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## Evaluating the marketing opportunities for shea nut and shea nut processed products in Uganda

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### **Contact:**

GALA Repository Team: [gala@gre.ac.uk](mailto:gala@gre.ac.uk)  
Natural Resources Institute: [nri@greenwich.ac.uk](mailto:nri@greenwich.ac.uk)

## Evaluating the Marketing Opportunities for Shea nut and Shea nut processed products in Uganda



Submitted to USAID October, 2001.



By R.S.B Ferris, C. Collinson, K. Wanda, J. Jagwe and P. Wright

## Contents

Executive Summary .....	4
Part 1. Background .....	8
Shea production potential.....	9
Shea markets.....	9
Demand and Marketable attributes of Shea high value products .....	9
Production method.....	10
Consumption.....	11
Main market features .....	11
Supply .....	11
Grades .....	11
Chemical composition of the nut across Africa.....	12
Market Development in Producer countries.....	13
West African market development .....	13
Eastern African market development.....	14
Rationale for Donor support to the Ugandan Shea sub-sector to date .....	16
Achievements of the COVOL project.....	17
Range of COVOL products.....	18
The COVOL marketing strategy.....	18
Part 2. The natural Shea resource in Uganda .....	19
Estimates of Potential Ugandan Shea Supply .....	19
Part 3. Shea nut's role in the Ugandan household economy .....	22
Shea nut in Uganda .....	22
Traditional processing techniques .....	23
Harvesting.....	23
Traditional oil processing.....	23
Gender division.....	23
Importance to household diet .....	23
Importance to household income.....	23
Importance to household food security .....	24
Part 4. Comparisons with Shea nut and butter industries and markets in West Africa .....	25
The experience in West Africa .....	25
International trade .....	25
Small and Medium Enterprise (SME) Shea butter extraction in Ghana .....	26
The interaction between industrial and traditional Shea activities .....	27
Key issues and their implications for Uganda.....	27
Part 5. Shea product market reviews.....	28
5.1 Traditional Shea nut market.....	28
Uses .....	28
Location.....	28
Volumes Traded.....	28
Market share of Shea compared with refined oils .....	29
Seasonality:.....	30
Prices: .....	30
Quality:.....	30
Constraints: .....	30
Interseasonal storage .....	31
Quality .....	31
Trading Chain .....	32
Prices .....	34

Market integration.....	34
Wholesaling profitability.....	34
Expansion of interseasonal trading - Opportunities.....	35
Constraints to expansion.....	35
Expansion - Implications for traditional Shea oil processing.....	35
Implications for the environment.....	35
5.2 Traditional crude Shea oil market.....	35
Uses.....	35
Location of supply and demand.....	35
Quantity.....	36
Quality.....	36
Substitutes.....	36
Competitiveness.....	36
Processing techniques (traditional and cold press).....	36
Processing profitability.....	37
Description of marketing systems (including estimated margins in the supply chain)...	38
Expansion in Uganda – Opportunities.....	38
Constraints to expansion.....	39
Implications for the environment.....	39
5.3 Ugandan vegetable cooking oils and fats markets.....	40
Description.....	40
Crude Shea oil and olein.....	40
Sources of supply.....	40
Quantity.....	40
Expansion in Uganda - Opportunities and Desirability.....	41
Potential constraints to expansion.....	41
Economic implications in northern Uganda.....	41
Implications for traditional Shea oil activities.....	41
Implications for the environment.....	41
5.4. Ugandan cosmetics industry.....	42
Background.....	42
Detailed findings: Cosmetics.....	44
Current Usage and Attitudes.....	44
Where do women buy these products?.....	45
Why buy one product over another?.....	46
Ugandan products - Attitudes.....	46
Shea Products - Cosmetics.....	47
Sample products.....	48
Where would you buy it?.....	48
Detailed Findings – Cooking Oil.....	49
Detailed Findings – Cooking Oil.....	49
Current Usage and Attitudes.....	49
Where do women buy these products?.....	49
Improved Shea Oil.....	49
Response from interview with Ugandan cosmetics companies.....	50
Shea Butter Uses and Concentrations.....	51
Concentration.....	51
Supply and demand.....	51
Quantity.....	52
The future.....	52

Ugandan Shea oil .....	52
Expansion of Ugandan supply in Uganda - Opportunities and Desirability .....	53
Constraints to expansion .....	53
5.6. The market for Cocoa Butter Equivalents .....	53
Opportunities in Uganda .....	54
Part 6. Guru Nanak Oil Mills (GNOM) .....	55
Recent Actions.....	56
Constraints.....	56
Part 7. Mukwano Industries Ltd. ....	58
Part 8. Main findings and conclusions from the survey.....	59
Potential agents for developing the Shea market in Uganda.....	61
Part 9. Recommendations.....	64
Part 10. References .....	66
Annex 1 .....	67
Stearic Acid and Sodium Stearate .....	67
Sodium Stearate - Soap .....	67
Biodegradability.....	68
Oleic Acid.....	69
Sources of Unsaturated Fatty Acids.....	69
Chocolate and Cocoa.....	70
Annex 2 .....	71
Shea Nut Production .....	71
Annex 3 .....	74
List of Importers .....	74
Annex 4.....	76
List of people contacted .....	76

## Executive Summary

This study was commissioned to evaluate the economic and environmental prospects for the Shea sector of Uganda. Specifically the study aimed to evaluate the market prospects for a range of low value, traditional products and high value, export Shea products in the local, national and international markets.

*Vitellaria paradoxa*, the Shea butter tree, grows throughout Sahelian Africa, from Senegal to Ethiopia. The trees are truly multi-purpose and are highly valued not only for the economic and dietary value of the cooking oil, but also for the fruit pulp, bark, roots and leaves, which are used in traditional medicines and for the wood and charcoal, used for building and cooking fuel.

European explorers first recorded Shea in the early 18<sup>th</sup> century and by the 1920s, a flourishing trade was developing between West Africa and Europe. However, changing agricultural policies due to the Wars in Europe and new product formulations led to a decline in demand for Shea. Despite interest by Governments and FAO expert panels to develop Shea industries, no attempts have been made to domesticate the crop and essentially Shea remains a wild fruit that is seasonally gathered by the local community.

For industrial processors, Shea is a low cost substitute product sold mainly into the cocoa butter equivalent markets and the bulk of Shea produced in West Africa supplies this market. However, there has been a renewed interest from the high value cosmetics companies and for this market sector, the very fact that Shea remains a wilderness crop, which is collected and processed by women's groups in remote rural areas, creates a fashionable marketing scenario.

According to Boffa, (1999), the shea belt comprises more than 500 million fruiting trees and FAO, estimate the total African production is approximately 1,760,000 mt of Shea nuts. From this potential yield, only 35% of the nuts are gathered and 85% of this harvest is locally processed, to make 100,000 mt of local butter. The remaining portion, approximately 65,000 mt are exported, mostly to the food industry. Less than 5% of the exported butter is used in the international cosmetics industry, a ball park figure would be 3000 mt per annum.

Recent changes in EC regulations on the use of substitutes for cocoa butter have increased demand for Shea butter from chocolate confectioners, as it is now possible to blend up to 5% non cocoa butter equivalents into chocolate products. Also some recovery in the former Soviet states has led to increased demand for Shea for input into their confectionary products. At present, the main industrial consumption is in Europe, Japan, and Northern America. There is also a renewed interest in Shea butter from the cosmetics industry and according to Collinson and Zewdie-Bosuener, (1999), this level is rising.

Supply of Shea butter to the international market is flexible but demand is not. Only a fraction of potential production is exported for industrial use. Although Shea butter offers certain useful technical characteristics to the chocolate maker, its use in the chocolate industry depends on its price in relation to that of cocoa butter. There are very few major refiners and it is, therefore, something of a closed market in terms of export.

Shea nut supply far outstrips demand. Over 600,000 MTs of the dominant variety, *Vitellaria paradoxa*, is produced in West Africa. Most is used as a cooking oil or as a butter for the skin and hair locally. The variety, *Vitellaria nilotica*, which grows in Uganda, is preferred by cosmetics firms due to its higher oil fraction. Unfortunately this variety is primarily grown and processed in northern Uganda and southern Sudan and both areas are currently suffering from states of civil unrest, and so the product is generally unavailable on the market.

Chemical analysis of Shea butter extracted from nuts samples from four African countries (Uganda, Nigeria, Burkina Faso and Mali) confirmed the considerable variability in Shea oils

across Africa. The Ugandan sample had a 59% oleic acid content compared with 47% for Nigeria and only 39% for Burkina Faso. From these studies it was found that Malian Shea closely resembles cocoa butter while Ugandan Shea has more similarities with olive oil. This variability suggests that Shea oil from different regions could be targeted towards different niche markets or industrial uses.

In West Africa, particularly Ghana and Mali, marketing channels are well defined and there has been a long standing export of shea nuts and butter to European and North American countries. The primary export market for the West African Shea butter is as a substitute for cocoa butter in the chocolate and confectionery industry. However, there have also been some attempts to market local cosmetics products such as “Vaseline Shea Butter” in 1996. The commercial success of this product was mixed and Unilever (Ghana) have plans to relaunch this product.

In comparison with West Africa, the commercial development of Shea products in Uganda remains at an embryonic stage, with little documentation on the market dynamics of the crop in Uganda and its surrounding countries. The crop is used as a cooking oil and market supplies are highly localised. In the Ugandan Shea production area, a Vaseline type product is used for babies and for other quasi-religious ceremonies. The supply of Shea nuts from Eastern Africa, are considerably less than in West Africa and there are no statistics available for export.

The current market sector can be described as almost entirely traditional in nature with low levels of collection and consumption. There are numerous reasons why a parallel industrial supply has not emerged, the major factors include a significantly lower concentration of trees, high levels of local oil consumption, softer Shea butter which is not suitable for CBE users. Uganda is landlocked leading to higher transportation costs in East Africa, compared with Western Africa. Lack of security within the Ugandan-Sudanese Shea belt, has also reduced investment and obviously hampers supply chain support and activities. Probably most importantly, Uganda also lacks a traditional partnership between local producers and users in Industrialised nations. Despite this somewhat bleak outlook, the market potential for East African Shea is not entirely unpromising as the qualities of the Eastern African Shea are more suited for the high value cosmetics markets.

Results from this survey estimate that potential levels of Shea nut production in the Ugandan Shea Belt range from approximately 70,000 – 385,000 MT. This would yield between 15 – 80 million litres of oil using traditional methods at a value of US\$ 30 M, increasing up to more than 120 M litres with improved extraction techniques. However, current levels of demand mean that most of the nuts are not harvested and hence the value of the market is considerably less than its potential.

Even with a low level of collection, Shea oil plays a significant role in household food and income security of northern Uganda, especially in the districts of Lira, Katakwi, Kitgum and Kotido. The crop is a particularly important source of income for rural women and children and interviews revealed that women processors rated Shea oil as the highest source of income generation. According to them Shea oil provides more income than brewing and farming. The money made through Shea is also clearly for the women, whereas much of a woman’s labour goes into products that are sold by the head of the family. Shea nut wholesalers also indicated that trading in shea was highly lucrative, with gains being higher compared with other crops such as groundnuts and maize. The Shea region is located in the poorest area of Uganda and therefore any increases in income through interventions that increase the demand of Shea in this region will have significant economic and social benefits.

In comparing the market development for Shea in West Africa with that for Uganda there are some key issues that should be taken into consideration:-

Personal contact with both CBE and cosmetics buyers is indispensable. In many cases, links with overseas industries are well established in West Africa and similar contacts will have to be built in East Africa if development of the Shea sub-sector is to occur.

Producing Shea butter commercially using a range of technologies is possible. However, scale of output must be matched to market requirements. Cosmetics buyers require small quantities but pay high prices, while CBE buyers want large quantities but pay relatively low prices.

In Ghana, Lever Brothers' experience of producing a mass market skin moisturiser product containing Shea butter points to the potential of exploiting regional cosmetics markets. East Africa's large-scale cosmetics industry is well developed and has the capacity to develop new products.

From interviews and market visits it was estimated that the total quantity of Shea nuts traded through the northern Ugandan markets per year is approximately 6,000 tons. This is 10% of the lowest estimated potential nut yield. The study showed that these nuts are traded between the same groups and therefore, we assumed a real trade in sellers and users to be 3000 – 4000 tonnes. This volume of nuts equates to approximately 700 tonnes of oil, or 0.7 millions litres of oil. Given that the wholesale value of shea oil is approximately 1500 shillings per litre. This translates to a market value of 1,155,000,000 shillings, which is equivalent to 0.66 M US\$. (1\$-1750 shillings).

The overall oil market in Uganda is estimated at 44,000 MT / year, which has a value of approximately \$36 M US. Current production of sunflower seed was recorded by UOSPA at 78,000 tonnes in 1999, Otimodoch and Singh (2000). This converts to approximately 18,750 tonnes of oil. Given a wholesale prices for refined oil at 1300 shillings per litre, this level of locally produced seed equates to approximately \$15 Million US. Therefore, current trade in Shea nuts accounts for approximately 4% of the locally sourced oil market share. This figure does not take into account the amount of oil that is locally produced and does not enter the market place and further studies would be required to determine this level.

Market chain analysis provided information on profitability along the market chain and these figures suggest that shea marketing is fairly lucrative, particularly for the wholesalers. However, due to the low volumes of sale, overall incomes are relatively low. There are considerable seasonal fluctuations in market prices and expansion of the interseasonal storage would help to reduce the large seasonal price movements. It would also create a greater demand for nuts in the Shea season, increase household income during this period, and help to reduce household expenditure later in the year when Shea nuts have to be purchased. The overall effect would be an improvement in household food security.

Prospects for expanding the Shea olein market would mean moving from very small and irregular production to substantial tonnages. Whether this happens will depend on private sector decisions, which to a large extent are beyond donors' influence. There is an opportunity to supply a competitively priced Shea olein product to the expanding cooking oils market. As a by-product of Shea stearin export production, Shea olein could be sold as a highly competitive product. Sales of crude Shea oil on national and possibly regional markets depend crucially on consumer preferences and how cleverly the product can be marketed.

Surveys in the local cosmetics markets found there considerable interest in developing value-added Shea cosmetic products for a domestic market of expatriates and upscale Ugandan women. Most respondents had never heard of Shea before, but all respondents reacted very favourably towards it when told of the benefits. Women would be interested in buying lip balm, body lotion, hand cream, and soaps. With the current emerging perceptions of richness, shea butter does not lend itself well to face cream.



With regards to a market in Northern Uganda for improved Shea cooking oil, response was very positive, but the reality of limited income and the spending habits of the women in Lira does not lend itself to further developing the product. Currently, women buy only small quantities of oil, tending towards the cheaper multipurpose oils like sunflower oil (locally produced) or 'cooking oil' from Mukwano. Shea Nut oil as a comestible is seen to be a luxury (and a seasonal one at that), and the flavour of shea is not one that people would want in their daily diet.

On the international market, the main cosmetics buyers of Shea butter/oil are located in Europe and the U.S.. European and U.S. cosmetics companies buy from a variety of sources, depending on their requirements. A large proportion of cosmetics Shea butter is purchased from the food industry in a highly refined form (de Saint Sauveur 1999). Such butter is cheap (having usually been obtained through solvent extraction), readily available, reliable in quality and does not become rancid. However, the refining process removes most of the sun-protection, healing and antiseptic qualities of the natural butter. Despite this, most of the larger cosmetics companies prefer to use refined butter as this enables the producer to label the product as a Shea formulation. Smaller companies and specialist cosmetic ingredient suppliers are willing to buy unrefined Shea butter from Africa. However, concerns over quality have forced them to become intimately involved with its production.

The Ugandan cosmetics market is supplied from both international and local companies. In this survey a small sample of the local cosmetics industries were interviewed. For those companies not using Shea, the response was that they would be interested to test the product. For those already using Shea, they had plans to expand to up to 10-15 tonnes per year.

In Uganda there are a number of private sector companies and agencies that are interested to expand the Ugandan Shea market. On the production and processing side these include COVOL, NUSPA, GNOM Ltd and Mukwano Industries, for local cosmetics manufacture these may include AVIS, Desbro and UKI Ltd and for export these would include COVOL, GNOM Ltd, Mukwano Industries and possibly Technoserve. However, for any progress to be made in the Shea sector, more detailed business plans need to be developed such that these agencies can make more informed decisions on investments.

Support services required will include product development, extraction testing, market testing of new products and linkage between local processors and international buyers. There are a number of local agencies that could assist in these areas, including NARO, Food Science Research Institute, International Institute of Tropical Agriculture and for product development. Market testing of products and packaging could be developed through agencies such as Research International and . Overseas market linkage could be investigated through the IDEA project and other overseas partners such as Natural Resources Institute or Fairtrade.

In conclusion, it appears that Shea is a highly valued commodity in northern, but is virtually unknown outside of the production area. In the northern districts, the crop is very important to the livelihoods of the people and Shea has a particularly important, dietary, food security and economic benefit for women. Due to changes in technology, and world market demand, Shea has potential for market expansion at both the local and international levels. Demand for Shea products are increasing and any donor intervention in this area, which leads to increased demand in Ugandan Shea, would significantly and positively impact on the livelihoods of the people in the Shea producing area. More commercial support could also assist in developing a potentially profitable niche market for community based and or factory scale processors in Uganda. If support is being considered to assist the community in northern Uganda, Shea is therefore a strong candidate for more intensive market linkage studies with a view to developing a more commercially driven Shea sector.

# Evaluating the Marketing Opportunities for Shea nut and Shea nut processed products in Uganda

This study was commissioned by USAID – Kampala to evaluate the economic and environmental prospects for the Shea sector of Uganda. Specifically the study aimed to evaluate the prospects for a range of Shea products for local, national and international markets. The output from the study being to provide options for improving the livelihoods of communities based in the Shea producing areas of Uganda and suggesting possible strategies to assist greater commercialisation of this novel, traditional product within an environmentally sustainable manner.

## Part 1. Background

*Vitellara paradoxa*, the Shea butter tree, grows across a wide swathe of Sahelian Africa, from Senegal to Ethiopia. Throughout, the “Shea belt”, the trees are highly valued by the local communities not only for the economic and dietary value of the cooking oil, but also for the fruit pulp, bark, roots and leaves, which are used in traditional medicines and for the wood and charcoal, used for building and cooking.

European explorers recorded the Shea tree as early as 1728 and first samples were collected by Mungo Park in 1796. It was some 30 years after Parks expedition to West Africa, that the tree was classified as *Vitellaria paradoxa* by von Gaertner in 1807. In 1865, the West African tree was re-classified as *Butyrospermum parkii*, by Theodore Kotschy, and the East African subspecies was classified as *Butyrospermum nilotica*.

In his journals, Park described the local trade in Shea products as a vibrant inland commercial activity and since that time agricultural officers posted to Africa have made detailed notes of the local trade in Shea nuts, butter, oil, cake and latex and also speculated on its export trade potential. Along with many other oil crops, samples were tested for fuel and food products. By the 1920s, a flourishing trade was developing between West Africa and Europe where the butter was used in making vegetable margarine and candles.

However, changing agricultural policies in Europe and new product formulations led to a decline in demand for Shea and in many respects Shea now falls into the “Cinderella” crop category. Shea continues to be used and traded in the Sahel as a source of cooking oil but Shea is no longer a mainstream industrial product. Despite interest by Governments and FAO expert panels to develop local industries on Shea, no attempts have been made to domesticate the crop and essentially Shea remains a wild fruit that is seasonally gathered by the local community.

For industrial processors, Shea has been relegated to a low cost substitute product, but as with true Cinderella commodities, there is a glimmering interest from the high value niche markets for greater use of Shea. Currently, Shea is undergoing renewed demand from the high value cosmetics companies and for this market sector, the very fact that Shea remains a wilderness crop that it is produced naturally, that it has cultural and medicinal qualities and is collected and processed by women’s groups in remote rural areas, all combine to create a fashionable marketing scenario for high profile cosmetics products.

### **Shea production potential**

According to Boffa, (1999), there are more than 500 million fruiting Shea trees across the production belt and FAO, estimate that the total Shea nut production is approximately 600,000 mt per year. This volume translates to more than 1.5 M mt of fresh fruit which is comparable to the production of other commercial oil crops, such as avocado, which currently stands at 2 M mt tonnes per annum. This is a huge production given that there are no Shea plantations and farmers only start to protect trees once they are more than saplings as part of traditional parkland farming system.

Studies by Ruysen 1957, found that productivity in subsp *V. paradoxa* rises rapidly in the age range 40-50 years and stabilises in trees of 100-200 years before declining in aging plants of 200-400 years. Due to the adverse weather conditions in the Sahel, fruit production fluctuates considerably from tree to tree and between seasons. An average fruit yield per tree was conservatively estimated at 15-20 kg / year, Ruysen 1957 and later more optimistically at 25-55 by Fleury (1981). Schreckenber 1996, calculated an average annual yield of 5 kgs dried kernels per tree in a study in Benin. This would yield approximately 1.8 litres of oil.

Using sampling techniques and extrapolating this data over the Shea belt it has been estimated that the total yield of shea nuts is 1,760,000 mt of nuts, which translates into 432,000 mt of Shea butter. However, due to the scattered nature of the crop over an extensive and remote landscape, it is estimated that only a third of this amount is collected. Therefore a harvested yield of 545,000 mt, (=131,000 mt shea butter), is used for household and commercial purposes. According to Obi (2000), approximately 65,000 mt of nuts (26,000 mt butter) are exported for use in food and cosmetics industries.

