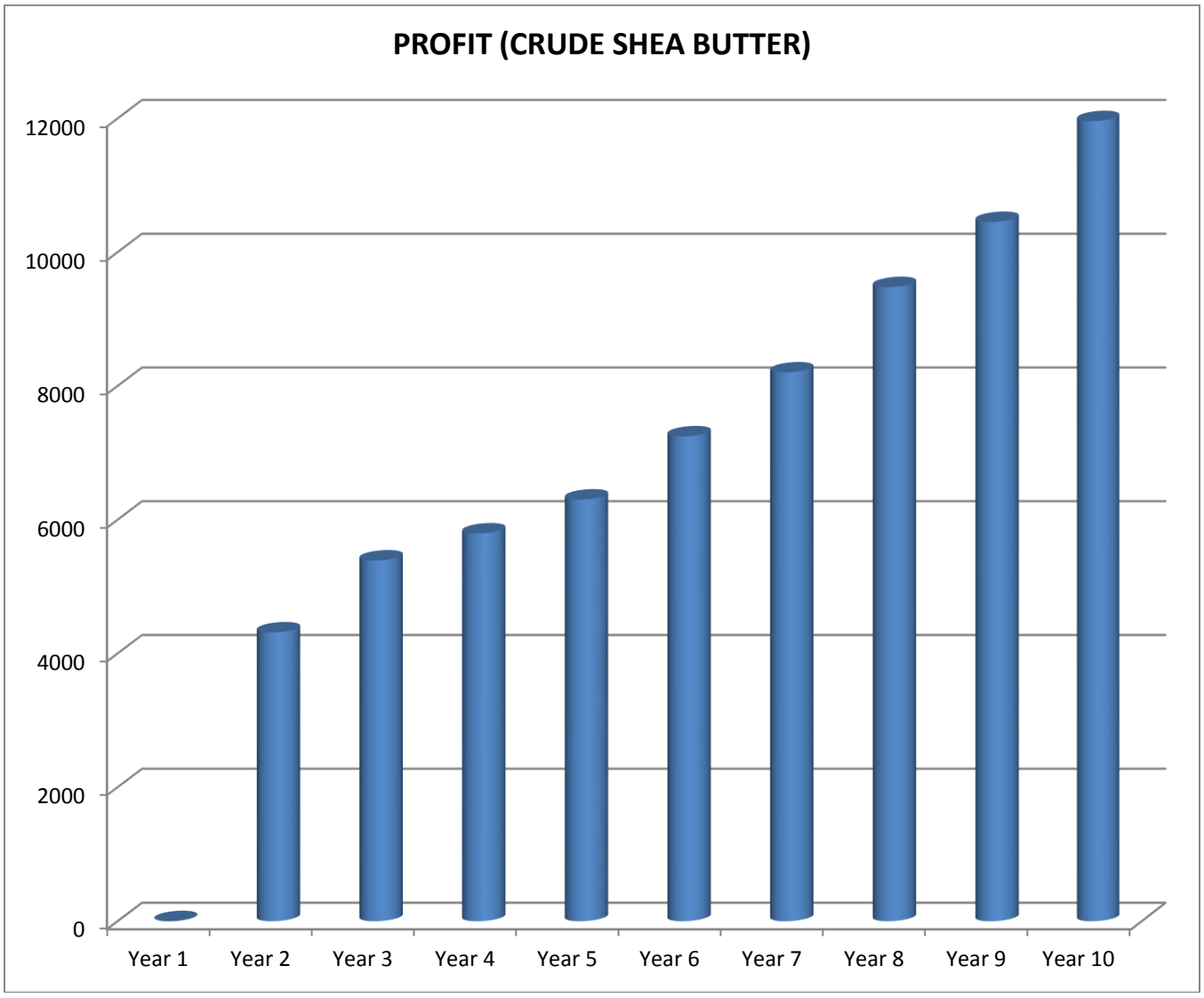
PERIOD	BEGINNING BALANCE	INTEREST	PRINCIPAL	ENDING BALANCE
YR 1	1 878 395	131 488	217 055	1 661 340
YR 2	1 661 340	116 294	232 248	1 429 092
YR 3	1 429 092	100 036	248 506	1 180 586
YR 4	1 180 586	82 641	265 901	914 685
YR 5	914 685	64 028	284 514	630 170
YR 6	630 170	44 112	304 430	325 740
YR 7	325 740	22 802	325 740	0

PROFITABILITY TABLE

YEAR	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
PROFIT	0	4 314 028	5 389 796	5 794 439	6 300 588	7 246 563	8 202 984	9 478 050	10 452 750	11 959 050


PROFIT
Year 10
Year 9
Year 8
Year 7
Year 6
Year 5
Year 4
Year 3
Year 2
Year 1
0
5
10
15
20
PROFIT


PROFIT (CRUDE SHEA BUTTER)
14000
12000
10000
8000
6000
4000
2000
0
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10
PROFIT


PROFIT (CRUDE SHEA BUTTER)
12000
10000
8000
6000
4000
2000
0
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10

REFINED SHEABUTTER

Hypothesis of Financing (Start level price=$5-$2=$3)

Equity Capital 40%	COST & PROFIT ACCOUNT ($)			
TITLES (YR)	Year 1 ($)	₦aira($1=₦300)	Year 2	₦aira
Revenues	0	0	16 200 000	4 860 000 000
Total Revenues	0	0	16 200 000	4 860 000 000
OPERATING CHARGES			5 541 947	1 662 584 100
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	0	0	2 750 000	825 000 000
Spare Parts	500	150 000	160 000	48 000 000
Refining Chemical	5000	1 500 000	100 000	30 000 000
Fuel & Engine Oil	20 000	600 000	120 000	36 000 000
Public Utilities	120 000	3 600 000	100 000	30 000 000
Rent & Lease Expenses	70 000	21 000 000	70 000	21 000 000
Insurance	7 000	2 100 000	110 000	33 000 000
Miscellaneous	150 000	45 000 000	200 000	60 000 000
Consultant fees	132 458	39 737 400	120 000	36 000 000
Salaries board, Advisory board & Staff	310 000	93 000 000	500 833	150 249 900
Depreciations	30 000	9 000 000	210 000	63 000 000
Depreciation Pre- Operating Expenses	0	0	1 101 114	330 334 200
FINANCING CHARGES	256 156	78 846 800	274 087	82 226 100
Loan Charges & Interest	256 156	78 846 800	274 087	82 226 100
TOTAL CHARGES	1 101 114	330 334 200	5 816 034	1 744 810 200
Profit	(1)		10 383 966	3 115 189 800
Tax on Profit 10%	0		1 038 397	311 519 100
Net Profit	0		9 345 569	2 803 670 700
Percentage Profit	0		169%	169%

HYPOTHEIS: For the Oil Refinery, the Oil Refinery rate is 90-97% but for purpose of this feasibility,90% is assumed but altogether depends on the crude oil parameters.
Start Price of Sheanut= ₦50,000 [$166.66]
Benchmark Exchange Rate = ₦300 TO $1

Equity Capital 40%	COST & PROFIT ACCOUNT ($)			
TITLES (YR)	Year 3 ($)	₦aira($1=₦300)	Year 4	₦aira
Revenues	17 280 000	5 184 000 000	18 360 000	5 508 000 000
Total Revenues	17 280 000	5 184 000 000	18 360 000	5 508 000 000
OPERATING CHARGES	4 574 500	1 372 350 000	4 777 708	1 433 312 400
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	2 887 500	866 250 000	3 031 875	909 562 500
Spare Parts	160 000	48 000 000	165 000	49 500 000
Refining Chemical	120 000	36 000 000	125 000	37 500 000
Fuel & Engine Oil	120 000	36 000 000	125 000	37 500 000
Public Utilities	80 000	24 000 000	100 000	30 000 000
Rent & Lease Expenses	60 000	18 000 000	60 000	18 000 000
Insurance	110 000	33 000 000	110 000	33 000 000
Miscellaneous	180 000	54 000 000	180 000	37 500 000
Consultant fees	135 000	40 500 000	140 000	54 000 000
Salaries board, Advisory board & Staff	510 000	153 000 000	530 833	159 249 900
Depreciations	212 000	63 600 000	210 000	63 000 000
Depreciation Pre- Operating Expenses	0	0	0	0
FINANCING CHARGES	293 273	87 981 900	313 803	94 140 900
Loan Charges & Interest	293 273	87 981 900	313 803	94 140 900
TOTAL CHARGES	4 867 773	1 460 331 900	5 091 511	1 527 453 300
Profit	12 412 227	3 723 668 100	13 268 489	3 980 546 700
Tax on Profit 10%	1 241 223	372 366 900	1 326 849	398 054 700
Net Profit	11 171 004	3 351 301 200	11 941 640	3 582 492 000
Percentage Profit	202%	202%	215%	215%

HYPOTHEIS: For the Oil Refinery, the Oil Refinery rate is 90-97% but for purpose of this feasibility,90% is assumed but altogether depends on the crude oil parameters.

Start Price of Sheanut= ₦50,000 [$166.66]

Benchmark Exchange Rate = ₦300 TO $1

Equity Capital 40%	COST & PROFIT ACCOUNT ($)			
TITLES (YR)	Year 5 ($)	₦aira($1=₦300)	Year 6	₦aira
Revenues	19 440 000	5 832 000 000	20 520 000	6 156 000 000
Total Revenues	19 440 000	5 832 000 000	20 520 000	6 156 000 000
OPERATING CHARGES	4 941 469	1 482 440 700	5 153 461	1 546 038 300
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	3 183 469	955 040 700	3 342 628	1 002 788 400
Spare Parts	170 000	51 000 000	172 000	51 600 000
Refining Chemical	125 000	37 500 000	130 000	39 000 000
Fuel & Engine Oil	126 000	37 800 000	120 000	36 000 000
Public Utilities	100 000	30 000 000	100 000	30 000 000
Rent & Lease Expenses	60 000	18 000 000	65 000	19 500 000
Insurance	110 000	33 000 000	113 000	33 900 000
Miscellaneous	180 000	54 000 000	185 000	55 500 000
Consultant fees	135 000	40 500 000	150 000	45 000 000
Salaries board, Advisory board & Staff	540 000	16 200 000	560 833	168 249 900
Depreciations	212 000	63 600 000	215 000	64 500 000
Depreciation Pre- Operating Expenses	0	0	0	0
FINANCING CHARGES	335 768	65 116 500	359 272	107 781 600
Loan Charges & Interest	335 768	65 116 500	359 272	107 781 600
TOTAL CHARGES	5 277 237	1 583 171 100	5 512 733	1 653 819 900
Profit	14 162 763	4 248 828 900	15 007 267	4 502 180 100
Tax on Profit 10%	1 416 276	424 882 800	1 500 727	450 218 100
Net Profit	12 746 487	3 823 946 100	13 506 540	4 051 962 000
Percentage Profit	230%	230%	244%	244%

HYPOTHEIS: For the Oil Refinery, the Oil Refinery rate is 90-97% but for purpose of this feasibility,90% is assumed but altogether depends on the crude oil parameters.

