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THE SHEA BUTTER VALUE CHAIN

*PRODUCTION, TRANSFORMATION AND MARKETING IN WEST
AFRICA*

WATH Technical Report No. 2

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This publication was produced for review by the United States Agency for International Development. It was prepared by Dr. Peter Lovett, Shea Butter Consultant for WATH.

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DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.



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SHEA BUTTER PROCESSORS
IN KANFIYILLI NORTHERN GHANA

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I would also be grateful if, after reading this report, you would share your thoughts about the results and suggestions offered, in order that future work might be made more relevant to the sustainable development of the shea industry in Africa.

Dr. Peter Lovett is a research scientist who has worked with various shea development projects in West Africa since 1994.

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EXECUTIVE SUMMARY

- Shea butter has been traditionally extracted by women from the dried kernels of the shea tree (*Vitellaria paradoxa*) for many millennia. This species grows extensively in the agroforestry parklands of semi-arid Africa in a 6,000 km x 500+ km zone from Senegal to Uganda, where it is protected and managed. Total production potential reaches over 2.5 million metric tonnes (MT¹) kernel.
- People living in the semi-arid zone of sub-Saharan Africa (SSA), who until recently, have had few native sources of edible oil or fat, have traditionally used shea butter in large quantities. It is estimate that at least 150,000 t kernel is consumed annually for frying, adding to sauces, as a skin pomade, for medicinal applications, to make soap, for lanterns, and for cultural purposes at ceremonies, like births, weddings and funerals.
- The demand for vegetable fat in the western marketplace grows, and shea butter is now commonly used in the production of cocoa butter equivalents or improvers (up to 5% content by weight is allowed under European Union (EU) regulations on chocolate), other confectionaries and margarines. Exports from Africa now total an estimated 150,000 t of dry shea kernel with a current market value of approximately US\$30 million with prices around US\$200 t f.o.b. West African port. Producers use this for the preparation of ca. 18,000 t of stearin (the solid 'fat' fraction) with an estimated value of US\$36 million. No one knows what volume is used in the United States (US) for edible products, since the US does not permit non-cocoa vegetable in products labelled as chocolate.
- Shea butter has important therapeutic properties, particularly for the skin - Ultra-violet (UV) protection, moisturizing, regenerative and anti-wrinkle properties, as well as in personal care products, like pomades, soaps, and pharmaceuticals. This market uses as much as 5-10% of the total African exports, which equates to an estimated 2,500 and 8,000 t shea butter used worldwide. A significant portion (500+ MT) is now used in the US market. Since we know that Africa exported less than 200 t of traditionally processed shea butter in 1994, the growth rate of this market shows growth of over 25% per annum.
- The current market prefers the following kernel quality (for mechanical extraction and later refinement in EU): Free Fatty Acids (FFA) <6%, kernel fat content 45-55%, water content < 7% and impurities < 1%. The preferred demand for butter quality for the cosmetic industry, however, varies depending on end use, although discussions have revealed some preferences, like non-solvent extraction, natural source (organic certification if possible), low FFA, 'clean' white to yellow colour (not grey), filtered to remove impurities, low water content, low odour, low melting point, and high unsaponifiable fraction (the portion with therapeutic properties, 3-12% of total extract).
- Certification of shea kernel and butter has become increasingly important for a number of reasons. Beginning January 1, 2005 the EU will start to demand that all agricultural products, including shea nuts, are traceable from source (Reg. 178, Jan. 2002). A number of cosmetic companies are asking for organically certified shea butter for the formulation of organically

¹ Lists of abbreviations and common terms used in this report are given below.

labelled ‘botanical’ products. Demand for consistent ‘**Quality @ Quantity**’,² is increasing the need for quality assurance. A number of buyers also hope to obtain ‘fairly traded’ supplies, and the Fairtrade Labelling Organisation (FLO³) is currently developing a set of guidelines specific to shea butter.

- Two major issues occur at the upstream end of the supply chain for shea butter in regard to ‘**Quality @ Quantity**’.

-Firstly there is a wide range of provenance variability (genetic or environmental variation) that results in shea kernels and butter with a broad range of fatty acid and unsaponifiable profiles, e.g. the same processing methods could produce butter with different melting points or varying antioxidant levels (tocopherols or catechins) if kernel from different sources were used.

-The second constraint is the presence of a bottleneck due to the lack of quality control during the processing of the kernel and shea butter at the rural end of the chain. Recent research supported by USAID and commissioned by TechnoServe-Ghana, has shown that the first three steps in the post-harvest processing (accumulation of fresh shea nuts, heating the fresh nuts and drying the kernel) are the critical determinants of kernel quality, e.g. FFA, Peroxide Value (PV) and fungal levels. Subsequent steps during extraction, can only ‘maintain’ quality, which if low, will almost certainly necessitate the need for refining before use in the Western marketplace.

- **Supply chain players:** There are a wide range of stakeholders in the shea industry – village pickers and post-harvest processors of dry kernel; local buying agents (LBAs); rural or urban traditional butter processors; large-scale exporters of shea kernel; large-scale processors (mechanical extraction and export) of shea butter based ‘in-country’; small-scale entrepreneurs formulating cosmetics based on shea butter in Africa; external (US, EU, India and Japan) large-scale buyers and processors of kernel and butter; external entrepreneurs or companies formulating cosmetics based in shea butter; and, external entrepreneurs or companies formulating edible products, including Cocoa Butter Equivalents (CBEs) or Cocoa Butter Improvers (CBIs) based in shea butter.
- **The regional supply chain:** Based on discussions with traders and parkland studies, ‘potential’ and maximum ‘actual’ shea production figures have been estimated for all countries across the species range, exemplified below:

-In peak production years it is estimated as much as half (52%) of the total shea harvest in the major WATH producing countries is never collected or utilised. Providing stronger economic incentives to women collectors during the harvest period could significantly expand the available supply in the short run, although it is unclear to what extent tree accessibility, harvest variability or labour availability is constraining increased collection.

-The major WATH producers of shea represent 81% of estimated production potential in SSA and 94% of actual estimated shea collection and 91% of actual estimated utilisation across all producing countries.

-In those major WATH producing countries, a little over half (55%) of the total Shea collected is consumed domestically, while 45% is exported.

² This term or concept was developed by the consultant to describe the consistent high quality shea produced in quantities suitable for international commercialisation and arose following USAID funded research on the ‘kernel bottleneck’.

³ A complete list of acronyms of the relevant organisations is given in ANNEX 5

-Of all shea exported annually from major WATH producing countries, it is estimated that 82.5% is in the form of shea kernels. There would appear to be scope to expand exports of shea butter if technical, quality, and shipping constraints could be resolved in a cost-competitive manner.

- **Downstream constraints:** Aside from the upstream constraints mentioned above, there are a range of issues that constrain the shea industry from developing its full potential:

-Trade networks for shea in West Africa are dominated by a lack of information and standards in terms of market demand and quality/price structure. This typically leaves the women as price-takers and prevents shea kernels or butter being traded as a true commodity. Since trade (and therefore pricing) in kernel does not usually commence until 2-3 months after the harvest has been completed, there is currently zero incentive, let alone opportunity, to improve quality.

-Organisation of the shea industry at a local, national and international level is generally weak with few, if any, fully functional associations that could provide focal points for information flow and options for bargaining on the international trading arena.

-Transportation issues are widespread with high costs, limited reliability, lack of appropriate containers, poor roads and corrupt customs procedures in existence for anyone wanting to move shea kernel or butter between countries or out of continent.

-Centralised processing options exist particularly in regards to improving in-country 'value addition' and to circumvent the problems with quality variation resulting from traditional extraction. Despite being only a simple modification of the palm kernel extraction process, few mechanical shea butter extraction plants exist in Africa with the majority of kernel extracted overseas. This in turn leads to limited options for in-country refineries that are often only affordable with centralised plants that can benefit from economies of scale.

-The lack of access to affordable capital and business skills in Africa is well known and few options to improve shea butter production are possible without links to and support from, international non-governmental organizations (NGOs) operating in the shea zone.

- **Initiatives on shea:** As a result of the potential for the shea sub-sector to provide increased benefits to the rural poor, tackle dry land environment concerns and assist with development in the region, projects and the initiatives that aim to improve this industry include:

- A range of initiatives with United States Agency for International Development (USAID) funding in the shea butter production region. Techno-Serve (TNS)-Ghana that aim to offer business advice to shea butter production businesses in Northern Ghana; EnterpriseWorks Worldwide (EWW) hopes to address some of the technological constraints in the sub-sector; Action For Enterprise (AFE) -Mali aims to increase the quantity of quality kernel traded; Agribusiness in Sustainable Natural African Plant Products (ASNAPP) offers a platform for promotion of shea butter products and small businesses; and Market Information Systems & Trade Organisations in West Africa (MISTOWA), when started, should offer increased market linkages for a range of crops in the region.