### **Shea markets**

The Shea market is divided into three distinct categories:-

- (i) high volume, low value locally processed products
- (ii) high volume, intermediate value export to the food processing market
- (iii) low volume high value export to the cosmetics market

By far the largest part of the Shea production (65%) is not harvested, of the 35% which is gathered by women and children, 30% is used locally processed, at an extraction rate of 20%, to make an annual production of 100,000 t of local butter. Virtually all of this Shea butter is used as local cooking oil. The remaining 5% or less is exported, mostly to the food industry, which uses the Shea butter as a cocoa butter equivalent (CBE). Shea butter is currently trading on the international market at **50-60 US dollar** cents per kg, (**US\$500 / mt**). It is estimated that only 5% of the 65,000 mt exported to Europe and North America is used in the cosmetics industry, however, in a report by Collinson and Zewdie-Bosuener, (1999), this level is rising.

### **Demand and Marketable attributes of Shea high value products**

Recent changes in EC regulations on the use of substitutes for cocoa butter have increased demand from chocolate confectioners as it is now possible to blend up to 5% non cocoa butter equivalents into a chocolate product and still sell it with a chocolate reference. The price of shea in this case is driven by the cost of cocoa butter. In the current climate of world wide declining commodity prices, this will mean continued depressed prices into the foreseeable future.

However, a recent wave of renewed interest from cosmetics houses, have also rekindling market interest in Shea. Whilst, this increase in demand represents a small change in global terms, such opportunities can have considerable benefits to the small groups of traders, mostly women that

gather, trade and process the nuts. For the cosmetics industry Shea has a combination of marketable attributes, Shea is:-

- (i) Harvested by women in rural areas, which suggests that income will accrue to the most vulnerable, as such this is an incentive to pay premium prices for Shea products. This aspect has already been used by the Body shop in a high profile community based project based around one village in Ghana.
- (ii) Shea is grown in a natural parkland system lending it “natural organic qualities”, which are much in favour in industrial companies.
- (iii) Shea is considered to have traditional healing properties and this is a strong basis for building a “natural” identity.

Thus Shea is considered to be a highly suitable candidate for special interest support through ethical trading, gender support and “natural” labelling. These marketable qualities are becoming increasingly important market levers and if a quality product can be supplied on a regular basis, then the future market options for Shea has potential. However, in order to make this work, all the aspects in the marketing chain need to be highly polished and it will require a highly dedicated team, with considerable investment and business acumen to enter into the higher value markets.

It should also be noted that the future of the Shea market in cosmetics is uncertain. Shea was in high demand in the 1970s, but fashions changed and sales of Shea butter to the cosmetics industry declined. There is now a renewed interest in Shea and although the market is almost certainly growing, the rate of growth however, is unknown and the longevity of this market is also uncertain.

### **Production method**

Shea trees, that bear the nuts from which Shea butter is produced, grow widely and naturally in West and Eastern Africa. According to the literature, Shea trees only begin to bear fruit after 15 years and do not reach maturity for 45 years. The trees can produce up to 50 kgs of nuts per year and continue to produce fruit for up to 200 years. The long period taken to reach maturity has discouraged plantation planting, although they are used as shade trees for other crops in certain dry areas.

The nuts, which are embedded in a soft fruit, fall to the ground during the harvesting period between June and August in West Africa. In West Africa, the nuts are buried in pits, which causes the pulp to ferment and disintegrate, this process also produces sufficient heat to prevent germination, which spoils the oil.

After fermentation, the nuts are dried for a few days and later shelled to reduce moisture content from about 40 per cent to about 7 per cent. The oil is extracted locally by a process involving the heating and kneading of the crushed kernels and straining the resultant crush to release the oil, alternatively the oil is separated from the mash by heating the mash in hot water. Shea butter is produced on a commercial scale in Europe using hydraulic presses on the nuts and then placing them in hot air ovens. The product is then bleached with a hexane solvent. The butter must then be stored and transported in cool conditions and in airtight containers to avoid becoming rancid. Shea butter must be stored and transported in cool conditions and in air-tight containers to avoid the butter becoming rancid.

## **Consumption**

The main industrial consumption (almost all for chocolate production) is in Europe, Japan, and Northern America. In the EU only the UK, the Irish Republic and Denmark are permitted to use Shea butter in their chocolate products, but other EU countries are lobbying to be allowed to use up to 5 per cent vegetable fats, other than cocoa butter, in their chocolate. According to a recent EU ruling, chocolate made with less than 100% cocoa butter, can be sold under names such as “milk chocolate” to differentiate it from the pure and most expensive original product.

## **Main market features**

Supply of Shea butter to the international market is flexible but demand is not. Only a fraction of potential production is exported for industrial use. Although Shea butter offers certain useful technical characteristics to the chocolate maker, its use in the chocolate industry depends on its price in relation to that of cocoa butter. There are very few major refiners and they have considerable control of the market through a system of long-term purchase agreements. New producers of sizeable quantities are unlikely to find a ready market for their product. It is, therefore, something of a closed market in terms of export.

The main buyers in the international trade are the refiners in developed countries, often associated with the chocolate and/or food industry. They prefer to buy the raw nuts rather than the butter in order to have as much control as possible in the processing and quality of the final product. Another reason for preferring nuts is that they can be stored for up to five years in the right conditions, whereas butter is more expensive to store and deteriorates more rapidly. Any exports of butter from African countries tend to be of unrefined material.

## **Supply**

Shea nut supply far outstrips demand. Over 600,000 MTs of the dominant variety, *Vitellaria paradoxa*, is produced in West Africa. Most is used as a cooking oil or as a butter for the skin and hair locally. The other variety, *Vitellaria nilotica*, has a superior quality, which is preferred by the cosmetics firms (see excerpts from a Shea nut technical report produced by Fintrac in Annex 2). Unfortunately this variety is primarily grown and processed in northern Uganda and southern Sudan, both currently states of civil unrest, and so it is generally unavailable on the market. Several other countries, including Israel and Germany, are attempting to replicate this variety. A contact for the project that is marketing this variety can be found at the end of this survey. <http://www.raise.org/natural/pubs/Shea/Shea.stm>

## **Grades**

For the export market, individual buyers specify their own quality conditions for purchase of Shea butter. Typically free fatty acid (FFA and moisture content should be no higher than 1 per cent). Buyers may also specify a particular iodine value and a melting point of between 30 and 40 degrees C, the product should also be free of foreign bodies.

Users in the mainstream cosmetic industry only accept a very highly refined product and may require a detailed specification of the different fatty acids contained, the refractive index and saponification value. To achieve consistency for these high quality standards, the industry has tended to buy nuts from traders and store them at the processing factories.

Against this trend, there are some cosmetics companies who are working with communities in Africa, to source Shea products including butter, but processing methods are stringent and volumes of supply through in country processing remain very limited. The most well publicised community is the Ghanaina village that is linked with the Body shop UK. In this case, the

cosmetic company is working directly with women's groups to produce a high quality product that is then further refined and incorporated into the Bodyshop Shea product range. These products were highly promoted in the summer season of 2001.

For the local cooking oil and nut trade, there are no grades and standards and this leads to highly variable quality in the oils produced.

### Chemical composition of the nut across Africa

Chemical analysis of Shea butter extracted from nuts samples from four African countries (Uganda, Nigeria, Burkina Faso and Mali) were conducted by the Ben Gurion University, Isreal, as part of the ongoing EU funded INCO project on Shea. Fatty acid analysis shows there is a high level of variability in Shea oils across Africa, **Table 1**. The Ugandan sample had a 59% oleic acid content compared with 47% for Nigeria and only 39% for Burkina Faso.

The large variability in fatty acid profiles indicates that Shea Butter is not a single uniform product across the continent. For example, Malian Shea more closely resembles cocoa butter while Ugandan Shea has more similarities with olive oil, due to its high oleic content. This variability suggests that Shea oil from different regions could be targeted towards different niche markets or industrial uses. If reliable vegetative propagation techniques could be developed clones of trees bearing specific types of nuts with unique chemical constituents could also be selected and planted to produce a higher value crop. Specific selections may be envisioned for cocoa butter substitution in foods, for production industrial stearin, for cosmetic products high in vitamins and other anti-oxidant phenolic compounds and for a liquid oil that could compete with olive oil, (Maranz and Wiesman, unpub)

**Table 1 Fatty Acid Profiles Shea butter versus competitors**

Oil type	lauric (12:0)	myristic (14:0)	palmitic (16:0)	stearic (18:0)	oleic (18:1)	Linoleic (18:2)	Linolenic (18:3)
Cocoa butter			<b>25</b>	<b>35</b>	<b>30-40</b>	<b>2-4</b>	
Olive			<b>12</b>	<b>2</b>	<b>72</b>	<b>8</b>	<b>1</b>
Palm oil (husk)			<b>42</b>	<b>4</b>	<b>38</b>	<b>9</b>	
Coconut	<b>44</b>	<b>16</b>	<b>8</b>	<b>3</b>	<b>5</b>	<b>2</b>	
Shea Butter							
Literature	<b>0-0.5</b>	<b>0-1.6</b>	<b>3-9</b>	<b>30-50</b>	<b>41-50</b>	<b>4-11</b>	<b>0-7.5</b>
Uganda			<b>6.5</b>	<b>26.4</b>	<b>59.3</b>	<b>6.2</b>	<b>0.2</b>
Nigeria			<b>3.2</b>	<b>38.9</b>	<b>47.5</b>	<b>6.5</b>	<b>0.2</b>
Burkina Faso			<b>12.1</b>	<b>42.5</b>	<b>39.3</b>	<b>4.5</b>	<b>0.2</b>
Mali			<b>19</b>	<b>31.1</b>	<b>42.6</b>	<b>5.7</b>	<b>0.2</b>

## **Market Development in Producer countries**

### **West African market development**

In West Africa, particularly Ghana and Mali, marketing channels are well defined and there has been a long standing export of shea nuts and butter to a number of European and North American countries. The West African Shea tree *Vitellaria paradoxa* product is a hard waxy substance. The hardness at room temperature is due to the composition of oils within the nuts, which have a high stearin: olein ratio. Stearin is a solid fat fraction and Olien is an oil like liquid at room temperature, **See Annex 1**. Both fractions, the oil and the fat are used as raw materials in cooking oil, margarine, cosmetics, soap, detergents and candles.

The major Shea producing countries in West Africa, are Mali, Burkina Faso, Benin, Senegal Ivory Coast, Ghana, Gambia and Nigeria. Nuts for export are collected from gatherers or are collected on a large scale by local commercial companies, landowners or co-operatives which hold term contracts with large foreign refining companies. Mali, the largest producer, is estimated to produce approximately 150,000 tonnes of nuts per year, (Robbins, 1995)

The primary export market for the West African Shea butter is as a substitute for cocoa butter in the chocolate and confectionery industry, the Shea product being referred to as a Cocoa Butter Equivalent (CBE). The second and significantly smaller, but higher value export market is within the cosmetics industry, where small amounts of Shea butter are used as a component within skin moisturising, sun-screening and skin healing products. Other manufacturing uses are in the pharmaceutical and edible fats industries, however at this time these market are very limited. Currently, Shea is also being tested in new products such as dermatological creams for HIV patients to provide relief from skin rashes and irritations and veterinary products. Both of these markets offer new and potentially lucrative niche markets for the Shea gatherers and it is these markets that offer strong price incentives for exploitation.

In Ghana Lever Brothers a subsidiary of Unilever launched a skin moisturising product called "Vaseline Shea Butter" in 1996. The commercial success of this product was mixed and Unilever claim that much of the problems were technical rather than demand based. According to Collinson and Zewdie-Bosuener, Unilever were making plans to produce 150-200 tonnes of this product, which would be a significant market demand for the Shea butter in country.

Johnson Wax (Ghana), also launched two shea products onto the market in 1996, however, these products were withdrawn due to poor sales and quality problems. The company also has plans to relaunch these products if it can find a regular supply of high quality butter.

Within the industrial sector, Aarhus Olie, (DK) is the only large-scale company that manufactures edible fats and oils from Shea butter. Up until 1997, all processing of the Shea nuts was conducted in Denmark and formulations were supplied thereafter to confectionery and cosmetics firms. Grades and standards are clearly a major issue for confectionery and the cosmetics industries and for this reason, processing companies preferred to buy "standard" industrial products on guaranteed supply contracts from companies such as Aarhus. Reported problems with quality of supplies from producer countries have also led to all the value added part of the processing being conducted overseas, Collinson and Zewdie-Bosuener, (1999).

In more recent times, European environmental legislation has mitigated against processing of oil products in country and this has led to greater demand for processing in the Shea producing countries. For these reasons, Aarhus Olie (Ghana) branch had plans to increase purchasing of

butter up to 1000 tonnes per year and in 1999, AO was offering a FOB price of US\$0.80 per kg, with a 10% premium for quality butter.

In Ghana there are 3 –4 small to medium scale oil milling companies that process Shea butter. One typical company Kassardjians, is a medium sized company which produces 2-3 tonnes of Shea butter per day during the main season. The process is semi mechanised but all the processing is done using considerable labour and low tech systems. More recently, companies with more technical capacity have also contracted with the European buyers. These plants have mechanised presses and deodorising plants, which can offer 5-10 + tonnes of the product per day.

Body Shop a high street cosmetics company based in the UK, is also piloting a scheme to process Shea butter at the community level, in a collaborative commercial project with a village in northern Ghana. This joint venture, was exporting approximately 30 tonnes of butter per year. In the summer of 2001, the Body Shop Shea campaign was highly profiled in the highstreets of UK and this does indicate a revival in the interest of using Shea and in the idea of community based processing market linkage.

#### **Eastern African market development**

In comparison with West Africa, the commercial development of Shea products in Uganda remains at an embryonic stage, with little documentation on the market dynamics of the crop in Uganda and its surrounding countries. Production of Shea in Northern Uganda is from a different sub-species to that of West Africa. In Eastern Africa, the species *Vitellaria nilotica* is produced primarily in northern Uganda and southern Sudan. The crop is used mainly as a cooking oil in the Shea belt and market supplies are typically based on the local purchases of people from the Shea region, who know the product and have traditionally use it as a cooking oil, Vaseline product for babies and for other quasi-religious ceremonies. The supply of Shea nuts from Eastern Africa, are minimal with no statistics available for export from the region.

The current market sector can be described as almost entirely traditional in nature with low levels of collection and consumption. There are numerous reasons why a parallel industrial supply has not emerged, the major factors include:-

- (i) A significantly lower concentration of trees, (an average of 7 / ha in East Africa, compared with > 50 Shea trees / ha in western Africa),
- (ii) High levels of consumption of the local oil in the Shea belt of Uganda.
- (iii) The East African Shea butter is significantly softer than the West Africa Shea butter, which is preferred by the CBE users. East African Shea has a semi-liquid consistency at room temperature, whereas West African Shea butter is a hard wax at room temperature.
- (iv) Higher transportation costs in East Africa, compared with Western Africa, and lack of a nearby port to export the product through Uganda.
- (v) Lack of security within the Ugandan-Sudanese Shea belt, which has reduced investment to a minimum and obviously hampers supply chain support and activities.
- (vi) Lack of market linkage between gatherers and users in Industrialised nations

These factors all mitigate against the development of market linkage between suppliers in Eastern African and buyers in Europe and the northern America. In order to overcome these



problems new and highly innovative approaches will be required and new buyers identified if market opportunities are to be developed.

Despite this somewhat bleak outlook, the market potential for East African Shea may not be entirely unpromising as the qualities of the Eastern African Shea may be highly suited for specific niche markets. According to the advocates of Shea, Uganda Shea has all the typical attributes of a high value “natural” niche product and the medicinal and skin absorption qualities are “real”.

There is a strong cultural value attributed to the crop, it is grown naturally and due to its difficult terrain is limited in supply. Therefore the product has merit in that it can only be harvested through local community based action. Ugandan Shea comes from the sub-species *Vitellaria nilotica*, which has a higher oleic content compared with the West African, *Vitellaria paradoxa*. This makes the Shea butter from Uganda, more liquid at room temperature. This consistency is particularly suitable for cosmetics products such as creams and lotions. This quality attribute may have considerable commercial value as the new growth markets in “natural products” requires that the original product is used in its unrefined state.

Trends in the global market for “fair trade” agreements also indicate that western consumers are prepared to pay higher prices for products that are processed in the country of origin and for a limited niche production system this may be feasible.

Other unexplored potential markets are to sell value added products into the middle to higher income African consumer market. In West Africa, the local cosmetics industry is using increasing amounts of Shea in its beauty products and this may be a market, which has potential in Eastern Africa. Developing products for the local and regional markets also has the advantage in that it provides income and may prove to be a useful testing ground for products, prior to sales into export markets.

In spite of the potential suitability of Ugandan Shea for these growth markets, such opportunities have not been explored and as such Uganda Shea products remain a low value, low quality product sold to low income groups in and around the Shea production sites.

In some respects, the dilemma for Shea, is that it has a range of potentially good qualities which to advocates ensure market opportunities and therefore it has great appeal in terms of investment for development. At the same time, it is not a new product, it is not difficult to process and therefore one must ask the question, Why is there no industry?. The most likely answer to this is that there is no effective demand, beyond the local production of oil and therefore in order to assess the situation one must take a cold economic evaluation of this market opportunity against other market opportunities in Uganda.

## **Rationale for Donor support to the Ugandan Shea sub-sector to date**

Recent investment in the Shea sector offered the potential for USAID to fulfil two strategic objectives in Uganda, these being:-

- (i) to promote sustainable conservation methods and
- (ii) exploit indigenous crops for economic growth.

The Shea sector in Eastern Africa, has developed around two projects

- (i) COVOL, an NGO working on conservation of Shea in Northern Uganda, <http://www.covol.org/> and
- (ii) European Union funded INCO project on Shea development being implemented by Bangor University.

These projects aimed to provide economic impact in one of the poorest areas of Uganda, through working on a non domesticated crop within the traditional parkland farming systems. In this region, there are very few economic opportunities, investment is low, security is poor due to rebel activities from Sudan and Shea has the added attraction of being a crop which is almost exclusively gathered, processed and traded by women and children. Impact in terms of greater market linkage for the crop would therefore provide income for the most vulnerable in society and also protect an important natural resource.

The USAID supported COVOL project focused in seven counties in the Districts of Lira, Katakwi, Kitgum and Kotido. The project had two components (i) conservation and (ii) marketing and processing. The project aimed to develop and disseminate technology for “enhancing” the production of Shea oil/butter compared with traditional methods. The development hypothesis of the project was that improved quality and market efficiency of Shea products would raise income levels among rural households in a historically marginalized region of the country. This would lead rural producers to conserve the Shea tree and the savanna in which it grows and counter its destruction for fuel and charcoal making.

The conservation aspect of the work dealt with analysing the types of distribution of trees in northern Uganda, and also gathered information on tree age, production and rates of tree planting. Information from this work found that Shea trees in Lira district were at a density of 7 trees per ha. The trees produce approximately 30 kg fruit / annum, which in turn produces 3-5 kgs of nuts. This is traditionally processed into 1.5 – 3 kgs of shea oil per tree, (Nkuutu et al, unpub).

According to Lovett, (2000), shea tree numbers in northern Uganda are declining. Studies of shea tree populations in northern Uganda revealed a population gap of trees aged between 5-100 years. Shea does not produce fruit for the first 15-20 years and surveys in Otuke country, Lira district, indicate that the bulk of productive trees are more than 100 years old. The loss of younger trees has been linked with changing land-use practices and increased levels of more permanent arable farming. Increased arable pressure has led to a measurable loss of younger fruit bearing trees, which is considered to be the effect of slash and burn clearing methods. Increased population pressure has also led to higher levels of trees being felled for charcoal production and despite local bylaws, which ban the use of Shea for charcoal burning. According to local sources these laws are not well enforced and it is common knowledge that shea, is both a good wood for charcoal production and due to its termite resistance, is also an ideal wood for

house construction, consequently the tree is used for both purposes. To offset the destruction of the Shea trees, the Shea project led a high profile campaign against making charcoal from Shea and also developed tree nurseries to promote tree planning.

The processing and marketing aspect of the project focussed on developing improved methods of processing Shea butter, using mechanical grinders and screw press technologies. These technologies provide a higher rate of extraction compared with local techniques and produce a butter of a higher quality than the local technique. The so called “cold press” butter, is of high enough quality to be used in cosmetics formulation and this product has been incorporated into a number of cosmetics products that have undergone limited market testing in San Francisco.

During the life of the project, an indigenous production and marketing body – the Northern Uganda Shea Producers Association (NUSPA)– was established. NUSPA is an umbrella organization, with over 200 members, for widely scattered, small, village-based Shea processing groups. NUSPA has limited capacity, but desires to play a role in promoting and achieving the dual results of the project, namely conservation and value added processing.

Although the markets for Shea nuts and traditionally produced Shea oil/butter are established in the northern districts, opportunities for establishing a domestic market for both local and value-added products in the form of food oils and cosmetics have not been tested. Similarly, product testing of export formulations has been limited and there is no information of products being tested in Uganda.

#### **Achievements of the COVOL project.**

The conservation aspect of this project was successful and people in the Shea zone who were interviewed, clearly stated that the Shea project had played an important role in raising the cultural importance of the tree and stimulating a collective notion that the trees should be protected from careless burning and sales for charcoal.

The research aspects of the project were linked to an EU project and in June, 2000, COVOL COVOL held an regional conference to discuss the various issues related to Shea production in Eastern Africa, (Lovett and Masters, unpub). This is a useful information resource.