Start Price of Sheanut= ₦50,000 [$166.66]

Benchmark Exchange Rate = ₦300 TO $1

Equity Capital 40%	COST & PROFIT ACCOUNT ($)			
TITLES (YR)	Year 7 ($)	₦aira($1=₦300)	Year 8	₦aira
Revenues	21 600 000	6 480 000 000	22 680 000	6 804 000 000
Total Revenues	21 600 000	6 480 000 000	22 680 000	6 804 000 000
OPERATING CHARGES	5 328 770	1 598 631 000	5 661 092	1 698 327 600
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	3 509 770	1 052 931 000	3 685 259	1 105 577 700
Spare Parts	175 000	52 500 000	180 000	54 000 000
Refining Chemical	132 000	39 600 000	140 000	42 000 000
Fuel & Engine Oil	120 000	36 00 000	140 000	42 000 000
Public Utilities	110 000	33 000 000	130 000	39 000 000
Rent & Lease Expenses	60 000	18 000 000	75 000	22 500 000
Insurance	110 000	33 000 000	130 000	39 000 000
Miscellaneous	180 000	54 000 000	200 000	60 000 000
Consultant fees	140 000	42 000 000	160 000	48 000 000
Salaries board, Advisory board & Staff	580 000	174 000 000	600 833	180 249 900
Depreciations	212 000	63 600 000	220 000	66 000 000
Depreciation Pre- Operating Expenses	0	0	0	0
FINANCING CHARGES	384 421	115 326 300	-	-
Loan Charges & Interest	384 421	115 326 300	-	-
TOTAL CHARGES	5 713 191	1 713 957 300	5 661 092	1 698 327 600
Profit	15 886 809	4 766 042 700	17 018 908	5 105 672 400
Tax on Profit 10%	1 588 681	476 604 300	1 701 891	510 567 300
Net Profit	14 298 128	4 289 438 400	15 317 017	4 595 105 100
Percentage Profit	258%z	258%	276%	276%

HYPOTHEIS: For the Oil Refinery, the Oil Refinery rate is 90-97% but for purpose of this feasibility,90% is assumed but altogether depends on the crude oil parameters.

Start Price of Sheanut= ₦50,000 [$166.66]

Benchmark Exchange Rate = ₦300 TO $1

Equity Capital 40%	COST & PROFIT ACCOUNT ($)			
TITLES (YR)	Year 9 ($)	₦aira($1=₦300)	Year 10	₦aira
Revenues	23 760 000	7 128 000 000	24 840 000	7 452 000 000
Total Revenues	23 760 000	7 128 000 000	24 840 000	7 452 000 000
OPERATING CHARGES	5 874 539	1 762 361 700	6 119 834	1 835 950 200
Purchase Sheanuts	0	0	0	0
Consumption Sheanuts	3 869 539	1 160 861 700	4 063 001	1 218 900 300
Spare Parts	185 000	55 500 000	190 000	57 000 000
Refining Chemical	140 000	42 000 000	145 000	43 500 000
Fuel & Engine Oil	140 000	42 000 000	143 000	42 900 000
Public Utilities	135 000	40 500 000	140 000	42 000 000
Rent & Lease Expenses	77 000	23 100 000	78 000	23 400 000
Insurance	126 000	37 800 000	126 000	37 800 000
Miscellaneous	201 000	60 300 000	202 000	60 600 000
Consultant fees	163 000	48 900 000	165 000	49 500 000
Salaries board, Advisory board & Staff	620 000	186 000 000	650 833	195 249 900
Depreciations	218 000	65 400 000	217 000	65 100 000
Depreciation Pre- Operating Expenses	0	0	0	0
FINANCING CHARGES	-	-	-	-
Loan Charges & Interest	-	-	-	-
TOTAL CHARGES	5 874 539	1 762 361 700	6 119 834	1 835 950 200
Profit	17 885 461	5 365 638 300	18 720 166	5 616 049 800
Tax on Profit 10%	1 788 546	536 563 800	1 701 891	510 567 300
Net Profit	16 096 915	4 829 074 500	17 018 275	5 105 482 500
Percentage Profit	290%	290%	307%	307%

PROJECT INVESTMENT TABLE

SHEABUTTER REFINING

SUBJECT	AMOUNT ($)	AMOUNT (₦)	Percentage (%)
EQUITY	2 216 779	665 033 700	40
DEBT CAPITAL	3 325 168	997 550 400	60
TOTAL INVESTMENT	5 541 947	1 662 584 100	100

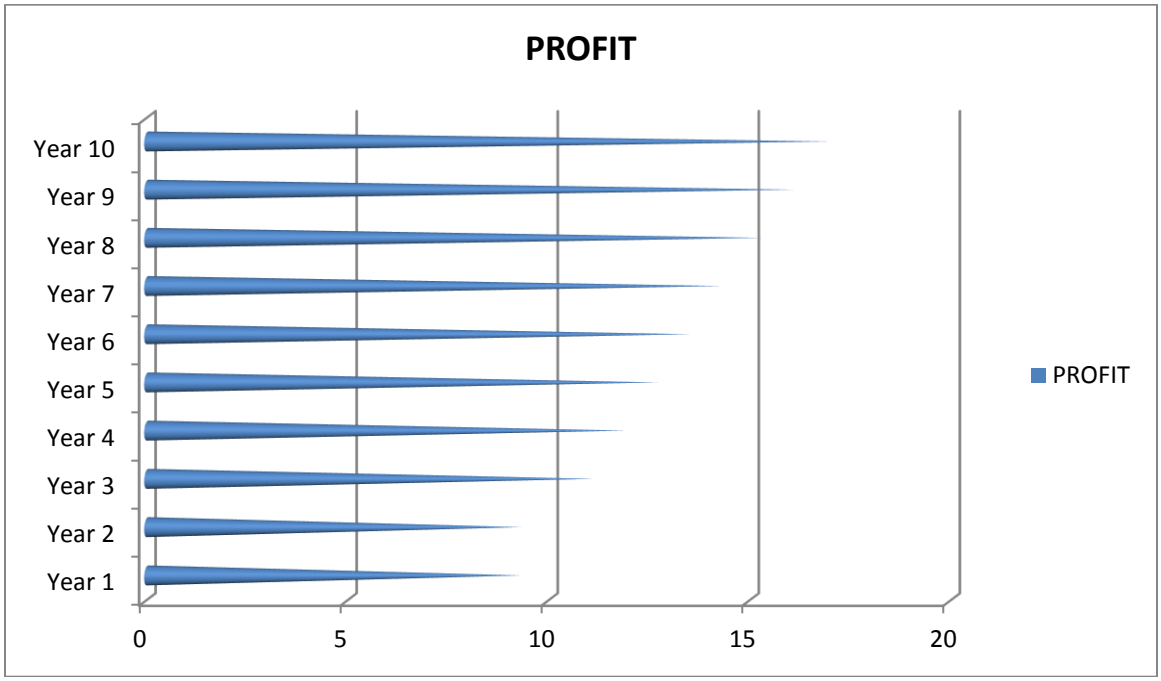
LOAN AMORTIZATION TABLE

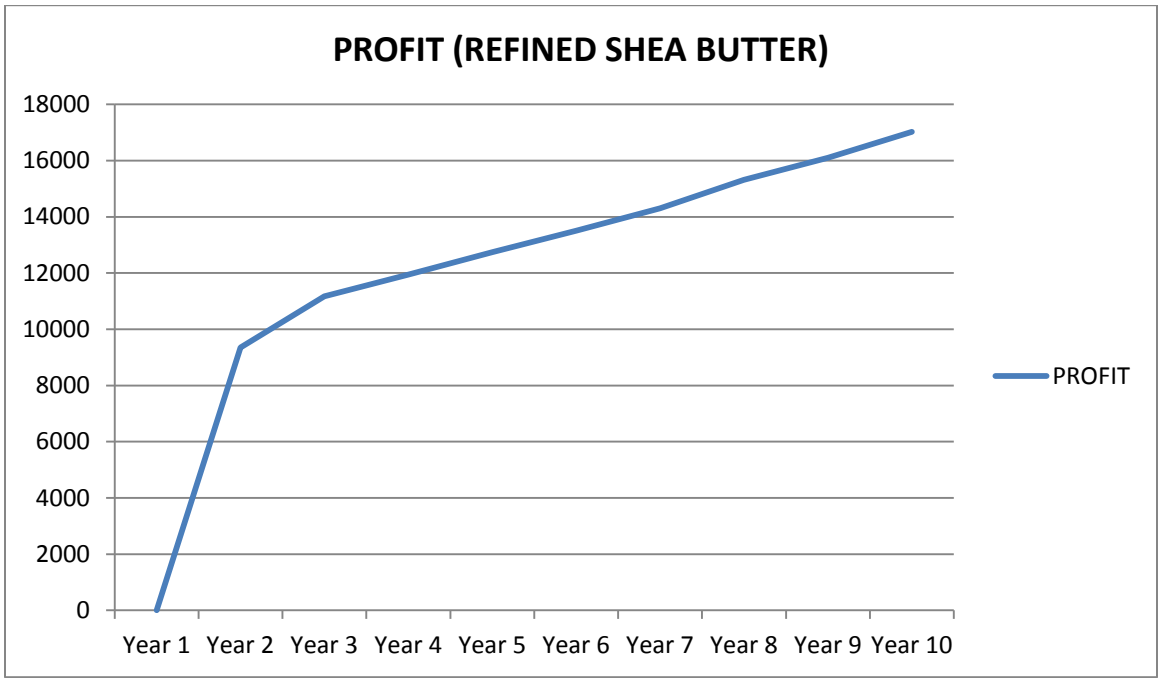
	AMOUNT	$411 330	₦123 399 000	
	TOTAL	$2 879 313	₦863 793 900	
PRICE $3				INTEREST RATE= 7%
EQUITY CAPITAL=40%	TOTAL (INTEREST)	$662 534	₦198 760 200	PERIOD= 7 YRS

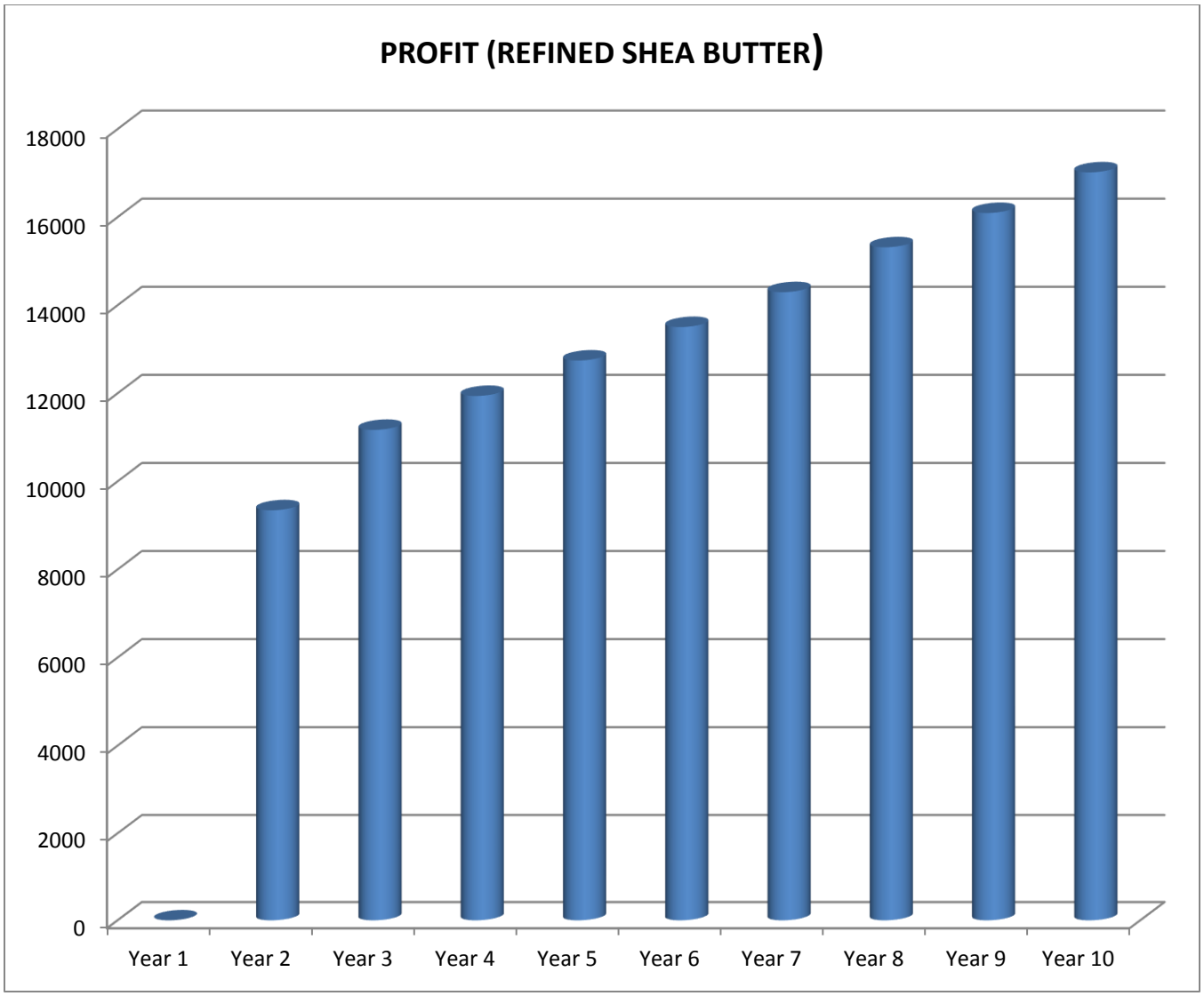
PERIOD	BEGINNING BALANCE	INTEREST	PRINCIPAL	ENDING BALANCE
YR 1	2 216 779	155 175	256 156	1 960 623
YR 2	1 960 623	137 244	274 087	1 686 536
YR 3	1 686 536	118 058	293 273	1 393 263
YR 4	1 393 263	97 528	313 802	1 079 461
YR 5	1 079 461	75 562	335 768	743 693
YR 6	743 693	26 909	384 421	384 421
YR 7	384 421	22 802	325 740	0