-Other initiatives with different sources of funding include those managed by CECI, GDCP, TRAX, OXFAM, CEAS, SNV⁴, etc, that all aim to provide a similar range of

⁴ A complete list of acronyms of the relevant organisations can be found in ANNEX 5.

support for the shea producer, e.g. business skills, improved resource management, trade facilitation and increased shea butter production.

-*ProKarité* – managed by World Agroforestry Centre (ICRAF) and the Food and Agricultural Organisation (FAO), financially supported by the Common Fund for Commodities (CFC) and the Dutch government. This project aims to establish international quality standards, support a network of testing facilities and offer the methods needed to achieve qualities required for the different markets.

- **Recommended points for WATH intervention:** From the magnitude of constraints in the shea industry it is clear that, for the sub-sector to be successful, there are a range of opportunities in need of support. At the upstream end of the industry it is evident that the primary need is for improving producer organisation, access to quality kernel and quality assurance. Assuming that this and other upstream constraints are addressed by initiatives already described, the missing link in the supply chain (particularly for shea butter to enter the US personal care market) is the lack of ‘middlemen’ capable of supplying high quality butter and finished products directly into the US market. In order for WATH to increase the export readiness of ‘shea butter entrepreneurs’, in order of importance and recommended action, the following strategies are offered:

-Develop strategic partnerships in the shea sub-sector through linkages to and discussions with a range of players across the region – national institutions, producers, NGOs, Consultative Group on International Agricultural Research (CGIARs), donors, associations, etc – in order to pinpoint a niche amongst the facilitators of the shea industry.

-Identify suitable clients – entrepreneurs and companies, either export ready or already involved with shea butter entering the US personal care industry – and countries in which to be involved. Supply chain studies have highlighted that not all countries have reached the same level of development in the sub-sector and entrepreneurs should therefore be selected in a range of locations to ensure comprehensive support across the region. Based on political stability, shea sub-sector infrastructure and existence of known entrepreneurs, recommended countries currently include Benin, Burkina Faso, Ghana, Guinea, Mali, Nigeria and Senegal.

-Through discussion and continued *in-situ* study with the selected clients, the key constraints and opportunities should be identified and solutions developed for a range of stakeholders and products (from large companies to individual producers).

-Develop and instigate a training program that will focus on these solutions and expose entrepreneurs to the US market through visits to personal care product outlets and tradeshows. In addition, large US buyers and personal care companies should be linked to African producers capable of supplying high quality kernel or shea butter.

-Some of the key constraints to entrepreneurs entering the US marketplace have been noted as lack of information on sourcing consistently high quality shea butter, transportation (custom regulations, costs, etc), and customer demand (appropriate packaging, advertising, etc). It is therefore recommended that the feasibility of a range of options be explored (films, guidebooks, pamphlets, etc) in order to address these constraints.

-Through partnerships with International Fertilizer Development Center (IFDC) and the MISTOWA project, national associations of shea butter producers should be supported throughout the region in order to build capacity for the supply of **“Quality @ Quantity”** shea butter and to offer a sustainable platform for linking upstream producers to the downstream market.

LIST OF ACRONYMS AND ABBREVIATIONS⁵

C&F	Cost and Freight
CBE / CBIs	Cocoa butter equivalents / improvers
EU	European Union
FFA	Free Fatty Acids
f.o.b.	Free On Board
g	Grammes
HACCP	Hazard Assessment and Critical Control Points
kg	Kilogramme
km	Kilometre
lbs	Pounds (weight)
MISTOWA	Market Information Systems & Trade Organisations in West Africa
t	Metric tonnes (1,000 kg or 2,205 lbs)
NGO	Non-governmental Organization
NWFP	Non-Wood Forest Product
p.a.	per annum
PAHs	Polycyclic aromatic hydrocarbons
PV	Peroxide Value
QA	Quality Assurance
“Q@Q”	“Quality @ Quantity”
R&D	Research and Development
SOPs	Standard Operating Procedures
SSA	sub-Saharan Africa
syn.	Synonym
ToR	Terms of Reference
Unsaps	Unsaponifiables
US	United States of America
USAID	United States Agency for International Development
UV	Ultra-Violet radiation

⁵ A glossary can be found in ANNEX 1.

1. INTERNATIONAL TRADE IN SHEA NUTS AND BUTTER

For millennia in Africa, shea butter has been exploited as a food, for skin pomade, medicinal uses, etc. Since the 19th century, Africans have traded the tree crop and used shea as a source of stearin (vegetable fat), particularly for the European chocolate industry, and more recently as a highly valued and beneficial component of personal care products. Total exports from Africa are estimated at 150,000 t kernel, similar to the amount locally used, with up to 10% of the total exports consumed in cosmetics. Recently, consumer demand for traceability and certification in terms of fair-trade, quality assurance and organic farming methods has increased.

1.1 Traditional African Markets for Shea Butter

The main importance of the shea tree (*Vitellaria paradoxa*) is due to the oil or fat that can be extracted from the dried kernels (often known in western countries as shea butter or beurre de karité) which is traditionally utilised in large quantities for cooking, as a moisturising cream, for illumination, for soap-making, as a herbal medicine, for fire-lighting and for waterproofing houses. In areas where there have been few other sources of edible oil, the magnitude of use of this oleaginous product is comparable to olive oil in the Mediterranean areas or to palm oil in the wetter regions of West Africa, and travellers have documented the widespread use of shea and trade in the region for many centuries, e.g., Ibn-Batutta in 1354, and Mungo Park in 1797⁶.

The enormous range of the species (6,000 km x 500+ km wide zone, Figure 1) and lack of reliable figures make an estimate of the total production of shea kernel difficult. One estimate (Boffa, 1999) suggests at least 500 million production shea trees are accessible in this zone, which equates to a total crop of 2.5 million t of dry kernel per annum (based on 5 kg dry kernel per tree). Based on discussions with traders and parkland studies, 'potential' and maximum 'actual' shea production figures have been estimated for all countries across the species, shown below (Table 1). These show that the total potential available for collection may only be half of the estimate based on Boffa's figure, since many shea trees are further than walking distance to village, and all shea nuts are collected by women and children picking fallen mature fruits from beneath the trees and carrying the harvest back to the homestead.

In peak production years, as much as half (52%) of the total available potential shea harvest in the major WATH producing countries remains uncollected and therefore unutilised. There are few incentives to increase collection during one of the busiest periods of the agricultural calendar, and the high-priced trade for exported dry shea kernel does not begin until at least three-four months after the

⁶ "The growth and preparation of this commodity appears to me one of the first objects of the local people in this and neighbouring states, as it constitutes the main article of inland commerce. The butter serves also for every domestic purpose in which oil would otherwise be used; the demand for it is therefore great." (Park, 1799).

peak harvest. The major WATH producers of shea represent over 80% of the estimated production potential in SSA and over 90% of both the actual estimated shea collection and estimated utilisation across all producing countries (although this may be an underestimation and artefact resulting from the limited knowledge of shea from countries not involved in the international trade). Conservative estimates from the major WATH producing countries, suggest that the domestic market consumes a little over half (55%) of the total shea collected, while 45% leaves the country as exports. Other estimates in the literature suggest that over 75% of all shea collected in SSA is consumed within Africa.