In regard to the commercialisation of Shea products in Uganda, the COVOL project also made significant progress in several aspects:-

- (i) Development of women’s groups for the collection and processing of Shea nuts
- (ii) Establishment of a co-operative entitled the Northern Uganda Shea Processors Association
- (iii) Introduction of equipment to process the Shea into a higher quality product via a cold press process.
- (iv) Training of women in quality grading of nuts and in high quality processing of Shea butter.
- (v) Development of a range of products for local and international markets
- (vi) Development of a partner organization in USA, which plans to act as a conduit for sales of processed Shea butter, first stage processed product
- (vii) Product brand name “Nilotica” [www.covol.org/](http://www.covol.org/) see **Annex 3**
- (viii) An interactive website for promotion and sales of Uganda Shea products
- (ix) Linkage with a major boutique BodyTime for sales of the product.



**Range of COVOL products**

Despite substantial progress in the area of product development and local supply chain organisation, export market linkage remains weak and at this time, the level of sales of Shea butter to the USA is currently measured in terms of tens of kilos and the secondary processing of the butter into high value niche market products are irregular and in small volumes.

**The COVOL marketing strategy**

The model for sales of the product was based around a community scheme in which women's groups purchased shea nuts and processed the nuts into butter in their villages. The butter was then sold to COVOL for 110,000 Ug shillings per 20 kgs of cold pressed oil and for 65,000 Ug shillings for hot pressed oil. (1US\$ = 1750 Uganda Shillings).

The wholesale market price for Shea oil is approximately 30,000 Ugshillings and hence there was a very strong price incentive for the women's groups to store their nuts and process when COVOL required a shipment. It should be noted that average incomes in this region of the country are less than one dollar per day, and therefore the prospects of \$60 batch supplies are probably the most lucrative activity the women would be able to access in a year.

The COVOL organisation, purchased the processed oil and then conducted some simple form of fractionation, prior to shipping the butter to their sister agency in USA. In the USA, the butter was processed it into high value hand and body creams through a partner cosmetics manufacturing company. The product was then retailed at 15-35 US\$ per for a 35 ml container, **Annex X**. At this price, even the high premiums paid by COVOL to the women's group were easily absorbed.

Given this marketing plan, if volumes of the product were to increase, there would be a dramatic economic benefit to the NUSPA women's groups. A detailed economic assessment of the COVOL project was undertaken by PROPAGE in February 1999. This provides a clear breakdown of the exact costs for the products and the conclusion was that the process and model developed by the project was viable. For more information on COVOL activities see [www.covol.org](http://www.covol.org)

The acid test however, is the volumes of sale and whilst the Body shop approach was able to make shipments of 30 + tonnes per year, the COVOL project was only able to export 100 kgs of Shea per year.

## Part 2. The natural Shea resource in Uganda

There has been no comprehensive study to determine the supply of Shea nuts in northern Uganda and although Shea has been under investigation for commercial exploitation since the 1930s, estimates for potential market supply remain vague. The best information comes from the COVOL-INCO research project, which conducted a series of surveys to determine tree density by landuse and tree age profiles in selected counties of Lira district. In addition, D. Nkuutu also conducted more extensive, though rapid reconnaissance surveys in the northern districts outside of the COVOL project area, to gauge the approximate density of Shea in the Ugandan shea belt.

For the purposes of this study a combination of these datasets was used to estimate the potential supply of Shea in Uganda. The detailed surveys, conducted in Otuke county by Nkuutu et al. showed a mean of 32 trees of various species per ha. The tree populations was made up from 72 tree recorded species. Within this agro-ecozone, the most common tree was *V. paradoxa*, at a density of 7 trees /ha, which accounted for 54.7% of the total biomass. The survey revealed that in the highest density locations the numbers of Shea trees were up to 50 trees / ha. Excluding the wetland areas, the average density of Shea was approximately 9 trees / ha, **Table 2**.

**Table 2 Distribution of tree density by landuse**

Landuse	Mean <i>V. Paradoxa</i> density ha <sup>-1</sup>	Mean other trees density ha <sup>-1</sup>
Cultivated	7.0 +/- 4.7	19.3 +/- 8.3
Fallow land	7.2 +/- 2.8	33.8 +/-17.6
Compound gardens	12.0 +/- 12.2	22.4 +/- 27.1
Wetlands	0.3 +/- 0.4	44.1 +/- 12.1
Grand total	5.7 +/- 2.0	31.6 +/- 8.4

(Source Nkuutu et al. unpub)

Analysis of the population structure by Lovett et al. showed that the age profile was somewhat skewed with a gap in the age profile for trees in the size class 7-25 cm at the base of the tree. This finding suggests that the tree has been subject to selective age management, indicated by a high number of trees at the lower age and higher age classes. This information supports the view that there has been, in recent years, a systematic removal of trees, to provide building materials, charcoal and losses due to increased agricultural activities, road building and urban spread.

### Estimates of Potential Ugandan Shea Supply

In order to gain a better idea of the potential supply of Shea throughout Uganda it was decided to use a combination of techniques and interviews to gain a conservative estimate of the potential supply of the crop. The initial data was taken from the surveys conducted by the D. Nkuutu as part of his BSc thesis. Mr Nkuuta, then used Arc View to map tree densities. This information was then extrapolated across the shea belt, to the produce the Maps 1-4.

Map 1 defines the general Shea belt in Uganda.

Map 2 used a series of density dots based on survey work to establish zones (yellow = a density of 1-5 trees per ha, blue = 6-10 trees per ha, red = 11-15 trees per ha).

Map 3 Shows these zones defined on an area basis

Map 4 Shows distances from roads in the Shea belt at increments of 5 km.

This data was then subject to a series of assumptions on yield as shown in the tables below, to determine density, yield and potential supply in Uganda.

**Table 3 shea density zones by area**

	<b>Km2</b>	<b>Ha</b>
<b>Zone 1 red dots</b>	6,445	644,515
<b>Zone 2 blue dots</b>	8,727	872,674
<b>Zone 3 yellow dots</b>	14,554	1,455,449
<b>Total</b>	29,726	2,972,638

**Table 4 Tree Density**

<b>Trees/ha</b>	<b>Trees/ha</b>	<b>Trees</b>	<b>Trees</b>
<b>11</b>	15	7,089,665	9,667,725
<b>6</b>	10	5,236,044	8,726,740
<b>1</b>	5	1,455,449	7,277,245
		13,781,158	25,671,710

**Table 5 Tree estimates**

Tree estimates	Low yield MT	High yield MT
Low	68,906	206,717
High	128,359	385,076

**Table 6 Potential oil supplies given an extraction rate of 20% using traditional techniques**

Tree estimates	litres	litres	Value US \$	Value US \$
Low	15,159,274	45,477,821	<b>12,993,663</b>	<b>38,980,990</b>
High	28,238,881	84,716,643	<b>24,204,755</b>	<b>72,614,265</b>

**Table 7 Potential oil supplies at an extraction rate of 30% using improved techniques**

Tree estimates	litres	litres	Value US \$	Value US \$
Low	22,738,911	68,216,732	<b>19,490,495</b>	<b>58,471,485</b>
High	42,358,322	127,074,965	<b>36,307,133</b>	<b>108,921,398</b>

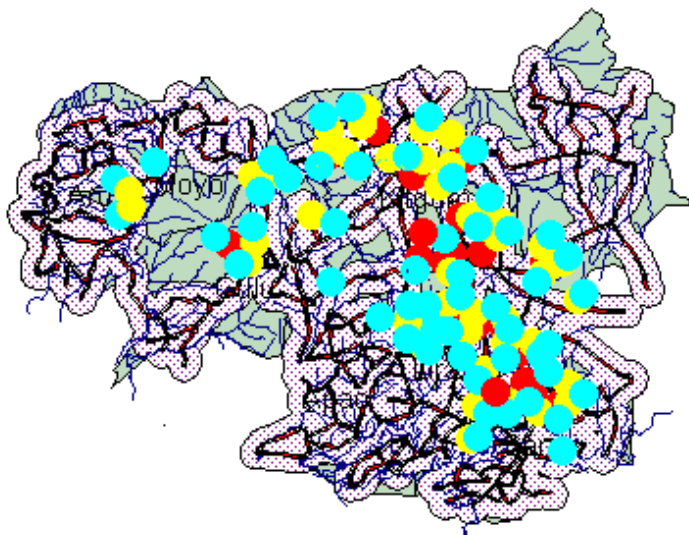
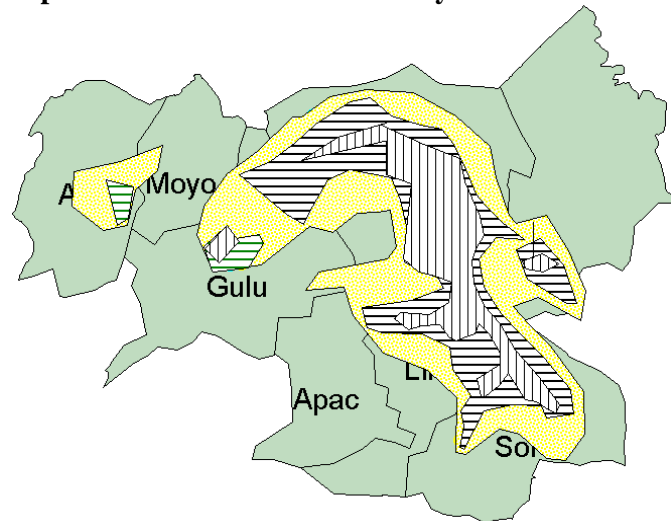
These assumptions provide an estimate, that levels of Shea nut production in the Ugandan Shea Belt range from approximately 70,000 – 385,000 MT. This would yield between 15 – 80 million litres of oil using traditional methods at a value of US\$ 30 M, increasing up to more than 120 M litres with improved extraction techniques.

The road map 4, is shown to give an idea of the distance a person could collect nuts away from a road. It is clear from this diagram that the entire northern part of the country is fairly well served by roads and that there are very few areas which are more than 15 km away from a road. This was considered the maximum distance that any person could travel to collect nuts from a road.

**Map 1 Main Shea Belt in Uganda**

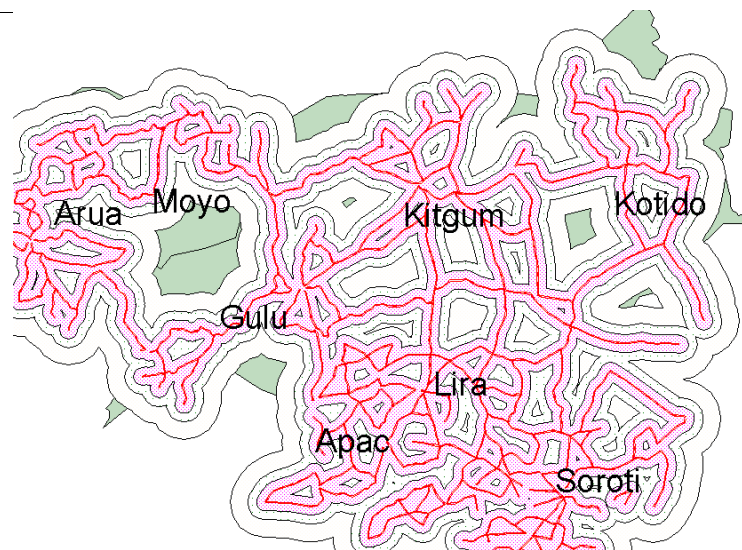


**Map 3 Distribution of Shea density zones in Northern Uganda**



**Map 2 Mapping density zones for Shea**

**Map 4 Distance from roads in 5 km isolines in Northern Uganda**



### Part 3. Shea nut's role in the Ugandan household economy

#### Shea nut in Uganda

Shea oil is considered to be particularly important for household food and income security in the districts of Lira, Katakwi, Kitgum and Kotido. The crop is a particularly important source of income for rural women and children. Studies by Lovett found a number of categories for utilization of Shea, **Table 8**.

**Table 8 Utilization of the Shea tree**

Part of tree (Vernacular)	Recorded use
Fruit (kom yao)	Eaten fresh or dried and stores for later use. Also described as a famine food.
Seeds (nyigi yao)	Dried seeds used for oil production or sold for immediate income
Oil (Moo yao)	The oil is mainly used as edible oil, for frying, as an addition to sauces or sold in local markets as an important source of income. Other uses include utilization in many cultural ceremonies (wedding, birth, naming of new babies, funeral, rain, crop/soil fertility, divining the future and ordination of local chiefs or priests) and as a preparation for battle. The oil has also been described as a traditional; moisturizer, as an ointment for newborn babies, as a lubricant of machinery and as an important component of medicines for sprains, scabies or as an open wound dressing. The oil/fat can also be used to produce traditional soap and to protect wood or metal from corrosion.
Wood (dur Yao)	The wood is used as charcoal or firewood and the poles are frequently employed as the roof or 'Y' shaped poles in house construction. The timber is also used for local handicrafts (stools, pestles and mortars) and as beehives. In addition, large tree boles are used to build local canoes.
Whole tree (Yao)	The whole tree is said to improve soil fertility, provide shade and protect against wind or soil erosion.
Leaves (Pot yao)	Although rarely utilized, the leaves from this tree species are used in funeral ceremonies
Flowers (tur yao)	The flowers are used – to flavor tobacco, as a medicine to reduce chest pains and to cure eye problems. They are also know to be important in honey production
Bark (pok yao)	Frequently used as a medicine for stomach problems, specifically against diarrhoea
Residue (cet yao)	The bi-product or residue from oil production is commonly used as a termicide for houses (to protect walls and poles) or crops, burnt to repel mosquitoes and the ashes from this product can be used to produce local salt
Latex (odox yao)	The latex is used as a medicine to dress open wounds, as a glue to seal pots or calabashes and as an adhesive to trap animals or birds
Roots (Iwit yao)	The roots are utilized in the production of unspecified medicines (should not be confused with mistletoe which is also known as <i>Iwit</i> yao

Source: Lovett 2000



### **Traditional processing techniques**

Processing Shea nut into oil is an historical traditional for communities in Northern Uganda. This knowledge has been passed from generation to generation and is widely practised in the shea belt. The process is however, time consuming, labour intensive and hard work. Our surveys revealed that many younger women are unwilling to process Shea and particularly those in the towns preferred to use refined oil or buy Shea.

### **Harvesting**

The Shea fruit is perennial and typically fruits mature in June. Women and children harvest the Shea fruits when they fall from the trees. At harvest, the fruit are eaten raw and then the kernels are cracked using a stone to obtain the nuts. In Uganda, the nuts are sun dried for about 1 week. Drying the nuts requires some care and nuts are usually only dried for 2-3 hours per day. Slow drying prevents oil losses. If nuts are overdried or overheated they become black and either reduce the quality of the oil or cannot be sold to processors. Heating the nuts also prevents the nuts from germination. Germination reduces oil quality and is associated with a bitter taste in the processed oil.

### **Traditional oil processing**

Processing Shea oil is a highly labour intensive process, taking a day to produce a sufficient amount for sales and home use. There are many variations around the main procedures, but essentially, the nuts are ground or pounded into a rough grist, using mortars and grinding stones and then roasted. In some cases the nuts are roasted prior to grinding. After heating the nuts are ground into a paste. This paste is mixed with an equal amount of water and boiled. The oil is then skimmed off and held in a separate container.

The oil is often rewashed and boiled to remove particles and mucilage from the first stage boiling. The oil is then left to cool, typically in Uganda, the product is a brown oil which separates into the oil and stearin fractions. It can take 4-6 women a full day to produce 4-5 litres of oil, from 20 litres of nuts. This quantity can last a family 1-3 weeks depending on usage. Shelf life of the oil is from 1 to 3 weeks depending on the moisture content of the oil after processing.

### **Gender division**

Shea fruits and nuts are gathered, processed and retailed exclusively by women and children. Shea is therefore an important source of income for women and this income is used to educate children or pay for medication. Children can also earn an income through gathering shea nuts and selling the kernels at the market. In interviews with oil traders, we were told that children use the funds made through sales of Shea to buy their clothes. The money made through Shea sales is also used for joint family purchases.

Men are involved in wholesaling the nuts as they have sufficient capital to purchase bulk loads of the commodity and also rent stores in the local markets in the main towns to store and then either retail or wholesale the nuts back to the village markets.

### **Importance to household diet**

Shea nut products command an important position in the diet of the rural. The children and women eat the fruit while it is raw while the processed crude oil is used as a food accompaniment. In most northern villages, Shea oil is the only source of cooking oil and is used for all the traditional foods. In most villages, the refined cooking oil is not available and therefore Shea is the only source of cooking oil.

### **Importance to household income**

Shea oil provides a major source of income to the households engaged in its trade. Interviews in the villages and rural markets revealed that women processors rated Shea oil as the highest

source of income generation. According to them Shea oil provides more income than brewing and farming. The money made through Shea is also clearly for the women. Whereas much of a woman's labour goes into products that are sold by the head of the family. Wholesalers also indicated that trading in shea was highly lucrative, with gains being higher on shea compared with other crops such as groundnuts and maize.

**Importance to household food security**

Shea fruit and oil provide an essential part of the diets for the people in the Shea belt. Trading in shea also provides an important source of income that is used by the rural households to purchase of food.

## **Part 4. Comparisons with Shea nut and butter industries and markets in West Africa**

### **The experience in West Africa**

Shea is an important household resource in savanna regions of Cote d'Ivoire, Ghana, Burkina Faso, Mali, Togo, Benin and Nigeria. Nut gathering practices and traditional processing techniques are broadly similar across the region. Most Shea butter<sup>1</sup> uses are also commonly shared, and include cooking oil/fat, food accompaniments and topical treatments of various skin conditions. Shea butter's importance comes from its relative abundance in areas that are otherwise resource poor. Its contribution to household welfare and food security is therefore significant.

### **International trade**

In West Africa, the international Shea trade is dominated by purchases made by, or on behalf of, Cocoa Butter Equivalent (CBE) manufacturers in Europe and Japan. CBEs are a group of highly processed food products made from several different (mostly tropical) vegetable fats. They mimic the properties of cocoa butter, with which they can be mixed in chocolate and confectionary manufacturing to modify the properties and reduce the cost of the finished product. The CBE trade jealously guards its secrets, even to the point of refusing to release information on the quantity of Shea nuts that it purchases. However, African export and European import data suggests that the annual quantity varies between 50,000 and 70,000 tonnes of nuts per annum (Jaeger 1999)

Until recently, all the European CBE manufacturers have insisted on purchasing Shea nuts rather than Shea butter from Africa. Only this way, they have claimed, can they control quality (in particular the content of free fatty acids, the cause of rancidity). Ultimately however, this has merely been an excuse to avoid getting their hands dirty by engaging with oil seed millers in West Africa. There now appears to be a concerted effort on the part of some CBE manufacturers (notably the Dutch Unilever subsidiary Lodders Croklaan and the Japanese company Fuji Oils, through its buyer Itochu Ltd) to buy Shea butter from West Africa. To a large extent, this has been prompted by tighter European and Japanese environmental legislation that discriminates against dirty industries such as oil seed crushing. As a result, no European oil seed crushing companies are not re-investing in plant (pers. comm. Ian Cullen, retired Itochu oils and fats buyer).

There are now plans to export large quantities of Shea butter from Ghana. Buyers have favoured Ghana for several reasons:

- Ghana has a well earned reputation for producing good quality nuts, with low free fatty acid contents. This is a reflection of good post-gathering practices<sup>2</sup>.
- Since 1991, the Ghanaian Shea sub-sector has had minimum interference from the government<sup>3</sup>. This contrasts with the situation in the francophone countries, where government investment and control have been the norm (Devey 1995).

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<sup>1</sup> The crude vegetable fat produced from West African shea nuts is much harder than the East African product, which is usually referred to as shea oil. The difference lies in the stearin (hard fraction) content of the fat which is largely determined by the sub-species of tree that the nuts come from. Interestingly, shea butter gets progressively softer the further east its origin (pers.comm. Jaap Biersteker, Lodders Croklaan)

<sup>2</sup> However, recent improvements in Burkina Faso, prompted by the activities of the Canadian NGO CECI, have put Burkinan nuts on a par (pers. comm. Jaap Biersteker, Lodders Croklaan)

<sup>3</sup> The Ghanaian shea industry used to be controlled by the Cocoa Board (Chalfin 1996). Clearly, cocoa producers and exporters had a vested interest in controlling exports of a commodity that potentially reduces the

- Ghana is a politically stable country.

Until earlier this year (2001), the only significant Ghanaian Shea butter exporter had been Kassardjian Ltd. Alongside its regular European Shea nut buyers, this family owned company has formed an exclusive Shea butter trading relationship with Itochu Ltd, the oils and fats buying company for the Japanese CBE manufacturer Fuji Oils. Kassardjian has adapted the traditional boiling extraction process to produce a consistently high quality butter. Part of the secret of Kassardjian's success lies in its longstanding and strong position in Ghana's Shea nut export industry. The company has a well developed Shea nut buying network, which procures high quality nuts. This experience has meant that the nuts used for butter extraction have been very low in free fatty acids.

2001 has seen the emergence of Shebu Ltd as a serious Shea butter extractor. Backed by Loders Crokiaan, the new company plans to extract large quantities of Shea butter using expeller presses. The raw material will come from Loders' longstanding Shea nut suppliers (Kassardjian and Olam) plus a network of community groups. Loders intends that this latter source will ensure greater returns to poor village people.