PROFITABILITY TABLE

YEAR	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
PROFIT	0	9 345 569	11 171 004	11 941 640	12 746 487	13 506 540	14 298 128	15 317 017	16 096 915	17 018 275




PROFIT (REFINED SHEA BUTTER)
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10
PROFIT


PROFIT (REFINED SHEA BUTTER)
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10

HOW MUCH CHEMICAL IS NEEDED FOR REFINING PROCESS

CHEMICAL CONSUMPTION IN QUANTITIES FOR THE REFINING PROCESS		
CHEMICAL	**AMOUNT (KG) (PER TON OIL)**	**NOTE**
ALKALI	**1.6-2.2**	**Refining 1 ton Oil**
PHOSPHORUS	**0.5-1**	**Refining 1 ton Oil**
BLEACHING EARTH	**3.0-20**	**Depend on the Colour Requirement (Per ton Oil)**

HYPOTHESIS: About the Chemical Consumption of the Shea butter refining Production process, It is up to the acid value of your Oil.

WHAT IS THE CHEMICAL LOSS RATE OF THE REFINING PROCESS

CHEMICAL LOSS RATE IN PERCENTAGE FOR THE REFINING PROCESS		
CHEMICAL	**PERCENTAGE(%) (PER TON OIL)**	**NOTE**
LOSS IN DEACIDIFICATION	**1.2**	
LOSS IN DECOLORATION; BLEACHING EARTH DOSAGE	**23**	
LOSS IN DEODORATION	**≤0.5**	
LOSS IN OIL REFINERY	**1-LOSS%**	

Note that the total loss in the Oil Refinery production process will be 1-loss%

SHEANUT CAKE

SHEANUT CAKE (ANOTHER INCOME STREAM)

YR	1ST YR	2ND YR	3RD YR	4TH YR	5TH YR
PRD AMT(Tons)	-	27X26X12=8424			
REALIZABLE PROFIT PER TON [$]	-	100	105	110	115
TOTAL INCOME ($)	-	842, 400	884, 520	926 640	968, 760
TOTAL INCOME(₦)	-	252, 720, 000	265, 356, 000	277, 992, 000	290, 628, 000

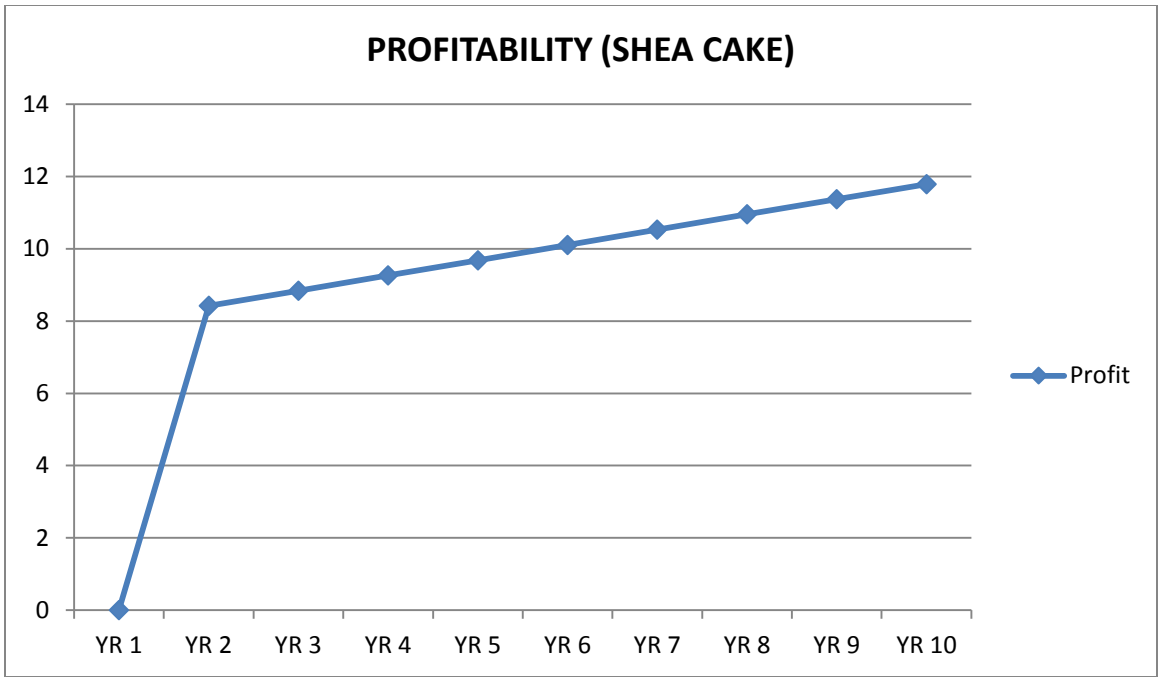
HYPOTHESIS: The capacity of the production plant is constant at 50tons shea nut utilization at the input level. The Percentage (%) yield of Shea nut Cake is constant at 53% of to input(50tons).
Starting profit at First Year= $100.
Percentage Increase= 5%
Benchmark Exchange Rate= ₦300= $1.

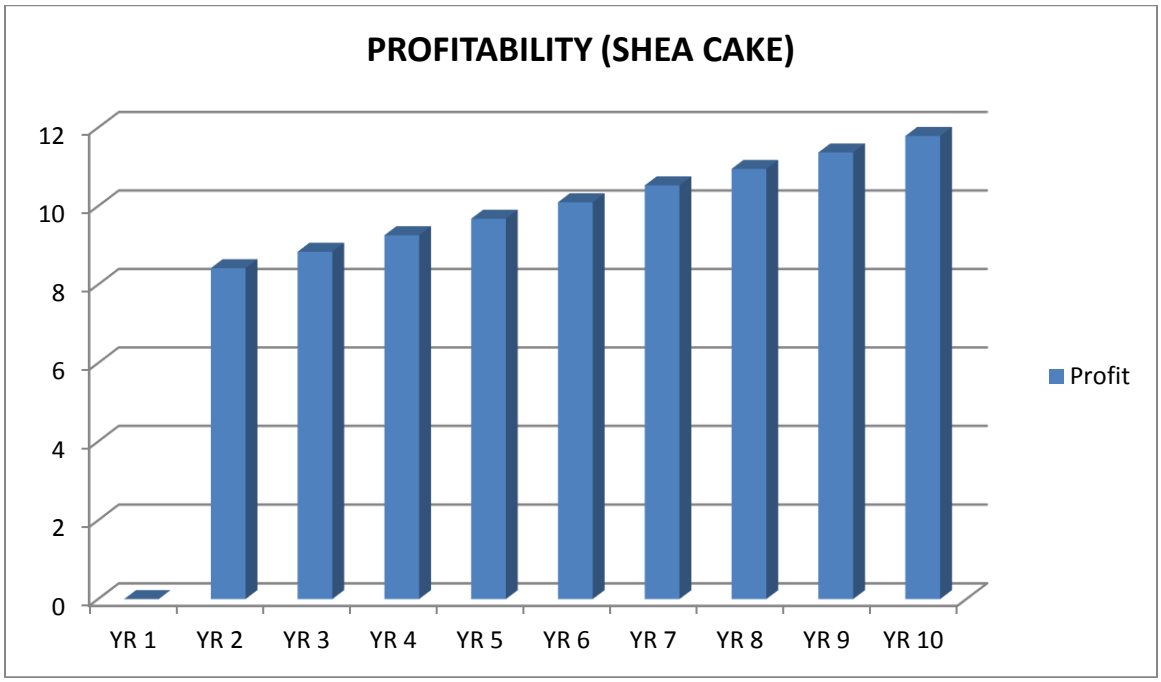
YR	6TH YR	7TH TH YR	8TH YR	9TH YR	10TH YR
PRD AMT(Tons)		27X26X12=8424			
REALIZABLE PROFIT PER TON [$]	120	125	130	135	140
TOTAL INCOME ($)	1, 010 880	1, 053 000	1, 095 120	1, 137 240	1, 179, 360
TOTAL INCOME(₦)	303 264 000	315, 900, 000	328, 536, 000	341, 172, 000	353, 808, 000

HYPOTHESIS: The capacity of the production plant is constant at 50tons shea nut utilization at the input level. The Percentage (%) yield of Shea nut Cake is constant at 53% of to input(50tons).
Starting profit at First Year= $100.
Percentage Increase= 5%
Benchmark Exchange Rate= ₦300= $1.