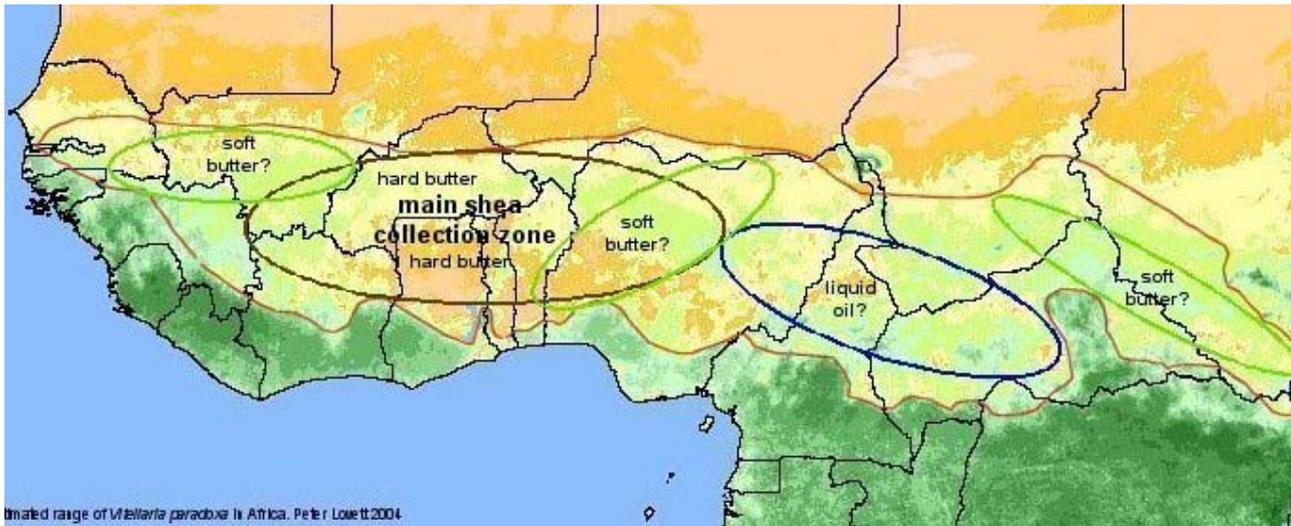
1.2 International Markets for Shea butter as an Edible Fat

The largest ‘non-traditional’ market for shea butter has used it as a source of the vegetable fat (stearin), mainly in the formulation of CBEs or CBIs. This started around the turn of the last century as a cheap alternative source of vegetable fat and has since become a major contributor to a number of African countries’ income through the current annual export of 150,000 t kernel (B. Kassardjian, pers. com. 2004) with an estimated value to producing nations of US\$30 million (based on US\$200 / metric ton f.o.b. African port). This trade centers on Ghana, Burkina, Mali, Côte d’Ivoire, Togo and Benin, countries believed to be the main areas of high stearin varieties of shea. Areas on either side of this zone vary with a progressively higher proportion of olein that result in softer butter and even liquid oil in some parts of the range, e.g. in Northern Uganda. (Figure 1). Of all annual shea exports from major WATH producing countries, over 80% is estimated to be in the form of shea kernels. This would indicate an enormous scope to expand exports of shea butter, and thereby improve addition of value in SSA, if technical, quality and shipping constraints could be resolved in a cost-competitive manner.

There have been recent changes in EU regulations (Official Journal of the European Communities, 2000), on allowable ‘non-cocoa’ fat additions to chocolate (now set at 5% throughout the EU), which leads one to predict a dramatic increase in the demand for vegetable fat or stearin, even though there is little evidence of this occurring in any dramatic way. For further discussions on this topic, please refer to *Fold and Reenberg, 1999; Fold, 2000; 2002*. These regulations dictate that all CBEs or CBIs be formulated using the stearin from only a short list of tropical plant species, although the choice of which species the market prefers, i.e., which ‘fat’ attracts the best market price, still depends on availability and quality. Shea stearin trades at about US\$2,000 per t C&F⁷ UK Port (Nov. 2003), somewhat lower than US\$2,400 per t suggested four years ago (Jaeger, 1999). As a guideline to current baseline demand, based on the most recent figures given above, this author suggests an estimate of 18,000 t of shea stearin produced in the EU with current value of ca. US\$36 million.

⁷ “Cost and Freight” – please refer to shipping definitions, e.g. <http://support.dialog.com/searchaids/tradstat/terms.shtml> f.o.b. refers “Free on Board”

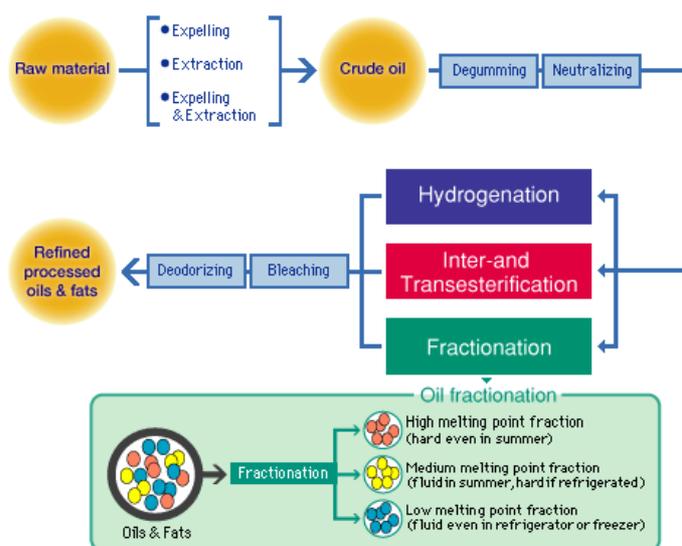
Figure 1 Estimated Range and Main Shea Kernel Production Areas



n.b. The distribution and locations of different butter types are only offered as examples, as additional further research is required.

The majority of the extraction, fractionation and refining (Figure 2) has traditionally been undertaken at the large and efficient centralised plants of European companies, e.g. Aarhus United in Denmark and Karlshamn in Sweden, although Japan (Fuji Oils) and India (Foods Fats & Fertilisers Ltd also process a portion of the kernel export . In these cases, after stearin extraction, other fractions sell as by-products, the olein fraction as an edible vegetable oil (< US\$500 per t for either human or livestock consumption); the waste residue from extraction is then used as organic mulch or for biofuel. Other components, such as the unsaponifiable fraction, go into for concentrates for cosmetic and pharmaceutical products.

Figure 2 Extraction and Refining Vegetable Oils

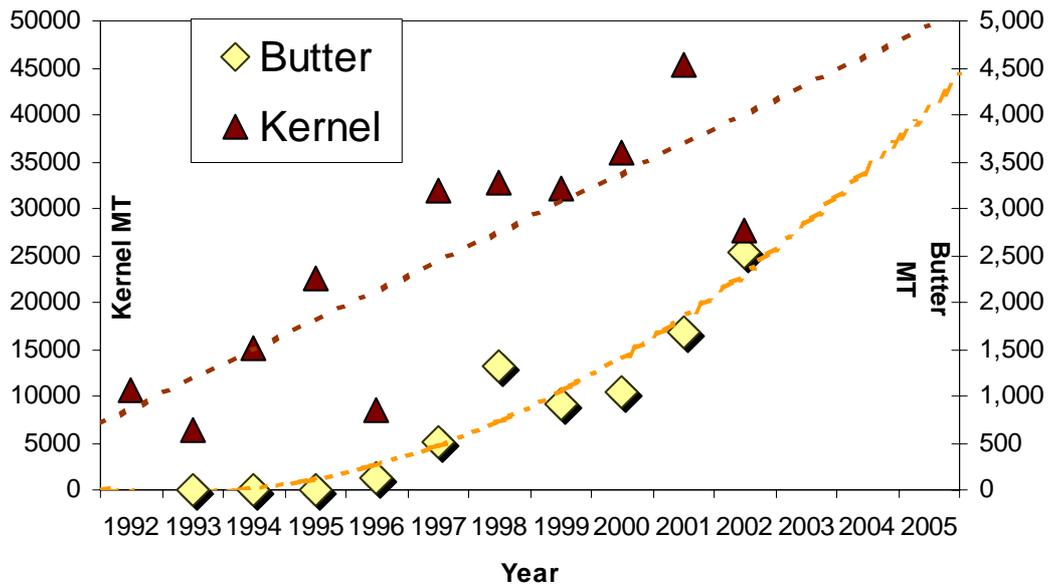


Source: Fuji Oils Ltd (website 2004)

Recently there has also been some experimentation in extraction of shea butter in Ghana, Togo and Nigeria. In Ghana, the same can be seen at a number of locations⁸ across the country using the mechanical expeller (horizontal screw-expeller with top kettle) system, followed by a filtration stage prior to storage and transport in standard vegetable oil tankers to the port of Tema. This is then shipped to the EU in specialised 24,000 litre tanks with steam inlets for melting the butter at destination. Most of this 'crude' shea butter is then fractionated and refined in Holland by Loders Croklaan. Export estimates from Ghana for 2002/2003 was ca. 2,000 MT, although demand exists for over 6,000 t per annum (p.a.) (Figure 3). Growing demand is assumed to be due to an increasing worldwide demand for vegetable oils and fats, especially for the stearin component for use in CBIs and other edible products. In this respect, the shea kernel from the semi-arid region centred on Northern Ghana and Burkina Faso is particularly valued for its high stearin and total fat content.