Industrial extraction in francophone West Africa has been directed towards local and international cosmetics and toiletry markets. This reflects the predominant French interest in Shea butter. As with many other industries in French dominated Africa, state involvement in the Shea extraction industry has been sizeable.

Shea nut and butter exports to international cosmetics markets have historically been dominated by French companies. Recently however, U.S. cosmetics buyers have shown interest in buying directly from African suppliers.

Cosmetics buyers, whether from the U.S. or Europe, are willing to pay considerably more for Shea butter than CBE industry buyers. However, on the most conservative estimate, CBE demand is at least seventeen times larger. A factor of seventy may be more accurate. There is a tendency for potential Shea butter extractors in West Africa to get carried away with the prices that overseas cosmetics buyers offer, while ignoring the small quantities required.

In 1998, Lever Brothers (Ghana), a subsidiary of Unilever, started producing a Shea butter based skin moisturising product designed for the Ghanaian market. Although the product was well received by consumers, difficulties in procuring Shea butter caused the company to withdraw the product. If these problems could have been solved, Lever Brothers' demand for Shea butter would have grown substantially, particularly if the regional market could have been exploited.

### **Small and Medium Enterprise (SME) Shea butter extraction in Ghana**

In 2000, DFID funded the Natural Resources Institute (NRI) to conduct a pilot project to test the feasibility of operating an SME to supply approximately 50 tonnes of Shea butter to the CBE industry per annum (Gallat et al 2000). The technology was the same as used by COVOL and NUSPA in northern Uganda. Unfortunately, the enterprise would have made a substantial loss, even if Shea butter prices offered by CBE manufacturers had been substantially greater than those that prevailed at the time. The only practical way of becoming profitable would have been to reinvest in much larger capacity plant, thereby putting the opportunity beyond the reach of most local businessmen. However, if production had been oriented to the cosmetics market, and a buyer willing to take 50 tonnes of Shea butter a year could have been found, the enterprise would have made substantial profits.

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quantity of cocoa butter consumed in the world. However, market liberalisation forced an end to this arrangement.

### **The interaction between industrial and traditional Shea activities**

In general, industrial and traditional Shea activities in Ghana have co-existed happily. Although the volume of exports is much smaller than local consumption, export buying sets the price for Shea nuts on the domestic market. Both sources of demand use the same network of traders and hence there is a danger that increased international demand for Shea would raise prices to the exclusion of traditional users (who, all things being equal, should be able to benefit from higher export prices).

If over-exploitation of the Shea nut resource was ever to occur in Ghana, it would probably not be widespread. Large, sparsely populated areas in the north are currently beyond the economic reach of Shea nut buyers (pers. comm. Mr Kassardjian Senior). A substantial increase in international demand would initially be met by extracting as many Shea nuts from existing supplying areas. Beyond that, traders would be encouraged to enter new areas.

### **Key issues and their implications for Uganda**

- Shea nut drying techniques largely determine the quality of Shea butter.
- Personal contact with both CBE and cosmetics buyers is indispensable. In many cases, links with overseas industries are well established in West Africa. Similar contacts will have to be built in East Africa if development of the Shea sub-sector is to occur.
- Producing Shea butter commercially using a range of technologies is possible. However, scale of output must be matched to market requirements. Cosmetics buyers require small quantities but pay high prices, while CBE buyers want large quantities but pay relatively low prices.
- The CBE industry fractionates Shea butter and uses the hard fraction in its products. West African Shea butter is particularly good for CBE manufacturing because the hard fraction accounts for a large proportion of the butter. East African Shea butter (or oil, as it is more commonly referred to) is a much softer product and is therefore of much less interest to CBE manufacturers.
- In Ghana, Lever Brothers' experience of producing a mass market skin moisturiser product containing Shea butter points to the potential of exploiting regional cosmetics markets. East Africa's large scale cosmetics industry is well developed and has the capacity to develop new products.
- Traditional and industrial Shea butter extraction can co-exist providing industrial demand does not increase the local price of the raw material beyond a certain threshold.

## **Part 5. Shea product market reviews**

### **5.1 Traditional Shea nut market**

#### **Uses**

Shea nuts traded through the local wholesale and retail markets are used in the traditional processing of crude Shea nut oil. The majority of this oil is consumed directly in the home, while the remainder is traded in local retail markets, usually by the women who process the oil.

#### **Location**

The trade is restricted to northern Uganda. We found no evidence that Shea nuts were traded outside the northern districts. Shea nut wholesalers tend to operate from the larger towns but their buying activities take them to rural Shea producing areas, where they often maintain satellite stores.

#### **Volumes Traded**

Three Covol members were interviewed to establish the following parameters to determine volumes of Shea traded:

- The zoning of the Shea Nut belt
- A list of markets where Shea nuts are sold (within the Shea belt)
- The seasonal changes in the quantities of nuts sold
- The quantities of nuts that get to the markets

The Sheanut belt comprises the following districts namely; Kotido, Katakwi, Kitgum, Gulu, Pader, Lira, Nebbi and Arua. A list of 59 markets in six of the above districts were identified through discussions with the COVOL team and these markets were confirmed in an later interview with the local trade officer. As we were unable to access market information collected by COVOL, the team members provided information was based on their best estimates of nuts regularly available in these markets per market day. The results are restuls from these interviews is summarized in **Table 9**:

**Table 9 List of Quantities of Shea Nuts Traded in 6 districts of Northern Uganda**

District	Quantity of Nuts traded in the markets per Week (Kg)	Quantity of Nuts traded in the markets per month (Kg)
<b>Peak Season (June July August)</b>		
Lira	29,421.60	117,686.4
Pader	108,178.2	432,712.8
Gulu	12,558	50,232
Kotido	7,176	28,704
Kitgum	33,368.4	133,473.6
Katakwi	29,959.8	119,839.2
<b>Off Peak Season (Sep,Oct, Nov,Dec, Apr, Ma</b>		
Total quantity of nuts traded in June July & Aug = <b>2,647,944</b>		
Lira	14,710.8	58,843.2
Pader	54,089.1	216,356.4
Gulu	6,279	25,116
Kotido	3,588	14,352
Kitgum	16,684.2	66,736.8
Katakwi	15,428.4	61,713.6
<b>Season of Scarcity (Jan, Feb, March)</b>		
Total quantity of nuts traded in Sep,Oct, Nov, Dec, Apr & May = <b>2,658,708</b>		
Lira	7,355.4	29,421.6
Pader	2,7044.55	108,178.2
Gulu	3,139.5	12,558
Kotido	1,794	7,176
Kitgum	8,342.1	33,368.4
Katakwi	7,714.2	30,856.8
Total quantity of nuts traded in Jan, Feb & March		<b>664,677</b>
<b>Total Quantity of Nuts traded in markets of the 6 districts p</b>		<b>5,971,329</b>
<b>Year (Kg)</b>		

*Survey Data, 2001*

NB: Gulu and Kotido show the lowest quantities and this is mainly due to the insecurity within the region that hampers the trade.

From interviews and market visits it was estimated that the total quantity of Shea nuts traded through the northern Ugandan markets per year is approximately 6,000 tons. This is 10% of the lowest estimated potential nut yield. The study showed that these nuts are traded between the same groups and therefore, we assumed a real trade in sellers and users to be 3000 – 4000 tonnes. This volume of nuts equates to approximately 700 tonnes of oil, or 0.7 millions litres of oil. Given that the wholesale value of shea oil is approximately 1500 shillings per litre. This translates to a market value of 1,155,000,000 shillings, which is equivalent to 0.66 M US\$. (1\$-1750 shillings).

#### **Market share of Shea compared with refined oils**

The overall oil market in Uganda is estimated at 44,000 MT / year, which has a value of approximately \$36 M US. Current production of sunflower seed was recorded by UOSPA at 78,000 tonnes in 1999, Otimodoch and Singh (2000). This converts to approximately 18,750 tonnes of oil. Given an wholesale prices for refined oil at 1300 shillings per litre, the value of oil produced from local seed is approximately \$15 Million US.

These figures suggest the market share of traditional Shea oil in is approximately 5% of the local production. It should be noted that this figure only includes the potential Shea oil produced from the traded nuts and does not include the amount of Shea oil sold in market. It was also noted that in many of the Shea markets, there was no refined oil on sale. Prices of Shea oil were also higher than refined oil in the main Lira market and oil traders confirmed there was strong demand for Shea oil and that people were prepared to pay more. Therefore, demand for the local product is strong and despite the often variable quality of the product, Shea is competing effectively in the market place at this time.

The future sales of Shea oil are however, unclear. Given the higher price of the product and the increasing competition between refined oil producers, it is likely that in the main towns of the north that refined oils prices will fall relative Shea, as production increases and that due to the more standard quality of the refined oil that consumers will shift to a lower cost substitute.

**Seasonality:**

The quantity of nuts available in the markets is dependent on the seasonality of the Shea tree and the sales of the nuts from the stores. Nut volumes at the markets are highest in the months of June, July and August (Peak season). In the months of October, September, November and December, volumes fall by 50%. The quantities are lowest in January, February and March then they begin to rise in April and May.

**Prices:**

During the peak season (June, July and August), the price of nuts are UgSh. 200 per Kg at rural market retail. During the Off Peak season in the months September, October, November, December, April and May, the price of the nuts rises to UgSh. 300 per Kg and in the season of scarcity, it may rise to UgSh.400 or 500 per Kg.

**Quality:**

It was observed that the nuts vary in quality though no grading is done at the market. For every given quantity of nuts available in the market, it was observed that 50% of the nuts were highest quality then 35% were moderate and 15% poor quality. COVOL had introduced a strong campaign to improve nut quality and although the system is not generally used in the trade at market, many traders were aware of the standards being used by COVOL.



**Plate 2 Quality grads for Shea nut**

**Constraints:**

- Lack of commercial markets in which to trade the commodity, Shea nuts and oil are traded in remote rural markets where the nut gatherers are price takers.
- Demand for the Shea nuts is generally low and static and most nuts are sold, at the time of gathering for subsistence or household consumption.



- There is a general lack of awareness of the higher value market opportunities for the commodity and no linkage of the farmers to new markets.

Traders buy Shea nuts from villagers in the Shea season (June, July, August), store for approximately six months and sell some of the nuts to townsfolk and the majority back to villagers when the price has risen sufficiently to cover carry costs and provide a healthy profit (usually in the period January to March). Consequently, a large proportion of our upper estimate of 6500 tonnes per year, comprises nuts that are purchased in one season and sold in another. The estimate therefore relates to volume of transactions rather than the physical quantity of nuts made available for trade. The lower estimate relates to nuts that are traded only in the Shea season, and is offered as a conservative estimate of the physical quantity of nuts on the market.

**Interseasonal storage**

Wholesaling and inter-seasonal storage services are provided by large urban traders and to a lesser extent by smaller rural traders. The fieldwork suggested that urban wholesalers are outnumbered many times by their rural counterparts. Storage also occurs in the home, but apparently in insufficient quantities to satisfy the regular need for processing Shea nuts into oil throughout the year.

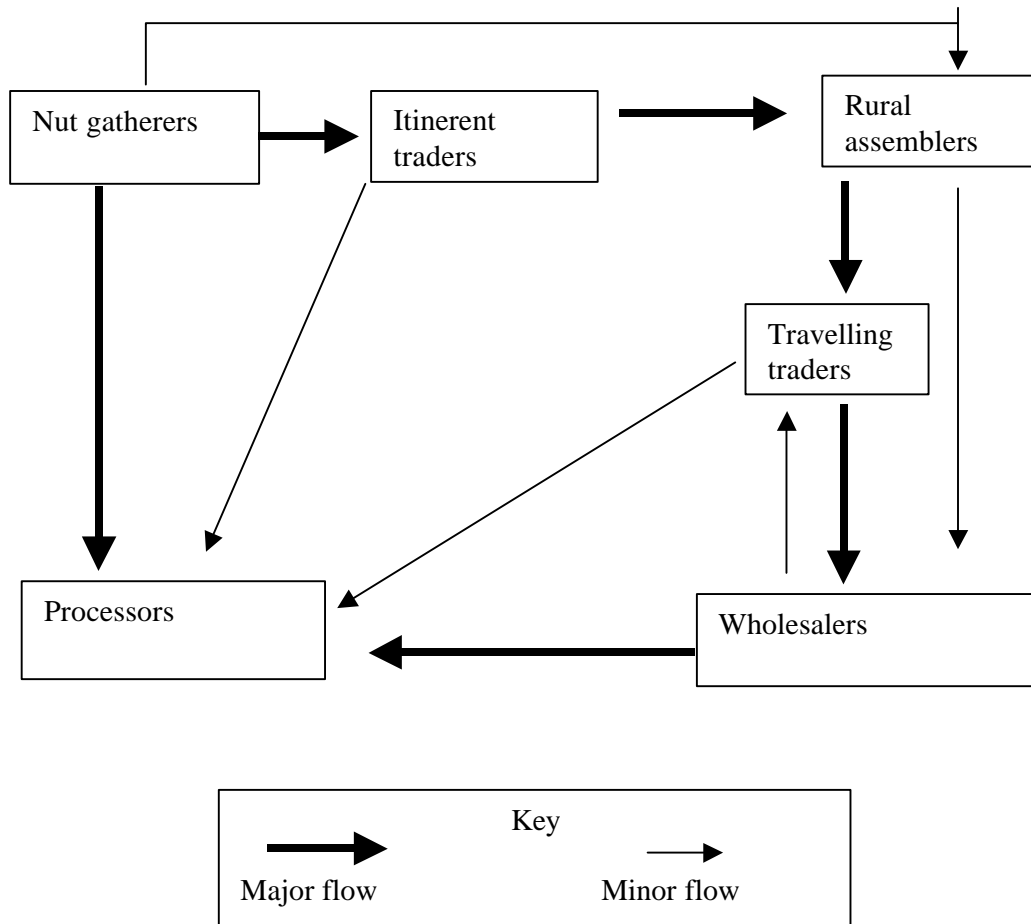
**Quality**

Approximately 50% of gathered nuts are top quality, another 35 to 40% are of second quality, while the remaining 10 to 15% are generally too inferior to process (pers. comm. NUSPA representative).

### Trading Chain

Figure 1 provides a diagrammatic illustration of the trading chain for Shea nuts. Margins and costs along the chain have also been calculated, see Table X. Marketing agents along the chain take on added responsibilities. Rural assemblers were found to involve themselves in transportation in addition to assembly. As can be seen from Figure 1, the distribution channel exhibits variations mainly due to seasonality.

**Figure 1: Trading chain including prices and margins along the chain.**



The nut is collected, dried and stored at household level by the gatherers, the first point in the trading chain. These have three outlet channels notably the itinerant traders, the rural assemblers and the processors. According to field interviews, both the itinerant traders and the processors constitute a large flow of volumes traded. During the peak season, processors buy directly from the nut gatherers on market days. They also purchase nuts from their households at other times. The major source of nuts for the processors in the peak period are the gatherers themselves.

While the volume that goes to the processors is consumed, that going through the itinerant traders during the peak season mostly ends up being stored by the assemblers and wholesalers to profit from scarcity during the lean periods.

Processors purchase the nut from travelling traders and wholesalers in the lean period with the later constituting the larger flow of trade volumes.

**Table 10** gives an example of costs and margins in the trading of Shea nut between the rural and urban areas. It summarises a chain that begins with the nut gatherer selling the nut to the village

assembler usually through the itinerant trader. The itinerant trader relies on his bicycle to traverse the countryside in search of the nut. Between the village assembler is the travelling trader who arranges for the transportation of the nut to the urban wholesalers/retailers in town. The wholesaler stores and sells the nut to the processor.

The cost and price information used to construct **Table 1.2** is the result of fieldwork conducted in July and later in September. The table gives a snap-shot of the flow of trade and estimated margins along the chain.

**Table 10: Shea nut trading costs and margins**

	Ush/100 kg	% of selling price
<b>Gatherer</b>		
Selling price	8000	
<b>Itenary trader</b>		
Purchase price	8000	
Selling price	9000	
Gross margin	1000	11.1%
<b>Village assembler</b>		
Purchasing price	9000	
Selling price	12500	
Gross margin	3500	28%
<b>Travelling trader</b>		
Purchasing price	12500	
Selling price	20000	
Gross margin	7500	37.5%
<i>Costs</i>		
Loading fee	200	
Local development tax	500	
Transport	2000	
Unloading fee	200	
Local development tax	1000	
Total variable cost	3900	
Net margin	3600	18%
<b>Wholesaler</b>		
Purchase price	20000	
Selling price	25000	
Gross margin	5000	20%
<i>Costs</i>		
Miscellaneous labor	300	
Overheads	400	
Total costs	700	
Net margin	4300	17.2%

## Prices

Shea nut prices vary considerably over the year. During the current Shea season (June, July, August 2001) the ex-store price in Lira is approximately USh280/kg (US\$0.16/kg). By January the wholesale price will probably have increased to USh495/kg<sup>4</sup> (US\$0.29/kg) (pers comm Lira wholesale trader).

Spatial differences do occur. In the main concentration areas of Kitgum, Pader and Gulu districts prices are lower than in Lira and the peripheral areas around the main Shea belt. This is mainly attributed to the forces of demand and supply prevailing in such areas. Local traders are of the opinion that prices deep in the areas of Pader, Kitgum and Gulu where nut concentration seems to be heavier are much lower than in the other areas. While a kg of nut costs about 50/= deep in the Shea belt areas of Kitgum, it is about 80/= per kg in areas around Lira during the peak season.

## Market integration

Prices across the Shea belt appear to be remarkably similar, and those that differ, tend to reflect higher transport costs (Masters 1992). This indicates fairly free transmission of market information and a well integrated market.

## Wholesaling profitability

**Table 11** gives an estimate of the costs, revenues and profits of a Shea nut wholesaler interviewed during our fieldwork (workings and assumptions appear in the appendices). The wholesaler operates from a store in Lira but has four rural stores in strategic buying locations. Apart from Shea nuts, the wholesaler trades and stores beans, soya beans, sorghum, millet and rice.

**Table 11: Lira Shea Nut Wholesaler – Analysis of profitability**

	Per annum	Per annum
	Ush	US\$
Operating costs – variable		
Purchase price	2760000	1577
Village development tax	50000	29
Bag	50000	29
Loading fee	20000	11
Transport	200000	114
Unloading fee	<u>20000</u>	<u>11</u>
Subtotal variable operating costs	<b>3100000</b>	<b>1771</b>
Operating costs – fixed		
Lira attributable store rent*	60000	34
Attributable rent for four village stores*	42000	24
Management	525000	300
Labour	<u>140000</u>	<u>80</u>
Subtotal fixed operating costs	<b>767000</b>	<b>438</b>
Subtotal operating costs	<b>3867000</b>	<b>2210</b>
Capital costs	193350	110
Total costs	<b>4060350</b>	<b>2320</b>
Revenue	<b>4950000</b>	<b>2829</b>
Profit (loss)	<b>889650</b>	<b>508</b>

\* Shea is only one of several commodities stored.

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<sup>4</sup> Sale price has been adjusted to account for a 10% weight loss from drying during the storage period

With a gross margin<sup>5</sup> of 37%, this is clearly a profitable business. There are reportedly only ten traders in Lira. In the main market in Lira town there are 6 nut traders. These buy in bulk usually in bags and their buying price is quoted in kg. They sell nuts in cups to processors in and around Lira town. Just outside the main market, in what is known as the “produce line”, there is one nut trader while other 2 nut traders operated further away from the main market. Greater participation in this trade is probably constrained by a lack of Shea nut storage expertise and working capital. Shea nut wholesalers admit that competition is not as great as in other wholesale food markets. Large seasonal price movements and the relatively high levels of profits earned from inter-seasonal storage also suggest that the Shea nut wholesale market is uncompetitive. One trader informed us that the main traders are those people who know the crop and know how to manage the product in store. For most people, Shea is considered not to be a major commercial commodity.

#### **Expansion of interseasonal trading - Opportunities**

Expansions of the interseasonal storage would help to reduce the large seasonal price movements. It would also create a greater demand for nuts in the Shea season, increase household income during this period, and help to reduce household expenditure later in the year when Shea nuts have to be purchased. The overall effect would be an improvement in household food security.

#### **Constraints to expansion**

Apart from concerns about liquidity and limited Shea storage expertise in the wholesale food trade, expansion might be constrained by a lack of unexploited Shea nut reserves. This problem would be compounded by industrial users of Shea nuts requiring a major share of the Shea resource. Although our rough estimates indicate that there are sufficient unexploited volumes available, the fragility of household economies in northern Uganda underlines the need for conducting a careful survey of nut resources and current demand in northern Uganda.

Alternatively, it may be speculated that an industrialist who would buy up a significant share of the shea nut would also create increased demand for the cheaper refined oil. If this were to occur, a secondary market could be exploited.

#### **Expansion - Implications for traditional Shea oil processing**

Expansion of the interseasonal Shea nut trade would support traditional Shea oil processing by limiting the price of Shea nuts in the lean season.

#### **Implications for the environment**

Greater income earned from Shea nut gathering would persuade villagers to give greater protection to Shea trees. However, over-exploitation of the Shea resource would limit natural regeneration of the Shea tree species, unless this were tied or supported with a planting scheme.

## **5.2 Traditional crude Shea oil market**

### **Uses**

Crude Shea nut oil, extracted by traditional techniques, is used as a cooking oil and food accompaniment, and as a skin protectant, moisturiser and healant. Women also use high quality oil as a hair conditioner and as a petroleum jelly extender.