PROFITABILITY TABLE (SHEA NUT CAKE)

YEAR	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
PROFIT	0	842 400	884 520	926 640	968 760	1 010 880	1 053 000	1 095 120	1 137 240	1 179 360


PROFITABILITY (SHEA CAKE)
14
12
10
8
6
4
2
0
YR 1
YR 2
YR 3
YR 4
YR 5
YR 6
YR 7
YR 8
YR 9
YR 10
Profit

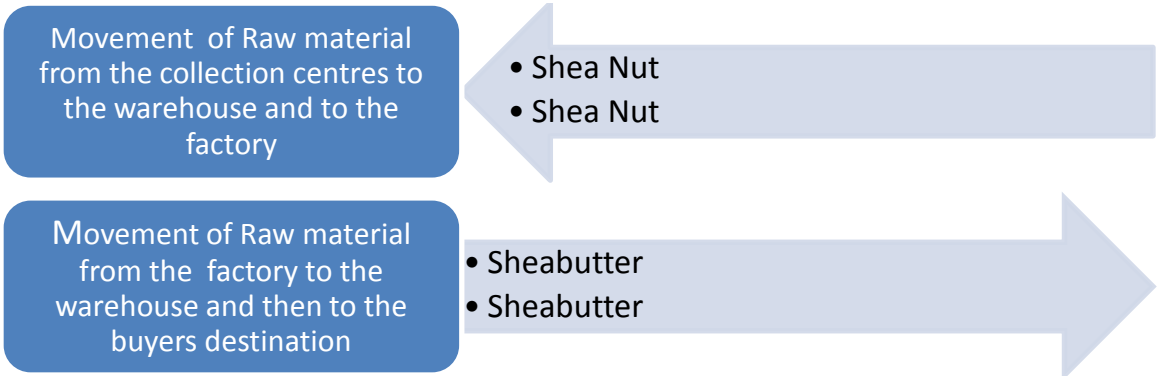

PROFITABILITY (SHEA CAKE)
12
10
8
6
4
2
0
YR 1
YR 2
YR 3
YR 4
YR 5
YR 6
YR 7
YR 8
YR 9
YR 10
Profit

TRANSPORTATION

There will be movement. Indeed, a lot of movement. There will be haulage of equipment, raw and finished goods to and from the factory. The transportation value chain will be key to the achievement of the set goals and priorities of the firm. The raw material is the Shea nut. The Shea nut will be sourced from the neighboring states of Oyo, Niger, Kwara, Kogi and Kebbi States of Nigeria. These states can produce high grade shea nut that can meet the quality requirement of the production factory. On the other hand, they can produce in quantity sufficient for production.
Adequate planning will be done. All processes would be streamlined; systems will be organized and made to be efficient to meet production targets. This planning would take into consideration the many factors that will ensure the efficiency of the entire process. The truck should be well fueled and maintained and there should be manpower training to equip the stakeholders involved in the transportation value chain to equip them with the requisite knowledge and skills to carry out their duties. Factors to take into consideration include:

- **Movement of Shea nuts from the collection centers to the warehouse for sorting and storage.**
- **Movement of Shea nuts from the warehouse to the production factory for processing and refining.**
- **Movement of She abutter from the production factory to the warehouse for storage.**
- **Movement of Shea butter from the warehouse to the Tin Can Port in Apapa and then will be shipped to its final destination.**

The Shea butter will be delivered ex-factory to the customer.



TRANSPORT OF SHEANUT FROM WAREHOUSE TO COLLECTION CENTER AND TO WAREHOUSE

MONTH	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
QUANTITY(TONS)	**4125**	**4125**	**4125**	**4125**	**16500**
NO. OF TRIPS	**75**	**75**	**75**	**75**	**300**
No. OF TRUCK (This figure is static)	**2**	**2**	**2**	**2**	**2**

TRANSPORT OF SHEANUT FROM WAREHOUSE TO PRODUCTION FACTORY

MONTH	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
QUANTITY(TONS)	**3750**	**3750**	**3750**	**3750**	**15500**
NO. OF TRIPS	**75**	**75**	**75**	**75**	**300**
No. OF TRUCK (This figure is static)	**2**	**2**	**2**	**2**	**2**

TRANSPORT OF SHEABUTTER FROM PRODUCTION FACTORY TO THE WAREHOUSE

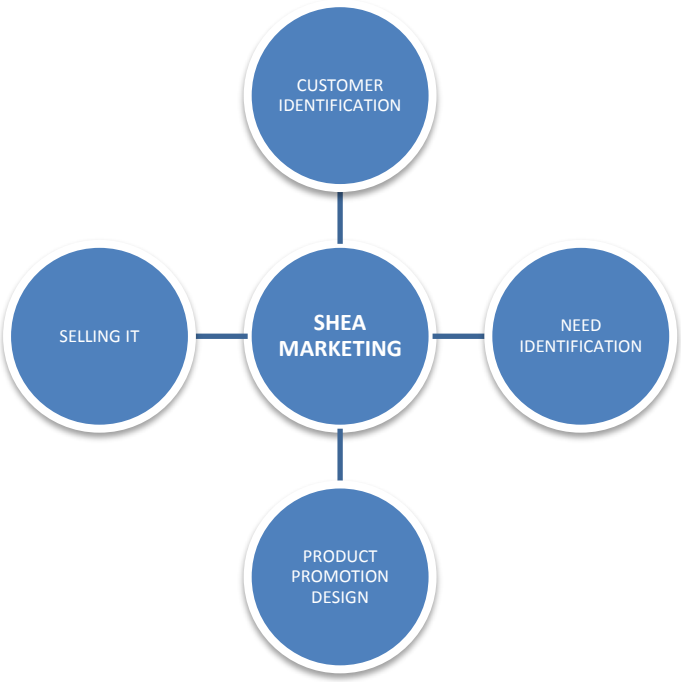
MONTH	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
QUANTITY(TONS)	**1500**	**1500**	**1500**	**1500**	**6000**
NO. OF TRIPS	**30**	**30**	**30**	**30**	**120**
No. OF TRUCK (This figure is static)	**2**	**2**	**2**	**2**	**2**

TRANSPORT OF SHEANUT FROM WAREHOUSE TO THE PORT

MONTH	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
QUANTITY(TONS)	**1500**	**1500**	**1500**	**1500**	**6000**
NO. OF TRIPS	**30**	**30**	**30**	**30**	**120**
No. OF TRUCK (This figure is static)	**2**	**2**	**2**	**2**	**2**

MARKETING STRATEGIES

We understand that Marketing is not simply advertising and sales activity, but a whole process for matching the Shea enterprise to its best market opportunities. Marketing is the process of identifying the customers, exploring their needs, designing how to promote the shea products and then selling it to them. It is an invaluable tool in driving the commercial success.
Its strategies should also adapt to the market to ensure the attainment of key marketing goals of the firm.



It is also important to remember that marketing of butter involves packaging, transportation to ports or local bulk buyers, export documentation and processing of letter of credit for payment to be done through a commercial bank.
It operates in a complex and constantly changing marketing environment. If the enterprise is to develop and survive, it must produce and offer something of value to some customer group. Through exchange, it gets back what it needs to survive, namely revenue. The enterprise must make sure that its products and services remain relevant to the market. Shea enterprises will re-examine their marketing objectives, strategies and tactics periodically. They will rely on market feedback as the main system for monitoring and adapting to the changing marketplace.
The next stage of planning is to undertake the marketing process, and if, after this process, you think that the customer is not going to buy your product or service, for whatever reason, then you should be prepared to change the idea. To understand the purpose of the Shea marketing process you will go through as part of your planning, it is useful to have an overview of the marketing system, what is included and the sequence of the process. The Shea Marketing System is a cycle: the cycle is dependent

on promoting and selling Shea products and services and on getting feedback on how the customer experienced the process.
Shea marketing includes a wide range of things to consider. The diagram above shows that the social enterprise has to push the product or service to the market and then the social enterprise has to pull the payment and feedback from the customer. The important point here is to recognize that the Shea enterprise has to do all the work and must therefore make sure that the marketing system is well managed. The most effective and inexpensive way of marketing is to get repeat sales with the same customers, much easier than finding and
attracting new customers.

There should be a Sales strategy. Sales will be concentrated:

- **in Europe, in UK, Germany and Northern Europe countries which have a tradition of using CBE and CBS in Chocolate products formulation.**
- **In America in USA and Canadian markets.**
- **In Asia in Japan market.**
- **In Nigeria for the Regional market.**

The Shea Marketing Process
The Shea marketing process will capture the widest range of market opportunities before narrowing it down to a manageable focus. This will give the Shea enterprise the full picture of possibilities, and enable it to look strategically to see future market opportunities.

There should also be a marketing Strategy.

- **Shea butter sample will be sent to known and potential buyers in the food, cosmetics and chemistry business in general, to promote the high quality of the enterprise production.**
- **The enterprise marketing manager will visit once per year big purchasers and will constantly keep in touch through the world wide web.**
- **A national network of traditional businessmen will be established for the distribution of shea butter on the home front.**

The Marketing Process follows the sequence outlined below.

As you go through the Shea marketing process you will be researching lots of areas to identify how the Shea enterprise will provide and sell the Shea product/service. At the same time you will be able to find out the costs of many of the things you will need to pay for as part of setting up and running the Shea enterprise. As you start to identify the costs you will incur, keep a record of them. In the next section when you look at the finance, these costs will provide some of the basic information for analyzing the financial viability of the Shea enterprise.

Analyze Shea Market Opportunities

Every enterprise needs to be able to identify market opportunities. Enterprises may think that they have limited opportunities, but this signifies a failure to think strategically about what business they are in and what strengths they have. No enterprise can depend on its initial products and markets lasting forever: some manufacturing enterprises will testify that much of their current sales and revenue comes from products that they did not produce five years ago. Every enterprise has an abundance of market opportunities.

Understand your idea - be clear about your product or service

It is useful to write a short description of the commercial idea as a way of keeping focus and testing it in relation to the market environment and conditions. It is important to clarify the key product/service and the associated products/services and focus on the key idea(s). Always keep in mind the option of changing or altering the idea as your market research develops.

Understand your market - gather market information

Once you have a clear idea of the product/service you need to go through a series of market research questions and gather information in order to answer the questions as best you can. Market research can be difficult to do because there are can be so many variables to factor in: you will have to use your own judgement. It is also, paradoxically, the case, that sometimes market research is quite simple and requires no more than asking a few questions and observing customer behaviour. The research will give you information that you can base your decision making on.

Select Target Markets

You now need to select the group(s) of customers – the target market (s), which are the initially easiest to reach and then assess whether the enterprise is positioned to reach this target market.

There are two stages in selecting your target markets, these are:

- **Measure and forecast demand**
- **Market segmentation, targeting and positioning**

Develop the Marketing Mix

We now need to concentrate on how we are going to sell the product/service to the target market. We do this by developing four components, known as the four Ps, to form the marketing mix, to be attractive to the target market and to make sure that the components complement and reinforce each other.

The marketing mix is made of four components:

- **Product: the design and process of manufacturing or process a product/service**
- **Place: the enterprise in the right location and the building**
- **Promotion: advertising and selling the goods**
- **Price: getting the policy on price consistent with the above**

Each of these components needs to be designed and structured to meet the expectations of the target market. Go through each of the four Ps in turn keeping in mind the positioning image you wish to create and the values of the Shea enterprise.

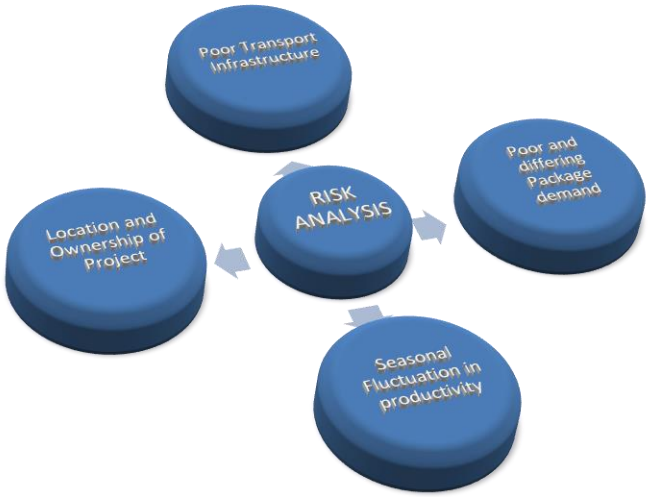
You can always add additional areas to the marketing mix but essentially after completing the four key areas you should be able to bring them together into a coherent set of intersupportive elements targeted at the customer and designed to create an attractive product/service that satisfies the customer and satisfies your social enterprise.