⁸ The two main examples are at Savelugu (20 kms north of Tamale) and Juaben (south-east of Kumasi). It is thought that Ghanaian companies wholly own both, although some external assistance has or is being provided by Loders Croklaan and Olam Singapore respectively.

Figure 3 Ghanaian Export Shea Export Figures (1992-2002)



Source: GEPC (2003)

1.3 Non-traditional Market for Shea Butter in Personal Care Products

The most recent ‘non-traditional’ demand for shea butter has been from the cosmetic market. Although still small, this market has grown remarkably and represents the highest potential to add value at source. Some estimates show the total West African trade growth from less than 200 t in 1994 to approximately 1,500 t p.a. in 2003 (Aarhus United, 2003). However, the use of un-quantified and traditionally produced butter for soaps and pomades, particularly in the US, Nigeria, and other African nations, already may have resulted in a trade far greater than 5,000 t (5-10% of the total exports). For example, The Body Shop, just one of many international companies buying locally produced shea butter from women’s groups, increased its demand for shea from 5 t in 1994 to over 100 t p.a. in 2003. Others estimate that total African export figures for traditionally produced butter in the cosmetic market has grown from less than 200 t p.a. in 1994 to over 2,000 t in 2004. This represents an annual average increase of 26%. Other experts in the industry have publicly offered figures as high as 8,000 t p.a., and a projected demand from one US/EU based company supplying the cosmetic industry has been stated at over 4,000 t of shea butter for 2005.

The main reason for this growing interest in the use of shea butter in the personal care market rests in the recognition by the cosmetics industry and its consumers of the presence of a significant fraction of unsaponifiables (3-12%) including a number of chemicals credited with a range of therapeutic benefits, such as, UV protection, moisturising, regenerative, anti-eczema, and anti-wrinkle properties. The latest factor in this growth of use in the cosmetics industry is the relatively recent recognition by the US market of this growing consumer demand for shea butter.

1.4 Future Marketing Opportunities

In recent years interest in speciality certification of shea butter for use in the personal care industry in both Europe and the US has grown. Since they source shea butter from a number of well-organised women's groups at 'above market' prices (Jones, 2002), The Body Shop now uses an internal system to label products as fairly traded. The Fairtrade Labelling Organisation is currently in the process of developing international guidelines for fair-trade production of shea butter⁹. A number of ongoing initiatives in relation to the production of organic shea butter, e.g., L'Occitane, the French cosmetics company, also source shea butter from women's groups in Burkina Faso; Ecocert organically certifies for Songtaaba ; Lacon certified groups are linked to Projet d'Appui aux filières Bio-Alimentaires du Burkina Faso (PAFB). Additionally, some producers in Northern Ghana are in process of being certified by IMO (Institute for Marketecology), and a project in northern Uganda has begun the process of organic certification with assistance from EPOPA (Export Promotions of Organic Produce from Africa). Although the majority of companies performing organic certification are European, according to the US National Organic Program (NOP) website, many of the same companies involved in the West African region are already accredited or have applications being considered for certifying sale of organic products in the US marketplace¹⁰.

As the western markets of the US and EU call for quality assurance (QA) and knowledge of product supply chains from the 'source to the shelf', demand for traceability also increases. Commercial certification companies, such as those mentioned above and international firms like Société Générale de Surveillance (SGS), provide these services. National laboratories, like the 'American Shea Butter Institute' (ASBI) in Atlanta, Georgia, offer services for testing a wide range of products, including shea butter. ASBI, a private testing lab, specifically provides commercial testing of butter destined for import into the US and charges African shea butter producers a fee to have their product assigned an A-D ranking¹¹.

With support from the Common Fund for Commodities (CFC) and the government of the Netherlands, the **ProKarité** project, CFC/FIGGOOF/23, began in April 2004 to address the need for quality assurance. With the implementation by The World Agroforestry Centre (ICRAF) and the Intergovernmental Group on Oilseeds, Oils and Fats of the FAO, the project aims to improve product quality and market access for shea butter, originating from SSA. The objectives of this project are:

- To establish common product quality parameters, grades, and standards, both regionally and internationally;
- To establish a credible and long-term sustainable product certification system;
- To increase nutritional benefits and economic returns to primary producers of shea nut and rural processors of shea butter; and
- To develop and sustain exchange of technical and market information by an active network of producers, key institutions, and other stakeholders of the shea sector across the African shea zone.

With funding of US\$3,225,312 through March 2007, the **ProKarité** project works to build a regional consensus on issues of product quality and certification through the 16 producer countries. It also collaborates with pilot activities implemented by national institutions in Senegal, Mali, Burkina Faso and Niger. Results from a Consultative Regional Workshop on Shea Product Quality and Certification System Design (6-8 October 2004) are anticipated for release in early 2005.

⁹ For further information please contact John Arnold, (Product & Standards Development Manager, Tel: +44 (0)20 7440 7697, Email: john.arnold@fairtrade.org.uk, Website: <http://www.fairtrade.net>)

¹⁰ <http://www.ams.usda.gov/nop/CertifyingAgents/AccreditationStatus.html>

¹¹ This voluntary labelling system has not been officially sanctioned by the US Food and Drug Administration (FDA) or the US cosmetics industry, and no public domain research has yet been found that supports the claims made as scientifically proven

In summary, these ongoing developments highlight that the future for both sections of the “non-traditional” shea market appears increasingly positive. However, in such a competitive industry, with a growing and a more demanding consumer base, a need for certain changes in the industry exists. For example, there are few standardised supply chains for shea butter; and quality, supply and current market prices vary greatly, with the traditional shea butter processors continually left as price takers. Market research demonstrates that exporters pay less than US\$0.75 per kg (2.2 lbs) for traditional, locally sold shea butter in Africa; and sell it for a minimum of US\$3 per kg for refined shea butter in the US. Traditional butter, with certified quality and origin assurance, is wholesaled in the US for US\$10-15 per kg and over US\$250 per kg for pure shea butter sold in 5 oz ‘luxury’ containers.

Organic Certification of Shea Butter

Many systems exist around the world for certification – organic, fair-trade, HACCP, Eurogap, ISO, Kosher, Halal, quality assurance, etc. - in order to prove to stakeholders that an agricultural product meets the expected requirements for health and safety, or environmental and social sustainability. These usually involve a series of visits to the production facilities (farms, factories, traders, etc) by accredited certifiers (analytical tests of products or farms may be performed) and then provision of documentation (usually with a ‘seal of approval’ for product labelling) after the requirements have been satisfactorily met.

Of particular interest to those selling shea butter into the personal care market is the current demand for organically labelled products that demonstrate ingredients have come from a sustainable farming system maintained in the absence of harmful inorganic inputs (pesticides, fungicides, fertilizers, etc). Organic certification also provides a traceable system (from farm to market) that, together with the premiums for such products, can encourage payment of fairer prices to producers. With regard to the agroforestry parkland system in which shea nuts are harvested, although there is limited use of inorganic inputs in the West Africa savannahs, e.g. cotton production, it is hoped that the certification will focus on future sustainability¹ of the system, i.e. ensure young trees are still maintained on-farm, marketable quality of the shea butter is high, and assure that fair-trade is conducted.

In order for products to get organically certified a number of requirements must be met. First and foremost products must be grown and handled in accordance with all the US Department of Agriculture (USDA) NOP regulations (or EEC regulations² if for EU marketplace) and all parties (farms, processors, handlers, etc.) must be inspected on an annual basis. These inspections are to be conducted by an inspector from an accredited certifying agency. These agencies are private, domestic or foreign, groups that have gone through the accreditation process with USDA³. Certification for products from foreign countries is typically accomplished in one of three ways. An inspector from a domestic accredited agency may travel to the farms and processors to perform the inspections. A second option is for an accredited foreign agency to send someone to do the on-site inspections, although there are limited options for accredited certifying agencies based in West Africa. The third, and potentially the least costly, option is to find an inspector affiliated with either a foreign or domestic certification agency, but who is based in the country or area in which the inspections are to occur. Assuming the complete system is certified, the costs of this process would ideally be paid both by premium-priced sales of the ‘organic’ shea butter (+10-15% required⁴) and from sales of other ‘organic’ agricultural commodities.

¹ Lovett PN (2004b) The Impact of Certification on the Sustainable Use of Shea Butter (*Vitellaria paradoxa*) in Ghana. Report prepared for the FAO Non-Wood Forest Products Programme under the supervision of Sven Walter.