### **Location of supply and demand**

Supply is limited to northern Uganda. Although northern Ugandans living in the south still use crude Shea oil, we understand that the Shea oil trade does not extend outside the north. Demand is satisfied by individuals travelling up and down the country on personal or business trips.

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<sup>5</sup> Here, gross margin is calculated as  $100 \times (\text{Revenue} - \text{Total variable operating costs}) / \text{Revenue}$

**Quantity**

There was insufficient time to collect information on the quantity of shea oil consumed by the population in the north of Uganda, this would require an in depth study at the household level.

**Quality**

High quality is associated with dark brown oil, which is the best indication that nuts have been correctly roasted before oil extraction. Such oil is more flavoursome and has a much longer shelf life (lighter coloured oils have been known to become rancid within two weeks, whereas dark brown oil can last for several months). Given this rapid market appraisal, consumers are generally unwilling to pay more for higher quality oil. However, traders know that they can sell darker oil much more quickly than the inferior lighter coloured oil. Quality therefore does have a market value.

**Substitutes**

Due to its varied uses, crude Shea oil has no direct substitutes. Clearly however, for some specific uses, substitutes do exist. For frying, the main alternatives are palm and sunflower cooking oils. As a skin moisturiser and protectant, petroleum jelly is a competitor although it does not have the same healing properties (probably linked to Shea oil's vitamin content). As a means of proofing against bullets, there would appear to be no substitutes currently available on the Ugandan market.

**Competitiveness**

In northern markets, Crude Shea oil is currently more expensive than palm and sunflower cooking oils. A bottle of 200 ml filled to the top costs 300/= while a similar quantity of the improved sunflower oil is retailing for 250/= A fanta bottle (300ml) of crude Shea nut is retailing at 600/= while its sunflower equivalent is costing 500/=.

Information about price movements, however, suggests that in areas deep into the Shea belt sunflower oil is more expensive during the Shea peak period. The improved oil is transported into these areas from the major urban centers.

During the Shea lean period crude Shea oil prices across the region increase dramatically surpassing those of improved sunflower oil even in the major urban centers. While the price of a fanta bottle (300ml) is fairly stable at 500/= per bottle in Lira town, that of crude Shea nut oil increases to as high as 800/= in the lean period.

**Processing techniques (traditional and cold press)*****Traditional***

Once the nut has been dried sufficiently, it is mixed with ash or sand and roasted. The ash or sand helps to achieve uniform spread of heat and thus avoid burning the nut. According to the local processors this may take up to 2 hrs and more if the nut is not well dried. Thereafter the roasted nut is sieved out of the ash and sand and is cleaned with leaves.

The nut is then put into a mortar and pound. According to most processors this is the toughest activity in the process. The nut is pound into smaller particles ready for grinding.

Grinding is done until a fine powder is produced. This powder is then mixed into boiling water. The paste water mixture is later removed from fire and left to cool. Oil then settles at the top and is removed leaving the residues under.

***Cold press***

This is one of the methods that is used with improved processing techniques being promoted in the region. Once the nut has been dried to readiness for processing, it is ground into powder form. After grinding two processes are available, the hot and cold press.

In the case of cold press, the powder is mixed with hot water and poured into a bag which is put in a container. It is hand pressed and the Oil filters through the bag into the container.

According to reports from Sudan, for a family of 5 women which processes 4 litres of oil every 2 weeks, this means that 130 women work days are required per year. Using the COVOL technology, women obtain a higher quality product and can produce about 4 litres in 30 minutes or up to 40 litres in one day.

#### Processing profitability

**Table 12** presents the costs, revenues and profits of a typical crude Shea oil processor (the workings and assumptions that support the figures appear in the appendices).

**Table 12: Analysis of profitability – Processing and selling 15 litres of crude Shea nut oil using traditional methods**

	Peak Shea Season		Lean Shea Season	
	Ush	US\$	Ush	US\$
Operating costs – variable				
Raw material cost	14400	8.23	32400	18.51
Firewood	2506	1.43	2506	1.43
Water	1504	0.86	1504	0.86
Labour	1804	1.03	1804	1.03
Subtotal variable operating costs	20214	11.55	38214	21.84
Operating costs – fixed				
Market dues (4 days)	800	0.46	800	0.46
Subtotal fixed operating costs	800	0.46	800	0.46
Subtotal operating costs	21014	12.01	39014	22.29
Capital Costs	0	0.00	0	0.00
Revenue	30072	17.18	45108	25.78
Profit (loss)	9058	5.18	6094	3.48

Profit, higher in the peak than in the lean season, can be seen as a combination of the gross margin made on processing the oil and the returns from trading it in the market. Although not particularly great, the profits can be the most important part of a woman's contribution to household income.

Across the Shea belt individual women process the nut into oil, which they retail in local markets. In Lira main market there are about 10 small-scale women processors. These form the main trading chain for the nut wholesalers. They buy the nut from wholesalers inside the market. They buy weekly quantities measuring 120 cups.

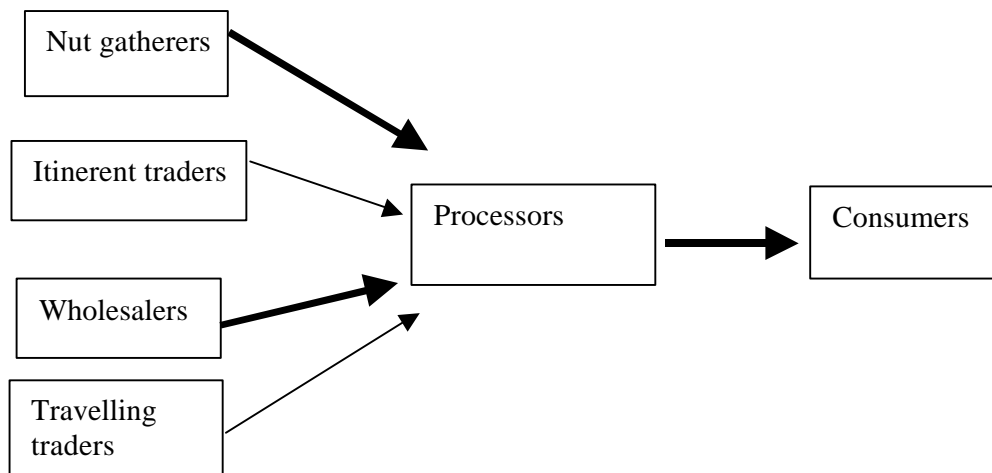
The women rely both on hired and family labor to process the oil. In the town markets hired labor is mostly used while in the rural areas family labor is common. Processing is done in smaller batches of 40 cups weighing 16 kgs. From this, a full 5 litre jerrican is obtained. On average, they process 15 liters of oil.

Average sales per week amount to about 15 liters. During peak demand periods volumes per week double. In addition the number of processors may fall due to scarcity of the nut.

**Description of marketing systems (including estimated margins in the supply chain)**

Processors have several sources of nut depending both on seasonality and social-economic factors. During the peak season, processors get the nut from gatherers while in the lean period wholesalers provide the main supply channel.

**Figure 2: Shea oil trading chain**



**Table 13** below gives an estimation of trading costs and margins accruing to small scale women processors across the Shea belt. Variations were found to exist depending on whether family labor is used or not; the source of nut and seasonality.

**Table 13: Shea oil trading costs and margins in the peak season**

Processor	Peak season	Margin	Lean season	Margin
Raw material cost	4000/=		8000/=	
Income	9000/=	55.6%	14400	44.4%
<i>Processing Costs</i>				
Miscellaneous labor	1000/=		2000	
Firewood	1500/=		1500	
Total costs	2500/=		3500	
Net income	2500/=	27.8%	2900/=	20.1

**Expansion in Uganda – Opportunities**

In northern Uganda, supply appears to be in balance with demand, which according to several of our informants, is fairly constant throughout the year. Although market prices rise on a seasonal basis, this is caused by an increase in raw material (Shea nut) costs rather than a reduction in processed volumes. The desirability of expanding supply is unclear. Given the lack of direct substitutes for traditionally processed crude Shea oil, one might expect demand to be inelastic. However, households have the ability to process their own Shea oil, suggesting that market demand may be elastic. In this uncertainty, the extent of the downward pressure on price arising from an increase in supply is difficult to predict. Ultimately, the type of people who purchase Shea oil and those who market it are the same, and so even if suppliers should lose out to consumers (or vice-versa) as a result of increased supply, the welfare of the northern Ugandans as whole should increase.



**Constraints to expansion**

From our limited fieldwork, the following appear to constrain processing

- ◆ The expense of transport, either in fares or time spent providing own transport
- ◆ Scarcity of nuts in the lean season
- ◆ The price of nuts in the lean season (perhaps implying a cash-flow problem)
- ◆ Poorly dried seed

Sales and market taxes were also mentioned but we have no objective measure of whether these are over-burdensome.

**Implications for the environment**

Given the importance of Shea in the income and food security of the women in the north of Uganda, and that this is most economically depressed region of the country, there is scope to consider some of the more social benefits to investment relative to economic agri-business type interventions. If one accepts that a marketing approach will not work for everyone, as clearly shown in industrialised nations where depressed regions are given strong social support programmes, then several options may be considered:-

Increased revenue from Shea oil sales would encourage people to conserve Shea trees. It is unlikely that Shea oil production will increase to the extent that the Shea resource will be over-exploited.

### **5.3 Ugandan vegetable cooking oils and fats markets**

#### **Description**

The Ugandan vegetable cooking oil and fat market is dominated by low cost products, mostly produced from imported crude palm and sunflower oil and domestically grown sunflower seed. US cooking oil from USAID's PL480 programme is also sold on the market, although programme officials claim that quantities are insufficient to distort the market. The size of the vegetable cooking oil market is estimated at approximately 44,000 tonnes (Otimodoch and Singh 2000) and is growing at about 2% per annum. 65% of cooking oil is currently produced from imported raw materials.

Mukwano Industries Ltd, Uganda's largest oil processor, has plans to install a solvent extraction plant in northern Uganda with a capacity of 500 tonnes of oil per day. The plant will be supplied with oilseeds grown on a 10,000 ha company farm and on a considerably larger area owned and managed by outgrowers. If this plan is realised, Uganda will probably become self-sufficient in oil seed production.

Vegetable oil and fat consumption is highly price sensitive and consequently brand loyalty, at least among poor and lower middle class consumers, is low. Wealthier consumers prefer "big name" company products, which they associate with quality and status (pers. comm. William Mollah, Research International)

#### **Crude Shea oil and olein**

Crude Shea oil can be used as a cooking oil either directly or fractionated to yield stearin and olein. The stearin is valued too highly on domestic and international cosmetic markets to be used as a cooking fat. However, Shea olein has yet to find a substantial international market and therefore could be sold as a cooking oil on the Ugandan market. It is a golden coloured oil, of which the quality has tentatively been compared with olive oil (Maranz and Wiesman 2000).

Consequently, it could potentially be marketed to the small but probably growing group of wealthier Ugandan consumers who appreciate quality cooking ingredients. If it was produced in any quantity, it would have to compete on price with refined palm and sunflower oils. Our financial analysis of Guru Nanak Oil Mills in Lira suggests that this can be done profitably (section INSERT NUMBER), assuming that a reasonably valuable market for Shea stearin can be found, in the local cosmetics market.

#### **Sources of supply**

One option would be for NUSPA in conjunction with COVOL to supply cold pressed crude Shea oil to the cooking oil market. However, in the absence of a market premium for crude Shea oil, the profitability of doing this would be questionable. Marketing the product in the north would be unwise, given northern consumers' preference for a much darker oil, and the danger that cold-pressed oil would capture market share from traditional oil processors (de Saint Sauveur 1999).

Alternatively, COVOL has the capacity to supply olein as a by-product from its fractionation process. Assuming that COVOL continues to supply Shea stearin to the valuable cosmetics industry in the U.S., the organisation could probably sell Shea olein at a price that is competitive with the palm and sunflower cooking oils that currently dominate the market. This aspect is however, much dependant upon the levels of processing that COVOL undertakes.

#### **Quantity**

If Guru Nanak Oil Mills (GNOM) implements its plans to produce Shea stearin for the export market, there could be up to 600 tonnes of Shea olein available to the national vegetable cooking oil market. Mukwano Industries currently plans to extract and export crude Shea oil. However, if the company went one step further and fractionated its crude oil, the total amount of olein on the Ugandan market could rise to as much as 1700 tonnes. COVOL's output would not add

substantially to this figure. The capacity of the market to absorb the total quantity would depend on how competitively priced the oil is.

#### **Expansion in Uganda - Opportunities and Desirability**

In the Shea olein context, expansion means moving from very small and irregular production to substantial tonnages. Whether this happens will depend on private sector decisions, which to a large extent are beyond donors' influence. There is an opportunity to supply a competitively priced Shea olein product to the expanding cooking oils market. As a by-product of Shea stearin export production, Shea olein could be sold as a highly competitive product. Sales of crude Shea oil on national and possibly regional markets depend crucially on consumer preferences and how cleverly the product can be marketed.

#### **Potential constraints to expansion**

- ◆ Commercial decisions not to extract and fractionate Shea stearin and olein. Although current interest from GNOM is high, many factors could persuade its owner not to proceed.
- ◆ Adverse changes in the international markets for stearin. The international cosmetics market for stearin will become more integrated, meaning that the very high prices that some buyers are willing to pay will decline. The current situation is that Shea stearin is being sold into the CBE market at 60 us cents / kg and virtually the same product is being wholesaled into the cosmetics market at prices ranging from \$5-25 / kg.
- ◆ Insufficient supplies of Shea nuts.

#### **Economic implications in northern Uganda**

Shea nuts will become a more valuable resource. Due to its remoteness and scattered distribution, its further exploitation will have to involve poor local people. This will help to spread the economic gains from the new Shea industry among poor communities.

#### **Implications for traditional Shea oil activities**

As long as industrially extracted crude Shea butter is not marketed in the north of Uganda, the only danger to traditional processing activities would be if competition for the Shea resource pushes nut prices upwards.

#### **Implications for the environment**

The biggest danger would come from the over-exploitation of the Shea nut resource and the subsequent interruption to the natural regeneration of the Shea tree species.

#### **5.4. Ugandan cosmetics industry**

Following a series of focus groups conducted in September and October 2001 in Kampala and Lira, there appears to be potential for developing value-added Shea cosmetic products for a domestic market of expatriates and upscale Ugandan women.

While most respondents had never heard of Shea before, all respondents reacted very favourably towards it when told of the benefits. These product benefits - namely healing and moisturising - combined with the emotional benefits of 'Organic', 'All Natural', 'Environmentally conscious' and 'Made in Uganda', create a very appealing proposition. For expat women, the additional emotional benefit of community trading and women's empowerment were also valuable, but to a much lesser degree with the Ugandans.

Women would be interested in buying lip balm, body lotion, hand cream, and soaps. With the current emerging perceptions of richness, shea butter does not lend itself well to face cream.

With regards to a market in Northern Uganda for improved Shea cooking oil, response was very positive, but the reality of limited income and the spending habits of the women in Lira does not lend itself to further developing the product. Currently, the women buy only very small quantities of oil, tending towards the cheaper multipurpose oils like sunflower oil (locally produced) or 'cooking oil' from Mukwano. Shea Nut oil as a comestible is seen to be a luxury (and a seasonal one at that), not an everyday commodity. Even if the price were to remain consistent, the flavour of shea is not one that people would want in their daily diet.

Research was conducted among expatriate women living in Kampala (from Europe and North America), and among Ugandan women in Kampala and Lira. Asian women (who comprised of one focus group) were not willing to come to the focus group (husbands did not want them to travel outside the home to meet a stranger). Appointments are being made to visit these women in their homes and an addendum report will be submitted shortly to include these findings.

#### **Background**

In Northern Uganda, Shea oil has a current market in its crude form for various household uses:

- Cooking fat
- Food accompaniment and/or flavour enhancer
- Cosmetic use (moisturiser, skin protectant)
- Healing cream

Commercially, a fractionated version of the product – stearin – receives high unit returns when sold to the US cosmetics market, but export volume continues to be very low.

Commercialisation of the product on a local scale has been unsuccessful to date, possibly due to several likely factors:

- No promotional support
- No clear communication and understanding of benefits
- Confusion in consumer perception of the oil

The benefits of Shea oil are not currently valued, and the product competes in the market purely based on price.

Foodnet / IITA , through support to the appropriate commercial or community organisations, want to promote sustainable development in Northern Uganda. Trade in renewable shea tree products could potentially promote economic growth while protecting the natural environment.

Research was needed to investigate the market potential of ‘cold-pressed’ and ‘traditional’ shea oil products, for local and regional markets.

Pamela Kertland Wright was contracted by IITA to manage and conduct qualitative research in Kampala and Lira among the potential target markets. Ms Wright has managed numerous research projects in Uganda, Canada and the UK. A field team was appointed and managed by the lead consultant.

### **Methodology**

A series of focus groups were conducted among women in Kampala and Lira. Groups in Kampala focused on the cosmetic sector and involved expatriate, Aisan and Ugandan women. The majority of Asian women approached were unwilling to leave home without their husbands and will interviewed in their homes at a later date. Summary of these depths discussion will be provided as an addendum to this report when these interviews are finished.

The Lira groups focused primarily on the cooking oil sector and were conducted in Luo, the local language.

Separate discussion guides were designed for each group of respondent, each following a specific line of discussion, touching on all of the topics required. The discussion guides were approved by the client and are appended.

A maximum of eight women attended each focus group, which lasted approximately two hours. Each woman was given refreshments and a cash incentive for attending the group, which encouraged and ensured participation from all respondents.

As stimulus material, respondents were shown several concepts of Shea butter (appended) and were also shown a collection of shea products ranging from locally produced butter and oil to products produced in Britain, France and the US.

Brands shown:

- L’Occitane Shea product line: soap
- Body Shop
- Nilotica
- Locally produced soaps
- Covol oil and butter
- Local oil

In addition, during the field visit to Lira, an oil-milling factory was visited (Guru Nanak) as well the local town market where several oil vendors were informally interviewed. Several retailers were visited in Kampala.

The field team consisted of the following: Pamela Kertland Wright as lead consultant, Naome Namakula handled recruiting, Florence Akello and Martin Odido conducted upcountry fieldwork in the Luo language. The above field team are all graduates of Makerere.

### **Detailed findings: Cosmetics**

#### **Current Usage and Attitudes**

**Expatriate women** are far more entrenched in beauty and cosmetic routines than their Ugandan counterparts.

All women interviewed bathed daily, sometimes twice a day. They used a wide range of soaps, some bought here in Uganda and some brought in from home leave. Most expat women have established a routine of cleansing and moisturising in the morning and evening and indicate a high degree of brand loyalty, especially where the face is concerned. Some women had been using the same brand for over 10 years. Brands used are all well-known, and high-end:

- Clarins
- Neil's Yard
- Clinique
- L'Oreal
- Elizabeth Arden
- Body Shop
- Vichy
- Lancome

Expenditure on face creams is a given for these women and needs no justification. Many use a day cream as well as a night cream, which is reportedly richer and more 'reparative'.

These women believe that by living in Africa they are more exposed to sun damage than their European counterparts and are more likely to use expensive products to counter the effects of *aging*.

**“They say that for the skin, one year in Africa is like 3 years anywhere else”**

Ironically, however, none of the women in this group used sun protection in their daily routines.

For all-over body moisturising, this group agreed that because of the humidity in Uganda, there is less need to moisturise their bodies than in their native countries. They do moisturise if they have been swimming or lying in the sun, or when preparing for a special evening out. When moisturising the body, there is less brand loyalty and less tendency to spend highly. Products are more of a supermarket variety: Revlon, Vaseline, Johnson and Johnson. Only one woman stuck to her line of products for all skin-care (Clarins).

**Ugandan women** are far less brand loyal. They are aware of the numerous brands available, but tend to roam between brands of soaps, creams and oils. This group is also far less likely to differentiate between moisturiser for body and for the face, and are much less likely to spend highly.

Brands used are as follows:

- Mary Kay
- Pixie
- Revlon
- Shelly Cream
- Faraway
- Fair and White
- Fair and Lovely
- Comfort
- Clear
- Nivea
- Soft and Free
- Protex
- Vaseline
- Cussons
- Mekako
- Black Star
- Clear Essence
- Body Shop

For Ugandan women, South African, British, and even Kenyan products are seen to be far superior to Ugandan. They have better packaging, better promotions and, by association, better content.

Ugandan women in the north use shea butter for 'smearing'. They use it as a moisturiser but only for babies – adults do not use it because of the smell.

#### **Where do women buy these products?**

*Expat women tend to buy their cosmetic products while on home leave. They also have a tendency to stockpile for the year ahead. Some of the brands and products used (ie: l'Oreal) are available in Uganda now, but at a significant mark-up and these women don't like paying more than they need to.*

Duty Free counters are a popular place for buying cosmetics – *if they are buying a product they are already using*. All women in this group said that they preferred specialty shops if they are trying a new product, partly for the expert opinion, partly for the relaxed atmosphere and partly for the pampering.

Soaps and body lotion, however are bought in a myriad of retail outlets, from chemists to supermarkets to specialty shops. Lotions and soaps are bought locally, but are generally imported. There is a real lack of knowledge of any Ugandan products, and the general feeling is that Ugandan products are bound to be inferior.