Manage the Marketing Effort

Marketing is not something done in the beginning and then forgotten about, but must be incorporated into the day to day management of the Shea enterprise. The marketing effort will need reviewing regularly and updating when necessary. In large enterprises, marketing sometimes has its own department, or has a designated member of staff, in small enterprise there is likely to be only one manager and it will be one of their tasks. It is advisable to involve all staff in marketing, you staff will have insights and valuable information, make sure that it responds to customer feedback and is refreshed .Include marketing activities in each staff member's job description and provide internal induction training, and allocate an annual budget for marketing and try to make sure you spend it during the year.

RISK ANALYSIS

There are high end risk factors that can undermine the smooth operation of the shea facilities and can delay the achievement of the key vision and goals of the shea enterprise. The smooth operation of the shea value chain is going to be of deep concern to the stakeholders of this enterprise and extra effort would be taken to manage them.
One of the challenges to be encountered is poor transport infrastructure especially in the rural areas where shea nut would be sourced. This can delay the procurement of shea nut meaning that large shea nut producing areas are inaccessible.
Another risk factor is poor packaging. Exporters that trade with more than one oversea partners are expected to package shea butter in different ways for each export destination. For example Donjay is expected by Unilever to package shea butter in wooden boxes while Ikochi require metal drums which might be difficult to procure or at an added cost to the company.



One should also know the harvest seasons of shea nut or shea nut production cycle to understand there can be a low production season. A season when there is less production of this gold crop from the shea tree. One should have a backup sources to procure the seed crop to avert an economic loss to the shea enterprise. During the off peak period, prices will be higher due to low production volume and higher demand.

One potential risk factor is shortage of working capital. Working capital is capital that is used for the day to day running of the Shea enterprise. This capital should be available to sustain operation of the firm. On the other hand some processors lack the capital to purchase sufficient stock of Shea nut. One possible solution is for shea butter buyers to extend credit to processors. However business

relationship has not developed to the extent where buyers trust processors to apply funds responsibly and honour business agreement.

One area if not addressed that will affect the business bottom line is quality of shea nut procured. One thing is very clear. Poor quality shea nut means poor quality shea butter. The quality of shea nut that would be hauled to the production facilities will be a top priority of concern and every concerted effort will be made to ensure that shea nut procured for production will be of high grade and meets international standard.

Of similar concern will be the storage of the procured nut in the warehouse prior to the movement to the production zones. Because shea nut procured might not be pushed immediately for production, efforts should be made to apply the best storage and preservation technique of oil seed. A technique that ensures the quality will not be compromised because the final end product which is shea butter depends on the initial quality of the shea nut feed into the production plant. On the other hand, this should also prolong the shelf life of the shea nut. Also equally important is to know that it is capital intensive to store nuts. This should be put into factor in planning for this project.

Another is the Export price of shea butter. Several Companies and organization who have recently entered the export business complain that Shea butter prices offered by importers are too low. This is a cost of production problem rather than a price problem. The new entrants may not yet have rationalized their production system or received sufficient orders to exploit economics of scale within their plants. High cost of production are reflected in the high crushing charges some companies levy for extracting shea butter on a service basis. Some of the companies with the longest experience in processing and exporting does not complain about export prices.

On the other level is refined Shea butter. Sometimes buyer might complain that suppliers of refined shea butter charge too much. The buyers might provide evidence that the refined product is not competitive with that of the other countries. However, refineries from those countries might have been existed or established for longer period and have almost certainly exploited the economics of scale.

Another risk factor is inaccessibility to the International Market. Some processors again those with the least experience in the business find difficulty establishing contact with oversea buyers.

Next in line on the risk factors is Competition for Shea nut. One exporter fear that competition among processors for shea nut will drive up procurement cost to the extent that the Nigeria shea butter processing industry would become Internationally uncompetitive.

A threat exist in lack of technical Market Information. When it comes to statistical data on shea industry, it is a shame that accurate statistical data are not available. Shea nut and butter are smuggled through the neighboring countries on the daily basis with the connivance of the people who are mandated to enforce the laws. A competent technical manager should be hired to carry out research and provide technical information that can boost revenue and add immense value to the business bottom line.

We are confident that we have sold our Shea Butter production before we start the production. There is a huge worldwide demand of high grade quality of the Shea Butter. We follow daily the major players in the Shea Butter, Chocolate and Cosmetic industry. So we can respond immediately to the market trends and we are always our competitors a step ahead.

Another area of concern is Poor Management. For this shea enterprise, we expect the managers to do things right while leaders should do the right things. Management is all about things that don't have freedom to choose while leadership is all about people. Leadership and management style should adapt to changing times and market realities and keep abreast of world innovation and technologies. Systems must be aligned. Managers should acquire skills necessary to excel in this job function and all employees of the shea enterprise must see themselves as leaders who take responsibilities and initiatives rather than wait to be told.

NO.	RISK FACTORS AND THREAT OF THE PROPOSED SHEA INVESTMENT
1	**Poor Transport Infrastructure in the rural area**
2	**Poor and differing Package demand**
3	**Season fluctuations in Productivity**
4	**Shortage of Working Capital**
5	**Quality of Shea nut procured**
6	**Storage and preservation Method and procedures**
7	**Export price of Shea nut and Shea butter**
8	**Inaccessibility to the International Market**
9	**Competition for Shea nut**
10	**Lack of Technical Market Information**
11	**Poor Management**

RECOMMENDATION

First, we will recommend this project. Investing in high tech Shea butter machinery is a responsible and low risk investment. This by the huge demand for chocolate and personal care products by consumer's world wide.

INDUSTRY	%
Chocolate Industry	85-90
Cosmetic Industry	10
Pharmaceutical Industry	0.05
TOTAL	100

With Confidence, we recommend Zhengzhou Qi'e Grain &Oil Machinery Co., Ltd for this project. A company based in China with proven track record in oil machinery production and installation. Because of their long experience, they have achieved economics of scale to carry out this project in cost effective manner.

This company have also passed ISO9001:2000 international quality management system certification successfully. It has the qualification of manufacturing for one and two types of pressure vessel ,besides, it also has a number of national patents. Since founded in 1982,It has been awarded the "The quality-star enterprise of Henan province", "Model enterprise with High quality, and keeping promises ","3.15quality and reputation double promise enterprise " and so on. Its Body shape "Qi'E" mechanical products have been awarded with "Chinese famous brand products", "National Quality trusted consumer products" and many other honored titles. The pennants such as "High technical skills , reliable partners "from our customers are countless.

They have grown into Chinese grain and oil machinery production and export base with scientific management method, strives for perfection the manufacturing process, innovative manufacturing idea rapidly , its production and the comprehensive economic indicators lies in the forefront of the same industry line, The products have been sold all over the country and exported to more than 30countries and regions such as Russia, India, South Africa, Ukraine, Nepal, Indonesia and so on.

They have their address on The Crossing of Huagong Road and Changchun Road, High Tech Development Zone, Zhengzhou City, Henan Province ,China. Phone line is +8615093389825(Mobile), Email is oilmachinery02@qiemach.com.

As alternative, we have provided other list of edible oil equipment manufacturers as an annex in this document. Their names, description, address, phone numbers, services and email address are included for reference purposes.

We also will recommend a Shea butter quality specialist Mrs Nelly Osagie Ndaguba who has its training from the American Shea butter Institute in Atlanta USA. She is also the first Vice president of Natural Shea products Association of Nigeria and CEO of Nelsag Enterprise International Limited. She has trained with Dr Peter Lovett of the West Africa Trade Hub, Ghana on Shea picking, processing, packaging, labeling formulation and marketing. She is a Consultant on Shea quality issues. Website is Naturalnigerian.com and can be reached on 08062695389.

We can also recommend other consultants on request.

We also recommend this project be set up in Sagamu which from research is becoming an industrial zone for manufacturers with good road networks, friendly and conducive business environment. It is closer to the Nigeria commercial and industrial hub, Lagos state with easy access to the Tin Can port in Apapa for the purpose of export. On the more Positive side, the major raw material which is shea nut can be accessed from the neighbouring states of Oyo, Kwara, kebbi and Niger state.

The closest shea state to the proposed Shea butter facility in Sagamu is Oyo state which is a 3 hours 14 mins Journey when there is no traffic. Kwara state is 4 hours 30mins without traffic, Niger state is 8 hours 42 mins on no traffic while the furthest is Kebbi State which is an 11 hours and 8 mins from Sagamu. These Shea States have comparative advantage in quantity and quality of sheanut produced and are accessible to source the raw sheanut.

We also will recommend a shea nut gathering point be set up in each of the shea area. There should be a central warehouse and office in each shea area, where the shea nuts will be harvested and stored temporarily. Harvesting of the shea nuts wil be coordinated from this office. The women cooperatives collect shea nuts, and bring the collected shea nuts to a central point/office. Small trucks will be transporting the shea nuts from the central point to the central warehouse in the shea zone where it will be stored temporarily before it will be conveyed by larger trucks to the proposed production factory in Sagamu.

Similarly, another warehouse should be set up nearer to the port where the processed shea butter will be transported by truck. From there, the shea butter will be moved to the port and then will be shipped to its final destination. The shea butter will be delivered ex factory to the customer.

A sophisticated software should be installed to fully integrate the company three divisions- Production, Sales and marketing and administration with a single program. An intranet should be set up. This will help to start a successful marketing campaign that really sells; to control inventory easily; to perform accounting painlessly; to give more accurate information to the management to make well substantiated decisions through the creation of financial reports and statements; to reach international customers through the world wide web; to keep close track of the national and regional customers.

We will also want to recommend the company belong to The Global Shea Alliance which promotes Shea worldwide, establishes industry standards for quality and sustainable sourcing and facilitates information exchange. The Global Shea Alliance organizes the key international Shea Industry Event,

bringing together: stakeholders from across West African and around the world. From producers to traders to international buyers to retailers in the end market, every level of the Shea value chain is represented, including associated logistical support organizations, from financiers to certifiers, to transporters, packaging supplies and researchers. There website is www.globalshea.com.

We will recommend contact with companies in the shea butter, cosmetics and chocolate industry, In Europe, North and South America and Asia. Those interested to buy the shea butter for their final products. We recommend Loders Croklaan Bv, Food Fats and Fertilisers Ltd, Barry Callebaut AG, Zaanlandse Olieraffinaderij Bv, Unilever, Vandermoortele NV, Britannia Food Ingredients Ltd etc.

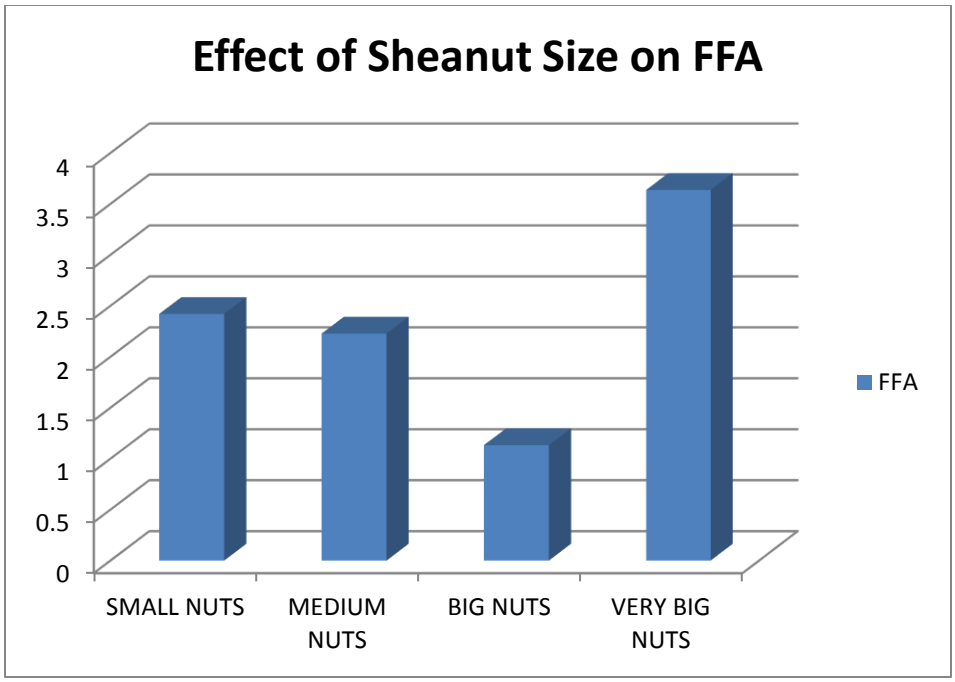
Loders Croklaan Bv
Food Fats and Fertilisers Ltd
Barry Callebaut AG
Zaanlandse Olieraffinaderij Bv
Unilever
Vandermoortele NV
Britannia Food Ingredients Ltd
Among Others.