² EEC (1991) Council Regulation EEC No. 2092/91 Council of June 24, 1991. Annex VI. 2.16 (Regulation EEC No. 207/93 of the Council of January 29, 1993)

³ <http://www.ams.usda.gov/nop/CertifyingAgents/AccreditationStatus.html>

⁴Exporting 20 t of organic shea butter to a US cosmetics company, with yields of ca. 30 kg per ha of shea butter, will require ca. 600 ha of parkland (maybe 750 farmers) for certification. With an estimated annual certification cost of US\$4,000 and a fair-trade production price of US\$1.50/kg, a minimum selling premium of 10-15% will be required to cover costs and ensure that fair prices are paid to the women producers.

Table 1 Shea Kernel Production and Utilisation (metric tons per annum)

Country	Est. Total Potential Production ¹²	Est. Actual Collection	Estimated Consumption	Total Exports	Export as Shea kernels	Export as Shea Butter
Benin	80,000	50,000 ¹³	14,900	35,100	35,000	100
Burkina Faso	150,000	75,000	35,000	40,000	37,000	3,000
Cote d'Ivoire	150,000	40,000	15,000	25,000	15,000	10,000
Ghana	200,000	130,000	70,000	60,000	45,000	15,000
Mali	250,000	150,000	97,000	53,000	50,000	3,000
Nigeria	250,000	100,000	80,000 ¹⁴	20,000	20,000	0
Togo	50,000	40,000	10,000	30,000	15,000	15,000
WATH Major Exporters Sub-total	1,130,000	585,000	321,900	263,100	217,000	46,100
Gambia	100	0	0	0	0	0
Guinea Conakry	25,000	5,000	4,500	500	450	50
Guinea-Bissau	1,000	100	100	0	0	0
Niger	5,000	5,000	4,000	1,000	0	1,000 ¹⁵
Senegal	10,000	500	490	10	0	10
Sierra Leone	100	0	0	0	0	0
Cameroon	30,000	5,000	2,500	2,500	2,500	0
Chad	10,000	2,000	2,000	0	0	0
WATH Minor Exporters Sub-total	81,200	17,600	13,590	4,010	2,950	1,060
Ethiopia	1,000	100	100	0	0	0
Sudan	100,000	10,000	9,800	200	0	200
Uganda	70,000	6,000	5,900	100	0	100
Central African Republic (CAR)	15,000	2,500	2,500	0	0	0
Dem. Republic of Congo (DRC)	5,000	750	750	0	0	0
Not WATH Sub-total	191,000	19,350	19,050	300	0	300

¹² Since not all African countries collect detailed or reliable data, the figures above represent estimates from personal observations and give an approximate order of magnitude for maximum annual production, collection and export figures (given as standard MTs of dry kernel per annum.) To convert into fresh shea nuts, multiply by 35-40% and to convert to actual butter quantities, divide kernel weight by 33% (latter is dependent on extraction method and quality of kernel – empirically determined figures range from 20-45%).

¹³ Includes an estimated 10,000 t imported from Nigeria, also included as exported to Benin in Nigerian figures, therefore, this quantity is double counted in total exports

¹⁴ Includes traditional consumption and mechanically processed in vegetable oil industry

¹⁵ Exported to Nigeria for traditional consumption

2. SUPPLY CHAIN ISSUES IN THE AFRICAN SHEA ZONE

There are two main upstream constraints to supplying “*Quantity @ Quality*” - crop variability, in terms of chemical profiles, and lack of quality control during the first three steps of traditional post-harvest processing. The industry involves a range of stakeholders. Poor communication, minimal access to capital and lack of technological skills leave the producers as price-takers. Few reliable figures exist for harvest, but the stearin-rich areas of Ghana and Burkina Faso clearly produce the major exports of shea, even with large quantities remaining unpicked across the species range. A number of donors and organisations, including USAID, ICRAF and FAO, hope to improve the industry through their support of a several initiatives.

2.1 Upstream Bottlenecks to High Quality Shea Production

A recently completed study for EWW¹⁶ focused on analysis of some of the critical bottlenecks currently affecting the shea industry, particularly in regard to the need for additional technological innovations. The major findings of this study highlighted the complexity of the shea industry, and the question as to what the critical ‘bottlenecks’ are will depend on which view one takes, i.e. either at the upstream or the downstream end of the shea industry. The need to focus some form of development assistance in support of the rural producers, i.e. at the upstream end of market, remains important. Recommended goals and objectives follow:

Major Goals and Objectives:

- Improve the benefits of shea production
- Expand options for value-addition
- Reduce harvest & processing expenses
- Encourage sustainable resource management

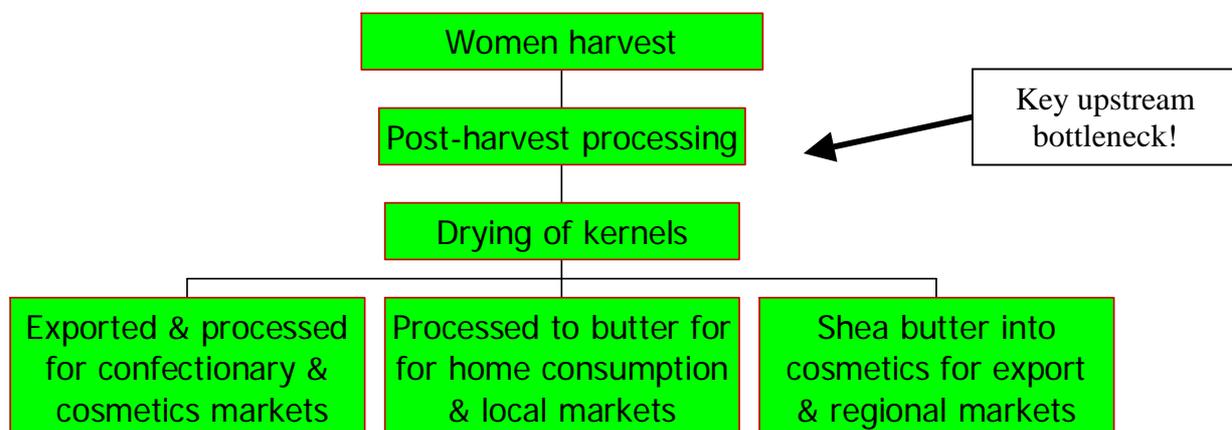
¹⁶ Lovett PN (2004) “Opening bottlenecks in the African shea butter industry”. Report prepared for EnterpriseWorks Worldwide, under the supervision of Steev Lynn and Ed Perry with funding from USAID.

Major Constraints to the Shea Industry:

- The end of traditional protection threatens agroforestry parklands, particularly as a result of low financial returns to production
- Local processing methods and provenance variability are unable to produce the requisite **“Quality @ Quantity”**¹⁷.
- Supply chains are disorganised with multiple markets & weak linkages

One of the most important bottlenecks identified relates to shea kernel quality, since traditionally post-harvest processed of all shea nuts currently leads to inconsistent quality before trading. Although this might be currently acceptable for the traditional market for shea butter, the lack of kernel QA results in the need for refining virtually all shea butter that is to be used in the other two major markets (Figure 4).

Figure 4 Three Markets in the Shea Industry



Many other initiatives have attempted to address “quality” and “marketing” issues at the ‘shea-extraction’ stages. Innovations to improve extraction processes, however, have only addressed the issue by aiming to reduce inputs (labour, water, fuel wood, etc.) and attempting to improve consistency of quality through the use of machines, such as crackers, roasters, grinders, presses and kneaders. Attempts to improve supply chains through the formation of co-ops, market linkages & in-country processing groups have also been made.

Regrettably though, the main problem of market access remains, as seen by the women producers, still price takers, who are unable to supply the requisite consistency of quality. NGOs have also been accused of raising unrealistic, or unsustainable, expectations, leaving the multi-national buyers of kernel for shea butter extraction and refining in total control of the export market (Chafin, 2005). The EnterpriseWorks studies and other recent research commissioned with USAID funding, including the research and development project commissioned by TechnoServe-Ghana, clearly demonstrate that consistent “Quality @ Quantity” keeps emerging as the major issue in the marketing process. From subsequent discussions with the private sector, including buyers and sellers of shea butter products, clear demands are present.

¹⁷ The consultant developed this concept to describe the need for consistent quality shea produced in quantities suitable for international commercialisation and arose following USAID funded research on the ‘kernel bottleneck’.