Ugandan women are divided into two camps: the younger more brand-savvy women (19-30) are likely to shop at Pioneer Mall for their cosmetics. There are two specialty shops there that deal in beauty products. Another shop, Avoa, on Buganda road was also cited. Some women buy

their products from the beauty salons where they go for treatment. As with the expats, these women are looking for an outlet offering advice and a level of customer care.

Note: *they trust these shops and the products bought from them.*

There is great concern that there are too many product rip-offs in Uganda. Consumer Protection is in its infancy and cosmetics are seen by these women as a prime target for rip-off scams.

These women do not buy from town, from the hawkers or from Dukas as they suspect that the products are not bonafide. They also suggested that Ugandan products are far more likely to be ripped-off than imports.

The older women (35-50) are far less likely to care about these things and tend to buy their beauty products at supermarkets for ease. They have full time jobs and children at home and do not have the time to shop specially for cosmetics (they will, however, sit in a beauty 'saloon' for two days to have their hair done for a special occasion).

#### **Why buy one product over another?**

- Word of mouth is one of the most powerful means of influence. Women in all groups talked of friends suggesting they try a certain brand or product.
- Advertising is also very influential to call attention to the product. The younger Ugandan women spontaneously cited several ads which influenced their decision, and openly scoffed at some of the ads produced in Uganda (ie: Sleeping Baby)
- Packaging has a tremendous impact, especially where on-pack copy is concerned. Words that draw the consumer in are: Natural, anti-aging, smooth skin, revitalising,.
- Ugandan women are significantly more likely to read labels that list the ingredients, ever watchful for hydrochloride, a bleaching agent. In both groups it was stated that they would never buy a product which contained this ingredient.
- Despite all of the above factors, women will not continue to use a product if it doesn't appear to work for them.
- Younger Ugandan women will switch brands if they feel that their current brand is becoming 'too common'. As they become more sophisticated as consumers, they want to stay one step ahead of the trend.

#### **Ugandan products - Attitudes**

Ugandan products that are perceived to be good are generally agricultural in nature: fruit, vegetables, meat, tea and sugar. Coffee is misunderstood, and those who drink it drink imported instant coffee . There appears to be an underlying lack of faith in any Ugandan value-added product, despite a real awareness that Uganda could produce so many more consumer products.

Perceptions are currently that Ugandan products are inferior to imports. As far as the respondents are concerned, the following are problems with domestic products:

- Ugandan oils are not refined
- Ugandan clothes shrink fast and tear more easily
- Ugandan packaging is unattractive
- Ugandan manufacturers don't really care about quality



- Uganda products are duplicated – cheaply and badly – by imitators and consumers have no recourse
- Quality control is not so much an issue as it is with other imported products

There was a real scepticism among the Ugandan women about Ugandan-Asian manufacturers, an undercurrent that these manufacturers generally compromised quality in pursuit of a profit. Several women even said, as the conversation progressed “Do not let an Asian develop these products for you”. The suggestion was, should this be the case, this segment of the market would be lost due to this pre-held scepticism.

### **Shea Products - Cosmetics**

#### **‘This is really too good to be true!’**

The women were all shown written concepts describing Shea, the origins, the properties, the physical benefits and the potential emotional benefits. These concepts were devised from numerous articles found on the internet and edited to suit the focus group environment.

Segments of the concepts have been isolated and expanded on below, but the key finding here is that gestalt (i.e.: ‘the whole is greater than the sum of the parts’) of the benefits is far more powerful than individual concepts.

Healing and Moisturising: Response was overwhelmingly positive to these concepts. Spontaneous links to Cocoa Butter and Aloe Vera were made, but it was acknowledged that there was no known cream that achieved both healing and moisturising.

**“I would consider using this for my son who has eczema. We have tried so many different things and nothing so far has worked.”**

It was noted that some women felt that this sounded too rich for facial use, afraid that it would cause breakouts and spots. As a night-cream it sounded conceivably affective, and as an all-over moisturiser and after-sun cream it sounded ideal.

‘Organic’, ‘Natural’: Conceptually, these are great selling points. Expat women have been buying into this concept for years, and Ugandan women are beginning to see the advantages. For the Ugandans there is particular concern about the addition of bleaching agents.

It is important to note, however, that consumers today are increasingly sceptical and terms like these are open to abuse. This led to a debate in several of the groups about whether preservatives are allowed in ‘Natural’ products. 100% Organic products are more likely to go rancid or smell bad, but by adding a preservative, you lose the organic status. It was agreed that a preservative was acceptable.

‘Environmentally Friendly’: All of the women unanimously supported the environmentally friendly concept of shea products. Deforestation is becoming an increasingly salient issue in Africa, a concern borne by both Ugandans and expats alike. The fact that the shea nut harvest for oil production protects the trees from being felled is an extremely appealing factor. In addition, it was understood that the Karite tree is indigenous to the area (not a plantation tree) and as a result, preservation of the trees became more significant to the respondents.

Tradition, Heritage: while there is a current general global fascination with traditional remedies, this concept was not altogether powerful for the respondents. In fact, this is possibly a turn-off for some of the younger, more modern and urban Ugandans who are shrugging off their heritage

in pursuit of sophistication. The scientific explanation of Shea's wondrous properties was far more effective, and relevant.

Community Development, Womens Groups: Again, this concept had higher cachet with the expatriate women whose collective consciences have been bombarded with 'responsibility' issues for years. Buying a product that helps a community, especially a women's cooperative adds a deep 'feel good' factor. The Ugandan women, while they were not opposed to this concept, felt that these women in Lira were simply doing their job...they didn't want to have to think about it.

Poverty Alleviation. This concept is a little less personal and a little less 'visual'. All of the respondents like to feel that they are contributing, and supporting those less fortunate than themselves.

### **Sample products**

A number of products were brought to the table for the women to try: creams, lip balms and soaps. The women were impressed and a little surprised that Shea products were already being produced elsewhere...which gave Ugandan shea a little more credibility.

The locally produced soaps were well liked (produced by Jane Bates). Respondents particularly liked the inclusion of herbs, both from a scent perspective as well as a textural perspective. The imported hand cream and moisturiser (produced by l'Occitane, mixed with honey and African flowers) was also met with rave reviews, in particular the scent and the packaging. Expats liked the soap from l'Occitane, but Ugandans did not.

Nilotica packaging was well-liked (green glass jar) but the lemony scent was overpowering.

The pure shea butter was then passed around and while all agreed that it had a very unpleasant smell, all liked the texture and how it made their skin feel. It was understood that this was 100% pure shea butter, and could be reduced to a lesser consistency (like the l'Occitane 20% shea products). As long as the ingredients were natural and Shea was one of the primary ingredients, respondents were still positive.

### **Where would you buy it?**

Many respondents suggested that a specialty shop should be opened in Kampala that showcased natural Ugandan products like this. A dedicated shop would prevent false rip-offs and provide the level of trust that many women need. Others suggested Pioneer Mall, Banana Boat (Kisemente), Avoa (Buganda Road). Expats added that they would certainly buy up lots of soaps and creams to take back to their home countries as gifts.

The owner of Avoa, Ori Kahana was interviewed following the fieldwork and indicated a willingness to further explore shea products. She currently is making her own products, and uses shea. Other manufacturers (UKI, AVIS) are interested, but not yet using it.

## **Detailed Findings – Cooking Oil**

### **Current Usage and Attitudes**

All of the women use cooking oil. They listed the oils by type, ie: cotton seed, sunflower, shea, muzigo, and Mukwano. To these women, Mukwano appears to be a type of oil rather than a brand or manufacturer, which is an indication of how unaware of brands women in the rural districts are compared to their more urban contemporaries. (According to the Lira oil-miller, Mr. Singh of Guru Nanak, the Mukwano oil is generally a mix of sunflower oil and imported palm nut oil, but the women just call it Mukwano).

Oil is frequently bought on a daily basis in various forms of containers:

- Cavera (plastic bag)
- Small tots or shots
- Small liquor bottles: ¼ litre
- Larger liquor bottles
- Jerry can: 5 litre, 20 litre

Mukwano is perceived as the better oil. Women refer to it as refined. Sunflower oil is recognised as locally produced but its heaviness and thickness are less desirable.

Mukwano and Sunflower oil are used for frying on an everyday basis use – and generally the women are buying it on a daily basis in small quantities. A clear product benefit of these types of oil, however, is their ability to withstand storage. Other oils tend to go rancid very quickly.

Cottonseed oil is used by Lira women, but not greatly liked because of its foul smell.

Shea oil is generally used as a flavour enhancer, not as a cooking oil. (Muzigo – or cow fat) is used in the same way. The roasted nut flavour of the shea oil is said to add a distinct flavour, and many women believe that adding a spoonful of oil creates a richness of texture, which will ensure that the belly is filled more quickly. It was said by several women that the distinct flavour of shea is part of the reason they do not use it more frequently: they tire of it (The paradox is, without this distinct flavour they would not buy it.)

### **Where do women buy these products?**

Women in Lira are not economically well off and tend to buy oil when they can. This means they are buying it in very small volume, sometimes on a daily basis. Oil is being bought at the market, from a duka (small makeshift stall), direct from the processor (cheaper), and in some cases, the women process it themselves despite the amount of time and effort required.

Shea is a seasonal oil, and while it is available in the markets year round, the price fluctuates dramatically (up to 100% more expensive in February-April). Pricing for other oils remains stable throughout the year. In addition, many women complain of the erratic quality of processing and say that the oil can be bitter if the roasting has not been done correctly, or the extracting has not been done correctly – the quality of other oils remains consistent

### **Improved Shea Oil**

There was great interest in the refined oil shown to the groups – they were impressed that their traditional product could be improved. If quality could be guaranteed (and the product priced consistently) the women were definitely interested in a value-added product. This should be

treated with an element of caution, however, as economics and behavioural patterns suggest that the women will not change their purchasing habits.

They felt that the colour was too light and that as a result the flavour would not be the same, but made suggestions about improvements.

**“you need to roast the nuts more or else you won’t have the flavour”**

It is possible that there could be a slow evolution away from other oils towards improved Shea oil, but the women are very entrenched in their habits and views. Without a high degree of sensitisation about the benefits of shea oil vs the sunflower oil and mukwano oils (ie: does not smoke at high temperature), shea will continue to have its niche as a flavour enhancer or a specialty oil in the north.

**Response from interview with Ugandan cosmetics companies**

In a rapid survey of the major local cosmetics companies in Uganda, the response to possible use of Shea product was favourable.

Company A purchases 300 tonnes of stearin per month at cost of \$350 per tonne is importing its products and would be interested to learn more about local supplies. The quality of the stearin was however paramount. The company would be interested to conduct trials with a supplier and would also like more information on product quality tests and market acceptance.

Company B provided no information on levels of stearin usage, but indicated that all the materials were imported. The company had heard about Shea and would be willing to trade in Shea if a supply of good quality materials, at low cost were available.

Company C. which is producing cosmetics (Lotions, Shampoo, Creams, Liquid soap) and Beauty Products is using a range of material including

- Shea butter
- Synthetic Stearic Acid
- Fatty Acids
- Sunflower
- Essential oils

At present, the company is buying 200 – 300 Kg per month of Shea Butter which it is using in the manufacturing of creams and Lotions. When Soap making begins, about 500 – 1,000 Kg could be utilized per month. The Shea butter used in this plant is supplied by Mr Singh (Nanak Oils) and it is produced locally from Northern Uganda. A similar quantity of synthetic Stearic acid is used and it is imported from the UK.

The company noted that Shea has been found to possess very good skin moisturizing properties. It is also a very good skin softener and it is less expensive than imported raw materials. Limitations in using Shea butter: include the lack of purification, potential for contamination by antioxidants and uncertain shelf life. According to this company the future for Shea looks bright and this company may utilize about 2 Tons of Shea butter every month in the manufacture of cosmetics and soap.

## 5.5. International cosmetics industry

### Shea Butter Uses and Concentrations

Shea butter is used as a fattening agent in cosmetic products, as well as topical ointments, creams and lotions. Because of its high content of unsaponifiables, it is mostly appreciated for facial, hand and body care products, giving a very pleasant smooth feeling to the skin. Also recommended for lipstick, make-up, sunscreen formulations and preparations for sensitive skins, due to its anti-inflammatory qualities. Shea Butter may also be used in hydrophobic (oil based) products, or in the oil phase of formulations for cosmetics, toiletries including soap industries and O.T.C. pharmaceutical preparations.

<i>SKIN CARE</i>	<i>O.T.C. PHARMACEUTICALS</i>
Sun Care and After Sun Products	Topical Analgesics and Anesthetics
Hand and Body Lotions (Oil Phase)	Hydrocortisone Creams
Shaving and Depilatory Preparations	First Aid Creams
Glamour Cosmetics (Hydrophobic)	Anti-Acne Preparations
Bath Oil	Rubs, liniments and Ointments
Facial Moisturizers	
<i>SPORT</i>	<i>INTERNAL AND ORAL APPLICATIONS</i>
Athletes and Sportsmen Cream	Lips Balms and Lipsticks
Body Butter	Oral Ointments

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### Concentration

Depending upon the formulation and budget, one will most likely want to choose a level which will take into consideration the cost-effect and the efficiency in the formulated product.

Two options :

- You are searching a better marketing labelisation with Shea Butter effect use below 5%.
- - You want the product to perform better due to Shea Butter in the formulation, use 10% and more.

### Supply and demand

The main cosmetics buyers of Shea butter/oil<sup>6</sup> are located in Europe and the U.S.. Although Shea butter is used extensively in Japan's food industry, it is not used in the country's substantial cosmetics industry (Bekure et al. 1997). European and U.S. cosmetics companies buy from a variety of sources, depending on their requirements. A large proportion of cosmetics Shea butter is purchased from the food industry in a highly refined form (de Saint Sauveur 1999). Such butter is cheap (having usually been obtained through solvent extraction), readily available,

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<sup>6</sup> The West African product is usually referred to as a butter, due to its solid form at room temperature. By contrast, the East African product is liquid at room temperature and is usually termed an oil.

reliable in quality and does not become rancid. However, the refining process removes most of the sun-protection, healing and antiseptic qualities of the natural butter. Despite this, most of the larger cosmetics companies prefer to use refined butter because of the natural product's reputation for unreliable quality and the occasionally high content of free fatty acids, the cause of rancidity (ibid 1999). This also enables the producer to label the product as a Shea formulation.

Smaller companies and specialist cosmetic ingredient suppliers are willing to buy unrefined Shea butter from Africa. However, concerns over quality have forced them to become intimately involved with its production. In some cases, buyers prefer to buy Shea nuts and extract the butter themselves. This approach has been adopted by TECO Finance, a French company that is one of the largest suppliers of unrefined cosmetics Shea butter in the world.

When sourcing butter directly from Africa, buyers tend to form exclusive relationships with African suppliers, thereby creating discrete marketing chains. This lack of market integration creates a situation where prices offered for essentially the same type of Shea butter can range from as little as US\$1/kg f.o.b. to as much as US\$60/kg c.i.f.

In Europe, cosmetics manufacturers have tended to use Shea butter in small quantities to add specific qualities to their products. Product promotion has paid no attention to the Shea butter content. More recently however, several European companies have introduced products that contain large proportions of Shea butter. Promotion of these products has focussed on the additional health-giving properties of Shea butter.

In many instances, U.S. cosmetics companies have treated Shea butter rather differently from their European counterparts. They have concentrated on selling Shea butter products into the "ethnic" and "natural product" market sectors (Bekure et al 1997). Shea butter content has been high and promotions have concentrated on the origins of the butter and its natural qualities. Large scale U.S. cosmetics manufacturers also use Shea butter, although they almost certainly buy refined Shea butter sourced from Europe.

### **Quantity**

The fragmented nature of the international Shea butter market means that no precise information is available on the quantity of Shea butter used in the cosmetics industry. Estimates range from 400 tonnes per annum to over 1500 tonnes (Jaeger 1999).

### **The future**

After an initial period of interest in the 1970s, sales of Shea butter to the cosmetics industry declined. However, interest has now revived and the market is almost certainly growing. The rate of growth however, is unknown.

### **Ugandan Shea oil**

International buyers have traditionally purchased West African Shea butter, which as previously noted, is much harder than the Shea oil from East Africa. Consequently, international buyers tend to be expect hardness. COVOL has tried to reproduce the qualities of the West African butter by fractionating Shea oil to produce Shea stearin (de Saint Sauveur 1999). However there are at least three reasons why East African crude Shea oil or even Shea olein has advantages over the West African product:

1. East African oil penetrates the skin more easily. Americans and Europeans prefer this quality.
2. East African Shea oil can be incorporated directly into an emulsion without further processing.

3. Shea is very good for the hair but the hardness of the West African butter limits the amount that can be used in hair formulations. East African Shea oil does not present these problems (ibid 1999).

East African Shea olein may also have considerable potential. After fractionation it remains high in unsaponifiables and vitamins, which makes it particularly suitable for moisturising creams (de Saint Sauveur 1999).

### **Expansion of Ugandan supply in Uganda - Opportunities and Desirability**

There seems to be some scope for increasing supplies of Ugandan crude Shea oil to the international cosmetic ingredients markets. Current interest in extracting Shea oil in Uganda for this purpose suggests that the opportunity could be exploited and there are players in the market who are interested in direct investment such as GNOM AND MUKWANO, see sections 6 and 7.

### **Constraints to expansion**

- The market is very small. If Guru Nanak Oil Mills and Mukwano Industries decided to enter production they would almost certainly swamp the current international market.
- The fragmentation of the market means that personal contact with buyers is indispensable. Buyers need to be reassured themselves that they will receive quality products and service. To add to the difficulties, East African Shea butter is not as well known as its West African counterpart.
- Market fragmentation will almost certainly diminish as the U.S. market matures and the very high prices paid by a few buyers will disappear. However, the market will become more predictable and easier to sell into.

### **5.6. The market for Cocoa Butter Equivalents**

Cocoa butter gives chocolate its texture. It melts at body temperature and gives that familiar sensation in the mouth. However, despite recent low international prices, it remains one of the most expensive ingredients in chocolate. For many years the confectionery industries in several countries have been using alternatives to reduce the quantity used. Cocoa Butter Equivalents (CBEs) are the closest substitutes for cocoa butter, and not only reduce the manufacturing cost but can also modify the properties of chocolate and confectionary products to allow more versatile uses. Among CBEs, those manufactured from Shea butter are highly regarded.

The Shea butter CBE manufacturing process involves extracting triglyceride fractions that in combination have the same melting point as cocoa butter. The process is highly specialised and conducted by only a few companies in Europe and Japan. In Europe, Aarhus Olie in Denmark, Karlshamns in Sweden, and Unilever (Loders Croklaan) in Holland, manufacture CBEs from Shea butter. In Japan, Fuji Oils is the major producer.

Secrecy within the CBE industry means that no precise figures for its Shea nut demand exist. However, industry sources suggest that imports to Europe and Japan amount to between 50,000 and 70,000 tonnes Shea nut equivalent per annum (Jaeger 1999). 50,000 tonnes would yield approximately 20,000 tonnes of Shea butter and 7,000 tonnes of Shea stearin, the hard fraction that contains the triglycerides of interest to the CBE industry. Trade volumes are probably increasing, due both to recent changes in EU legislation that has harmonised CBE usage in chocolate across the 15 member states and to a recovery in the traditionally strong CBE markets in Eastern Europe.

All Shea nuts and butter comes from West Africa, principally from Ghana, Burkina Faso, Mali and Cote D'Ivoire. The further east one travels across Africa's Shea belt, the softer Shea butter becomes. Given that CBE manufacturers are interested in the Shea hard fraction, the industry has paid no interest to Shea nuts produced in Uganda, the Sudan and Kenya.

In the past, the major Shea butter CBE companies have preferred to import Shea nuts and conduct their own crushing, thereby ensuring that they are using the best quality ingredients in their manufacturing processes. However, environmental concerns in developed countries are beginning to force companies to rethink. Legislation in Japan and the EU is increasingly discriminating against the smells and effluents associated with oil seed crushing. Aarhus remains the only European company that continues to crush its own Shea nuts. Loders contracts independent toll crushers in the UK, and within the last year, Karlshamns has sold its crushing mills. In Japan, Fuji Oils only imports Shea butter, leaving the extraction process to companies in countries of origin.

Shea butter CBEs have to compete with CBEs produced from palm oil mid-fraction, illipe oil (from the nuts of the mahwa tree, found mainly in Indonesia and Malaysia), and sal fat (from the sal tree in India). Of these competing fats and oils, palm oil mid-fraction is dominant, and sal fat is generally regarded as inferior. Illipe oil has become all but unobtainable in recent years. The competitive position of Shea nuts and butter is therefore quite strong, and at least for the time being, supply can not keep pace with demand. Furthermore Shea butter CBE manufacturers are unlikely to change their processes to suit other fats and oils because they have invested heavily in highly specialised processing technology for transforming Shea butter into CBEs.

Trade in Shea butter and nuts is not done through conventional commodity markets, in which thousands of transaction occur each day and futures and options markets provide mechanisms for risk management and price discovery. Too few buyers and sellers exist for such arrangements to have emerged. Trade is usually conducted through long standing relationships between organisations that know and trust each other.

In summary future demand for Shea butter as a CBE ingredient looks healthy. Changes to EU chocolate regulations, an improvement in CBE demand in both Eastern Europe and Japan, and the continued scarcity of illipe oil, suggest that West African Shea nut and butter traders can expect to receive a growing number of export enquiries. Furthermore, tight environmental legislation in developed countries suggests that the Shea butter CBE manufacturers will increasingly wish to import Shea butter rather than Shea nuts.