When the Shea Butter Plant in Sagamu functioned relatively optimal, it will make economic sense to expand the operation by building similar factory in neighboring country where sheanut is in abundant. For marketing purposes, there will be need to open sales offices in Europe, Asia and America. This will facilitate a good contact with the major customers. The aim should be that within 10 years, a large chunk of the Shea butter market will be in the hands. In the long term, It should be a Multi National and should create a good number of Jobs.

On shea nut, we recommend using shea nut of smaller size because from research it has been established that there exist a correlation between shea nut size and butter quality. The smaller nuts has higher Free fatty acid value (FFA) and moisture content, hence indicating higher butter quality.

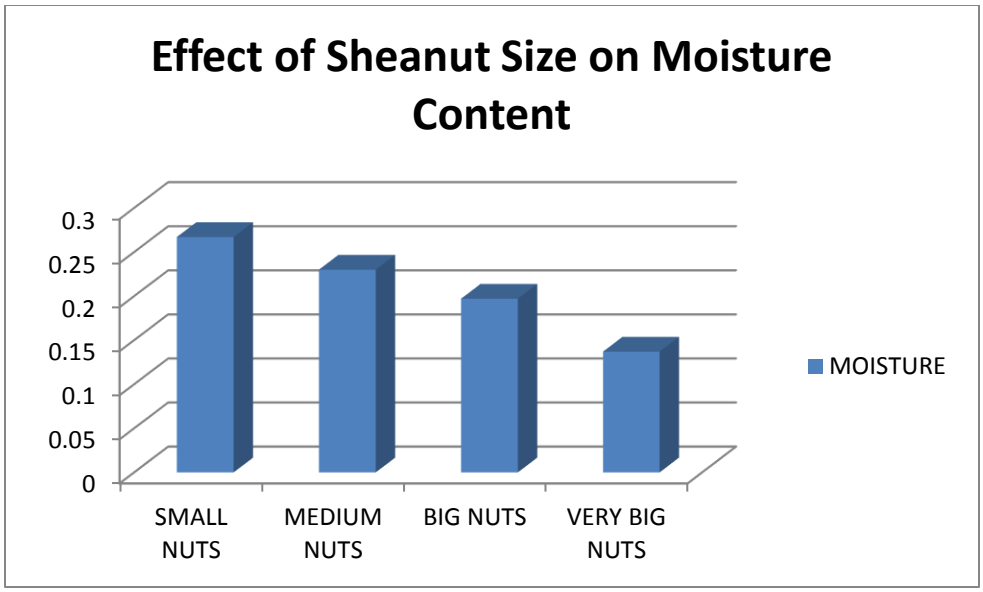
Treatment	Grade 1 (1)	Grade 2 (>1.0-3.0)	Grade 3 (>3.0 – 8.0)
Small Nuts	-	**2.420**	-
Medium Nuts	-	**2.227**	-
Big Nuts	-	**1.133**	-
Very Big Nuts	-	-	**3.637**

GRADING OF FFA VALUES OF SHEABUTTER



GRADING OF MOISTURE CONTENT OF SHEABUTTER

Treatment	Grade 1 (0.05%)	Grade 2 (>0.05-0.2%)	Grade 3 (>0.2 – 2.0%)
Small Nuts	-	-	**0.267**
Medium Nuts	-	-	**0.230**
Big Nuts	-	**0.197**	-
Very Big Nuts	-	**0.137**	-



Similarly, it has been established that the extraction method of the sheabutter has an effect on the yield and quality characteristic of oil from shea butter. Solvent method seem the better, more efficient method in terms of oil yield percentage, TBA, saponification and iodine value even though lacking in overall sensory acceptability compared to the traditional method of extraction which scored higher in terms for overall sensory attributes.

EFFECT OF EXTRACTION METHOD ON SENSORY ATTRIBUTES OF SHEABUTTER OIL

QUALITY ATTRIBUTES	SAMPLE A (SOLVENT METHOD)	SAMPLE B (TRADITIONAL METHOD)
Texture	**6.00±1.00**	**5.30±1.13**
Appearance	**4.90±0.79**	**5.90±0.91**
Odour/Aroma	**4.65±1.34**	**5.05±0.94**
General Acceptability	**5.30±1.08**	**5.75±1.07**

Now, it will be an economic mistake to forget the government. The Government of any country has a role to play in the success of any business enterprise. The Government policies can make or mar a business venture. For a long term success, we recommend a partnership with the government . The management of this business enterprise should form a team to negotiate with Government in the area of Tax waivers such as Export and import tax waiver and fringe of other benefits.

Last but not least is the need for a proper personnel plan. This proposed Shea firm should have a good management team which should include seven persons namely:

- **President- Chairman of the Board.**
- **General manager.**
- **Deputy general manager- in charge of personnel management.**
- **Production manager and his deputy.**
- **Sales and marketing manager and an accountant**

Staff members total sixty six (66) which reads as follows:

1. **Production: Foremen (3), mechanics (3); electricians (2); Plumbers (2); Screw presses workers (18); fork lifters (3); handlers (9), cleaners (3); chemists (1); chemist assistant (1); typist (1).**
2. **Sales and marketing: Drivers (5); fork lifters (3); warehouse officer (1); commodities receptionist (1); typist (1); sales/purchases officer (1).**
3. **Administration: Assistant/Executive secretary (1); typist (1); night watchers (2); errand men (2); cleaners (2).**

HYPOTHESIS OF MANAGEMENT TEAM AND STAFF MEMBERS OF THE PROPOSED SHEA FIRM

	STAFF: MANAGEMENT UNIT	
STAFF	**NUMBERS REQUIRED**	**REMARKS**
President-Chairman of Board	**1**	**Can be representative of technical or financing joint venture partners**
General Manager	**1**	**Seasoned businessman experienced in the commodities trade of Economics background**
Deputy Manager	**1**	**Can have more than 20 years experience gained as personnel manager of International air carrier.**
Production Manager	**1**	**A mechanics Engineer**
Sales and Marketing Manager	**1**	**Should have a finance background, computer literate with knowledge of cash flow and debt**

		management
Deputy production Manager	1	A mechanics Engineer
Accountant	1	Should have a proved and long standing experience in accounting practice
TOTAL	7	

STAFF: PRODUCTION UNIT

STAFF	NUMBERS REQUIRED	REMARKS
Foreman	3	-
Mechanics	3	-
Electricians	2	-
Plumbers	2	-
Screw Press Workers	18	-
Fork Lifters	3	-
Handlers	9	-
Cleaners	3	-
Chemist	1	-
Chemist Assistant	1	-
Typist	1	-
TOTAL	46	

STAFF: SALESS AND MARKETING

STAFF	NUMBERS REQUIRED	REMARKS
Fork lifters	3	-
Warehouse Officer	1	-
Commodities Receptionist	1	-
Drivers	5	-
Typist	1	-
Sales/Purchasing Officers	1	-
TOTAL	12	-

ADMINISTRATION		
STAFF	**NUMBERS REQUIRED**	**REMARKS**
Assistant/Executive Secretary	**1**	**-**
Typist	**1**	**-**
Night Watchers	**2**	**-**
Errand Men	**2**	**-**
Cleaners	**2**	**-**
TOTAL	**8**	**-**

Top management i.e President-Chairman, general manager, production manager, sales and marketing manager is entitled to housing scheme allocations; staff members benefit from many incentives such as permanent nurse and medical doctor present on the compound- but not on the list as employees; Professionals and pharmaceuticals for first care interventions. Globally, all these incentives and bonuses represent 13% of the payroll burden. Lastly, Salary increase should be set-up to increase on the annual basis.

CONCLUSION

Investing in the shea butter facilities for the processing of shea butter in Sagamu, Sagamu Local Government Area of Ogun State will be a viable and feasible idea. This is due to the strong and increasing demand for crude and refined shea butter all over the world and the availability of the raw material right here at home. This has created a business opportunity gap between demand and supply. Seeing demand for CBE(Cocoa Butter Equivalent equivalent rise over the years attest to the importance of this product for variety of purposes. Now, any creative investor can cash in. He can cash in on this opportunities to create a viable investment that won't just be profitable and last for years but can also be an industrial strategy to control the production and marketing of shea and its derivative in the market.

In other words, from the feasibility analysis, it is realistic to envisage that a high technological and mechanized shea butter processing plant could be successfully established in the planned location(Sagamu) in the current and prospective economic, technical, financial and legal environment of Nigeria. This conclusion is based on information available today on :

- ✓ **The positive boost in demand for Cocoa butter equivalent which is witnessing a continual rise due to rising world consumption of Chocolate and the high price of cocoa.**
- ✓ **The favorable business environment in Nigeria.**
- ✓ **Government favorable predisposition to Agriculture and agricultural export.**
- ✓ **Availability of the raw material which is the Shea nut.**
- ✓ **Ability to compete effectively with those of developed countries of Europe, US and Asia due to Location advantage, cheaper labour and access to raw material.**
- ✓ **A self contained industry with good prospect for growth.**
- ✓ **Use in the high end cosmetic sector which has seen strong growth for years with higher expectation for continual growth.**
- ✓ **Commercial interest in Shea mostly centers on its use as a substitute for cocoa butter (CBE) in the confectionary industry. This demand comes principally from the EU where Shea butter is approved as a CBE in chocolate up to 5%.**
- ✓ **A new emerging market in India and some other Asian countries.**
- ✓ **Regulatory changes in Europe favoring the use of Shea butter as CBE where they have allowed greater use in Chocolate and other foods.**
- ✓ **Ability to leverage on economics of scale over long term.**
- ✓ **Increased demand for natural products by the populace.**
- ✓ **Increased population.**
- ✓ **Utilization of high technological and mechanized machineries for production.**
- ✓ **Development of Information and Communication Technology (ICT) which has facilitated easy communication and trade all over the world.**
- ✓ **Increased need to diversify economics away from commodity exportation towards a value added industrial base and service sector.**
- ✓ **Consumer awareness around hydrogenated oils as with trans fats has also played an important role in the increased use of shea in CBEs, which is relatively low in trans fats.**

- ✓ **Economic value of bye-product of Shea nut such as shea cake after Oil extraction making shea product a valuable economic commodity worth developing.**

The shea sector, despite being a negligible share of the global vegetable fats market, has excellent prospects. Shea is an important input to the high-end cosmetics sector, which is expected to see continued strong growth for years to come. Shea is very much a self-contained industry, which could scale very quickly with investment in processing machinery and skills training, in addition to organizational restructuring of the supply chain.