International Market Demands

- Cosmetic industry wants:
 - Natural butter¹⁸, i.e. without inorganic solvents used in the process and preferably with certified traceability
 - Generally (but not necessarily¹⁹) with low smell, colour and FFA levels
 - Consistent quality over time at stable prices
 - Reliable supplies of large quantities
 - High levels of unsaponifiables
 - No foreign bodies
- International buyers for edible products demand:
 - Reliable supplies of large quantities of kernel or butter
 - Consistent high quality (needs refining to meet regulations in the food industry)
 - High stearin, low moisture, no smell, no foreign matter
 - Low FFA
 - White
 - Low unsaponifiables

2.2 “Quality @ Quantity”

Research conducted in the course of the above studies has demonstrated that this issue that can only be addressed if the kernel quality can be controlled; otherwise the butter must be bulked and refined for a consistent quality. Based on the typical traditional methods of shea kernel production as shown below (Figure 5), some important processing steps have been identified as critical to kernel quality:

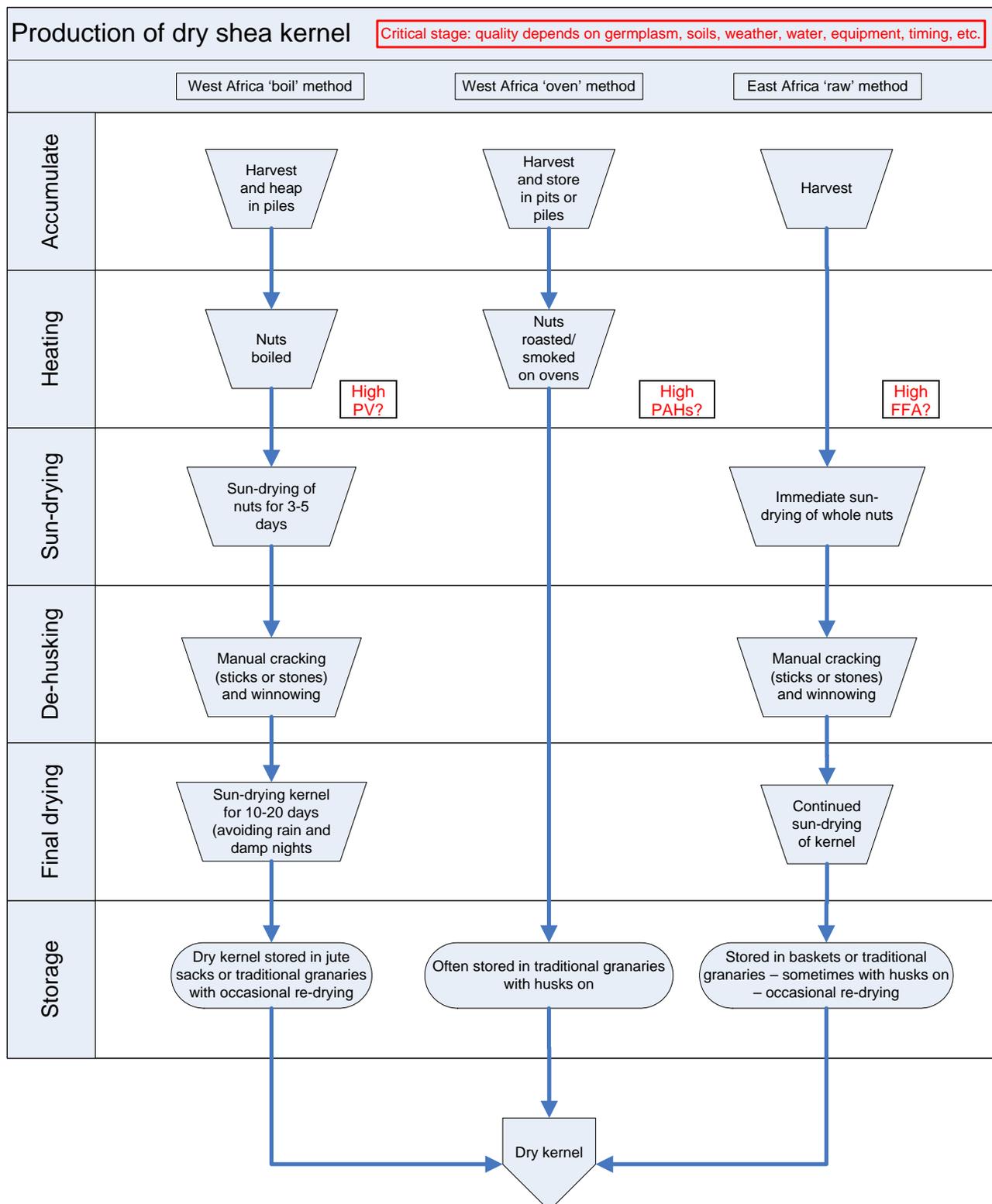
- Length of time between fruit maturation, harvest, heat treatment and drying affects FFA levels and fungal infections
 - Needs further research to confirm effect on unsaponifiables, etc.
- The boiling stage usually results in a high PV in the final shea butter.
 - Effect of water quality on peroxide formation needs confirmation.
 - Time spent being boiled needs to optimise.
- Fungal infections are likely when boiled kernels are sun-dried in the rainy season.
 - Options for drying in solar-dryers or on drying racks.
- If shea nuts dried without a heating stage, FFA levels in shea butter can be very high with aqueous extraction.
 - Need to develop alternative extraction methods to minimise lipase action
- If shea nuts are roasted on open fires there is a danger of PAHs
 - Hydrocarbons present a sensitive issue for edible products, but controlled heating conditions may provide other options, particularly for the cosmetic industry.

¹⁸ When traditionally produced in Africa US market often describes it as “virgin butter”

¹⁹ For example: the characteristic smell and ‘ivory’ colour is sometimes used to identify butter that has not been refined and higher FFA levels are preferred for the manufacture of soaps.

Plants in Europe currently prefer to use the processing method for kernel for extraction over the West African “boil method.” According to industry experts, they do this because the method results in low levels of polycyclic aromatic hydrocarbons (PAHs); the boiling deactivates kernel lipases, which are responsible for high FFA levels²⁰; and this process may denature a proportion of the unwanted unsaponifiables (including certain latexes and waxes) that occur in unheated kernel.

Figure 5 Traditional Methods of Shea Kernel Production



²⁰ Aside from the cost of refining, the process also results in 1% of oil or fat lost for each 1% FFA.

2.3 Downstream Constraints to Intra-regional Trade in Shea

Given that research, new technology, and upstream projects can address the above quality constraints, a wide range of other supply chain constraints also exists, some of which are country-specific, while others crosscut themes that should be addressed on a regional level. Fieldwork during this and other studies demonstrates the following range of issues. With the aim of elaborating constraints to improved African exports of shea products, particularly to the US, a complete summary of country-by-country issues follows (Table 2).

Quantity of Kernel: Historically the **potential to increase kernel exports** has been most closely linked to the world demand for cocoa products (in terms of price and quantity required). Shea kernel producers, therefore, have very limited options for influencing price, and the best means to attract international buyers of kernel has been to offer high quality kernel (boiled and sun-dried kernel preferred, as described above) in high quantities, preferably from varieties that have high levels of stearin, like those from Ghana/Burkina provenances. The biggest constraints to increasing kernel exports are, therefore, the lack of close links to buyers, institutions or associations who are able to influence the pricing of shea kernel and/or those able to offer advice or information on what the market wants and the technology or methods able to deliver this. These constraints could be as simple as lack of knowledge on how to access donkey carts, as opposed to head-panning the harvest, or, in association with the quality issues below, recognising the preference for boiled, sun-dried kernels that are bought in preference to wood-roasted kernel, due to fears about PAHs.

Quantity of Butter: Two main issues influence the **potential to increase butter exports** - 1) the demand for locally and mechanically extracted shea butter, mainly for the edible market and particularly for use in CBIs in Europe, and 2) the demand for locally and traditionally extracted shea butter, mainly for the cosmetics export market. Once again, quality is critical to this trade and, as we have seen earlier, this remains a constraining issue at the upstream end of the supply chain, and is better addressed by those closer to the grassroots operations, provided they have access to quality training materials. Other constraints also, for example, hinder overseas buyers requesting shea butter from rural cooperatives of Africa: the missing gap in terms of a formal 'institution' to which either buyers make requests for butter or producers make requests for market information. Furthermore, the production of high-quality butter and/or packaged products in the country of origin offers one of the best options for value addition and increased benefits at source. Overcoming this constraint can also assist in tackling others relating to production, such as lack of productive trees, since increased benefits at source have been shown to provide incentives for improving both quality and resource management.