### **Opportunities in Uganda**

As already mentioned, Ugandan Shea nuts produce an oil that is far too soft for the CBE industry. However, as part of our research, we tested the industry's interest in buying Ugandan Shea stearin (the hard fraction of Shea oil), a product that in theory should have similar properties to West African Shea butter. Mr Singh of Guru Nanak Oil Mills in Lira provided us with a sample of his Shea "stearin", which we asked Loders Croklaan to analyse and comment on. Unfortunately, the reaction was entirely negative. The sample was "even softer" than unfractionated West African Shea butter and its "fatty acid profile does not suit [Loders Croklaan's] application at all".

The sample's softness suggests that Mr Singh's process only partially fractionates the Shea oil. However, even if the oil was completely fractionated, the fatty acid profile would remain unsuitable. Clearly it is unwise to base any conclusion on the results from a single sample but the long history of CBE industry indifference to East Africa Shea gives no room for optimism. Consequently we do not recommend donor support for Ugandan attempts to break into the CBE raw material market.



## **Part 6. Guru Nanak Oil Mills (GNOM)**

For twenty years the owner of GNOM, Mr Surjit Singh, has made his career in oil and fat extraction, fractionation, refining and further processing. As a chemical engineer with an MBA he is a respected member of the Ugandan oils and fats industry. Before establishing his own factory in Lira in 1996, he was Mukwano Industries' oils and fats production manager.

His factory has two Indian made expeller presses, which have a capacity of 15 tonnes of oil per day. He currently processes cotton seed and sunflower oil. The products are sold on the local market in competition with oil from other large and small Ugandan manufacturers. GNOM also processes its oil into liquid detergents, wood preservatives and disinfectants.

Mr Singh's interest in Shea extraction grew when he discovered the high prices that US cosmetics manufacturers are willing to pay for Shea stearin. He built a pilot plant in his factory and experimented with extracting crude Shea oil and fractionating it into stearin and olein. Subsequently he visited California and contacted several cosmetics manufacturers and raw material wholesalers. In the meantime, he has supplied small quantities of stearin to Ugandan cosmetics manufacturers.

His current plans involve devoting his factory to Shea extraction for at least half the year. Initially he will purchase nuts from local wholesalers during the Shea season but ultimately his procurement requirements will force him to establish his own Shea nut buying network.

The following financial analysis (**Table 14**) is based on a potential order of two hundred and forty tonnes of Shea stearin per annum from the Shea Butter Company of Chicago, Illinois. GNOM would supply this quantity in six months, while the rest of the yearly capacity would be devoted to crushing cotton and sunflower seed. The Shea olein by-product would be sold at competitive prices on the local cooking oil market.

**Table 14. GNOM – Analysis of Shea processing profitability**

	\$ per annum	% of costs
Operating costs – variable		
Raw material	428,571	82.5%
Transport of stearin to Entebbe	5,486	1.1%
Unskilled labour	<u>1,440</u>	<u>0.3%</u>
Sub-total variable operating costs	435,497	83.8%
Operating costs – fixed		
Management	15,000	2.9%
Technical personnel	6,000	1.2%
Electricity, medical, motor, office	2,057	0.4%
Routine maintenance	<u>10,000</u>	<u>1.9%</u>
Sub-total fixed operating costs	33,057	6.4%
<b>Sub-total operating costs</b>	<b>468,554</b>	<b>90.2%</b>
Contingency - 5%	<u>23,428</u>	<u>4.5%</u>
<b>Total operating costs</b>	<b>491,982</b>	<b>94.7%</b>
Capital costs	<u>27,500</u>	<u>5.3%</u>
<b>Total annual costs</b>	<b>519,482</b>	<b>100.0%</b>
Annual revenue	<b>592,653</b>	
Profit (loss) before tax	<b>73,171</b>	

On the basis of this financial projection, GNOM would make a gross margin of 26.5%. This is a reasonably good return for a company of this type.

Although the analysis was conducted using fairly conservative assumptions, GNOM would be vulnerable to changes in key parameters. In particular, if the cost of raw materials increased by 14%, the company's gross margin would drop to 16%. Similarly, if the price of stearin dropped by 10%, the gross margin would drop to 23%.

On the brighter side, if Mr Singh's buying Shea nut operation can reduce raw materials costs by a realistic 14%, the gross margin would increase to over 37%.

#### **Recent Actions**

In July 2001, Mr Singh purchased more than 5 tonnes of Shea nuts to produce 2000 kgs of shea butter. Small amounts of this butter is being sold into the local Kampala cosmetics industries. Mr Singh is advertising his Shea butter in the local newspapers promoting his products.

#### **Constraints**

- ◆ Although several cosmetics companies in the U.S. have expressed interest in buying Mr Singh's Shea stearin, they are not willing to import. The Shea Butter Company is an exception but is only willing to offer a very low price (US\$1 f.o.b. Entebbe). Mr Singh lacks the necessary linkages to get his product to the U.S. and European markets.

- ◆ As previously discussed, the international Shea product cosmetics market is small and may limit the expansion of Mr Singh's business.
- ◆ The local cosmetics industry in Uganda, is unfamiliar with Shea stearin and will require considerable persuasion to buy bulk consignments of this product. Although, they have purchased small lots, the companies have indicated that they require more information on product usage and incorporation into creams and lotions.
- ◆ Mr Singh's entry into the much larger international food ingredients markets will be barred by a poor perception of Ugandan Shea oil, or he will not be able to compete on the this market due to more competitive prices in Western Africa.
- ◆ Finding the required volume of Shea nuts (2,140 tonnes) will probably not be a problem but if supplies are not properly dried and contain a large proportion of poor quality nuts, Mr Singh's raw material costs will rise substantially. Estimates of the proportion of nuts offered for sale that are of unprocessable quality range from 10 to 15%.
- ◆ On the basis of our analysis, during Mr Singh's six months of Shea processing, he will require US\$185,000 of working capital (refer to the appendices). Without making too many assumptions about Mr Singh's finances, he might find difficulty in raising this sum.
- ◆ GNOM would be unable to dispose of the large quantities of Shea nut cake (1,290 tonnes) that would be produced as a by-product of the crushing process. Mr Singh claims that the cake could be used as a fertilizer that also has insecticidal properties. Realising even a modest income per tonne of cake would increase GNOM's profitability substantially.

Mr Singh may go ahead with his plans regardless of donors intervention. However, his business is not so big that he is likely to ignore donor assistance if it was offered. The following donor interventions would simultaneously assist Mr Singh and protect the interests of poor northern Ugandans.

## **Part 7. Mukwano Industries Ltd.**

Mukwano industries is the largest Oil processing plant in Uganda. This industry, imports unrefined and refined oils. The main products from the processing plan are refined oils and soap. The MD of the company, Mr Alykhan Karmali, is currently considering a number of market interventions including:-

- 1 Installing a solvent extraction oil plant in Lira district with a capacity to process up to 500 tonnes of sunflower seed per day. The effects of this would put extreme pressure on the current association of 18 millers operating in Lira. The factory would reduce costs of oil and with an associated plan to develop a 25,000 acre farm to produce sunflower, the shift in source of material would significantly alter the current levels of oil importation.
- 2 Mukwano were also considering other options such as diversification into other types of oil crop including sesame and shea.
- 3 The Shea extraction would aim to process up to 2000 tonnes of oil per year, based on the purchase of some 5,000 tonnes of nuts. The stearin would be used in an in house cosmetics company and the olien would either be mixed into the sunflower oil or sold as a stand alone product, at worst the oil would be used in the soap making process.
- 4 In order to produce a high quality Shea Stearin, that would be accepted by the international cosmetics trade, Mukwano would be required to purchase a specialist deodourising unit, which is currently available from Alfa Laval at a price of approximately \$250,000.
- 5 Mr Karmali has already been in contact with the Body Shop, but it was clear that the Body Shop is only interested in community based organisations and would be prepared to deal with a larger business such as Mukwano.
- 6 An alternative market strategy would be for Mukwano to produce and sell the shea stearin into generic cosmetics companies that make products for the major retail stores in Europe. According to Mr. Karmali, there is a potential market for cosmetics and ingredient sales of such products for mass sales.

## **Part 8. Main findings and conclusions from the survey**

### **Importance of Shea in Uganda**

- 1 The survey confirmed that Shea is a significant source of income for the community in the main Shea producing districts of Uganda and that within the local market Shea trees are valued for cooking oil, but also for the fruit pulp, bark, roots and leaves, which are used in traditional medicines and for the wood and charcoal, used for building and cooking fuel.
- 2 In terms of gender, Shea is a crop which is almost exclusively the domain of women. The crop is gathered by women and children, the crop is processed and the majority is sold by women. Shea is enshrined in the domestic culture of women and is used as source of fruit, oil, Vaseline and medicine. Men are mainly involved in wholesaling and storage of shea nuts.
- 3 Surveys found that for women involved in shea nut and oil sales, this commercial activity was likely to be the most lucrative commercial activity of the year. Therefore any increase in demand for Shea nuts or oil would have a considerable positive economic impact on their livelihoods
- 4 For dietary and food security importance, shea is highly prized as a fruit during the lean season and is an important source of vitamins, for most of the villages in the northern districts, shea is the only source of cooking oil.

### **Environmental and Research status of Shea in Uganda**

- 5 Previous USAID investment in the Shea sector has significantly raised the importance of Shea in the production zone. Shea awareness campaigns have developed a strong community spirit towards protecting the Shea trees and preventing the exploitation of Shea for charcoal burning.
- 6 The COVOL project working in collaboration with and EU funded INCO has developed a strong team of Shea researchers and significant progress has been made in our understanding of the Shea crop. Much of this information is captured in the proceedings of a regional Shea Tree workshop, held in Lira, 2000.

### **World Trade in Shea**

- 7 In West Africa, marketing channels are well defined and there has been a long standing export of shea nuts and butter to European and North American countries. The primary export market for the West African Shea butter is as a substitute for cocoa butter in the chocolate and confectionery industry. However, there have also been some attempts to market local cosmetics products such as “Vaseline Shea Butter”. The commercial success of this product was mixed and Unilever (Ghana) have plans to relaunch this product.
- 8 International market demand for Shea products are increasing due to three factors (i) recent changes in EC regulations now make it possible to blend up to 5% non cocoa butter equivalents into chocolate products, (ii) The economic recovery in former Soviet states has led to increased demand for Shea for input into their confectionary products. (iii) There is also a renewed interest in Shea butter from the cosmetics.

- 9 Chemical analysis of Shea butter extracts indicates that Ugandan Shea has more similarities with olive oil and that this offers two potential markets, in cosmetic and oil production.

### **Supply of Shea**

- 10 According to FAO, the potential production of Shea in Africa is approximately 1,760,000 mt of Shea nuts. Only 35% of these nuts are gathered and 85% of this harvest is locally processed, to make 100,000 mt of local butter. Approximately 65,000 mt are exported, mostly to the food industry and it is estimated that 3000 mt per annum is used by the international cosmetics industry.
- 11 Potential Shea nut production in the Ugandan Shea Belt is estimated to fall within a range from 70,000 – 385,000 MT. This would yield between 15 – 80 million litres of oil using traditional methods, which would have a median figure value of US\$ 30 M. Extraction may increase up to more than 120 M litres with improved processing techniques.
- 12 From interviews and market visits it was estimated that the total quantity of Shea nuts traded through the northern Ugandan markets per year is approximately 6,000 tons. However, of these nuts most are traded between the same groups and therefore, we assumed a real trade in sellers and users to be 3000 – 4000 tonnes. This volume of nuts equates to approximately 700 tonnes of oil, or 0.7 millions litres of oil. Given that the wholesale value of shea oil is approximately 1500 shillings per litre. This translates to a market value of 1,155,000,000 shillings, which is equivalent to 0.66 M US\$. (1\$-1750 shillings).
- 13 The, current trade in Shea nuts accounts for approximately 4-5% of the oil produced from sunflower in Uganda. This figure does not take into account the amount of oil that is locally produced and does not enter the market place. Further studies would be required to determine this level.

### **Current market status of Shea in Uganda**

- 14 The COVOL project in association with Northern Ugandan Shea Processing Association, (NUSPA) has made significant progress in the past 5 years to develop a more robust market for Shea products. This includes the establishment of NUSPA members into a Shea nut gathering network of more than 200 farmers across all the Shea producing districts of Uganda. These members meet on a regular basis and most importantly, are able to grade nuts according to quality. A number women's groups have been trained in high quality processing of Shea butter and improved Shea processing equipment based on West African designs have been deployed to the local community. The project has developed a range of improved Shea products including (i) local cooking oils being hot roasted and cold pressed (ii) export quality hand and body lotions, (iii) lip balm and (iv) some novel pet products.
- 15 Within the marketing strategy, COVOL was to play a market linkage role between NUSPA, the local processors and high profile cosmetics retailers such as Body Time. Although this strategy seems to be sound, in terms of (i) local equity for the processors, (ii) the establishment of an intermediary, which handles quality and market linkage scouting and (iii) a strong retail partner in USA, the volumes of sales through this system were low. The costing structure was somewhat unclear and poor sales performance,

possibly due to lack of aggressive marketing techniques led to lack of confidence in the approach.

### **Prospects for Market expansion**

- 16 Market chain analysis found there are considerable seasonal fluctuations in market prices for shea nuts and that expansion of interseasonal storage would help to reduce the large seasonal price movements. It would also create a greater demand for nuts in the Shea season, increase household income during this period, and help to reduce household expenditure later in the year when Shea nuts have to be purchased. The overall effect would be an improvement in household food security and less income drain in the offseason period.
- 17 Prospects for expanding the Shea olein market would mean moving from very small and irregular production to substantial tonnages. There is an opportunity to supply a competitively priced Shea olein product to the expanding cooking oils market. As a by-product of Shea stearin export production. As the chemical profile of Shea olein is most comparable with olive oil, high quality Shea olein could be sold as a highly competitive product. Sales of crude Shea oil on national and possibly regional markets depend crucially on consumer preferences and how cleverly the product can be marketed.
- 18 Surveys in the local cosmetics markets found there was considerable interest in developing value-added Shea cosmetic products for a domestic market of expatriates and upscale Ugandan women. Most respondents had never heard of Shea before, but all respondents reacted very favourably towards it when told of the benefits. Women would be interested in buying lip balm, body lotion, hand cream, and soaps. With the current emerging perceptions of richness, shea butter does not lend itself well to face cream.
- 19 With regards to a market in Northern Uganda for improved Shea cooking oil, response was very positive, but the reality of limited income and the spending habits of the women in Lira does not lend itself to further developing the product. Further analysis of this would be required with samples of the high quality olein to pursue this possibility.
- 20 On main international cosmetics buyers of Shea butter/oil are located in Europe and the U.S. A large proportion of cosmetics Shea butter is purchased from the food industry in a highly refined form (de Saint Sauveur 1999). Such butter is cheap (having usually been obtained through solvent extraction), readily available, reliable, in quality and does not become rancid. However, solvent extraction removes most of the sun-protection, healing and antiseptic qualities of the natural butter. Smaller companies and specialist cosmetic ingredient suppliers are willing to buy unrefined Shea butter from Africa. However, concerns over quality have forced them to become intimately involved with its production. This type of linkage will therefore require a considerable amount of market support for any group working from Uganda, either in terms of direct market linkage with the cosmetics company or through an intermediary organisation in Uganda.

### **Potential agents for developing the Shea market in Uganda**

- 21 COVOL, are currently the only Shea processors in Uganda that are producing higher value products on a regular basis. The organisation has developed a butter supply organisation and has deployed low technology processing equipment in the Shea producing villages, such that local community groups can process a high quality product. The organisation suffers from relatively high overhead costs and lack of capital from which to expand the business. The organisation has been successful in developing products and identifying buyers but sales volumes have been disappointing. COVOL developed a marketing model which is closely aligned with the 'ethical trade' movement,

it terms of maximising the involvement and rewards to the local community. This system may benefit considerably if an organisation such as Fairtrade were to work with NUSPA and the COVOL management to develop a more robust business plan. It is important to note that the decentralised community based processing model developed by COVOL, is unique and is highly attractive in terms of local ownership and retaining a higher portion of the added value in the rural areas. This model is most similar to the approach used by Body Shop, the main difference being that Body shop only works in one village, where the quality control can be more easily monitored, whereas COVOL works in a number of villages across the Shea belt. Nevertheless, the financial feasibility of the approach merits further review and the critical quality standards required for export products also requires more detailed investigation. Although COVOL are not at this time keen to centralise their activities, it may be that a critical financial review and quality assessment would indicate the advantages of a decentralised collection and grading scheme with a more centralised processing centre. During the visits to Lira, it was the view of several operators in the oil milling business that significant savings and quality improvements could be achieved if NUSPA supplied a more technically advanced organisation to process the product.

- 22 Mr Surjit Singh, of GNOM Lira, has built a pilot Shea extraction plant in his factory and is experimenting with extracting crude Shea oil and fractionating it into stearin and olein. He visited California and contacted several cosmetics manufacturers and raw material wholesalers. In the meantime, he has supplied small quantities of stearin to Ugandan cosmetics manufacturers. His current plans involve devoting his factory to Shea extraction for at least half the year. The market plan is to either to sell the whole butter to The Shea Butter Company, Ltd, USA, or fractionate the butter, sell stearin to international cosmetics houses, sell the Shea olein by-product on the local cooking oil market and also develop a market for the shea cake, which reputedly has anti-termite properties. Mr Singh has already started processing Shea butter in the hope that he will find a buyer and although there is a possibility that he may attract some local interest, the Ugandan cosmetics firms at present are not familiar with Shea and do not know how to formulate Shea in their products. In order for Mr Singh to develop either a local or export market he requires support in terms of technical analysis of the products he is currently processing, to determine their potential for export. To develop the local market, the cosmetics manufacturers would also require technical support in how to utilise Shea in their formulation ranges.
- 23 Mr Alykhan Karmali, the MD of Mukwano industries, the largest oil processing plant in Uganda, is currently considering the development of a Shea extraction plant that would process up to 2000 tonnes of oil per year, based on the purchase of some 5,000 tonnes of nuts. The stearin would be used in an in house cosmetics company and the olein would either be mixed into the sunflower oil or sold as a stand alone product, at worst the oil would be used in the soap making process. In order to produce a high quality Shea Stearin, that would be accepted by the international cosmetics trade, Mukwano would be required to purchase a specialist deodourising unit, which is currently available from Alfa Laval at a price of approximately \$250,000. Mr Karmali has already been in contact with the Body Shop, but it was clear that the Body Shop is only interested in community based organisations and would be prepared to deal with a larger business such as Mukwano. An alternative market strategy would be for Mukwano to produce and sell the shea stearin into generic cosmetics companies that make products for the major retail stores in Europe. According to Mr. Karmali, there is a potential market for cosmetics and ingredient sales of such products for mass sales.



- 24 Other potential players may include the recently established Nile Products Trading Company. The technical support for this new marketing initiative is being provided by Technoserve and the current consultant Mr A. Gasparotti, was previously involved in exportation of Shea products from West Africa into the Japanese cosmetics market.

## **Part 9. Recommendations**

1. In order to gain a better understanding of the supply it would be useful to conduct a comprehensive survey of the Shea nut availability, domestic demand and the importance of Shea nuts to household food security in northern Uganda and Southern Sudan. Some of this work has already been done and there is local capacity to complete this task.
2. If, from the survey, the local environmental, economic and food security implications of expanding the Shea nut industry are deemed positive, we would recommend donor assistance in forming community groups of Shea nut gatherers and in training these groups to supply high quality nuts.
3. Identify overseas cosmetic ingredients buyers, from Europe, USA and middle East and invite them to Uganda to meet potential Shea oil, stearin and olein producers. A study on Shea users is already available and initially this study would require updating to assess who would be the most probable buyers.
4. Invite potential international buyers to meet Mr Singh at his factory or to link Mr. A. Karmali through agencies such as the IDEA project.
5. Invest in a rapid market supply study with a company such as Fair trade who have links to the equitable trade companies in Europe and the US. This type of organisation would be able to use their current contacts within the equitable trade fora to assess, the best supply and marketing models to develop, the grades that are required for the products and evaluate the demand in terms of volumes. A critical part in this study would be to assess the real comparative advantage of Uganda compared with more established marketing agents in Western Africa.
6. Invest in a business planning workshop with the main players in Uganda that are interested to develop the Shea sector. This could be done through Technoserve, who would be able to assist in business plan development and more crucially to provide an overview of the most credible business plans that were developed.
7. In return for donor assistance, Shea nut processors could be expected to enter an ethical trade agreement, whereby they would pay a “fair” price to nut gatherers (possibly through a pricing formula)
8. Provide assistance in establishing a Shea buying network. Through COVOL’s training, NUSPA’s members already have the ability to supply large quantities of high quality, dry Shea kernels. The association would probably have to be expanded to meet Mr Singh’s buying requirements. During our fieldwork, the NUSPA chairperson estimated that her members could gather just over 1,000 tonnes in a Shea season. In return for access to this valuable supply network, Mr Singh could be asked to enter an ethical trade agreement with NUSPA, whereby he would be expected to pay a fair price for the Shea nuts.
9. Training of women’s groups in product development from Shea and the benefits of Shea in the diet.
10. Improved methods of Shea storage, and market information on the benefits of storage during the peak season
11. Training of women’s groups in propagation of Shea trees or review the potential for encouraging local horticultural agents, or tree stockist to propagate and sell Shea trees with the view to greater future intensification of supply.