On a wider scale, The frontier markets of Nigeria present investors with myriad of opportunities . There are opportunities for high business returns as its economy continue to modernize and economic growth continues to outpace that of the developed world. Investors who step into these markets typically have a view that is more long term , investors in mature markets can make higher returns over the long term if they are patient and creative. Nigeria continues to make great progress on reforms that make doing business in the region easier, which is essential to attracting continued foreign investment as manifested in shea business growth witnessed over the years and developing a domestic entrepreneurial class.

Finally, as far as the Company management can skillfully perform and keep close to this Business agreements, feasibility assumptions and recommendations made on this document, the financial future of this proposed Shea company at Sagamu will be cloudless; loans obligations will be met regularly and investors can expect hefty dividends from the second operation year.

ANNEX 1 MAJOR SHEA BUTTER REFINERIES

FUJI OIL, JAPAN
Founded in 1950, the Fuji Oil Group serves the world as a specialist in intermediate food ingredients. The Group's research and development has led to numerous innovative, high value-added specialty products. Sales for our oils and fats business yield about 50,475 million yen ($454 million). Total consolidated sales of Fuji Oil are 160,000 million Yen ($1,440 million).
Fuji Oil Group Kuhlmannlaan 36 9042 Gent Belgium Tel: + 32 (0) 9 343 0202 Fax: + 32 (0) 9 344 2610
www.fujioileurope.com
www.fujioil.co.jp.
Contact: Mr. Jan Sintobin, Procurement Director

2. LODERS CROKLAAN
The company was part of the Anglo-Dutch consumer goods conglomerate Unilever but has been sold at €217m to IOI Corp Berhad of Malaysia. The Loders Croklaan Group unit employs 600 people, with posted FY 2001 sales of €267m (US$262.53m).

IOI GROUP
IOI is one of Malaysia's homegrown business conglomerates. Within a relatively short span of 30 years, the IOI Group has firmly established itself as a leader in its core business areas of Plantations, Property Development and Investment and Manufacturing. From an oil palm plantation entity, the IOI Group has transformed itself to become a leading integrated palm oil player in the country.

Moreover through the acquisition of Loders Croklaan, IOI is now a strong global player with a strategic focus on growth in the area of palm based oil products. It is one of the largest plantation groups in Malaysia with a sizeable plantation holding of over 160,000 hectares. Annual production of CPO is in excess of 800,000 tonnes. To gain further leverage as a key palm oil producer, IOI has also ventured into downstream value-added palm oil based manufacturing activities such as palm oil refining, palm kernel extraction, oleo chemicals and specialty fats and oils. www.ioigroup.com :www.croklaan.com
IOI Group (Malaysia/Netherlands) Level 8, Two IOI Square IOI Resort, 62502 Putrajaya Malaysia Tel : +60 3 8947 8668 Fax : +60 3 8943 2899
Contact: Mr. Christopher R Donough, Research Controller (Plantation Division)

3. AARHUS UNITED - VEGETABLE OILS AND FATS
Aarhus was established in Denmark in 1871. It has 1,700 employees worldwide. In 2003, turnover totaled approximately $687 million, with profits reaching some $13 million.
Aarhus United comprises 14 subsidiaries with four manufacturing companies in Denmark (head office), Mexico, the United Kingdom (UK), and the US. An affiliated company - United Plantations - is based in Malaysia.

Aarhus United Denmark extracts and refines vegetable oils for use primarily in the confectionery industry. Shea nut represents one of the most important raw materials to Aarhus United Denmark, which provides a network of suppliers in the sub-region.
Aarhus United A/S M. P. Bruuns Gade 27, DK-8000 Arhus C, Denmark Tel: +45 87 30 60 00 Fax: +45 87 30 60 44 Email: dk.sales@aarhusunited.com URL: www.aarhusunited.com

4. KARLSHAMS (SWEDEN)
Karlshamns, one of the world's four leading manufacturers of high value-added specialty vegetable fats leads the market in Nordic countries and Eastern Europe.
The food industry embodies Karlshamns' largest customer segment and Sweden its largest single market. The Group consists of three business areas – Edible Oils, Technical Products and Feed Materials. The company purchases raw materials like seed, nuts, and crude vegetable oils globally, directly from plantations or on the major commodity markets.
With a turnover of roughly SEK 3,200 million (US$ 421 million?) and nearly 800 employees, of whom about 600 are in Sweden, the Group maintains three plants for refining oils and fats within the Edible Oils business area. These are located in Karlshamn, Sweden, in Hull, the UK, and in Zaandijk, the Netherlands.
Karlshamns AB, 37382 Karlshamn, Sweden
Tel: +46-454-82-137
Fax: +46-454-82-838
www.karlshamns.se
Contact: Mr. Jan-Olof Lidefelt, Strategic Marketing Manager, Oils and Fats Division.

ANNEX 2 EQUIPMENT MANUFACTURERS & CONSULTANTS

1. WESTFALIA (GERMANY)
Westfalia Separator builds state-of-the-art machines to the highest quality standards working to DIN ISO 9001 standard since 1989. Further, all domestic and foreign subsidiaries have been certified to the highest ISO standard since the beginning of the year 2000. In 2001 the new ISO 9001:2000 standard will be implemented.
Over 2000 applications in the field of separation technology have been successfully tested in practice. The core competence of the new Westfalia Separator combines separators and decanters with process engineering. This strategy has generated a turnover of 400 million EURO making Westfalia Separator a key player in the field of centrifugal separation technology.
Equipment offered include separators with a daily capacity of 50 t for small mill operators up to the separator with a capacity over 1000 t per day for large refineries- for the following:

- **Press oil clarification**
- **Dewaxing**
- **Degumming**
- **Fractionation**
- **Neutralization**
- **Soap stock splitting**
- **Washing**

Applications in oleo chemistry include:
- **Epoxidized oils**
- **Glycerin**
- **Mono/diglycerides**
- **Soaps • Fatty acids**
- **Fatty alcohols**
- **Trans-esterification**
- **Methyl ester**
- **Transesterification (e.g., for the production of biodiesel)**

2. TECHNOCHEM, INC. (USA)
TECHNOCHEM, an expert in designing and processing of vegetable oils, was founded in India in 1972 by Krishna Agarwal. The company was transformed into a limited liability company by the name of Technochem Engineers (India) Private Limited and was incorporated in the USA in 2000 as Technochem International Inc.
The company specializes in supplying plant and equipment for hydrogen generation, hydrogenation, and vegetable-oil refining companies. The company serves more than 150 factories in India and neighboring countries.

SERVICES
Oil Refining Plants
Crude Oils
Plants for processing of canola oil, castor oil, coconut oil, cottonseed oil, palm oil, peanut oil, rapeseed oil, rice bran oil, soybean oil, sunflower oil, and others.

Capacity
Offers commercial refining plants of any capacity ranging from 5 tons/per day to 500 tons/day.

Construction
Plans to build on site, assemble equipment and test for clients and offers consultancy services as well.
International, Inc.
3320 Goldenrod Circle
Ames, IA 50014 USA
Tel: (515) 292-2891
Fax: (515) 292-5572
Email: technocheminc.com

3. TROIKA (INDIA)
TROIKA, an ISO 9001 company in operation since 1971, specializes in the field of Oils and Fats technology. TROIKA equipment operates at more than 250 projects spread over 22 countries .
TROIKA offers services in all aspects of the industry; including commercial and operational safety aspects, international quality standards, and the latest design trends in the industry.

Installations
TROIKA has installed the following numbers of different types of units:
SOLVENT EXTRACTION LINE 96
VEGETABLE OIL REFINING LINE 53
OIL MILLING SECTION 12
INTERNATIONAL CLIENTELE 47
PILOT / SPECIALLY DESIGN LINE 20
TAILOR MADE EQUIPMENT 18

TROIKA has supplied equipment in Bangladesh, Ceylon, Ethiopia, Germany, Greece, India, Iran, Kazakhstan, Kenya, Kuwait, Macedonia, Malaysia, Myanmar, Nepal, Nigeria, Philippines, Russia, South Africa, Tanzania, Turkey, U.A.E. and Yemen.
Contact:
6th Floor, Embassy Centre
Nariman Point
Mumbai-400 021
India.
Tel: 00-91-(22)-2834429, 2834334, 2834515
Fax: 00-91-(22)-2823778
Email: troika@vsnl.com

4. GLAMPTECH (INDIA)
This engineering company was founded in 1990 to provide service in the field of Continuous Solvent Extraction / Vegetable Oil Refining and allied industries. The firm provides efficient engineering, technical and project management services for the process and related industries. These services include process development, technical evaluation studies, the design of plants, improvement and expansion of existing facilities, pollution prevention studies, energy conservation and staff training.

SERVICES
Provide turn-key projects services in the following fields:

- **preparatory section**
- **solvent extraction plant**
- **neutralizing section**
- **bleaching section**
- **dewaxing section**
- **continuous deodorizing & physical refining (cpo)**
- **dry fractionation plant(for olein & stearin separation)**

5. GA EXPERTISE, INC. (FLORIDA)
GA EXPERTISE, INC. provides engineering and construction consultancy in plant design and upgrading. The company was established over 30 years ago and has been involved in the design, construction, and operation of oil mills worldwide, but especially in the Far East, Latin America, and Africa. The plants operate to ISO/9000 standards.

6. JDC GLOW COMMERCIAL, INC. (PHILIPPINES)
This company deals in new and used vegetable oil technologies and production units. They provide various processing equipment, such as oil seed extraction, oil seed refining, oil seed degumming, and oil seed bottling.
Equipment is suitable for the following oil seeds:

Avocado, babaco, cotton seed, bilberry, borage, stinging nettle, beech nut, calendula, cashew nut, copra, sunflower, groundnut, spurge, rubber seed, rose hip, hemp seed, hazel nut, raspberry, elderberry, raspberry, blackcurrant, jojoba, coffee, cocoa, shea nut, coriander, pumpkin, linseed, maize germs, macadamia nut, almonds, melon seed, poppy seed, nutmeg, evening primrose, neern seed, niger seed, palm kernel, red pepper, brazil nut, passion fruit, pecan nut, rape seed, castor beans, mustard seed, sesame seed, soybean, sunflower seed, tropho plant, grape seed, walnut, citrus fruit kernels

USED EQUIPMENT
Buyers can purchase the following equipment on their website:
Extracting plant (oil mill for edible oil) EUR 667.000
Edible oil processing plant EUR 1.450.000 to EUR 2,350,000
Hydrogenated vegetable oil US$ 95,000 to USD 1.900.000 75.000
Vegetable oil refining unit with a capacity of 200 m tones/day No price available
Used vegetable oil extraction and refining plant USD 4.800.000
New vegetable oil screw press capacity 70 to 120 kg/h seed EUR 28.900
New vegetable oil screw press cap. 120 to 200 kg/h seed EUR 46.500
New KOMET oil extraction plant capacity 3 to 5 t/day EUR 130.750
Vegetable oil Refining 120 to/day EUR 389.000,
28, A. Ricarte St.
Las Piñas
Metro Manila
PHILIPPINES
Tel / Fax: 63 - 2 - 800 3128.
E-Mail: jdccntr@info.com.ph; jdc@ph.inter.net
Web: http://www.jdc-international.com

7. DE SMET (BELGIUM)
The De Smet Group (est. 1946), a world leader in extraction technology for fats and oil products, specializes in the supply of equipment and services to the Oil and Fat Industries. Based in Belgium, the group employs more than 500 people and operates in 27 languages, and boasts a turnover of more than 200 million US dollars (excess of 120 million Euros). The De Smet Name is well-respected all over the world, where it stands for experience, innovation, first class project management, customer service, and environmental protection.
De Smet has supplied over 780 extractors, and De Smet equipment processes 40 raw materials, of which Soya beans, sunflower seed, rapeseed, groundnuts, cottonseed, and palm oil are probably the most popular. The company has also supplied small and large plants to some 1,500 oil millers.
http://www.desmetextraction.com