Quality Issues: As described throughout this study, three main quality issues to shea production hold importance:

- The provenance of the kernel, i.e. genetic/environmental influences on the oil profile, unsaponifiables content, etc.;
- The quality of kernel that can be produced by traditional methods (demand for low FFA, low PV, low fungal infestation, etc.); and
- Ability to maintain consistent and high-quality production of shea butter using best practice methods for extraction, storage and packaging.

Table 2 below presents some of these quality issues, although the basic constraint persists. Africans in the industry need training and materials outlining appropriate information in a form accessible for producers, entrepreneurs and their customers. Entrepreneurs producing shea butter cosmetic products often need training in improved methods of packaging or marketing, as they are frequently unaware of western standards and market requirements.

Traceability: With regard to organic, quality or fair-trade certification, the most important hurdle, particularly economics of the process, continues to be the lack of organisation of producer groups, which prevents the tracing back of products through the supply chain to the source of production. A number of initiatives are ongoing which, one hopes, will provide the necessary standards, guidelines, examples or models on which the industry can base future successful implementation.

Trade Network: The demand for, and trade in, commercial quantities of kernel in the country represent the strength of this network. However, trader associations and support for extension information to producers can assist in the process of developing strong networks, once fully established. Little evidence shows that intervention by NGOs, etc. has much effect in a market-driven process controlled by very experienced, and culturally constrained²¹, local buyers and larger traders. In regard to supporting producers selling into this network, evidence shows the need to improve access to credit for local buyers or for capital investment for production of higher quality kernel, although one must be aware of the unscrupulous supplier.

Finally, difficulties result from fluctuations in supply and demand, inconsistent pricing through the supply chain, absence of trust in contractual agreements and lack of access to credit. These, amongst other things, may demonstrate a need for shea kernel to be traded in a manner more consistent with cocoa or other agricultural commodities, in order to bring shea into the 21st century.

Organisation of Processors: As mentioned earlier, significant opportunities exist to support the formation of processor associations, which may complement both the trader associations and assist buyers to more easily access locally processed shea butter. These associations should also provide the missing link for information flow from the market back into the domain of the rural shea kernel and butter producer. Burkina Faso highlights this issue now that it has a variety of processor networks (See ANNEX 3 for contacts), which were facilitated by players ranging from NGOs to governmental supported associations. This situation developed to overcome the information flow among producers, private companies, the state and donor-supported NGOs. As a model 'shea-producing' country, Burkina Faso offers a good opportunity for seeing which strategies have been most effective, as well as what can happen when many facilitators become involved. Countries conspicuously in need of similar 'linking' organisations include Ghana, Nigeria, Guinea and Benin.

Transportation and seasonality: In Africa, lack of communication channels also constrains commercial development. Remarkably, however, the long-term history of shea kernel trade has resulted in a network of traders, middlemen, etc. who manage to move huge quantities of kernel from a multitude of village markets, along very low quality roads, all the way to ports shipping to international destinations, such as Holland or Denmark. Those most successful in this respect, like Kassardjian, use their own fleet of lorries. Aside from availability and maintenance of vehicles, and in spite of ECOWAS, serious issues commonly described continue to be the high cost of regional, (often legitimate taxes around US\$10-20 per lorry) or national border crossings (often illegitimate bribes required of up to US\$500 per lorry). These costs are thought to significantly influence the volume of unrecorded cross-border trade in shea kernel.

Another important constraint in relation to the transportation of shea and the crop price involve the seasonality aspects, in relation to climatic conditions and other crops. As would be expected this has important implications for ease of transport across the region and availability of specific traders and their vehicles. Typically, the shea season starts in the south, and to a lesser degree the east of the WATH region in April or May, steadily moving north and west in pace with the rains, peaking across the main stands of the species in the Northern Guinean/Sudan eco-zones during June-July. The amount of fresh shea nuts available, and interest in their harvest, quickly falls off during September. In comparison with other annually planted crops, this creates a lot of competition for labour since these three periods typically occur during the land preparation/planting, weeding and harvesting periods

²¹ This concept is more fully explored as part of the sociological study made by Chafin (2003).

respectively. This in turn affects how the shea crop is valued – women usually desperately need cash at the end of the long rainy season. The first dry shea kernel or butter, often quickly sold on the village markets, raises urgently needed capital when sold at a lower price, even though the first kernels could potentially attract the highest prices of the previous season.

As the season progresses, the market becomes saturated, and prices plummet to their lowest annual levels. At this time savvy local traders, with some spare capital, often purchase and store the season's shea kernel in their depots in the larger market villages. Much later, in October or November, when the shea harvest has finished, the rains have stopped, and the roads have dried out, major buyers show an interest and agree to the first prices for the season. Additionally, during this period when producers trade other crop harvests, demand for vehicles will be at its highest, causing shea traders, often with their own lorries, to command the best (lowest post-village market) prices in the more rural areas. As the 'buying' season progresses, the limited number of larger exporters will start to compete as their agents complete purchases from their traditional and respected suppliers, and the prices for good kernel in the urban centres across the region will quickly start to rise. The actual export of the kernels should also have started by this period – December through January – and safe storage of large quantities (10,000+ MTs) may become one of the major difficulties, until a suitable carrier to the EU can be secured. As the actual export price becomes widely known, prices may likely become even higher, especially during poor harvests, as keen traders buy the last remaining kernels.

With regard to the traditional shea butter processors, this competitive trade, coupled with a lack of capital, can result in enormous difficulties to stay in business. Women will process their own kernel, however, more commonly when early kernels are sold, they must also buy their kernel from the local markets for later production and sale of shea butter, either to local or international buyers. This puts them again in a weak position, particularly without pre-financing, since without any form of commoditization or traceability, they have little control over the quality of the kernels. In turn, selling the kernels at their highest prices during certain times of the year may result in poor quality butter and/or low extraction rates that can force the women out of business.

The well-known, limited access to affordable capital in rural Africa has been the curse of many business opportunities. Annual interest rates on unsecured loans range from 40% and upwards, but in the absence of any collateral, such as freehold land, few options exist, other than to accept offers of financial support or business training from NGOs, which may be potentially inappropriate or even contradictory to emerging market forces. In return, those who have offered capital at reasonable rates or conditions can soon find themselves out of pocket when unscrupulous farmers, traders, and businesses disappear with the money.

Transportation of 'high' quality shea butter across Africa and onwards to the US or EU can present further obstacles to the shea trader. The lack of suitable containers to ship the product safely and in airtight conditions represents an added difficulty. One buyer of shea butter from groups in Northern Ghana has been looking for clean, affordable, plastic, sealable, wide-mouth containers of ca. 200-litre capacity. Regrettably, the only options available in-country were second-hand chemical or food containers, some of which have been used for caustic soda or pigs feet, which could cause considerable issues in relation to organic, kosher or halal certification.

Further downstream, high costs of air-freight (up to US\$6 / kg to US) and significant frustrations of shipping shea butter by sea cause problems. The latter shipping method costs 12 times less than air-freight, but can take up to three months to arrive in the US, if it arrives at all, since most trade passes through the EU. The lack of options to backload products in specialised tankers from the EU also has strong implications on the economics of processing shea in Africa, because all refining is currently performed in the EU, and no market exists for shea oil fraction in Africa.

Mechanical Processing Capacity: There clearly exist significant opportunities for in-country mechanical processing of shea kernel. Although opportunities are more widespread in the coastal nations of West Africa (e.g. Nigeria, Ghana and Togo), aside from a niche ‘Halal or Kosher certified market’ we can assume much of this ‘crude’ butter still goes to the EU for additional refining. Mechanical processing of shea further from the coast in the landlocked shea producing areas within Burkina Faso, Mali and northern Nigeria is rare and only apparent where a strong link has been made with guaranteed buyers, e.g. Loders Croklaan with the mechanical extraction plant of ‘Sheaba’ at Savelugu in Northern Ghana. However, strong interest on the part of national industrial companies, such as Huicoma for soap production in Bamako, Mali, exists, if reliable supplies of kernel or butter can be guaranteed at a steady price. The third component of the WATH Supply Chain Analysis further discusses the details of processing options.

Information Gaps and Alternative Information Sources: As a result of trade secrecy at the downstream industrial level, and because of the deficiencies in tracking trade in agricultural commodities across 20 countries in Eastern, Central and West Africa, the shea kernel/butter industry has traditionally been fraught by a lack of reliable information. The References and Recommended Reading portion at the end of this report shows the reader what information exists, and through additional references and key websites, additional data can be found. (See company contact sections in ANNEX 3).