12. Investigate the potential for training women's groups in storage techniques and how to manage credit in order to play a role in wholesaling the nuts.
13. Investigate the possibility of introducing simple equipment that could be used at the village level to reduce the drudgery of oil processing.
14. Investigate the prospects of assisting in the development of a medium scale oil milling business to improve the quality and throughput of Shea olein production, such that the oil can compete on a better price basis with refined oils.
15. Commission research to evaluate the fertilizing and insecticidal performance of ground Shea expeller cake.
16. Based on the positive response to the cosmetic concepts, it is recommended that IITA consider further support the development of value-added shea products for the potential domestic market.
17. It will be important to keep in mind – especially in the early stages – that there is virtually no knowledge of shea and its benefits, and as a result there is no ready market. These will not be market driven products. If a budget will be dedicated to product development and processing, a budget will also have to be dedicated to market development. Without this, shea products will continue to reside in obscurity.
18. Products that could be developed are: soaps, body lotion, lip balm, and solid hair oil. These products should only be embarked upon with the following caveats. (i) Will it be possible to locally produce and package value-added shea products to meet the criteria of a discerning market as listed above? Will it be possible to support product development and processing with a substantial marketing budget?

## Part 10. References

- Bekure Z., M. Donlan, Y. Gordon, J. (1997) Thomson. "Local to Global. The international market for Shea butter." Presented to United Nations Development Fund for Women.
- Cecile Murphy et. 1997. The Shea Project: A Final Evaluation.
- Chalfin B. (1996) "Market Reforms and the State: The Case of Shea in Ghana" The Journal of Modern African Studies. 34, 3.
- Covol Uganda. 1992. Shea in Uganda. A Covol Preliminary Report
- Covol Uganda. 1994. The Shea Project for Local Conservation and Development
- de Saint Sauveur, A. (1999) "The Shea project. An economic assessment . Profitability of improved Shea butter processing, potential new markets and products." Propage, Montpellier France.
- Devey M. (1995) "Le Karite: un arbre originaire d'Afrique, des marches qui se diversifient" Marche Tropicaux 1471
- Jaeger P-M. (1999) "The Global Market for Sheanut and Sheanut Butter" Unpublished report prepared for TechnoServe by Accord Associates, Dorset, UK.
- Jennifer Thomson, et. 1997. Local to Global: The International Market for Shea Butter.
- John B. Hall et. 1996. *Vitellaria Paradoxa*: A Monograph, Bangor, U.K., University of Wales.
- Masters E. (1992) "Shea in Uganda: A COVOL preliminary report."
- Otimodoch, P. and S. Singh (2000) "A study to establish oil milling capacity in Uganda" Vegetable Oil Development Project, Min of Ag Animal Ind and Fisheries
- P.N. Lovett and N. Haq. 2000. *Evidence for anthropic selection of the Sheanut tree (Vitellaria paradoxa)*, Netherlands, Kluwer Publishers.
- Peter Donkor. 1999. Testing of Sheabutter Equipment, U.S.T. Kumasi
- PROPAGE (Armelle de Saint Sauveur). 1999. The Shea Project: An Economic Assessment. Profitability of improved shea butter processing, potential new markets and products, Montpellier, France.
- Sheini M. Abu-Bakar and Peter Donkor. 2000. Shea Butter Extraction Technology and Marketing Appraisal Mission to Northern Ghana and Burkina Faso, (GRESDA) UNIFEM Project.
- Stephanie Gallat and Chris Collinson. 2000. The Economic Viability of Small-Scale Butter Processing in Northern Ghana, NRI Report No. 2521.
- William O. Ellis (Dr) and I. Oduro (Mrs) (Dr). 2000. Studies on Shea Butter, Biochemistry Department – UST.
- Zewge Teklehaimanot. 1997. Improved Management of Agroforestry Parkland Systems in Sub Saharan Africa, Bangor: A Project Proposal, U.K., University of Wales.

## Annex 1

### Stearic Acid and Sodium Stearate

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**Stearic Acid** is a typical example of a fatty acid, which are essentially long hydrocarbon chains containing a **carboxyl group** at one end and a **methyl** group at the other. The chain lengths can vary from 3 (**propionic acid**) to 24 (**lignoceric acid**) but the majority of fatty acids found in hydrogenated vegetable or animal oils are around C<sub>16</sub>-C<sub>20</sub> in length. Stearic acid is a *saturated* acid, since there are no double bonds between neighbouring carbon atoms. This means that the hydrocarbon chain is flexible and can roll up into a ball or stretch out into a long zig-zag.

It is made by extraction from tallow, which is the mixture of fats that are obtained by steam treating cow fat. Tallow contains **tristearin** (which is just 3 stearic acid molecules joined to one **glycerol** molecule, shown in blue in the figure), which, after heating with sodium hydroxide yields **sodium stearate**.

#### **Sodium Stearate - Soap**

**Sodium stearate** is a typical example of a detergent or soap, since it contains a long hydrocarbon 'tail' (magenta) and a carboxylic acid 'head' group (blue).

The molecule gets over the problem that "oil and water don't mix" by having a molecule with 2 parts - an oily part and an ionic part. The tail is basically an alkane, and so readily dissolves in fat, oil and grease, but *not* in water. Thus the tail is said to be *hydrophobic* (water-hating). The head-group however is polar, and so easily dissolves in water (*hydrophilic* - water-loving) and will not dissolve in oil or grease. Thus when added to water containing dirt, oil or fat droplets (*e.g.* when doing the washing up, at bathtime, or the laundry, *etc*), the tail avoids contact with the water by burying itself into the oil droplets, leaving the head groups sticking out into the water, as they prefer. Thus the oil and dirt are dragged off the dirty objects (dishes, clothes or people!) collected together into clumps and washed down the drain.

Sodium stearate is not the only fatty acid to be used in soaps. **Sodium laurate** (the salt of **lauric acid** which is a C<sub>11</sub> fatty acid extracted from coconut oil) is often added. Potassium salts of fatty

acids are also used, in combination with excess stearic acid, to give a slow-drying lather for shaving soap.

### **Biodegradability**

Natural bacteria can metabolize soaps, and this process is most rapid when there are no branches in the hydrocarbon tail of the soap molecule. Since the naturally occurring fatty acids are all straight-chained, soaps derived from natural fats (like sodium stearate and laurate) are *biodegradable*. However, in 1933 the first synthetic detergents were marketed, with the advantage that they did not form the hard 'scum' that often results when soap is used in hard water regions. (This scum is actually the insoluble calcium and magnesium salts of the fatty acid, *e.g.* **calcium stearate**.) The first detergents were **alkylbenzenesulfonates**: like soaps they had a polar head and a large hydrocarbon tail, but the tail was branched.

### Sodium Alkylbenzene Sulphonate

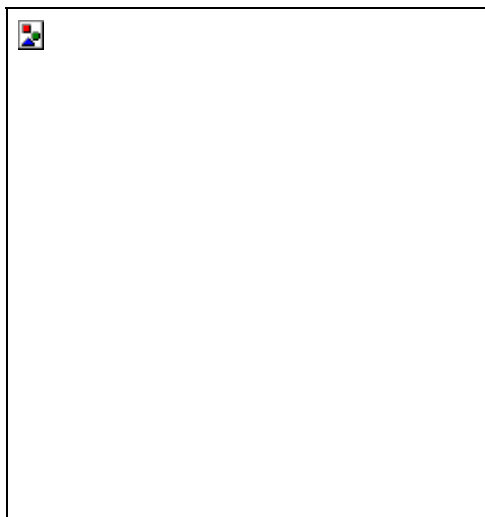
That meant that these early detergents were not easily biodegradable, and since the bacteria which operated in sewage plants could not metabolize them they were passed into the waterways with the treated sewage, often appearing as unsightly foam or suds on the surface of lakes and rivers. Faced with this problem, in 1965, the detergent industry introduced linear alkanesulfonate detergents (such as the one shown in the figure), which, being straight-chained compounds, were biodegradable.

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## Oleic Acid

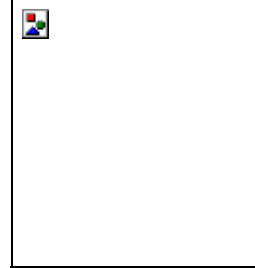
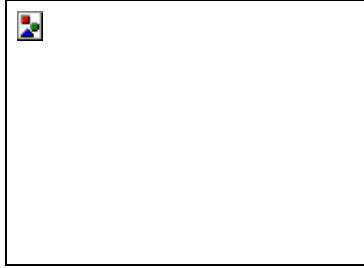
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**Oleic Acid** (also called *cis*-9-octadecenoic acid) is an example of a fatty acid found in animal and vegetable oils. It is a *mono-unsaturated* fatty acid, due to the presence of a single double bond. The physical properties of fatty acids like oleic acid are determined by the number, geometry, and position of the double bonds in the chain, along with the degree of unsaturation (*i.e.* number of double bonds). In naturally occurring fatty acids, such as those found in vegetable oils, the double bonds are all in the *cis* configuration (shown in red in the figure), making the molecules bent or curved. This also makes the molecules much less flexible than those of fully saturated fatty acids (*e.g.* **stearic acid**). Their bent shape also hinders crystallisation, and explains why these acids are oils at room temperature. (Saturated acids have straight chains and can pack easily into a crystal lattice, and so are solid at room temperature, *e.g.* butter).



### Sources of Unsaturated Fatty Acids

Unsaturated fatty acids are a good energy reserve, and are found in abundance in many meats. Pork, lamb and chicken fats all contain a higher proportion of unsaturated fats than beef and so feel softer to the touch. Plant seeds, too, are a good source of these fats, where they act as a compact efficient food reserve. They can be found in plants as diverse as corn, cottonseed, soybean, rapeseed, safflower and sunflowers. Oleic acid itself is the main fatty acid in the olive oil pressed from the ripe fruit of the olive (*olea europaea*). It was also featured in the recent Hollywood film '*Lorenzo's Oil*' (Universal Studios, 1992). In a rare genetic illness called adrenoleukodystrophy (ALD), young boys suffer from an excess of harmful long chain (C<sub>24</sub>-C<sub>26</sub>) fatty acids which causes the myelin around nerves cells to deteriorate, leading to brain damage. They progressively lose more of their faculties, speech, movement, *etc.*, until they eventually die. It was discovered that ingestion of large quantities of pure oleic acid triglyceride (mixed with around 25% of the related C<sub>22</sub> acid, **erucic acid**) prevented the build up of the harmful longer chained acids, relieved all the symptoms associated with the disease, and allowed the sufferers to lead a normal life. This works by essentially keeping the enzyme responsible for biosynthesis of the acids busy metabolising these harmless acids, and so they have no resources left to produce the harmful ones.



Meat - a good source of unsaturated fatty acids  
An olive tree in Italy. Olive oil is one of the main sources of oleic acid.

### Chocolate and Cocoa

Oleic acid is also present in the cocoa butter of chocolate as one component of a **triglyceride**. The other two components are often either **stearic acid**, or the closely related **palmitic acid**. This means that the triglyceride has a much more uniform structure than is normally found in most fats and oils - and this uniformity results in a sharper than normal melting point. This allows chocolate to remain stiff almost up to its melting point (34°C). When it does melt, the melting occurs suddenly and endothermically. If this occurs in the mouth it gives a feeling of coolness - perhaps one of the reasons for the lasting popularity of chocolate (along with its sweetness due to the added sugar).



## Annex 2

### Shea Nut Production

	1994	1995	1996	1997	1998
Benin	15 500	15 000	15 000	15 000	15 000
Burkina Faso	70 100	75 700	70 000	70 000	70 000
Côte d'Ivoire	19 785	20 000	20 000	20 000	20 000
Ghana	57 000	56 000	55 000	55 000	55 000
Mali	85 000	85 000	85 000	85 000	85 000
Nigeria	353 000	384 000	345 000	355 000	355 000
<b>TOTAL</b>	<b>607 385</b>	<b>644 220</b>	<b>592 504</b>	<b>606 500</b>	<b>606 500</b>

Source: FAOSTAT

FAO export statistics of major supplying countries are provided in **Tables 2 and 3** below, although they are not considered to be completely accurate and are primarily estimates.

Exports during the last two years of available statistics hovered around 50,000 MTs with an export value of around \$10 million. Exports in 1996 and 1997 are more than double the five year low recorded in 1993, but lower than the high recorded in 1994.

HS Code 120792	1993	1994	1995	1996	1997
Ghana	1 793	13 988	6 000	19 654	19 654
Benin	7 870	15 266	9 504	9 504	9 504
Côte d'Ivoire	4 792	12 163	11 195	5 422	5 422
Burkina Faso	5 000	5 000	7 633	7 633	7 633
Togo	1 112	6 562	4 606	8 330	5 284
Nigeria	-	5 000	-	-	-
Mali	500	500	500	500	500
UK	-	215	182	28	-
Other	28	10	34	21	31
<b>TOTAL</b>	<b>21 095</b>	<b>58 704</b>	<b>39 654</b>	<b>51 092</b>	<b>48 028</b>

Source: FAOSTAT

<b>Table 3: Worldwide Shea Nut Exports by Value, 1993-97 (US\$000s)</b>					
<b>HS Code 120792</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>
Ghana	340	2 590	1 500	5 846	5 846
Benin	1 071	2 223	1 400	1 400	1 400
Côte d'Ivoire	1 319	1 601	1 973	793	793
Togo	137	764	788	1 274	972
Burkina Faso	500	500	847	847	847
Nigeria	-	1 500	-	-	-
Mali	150	150	150	150	150
UK	-	45	37	9	-
Other	6	9	38	10	33
<b>TOTAL</b>	<b>3 523</b>	<b>9 382</b>	<b>6 733</b>	<b>10 329</b>	<b>10 041</b>
<i>Source: FAO/STAT</i>					

Historically the price for cocoa butter has reached a high of \$1,000 per MT, but there has been a gradual downward trend as the price of cocoa beans and butter has decreased (see Annex B). The price of shea nuts and butter follows the movement in the price of cocoa beans and butter but at a substantially lower price because it is only a substitute for cocoa butter in chocolate. The price of cocoa beans has decreased 40 percent in the past year due to increased supply at origin and lower consumption in the market.

Manufacturers add the shea butter to their CBEs in the hope that they can provide a discount on their product in order to increase sales, although they often try and convince consumers that there is a quality issue involved in their marketing decision. With lower cocoa bean prices there has been less of an incentive to purchase shea nuts. Chocolate manufacturers remain committed to CBEs, nevertheless, because their thinking is long-term and the confectionery industry has a labeling cost to contend with in Europe as they must state whether a product has CBEs in it or not.

There is a large mark-up for the various shea nut by-products: fractionated oil can fetch a price of \$3,300 per MT and the refined butter from Europe trades at \$1,000 per MT (all prices CIF US). The retail price for the refined butter is \$6 per ounce in the US. The unrefined *Vitellaria nilotica* shea butter from Uganda is priced at \$60/kg, while unrefined shea butter from West Africa is priced at \$200/MT (CIF Europe).

**Table 1: CSCE Cocoa Futures (\$/MT), May 98 - June 99**

*Source: Public Ledger Online*

**Table C2: Cocoa Butter, African type (\$/ton), May 98 - June 99**

*Source: Public Ledger Online*

## Annex 3

### List of Importers

Loders-Croklaan  
Hogeweg 1  
P.O. Box 41520 AA  
Wormerveer THE NETHERLANDS  
Tel. +31-75-6292911  
Fax +31-75-6292421  
Contact: Mr. Japp Biersteker  
WWW: <http://www.croklaan.com>  
(This office is a subsidiary of Unilever UK PLC and does all its tropical nut and edible oil buying)

Karlshamns AB  
37482 Karlshamn SWEDEN  
Tel. +46-454-82000  
Fax +46-454-82839  
Contact: Ms. Monika Hjorth  
email: [mh@karlshamns.se](mailto:mh@karlshamns.se)

Aarhus Oliefabrik A/S  
M. P. Bruuns Gade 27  
P.O. Box 50 DK-8000 Aarhus C DENMARK  
Tel. +45 8730 6000  
Contact: Mr. Soeren Laursen  
email: [sla@aarhus.com](mailto:sla@aarhus.com)

Brittania Food Ingredients Ltd.  
Goole DN14 6ES UK  
Tel. +44-1405-767776  
Fax +44-1405-765111  
Contact: Mr. Phil Nash  
email: [office@britfood.demon.co.uk](mailto:office@britfood.demon.co.uk)  
(Raw material supplier to Mars and Cadbury's UK)

Agrotropic s.a.r.l.  
Rue des Moulins  
43100 Vieille-Brioude FRANCE  
Tel. +33-4-71749790  
Fax +33-4-71749282  
Contact: Mr. Georges Brun  
(also acts as Commercial Director for Aarhus out their Abidjan office)  
email: [sla@africaonline.co.ci](mailto:sla@africaonline.co.ci)

Eurobroker  
30, rue d'Astorg  
75008 Paris FRANCE  
Tel. +33-1-44948787  
Fax +33-1-40060313  
Contact: Mr. Michael Becker, Tropical Nuts Division  
email: [michael@eurobroker.fr](mailto:michael@eurobroker.fr)

Aarhus Olie Côte d'Ivoire  
(subsidiary of Aarhus Oliefabrik A/S, Denmark)  
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  
Contacts: Mr. Søren Laursen, Managing Director  
email: [ghb@africaonline.co.ci](mailto:ghb@africaonline.co.ci)

EXA Cosmetics  
112 rue de Lagny  
93100 Montreuil FRANCE  
Tel. +33-1-42879698  
Fax +33-1-48708870  
Contact: M. Philippe Monmarché  
(Use refined shea butter in their line of cosmetics)

D2E  
202, rue de la Croix Nivert  
75015 Paris FRANCE  
Tel. +33-1-53785858  
Fax +33-1-53785850  
Contact: Dr. Laurent Sousselier  
(Use refined shea butter in their line of beauty creams)

Fuji Oil Company, Ltd.  
1-5, Nishi Shinsaibashi 2-chome, Chuo-ku  
Osaka 542 JAPAN  
Tel. +81-724-631364  
Fax +81-724-631601  
Contact: Mr. Uragami, Manager  
email: [780040@so.fujioil.co.jp](mailto:780040@so.fujioil.co.jp)  
(Import shea nuts, butter and oil)

Fuji Vegetable Oil, Inc.  
(US based subsidiary of Fuji Oil)  
120 Brampton Road  
Savannah, GA 31408 USA  
Tel. (912) 966-5900 x 315  
Fax (912) 966-6913  
Contact: Mr. Don Tanegawa  
email: [fvo\\_finance@gapcdr.com](mailto:fvo_finance@gapcdr.com)  
(Imports shea butter and oil only for sale to chocolate manufacturers in Canada and S. America)

AFAJATO, Inc.  
6455 E. Briar Drive  
Lithonia, GA 30058 USA  
Tel. (770) 482-4451  
Fax (770) 413-6389  
Contact: Mr. Paul Agbemashior  
Email: [afajato@aol.com](mailto:afajato@aol.com)  
(Imports shea butter only for sale to health food and arts and crafts stores, primarily from Ghana)

The Shea Butter Company, Ltd.  
16781 Torrence Avenue  
Lansing, IL 60438 USA  
Tel. 1-877-489-2700 (toll free)  
Fax (708) 481-3144 or 1-877-489-9917 (toll free)  
Contact: Mr. Thom Rivers  
Email: [trivers@naturalescence.com](mailto:trivers@naturalescence.com)  
WWW:

## **Annex 4**

### **List of people contacted**

- |                          |                                       |
|--------------------------|---------------------------------------|
| 1. Prossy                | Covol project field staff             |
| 2. Alice                 | Covol administrator                   |
| 3. John Bosco Okullo     | Covol Researcher                      |
| 4. Patrick Okello        | Oil trader, Lira market               |
| 5. George                | Shea nut wholesaler, Lira             |
| 6. Margaret Omara        | Crude oil processor in Cwagara market |
| 7. Awio                  | NUSPA chairperson                     |
| 8. Mrs Obito Omara       | Crude oil processor in Amachi         |
| 9. Mr. Sarafino Omedi    | Shea nut trader, Lira market          |
| 10. Mr. Martin Otika     | Shea nut trader, Lira town.           |
| 11. Christine Adong      | Crude shea oil processor, Lira market |
| 12. Mrs. Imat Keren Olap | Crude shea oil processor, Apur market |
| 13. Mrs. Susan Nyanga    | Crude shea oil processor, Apur market |
| 14. Hellen               | Crude shea oil processor, Apur market |
| 15. Jannet Awio-Alex     | Crude shea oil processor, Apur market |
| 16. Jannet               | Crude shea oil processor, Apur market |
| 17. Mrs. Sandra Okello   | Crude shea oil processor, Apur market |
| 18. Mrs. Cathrine Olima  | Crude shea oil processor, Apur market |
| 19. Mrs. Kutancia Ogwang | Crude shea oil processor, Apur market |
| 20. Mrs. Molly Ogwang    | Crude shea oil processor, Apur market |
| 21. Mrs. Bitoreci Omara  | Crude shea oil processor, Apur market |
| 22. Mr. S. Singh         | Guru Nanak Oil Mills                  |
| 23. Mr. A. Karmali       | Mukwano Industries                    |
| 24. Mr Mark Nyombi       | AVIS Company                          |
| 25. Venkata Rao          | Desbro ( U ) Ltd                      |
| 26. Darshak Oza          | UKI (Uganda) Ltd                      |
| 27.                      |                                       |

To be completed