8. SA FRACTIONNEMENT TIRTIAUX
This company specializes in the following processes:
Fractionation
Physical refining/Deodorizing
Degumming
Degumming & dewaxing
Interesterification
Batch Deodorizing
Bleaching

rue de Fleurjoux,
6220 FLEURUS
BELGIUM
Phone: +32-71-813787
Fax: +32-71-817024
Email: tirtiaux@tirtiaux.com

9. AGP HASTINGS (USA)
Started in 1983 as "Ag Processing Inc" a cooperative which adopted the corporate logo AGP® as its company trademark, AGP currently represents the fourth largest vegetable oil refiner in the United States.
Phone: (800)247-1345, (402)496-7809
Ag Processing Inc.
PO Box 2047
Omaha, NE 68103-2047
12700 West Dodge Road
Omaha, NE 68154
Web: www.AGP.com
Email: info@agp.com

10. OILTEK SDN BHD (Malaysia)
This company manufactures vegetable oil refining plants that conform to ISO9001 international standards and has clients in Bangladesh, China, Honduras, Indonesia, Kenya, Philippines, Thailand, Vietnam.
Lot 6 Jalan Pasaran 23/5
Kawasan MIEL, Phase 10
40000 Shah Alam
Selangor Darul Ehsan
Malaysia
Phone Number: 0355428288
Fax Number: 0355418288
Website: http://www.oiltek.com.my
Email Address: oiltek@oiltek.com.my
Contact Person: Mr. Wong Seong, Mr. Teh Pek Boon

- **Cosmetics and pharmaceuticals**
- **Water supply**

11. PENNWALT INDIA, LTD.
Pennwalt India, LTD. was established in 1959 under the name Sharples Process Engineers(P) Ltd. It has worked in collaboration with Feld & Hahn,Gmbh,Germany, Wallace & Tiernan Division, Pennwalt Corporation, USA M/S Bredel, Netherlands and M/S Alois Gruber, Austria.
Products include:

- **Super-D-Canter**
- **Vibrating Screens**
- **Super Centrifuge**

Vegetable Oil Refining services include:

- **Mineral oil purification**
- **Soya protein isolate & concentrate**
- **Safflower protein concentrate**
- **Fluoroplastic linings**
- **Hose pumps**
- **Chlorination equipment**

Pennwalt India Ltd.
D-221, MIDC, TTC
Thane Belapur Road,Nerul
Navi Mumbai 400706
India
Phone : 91 - 22 - 27632503 / 27632529 / 27632528
Fax : 91 - 22 - 27632560
Email: pennwalt@vsnl.in
Mr. Ashish Kashyap (Director)
Mobile: 9820080114
Phone: 91 22 55906630 (Direct)

12. GEBAFA GMBH (GERMANY)
This Germany based company is dedicated to bolster investments in energy and production facilities in sub-Saharan African countries by offering technical expertise as well as by financial and marketing assistance.
Gebafa provides turn-key projects with procurement, installation, testing and management services. They also offer financial assistance up to 50% of the essential mobile equipment. Gebafa also guarantees the successful start up of the production line they supply.
Services are in the following areas:

- **food processing**

• photovoltaic systems; solar home systems (SHS)

13. AUM CONSULTANCY

Aum Consultancy Pvt. Ltd. caters to various edible oil industries, chemical process industries and projects relating to specialty fats, essential oils and oleo resins, phytochemicals and herbal extractions, industrial enzymes, bulk drug units, etc. Aum works in agro oil extraction and refining, especially in the separation field for heat sensitive products and distillation for liquids and pastes . In the vegetable oil extraction line, Aum has designed the unique Distillation System to distill oil from hexane, which improves the yield and saves in the subsequent refining process.

Aum was recognized as an internationally certified ISO 9001 company for its quality system in execution of design and turn-key projects.

Services are in the following areas:

- **Conceptual Design & Process Engineering**
- **Feasibility Studies and Economic Evaluation**
- **Detailed Engineering, Design and Specification**
- **Equipment Fabrication and Procurement**
- **Construction and Installation Management**
- **Plant Commissioning and Troubleshooting**
- **Environmental Permitting Assistance & Adherence to International Standards.**
- **Market Development**

Contact:
89 A,Santhome High Road
Chennai - 600 028
Telephone : + 91 (044) 24943826, 24957220, 24950664.
Fax : + 91 (044) 4951217.
E-Mail: info@aumicon.com

Current Position at CWA
Wolf Hamm works as an external consultant with the CWA Food Technology Department.
Work Experience
Mr. Hamm has worked extensively in various aspects of oil production (crushing, solvent extraction) and the processing of edible oil in South Africa, UK, Holland and Malaysia, margarine and spreads processing in the UK and South Africa, and processing of dairy products, including ice cream and yoghurt. His more recent experience has included processing of butterfat and palm/palm kernel oil, market studies in the oleo-chemicals field and work on the possible use of edible oil in non-edible applications.

Projects undertaken include:

- **Analysis of performance of edible oil refinery**
- **Fat fractionation process assessments for vegetable oil and butterfat processors**
- **Study of process equipment used for cold pressing of oils**
- **Assessments of scope for improved process control and management information systems in food processing**
- **Study of oleo-chemicals production and the marketing needs of S.E Asian oleo-chemicals producers**

Mr. Hamm's consultancies in the UK, mainland Europe, USA, SE Asia, New Zealand and India, have covered a number of engineering fields, including edible oil production and processing (refining and fractionation), pharmaceuticals processing, food, oleo-chemicals and novel uses of vegetable oils. Additional clients include the United Nations, Bangkok. Leatherhead Food RA , Aarhus, Denmark, Unilever Research in the UK and Holland.

ANNEX 3 INTERNET RESOURCES

NAME	DESCRIPTION	ADDRESS	TELEPHONE	EMAIL
Fuji Oil Group. :.	**Processors of fats & oil Imports shea nut and butter**	**1-5, Nishi Shinsaibashi 2-chome, Chuo-ku Osaka 542 JAPAN Kuhlmannlaan 36 9042 Gent Belgium (US subsidiary) 120 Brampton Road Savannah, GA 31408 USA**	**Tel: +81-724-631364 Fax +81-724-631601 Tel : + 32 (0) 9 343 0202 Fax : + 32 (0) 9 344 2610 Tel: +1(912) 966-5900 x 315 Fax (912) 966-6913**	**www.fujioileurope.com www.fujioil.co.jp fvo_finance@gapcdr.com**
IOI Group (Loders Croklaan)	**Processors of fats & oils Imports Shea nut and butter**	**Level 8, Two IOI Square IOI Resort, 62502 Putrajaya Malaysia Hogeweg 1 P.O. Box 41520 AA Wormerveer THE NETHERLANDS**	**Tel : +60 3 8947 8668 Fax : +60 3 8943 2899 Tel. +31-75-6292911 Fax +31-75-6292421**	**www.ioigroup.com www.croklaan.com**

Aarhus United A/S	**Processors of fats & oils Imports shea nuts and butter**	**M. P. Bruuns Gade 27, DK-8000 Arhus C, Denmark**	**Tel: +45 87 30 60 00 Fax: +45 87 30 60 44**	**dk.sales@aarhusunited.com URL: www.aarhusunited.com**
Karlshamns AB	**Processors of fats & oils Imports shea nuts**	**, 374 82 Karlshamn Sweden**	**Tel : +46 454 82 137 Fax : +46 454 82 839**	**www.karlshamns.se mh@karlshamns.se**
Westfalia Germany		**Equipment manufacturer**		
Technochem International, Inc.	**Equipment Manufacturer**	**3320 Goldenrod Circle Ames, IA 50014 USA**	**Tel: +515 292 2891 Fax: +515 292-5572**	**technocheminc.com**
Troika India	**Equipment Manufacturer**	**6th Floor, Embassy Centre, Nariman Point, Mumbai-400 021.India.**	**Tel: +91 22 2834429, 2834334, 2834515 Fax: +91 22 282 3778**	**troika@vsnl.com**

Glamptech India			
GA Epertise, Florida			
JDC International:	28, A. Ricarte St., Las Piñas, Metro Manila / PHILIPPINES	Tel / Fax:+ 63 2 800 3128	jdccntr@info.com.ph; jdc@ph.inter.net Web: http://www.jdc-international.com

Oiltek SDN BHD	**Equipment Manufacture**	**Lot 6 Jalm Pasaran 23/5, Kawasan MIEL Phone 10, 40000 Shan Alam, Selangor Darul Ehsan, Malaysia.**	**Tel: +35 542 8288 Fax: +35 541 8288**	**Oiltek@oiltek.com.my** **Website: http://www.oiltek.com.my**
Pennwalt India ltd		**D-221,MIDC,TTC, Thane Belapur Road,Nerul, Navi Mumbai - 400706 , India**	**Tel: 91 222 763 2503 / 276 32529 / 276 32528 Fax+91 22 276 32560**	pennwalt@vsnl.in
Mr. Wolf Hamm	Consultant			
SA FRACTIONNEMENT TIRTIAUX		**rue de Fleurjoux, 8 6220 FLEURUS-BELGIUM**	**Tel: +32 71 813 787 Fax: +32 71 817 024**	tirtiaux@tirtiaux.com
De Smet, Belgium	Equipment Manufacturers			**http://www.desmetextraction.com**
The Shea Butter Company, Ltd.	Cosmetics Processing & Retail	**16781 Torrence Avenue Lansing, IL 60438 USA**	**Tel:+877 489 2700 (toll free) Fax +708 481-3144 or +877 489 9917 (toll free)**	**trivers@naturalessence.com**
AFAJATO, Inc.	Shea Butter Importer & Distributor	**6455 E. Briar Drive Lithonia, GA 30058 USA**	**Tel: +770 482-4451 Fax +770 413 6389**	afajato@aol.com

D2E	**Buys refined shea butter for to manufacture cosmetics**	**202, rue de la Croix Nivert 75015 Paris FRANCE**	**Tel: +33 1 537 85858 Fax +33 1 537 85850**	
EXA Cosmetics	**Buys shea butter for cosmetics manufacture**	**112 rue de Lagny 93100 Montreil FRANCE**	**Tel: +33 1 428 79698 Fax +33 1 48708870**	
Aarhus Olie Côte d'Ivoire (subsidiary of Aarhus Oliefabrik A/S, Denmark)	**Processing shea butter**	**Résidence de la Tour B.I.A.O 8-10 rue Joseph Anoma (entrée avenue Lamblin) Abidjan 01 BP 1730 COTE D'IVOIRE**	**Tel: +225 327052/53 Fax +225 327055**	**ghb@africaonline.co.ci**
Euro broker	**Broker in tropical nuts**	**30, rue d'Astorg 75008 Paris FRANCE**	**Tel: +33 1 449 48787 Fax +33 1 400 60313**	**michael@eurobroker.fr**
Agritropic s.a.r.l.	**Aahus agent**	**Rue des Moulins 43100 Vieille-Brioude FRANCE**	**Tel: +33 4 717 49790 Fax +33 4 717 49282**	**sla@africaonline.co.ci**
Brittania Food Ingredients Ltd.	**Raw materials supplier for Cadbury's UK**	**Goole DN14 6ES UK**	**Tel. +44 1405 767 776 Fax +44 1405 765111**	**office@britfood.demon.co.uk**