2.4 Opportunities for Developing an Improved Shea Industry

The industry sees increasing opportunities for rural producers to forge stronger links with buyers, institutions or associations, which would increase the likelihood that price premiums for the supply of improved **‘Quality @ Quantity’**. This should allow for opportunities to invest in the technology required to increase the quality of kernel, while at the same time reducing the inputs of production, such as, harvesting with donkey carts as opposed to head-pans, appropriate containers to capture of high quality water instead of metal-rich surface run-off water, and solar tunnel-dryers in place of unprotected sun-drying during the rainy season. By simultaneously helping the downstream buyers of shea butter achieve a higher extraction yield of better quality and traceability and the producer with better prices and/or lower costs, a “win-win” scenario will be created for the sustainable development of an improved shea industry.

In terms of organisational involvement, commercial buyers must be lobbied to include a premium for quality or assist producers with the necessary inputs. This leaves a need for considerable extension work, best carried out either by governmental agricultural institutions, private buying companies or NGOs that are well-connected at the grass roots level. Accessible booklets or films could provide needed training and facilitate the information flow to the upstream production level.

This form of assistance could prove beneficial to the rural producer through three broad areas of intervention:

- ‘Hard butter’ production areas of Burkina, Ghana, etc. where growers have the option to significantly improve kernel quality with subsequent benefits to the extraction rates obtained by locally-based mechanical processors would be in a better position to return this benefit - **“production of premium quality kernel”**
- In the ‘hard-soft butter’ production areas of Mali and Cote d’Ivoire where a long-standing tradition of heating and drying kernels prior to trade exists, there is a need to confirm the preferred kernel production method of oven-roasting versus boiling and to improve linkages

with traders in order to increase export quantities and benefits reaching the producer -
“increased trade in basic quality kernel”

- In the ‘hard-soft butter’ production areas of countries such as Nigeria see a huge potential to increase the trade of large quantities of quality shea kernel, however, extension is critical to persuade producers to heat their kernels prior to sun-drying, where raw nuts are left to ‘ferment’ in warehouses - **“start production of basic kernel quality”**

Many alternatives exist for facilitation of this process and points at which interventions should be directed. One example is highlighted when overseas buyers request shea butter from rural cooperatives in Africa. There exists no ‘institution’ or national association, to which buyers can place orders for butter or producers can request market information. Improved linkages such as these are crucial. They offer some of the best options for value addition and increased benefits at source, which in turn can provide incentives for further improvements to quality, leading to enhanced resource management.

There are many countries in which assistance could promote the increased production of shea butter and finished products, which would benefit the rural producer. These countries possess two commonalities - either they lack processor associations, and/or have promising companies with opportunities of increasing production or quality of shea-based cosmetics. Observations from field visits and meetings during 2004 in the countries of relevance to WATH show Benin, Burkina Faso, Ghana, Guinea, Mali, Nigeria and Senegal as the most likely to benefit from inputs at this level. More detailed suggestions are offered below.

Finally, worth highlighting is the already growing network of NGOs and other organisations that have joined with rural producer groups, particularly through “The Shea Network” supported under the FAO/CFC funded **Pro Karité** project. This group of organisations currently supports pilot activities in Senegal, Burkina Faso, Mali and Niger. These initiatives aim to develop appropriate criteria for quality standards, provenance definitions, processing procedures and agricultural practice, so that through the flow of information, shea kernels or butter can be more easily commoditized and internationally traded with confidence. By working at a level with strong links to both national institutions (e.g. IER in Mali, ITA/PROMER in Senegal, etc.)²² and grass-root stakeholders (shea-focused projects supported by CECI, SNV, AFE, etc.), these players find themselves in an ideal situation to offer a framework of support to the shea producers, while at the same time providing a mechanism for quality assurance, training and traceability. At a recent regional and consultative workshop in Bamako, sixteen of the shea producing African countries agreed on a number of resolutions, including one to form an international (African-wide) shea association that will link up national institutions and form a platform for further developments and discussions.

Assistance to a developing industry such as the shea industry needs this type of strong strategic partnerships between a range of facilitators and other players who are active at both upstream and downstream areas in the supply chain. Most importantly, players must be involved in giving support to those which have, or are developing, links to the cosmetics industry, the international market for edible oils and the entrepreneurs or companies who trade in the shea kernel/butter sector. Given the position that WATH holds in this chain with a mandate to promote increased trade between Africa and the US, it is highly recommended that discussions be held with other stakeholders to identify further opportunities for partnerships and the targeting of support to the shea sub-sector.

²² See ANNEX 5 for names of institutions and organizations.

Table 2 Supply Chain Issues by Major Producing Countries within WATH Service Area

Zone	Country	Potential to Increase Kernel Export	Potential to Increase Butter Export	Quality Issues	Certification	Trade Network	Organisation of Processors	Transportation Issues	Mechanical Processing Capacity
WATH Major WA	Benin	Med. (trade currently in process of being improved)	High (also options for finished products)	Further upstream training required, threat from Nigerian high FFA 'raw' imports. Best stearin from N.W. area	Good options for developing fair-trade & organic certification	Strong - KNAR	Weak – some previous CECI / UNIFEM intervention	Only 30 t per lorry, roads reasonable. Ports more expensive than Togo	None known (other reports give 20,000 MT)
	Burkina Faso	Low (unless access to resource increased)	High (also options for finished products)	Need for training on kernel quality. Very high stearin	Ongoing fair-trade & organic certification projects	Strong	Strong but complex	Landlocked exports through Ghana & Togo ports (Côte d'Ivoire currently insecure)	30,000 t (but unsure if any current operation: SITEC & SOFIB)
	Cote d'Ivoire	Low-Med. (unless access to resource increased: due to insecurity & focus on cocoa)	High (due to high technology in South but insecurity & N-S divide may prevent)	Information lacking due to current insecurity probably high stearin in N.E. (some kernel is oven roasted)	No information	Good according to K.I. When no security issues	Unknown	Good & has sea ports but current insecurity between N & S	10,000+ t (unsure if any current operation: TrituraF?)
	Ghana	Low (unless access to resource increased)	High (also options for finished products)	Need for training on kernel quality. Very high stearin	Ongoing fair-trade & organic certification projects	Strong	Still weak (lacks national producer assoc.) despite extensive donor support	Improving road network & has two major sea ports	20,000 t & increasing (Sheaba & Juaben)
	Mali	High	V. High (also options for finished products)	Large amount of training needed to improve kernel quality (most kernel is oven roasted)	Strengthening options for fair-trade & organic certification projects	Improving with support from USAID projects	Improving with support from CECI, SNV & USAID projects	Landlocked but road network being developed – also rail link to coast	Potential for mills to process up to 50,000 t but not currently looking at shea – Huicoma & Sika)
	Nigeria	High	High (also options for finished products)	Huge amount of training needed to improve kernel quality. Range of fat profiles! (kernels being dried raw!)	Need for organisation!	Some areas have improving network (Olam)	Mostly weak opportunity for formation of producers association	Road network good, 30MT per lorry & costs to cross state borders. Number of sea ports but concern on losses	Potentially huge but most processors not interested in shea due to quality concerns (RIVOC, 10,000 MT?)
	Togo	Med	Med	Probable training required, threat from Nigerian high FFA imports. High stearin expected in N.	Unknown	Thought to be strong	Unknown	Good north-south links & well-supported sea-port	15,000+ t (Nioto)

WATH Minor WA	Gambia	V. low	V. low	High olein types (limited occurrence)	None	Non existent	Non existent	Unknown	Non existent
	Guinea-Conakry	High	High	Large amount of training to improve kernel production	Good potential for projects	Weak	Weak	Has sea port. Inland maybe difficult due to insecurity & poor roads	Unknown
	Guinea-Bissau	Low (unconfirmed whether shea exists)	Low	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
	Niger	Med (limited production base)	Med	R&D ongoing on resource	None	Nigerian women buying butter	Strengthening	Good E-W roads but landlocked	None
	Senegal	Med (limited production area)	High (good options for finished products)	Need for training on kernel quality – some areas high olein varieties	Strengthening options for fair-trade & organic	V. limited	Strong with ongoing projects (PROMER)	Isolated production zone in S.E. of country with poor road access	None - except improving option for manual-pressing
	Sierra Leone	Low (unconfirmed whether shea still exists)	Low	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
	Cameroon	Med.	Med.	Good R&D ongoing – some high olein types	Unknown	Unknown	Unknown	Unknown	Unknown
	Chad	Med.	Med.	R&D ongoing – high olein & good cosmetic types	None	None	None	Weak	None
Not WATH	Ethiopia	Low	Low	High olein types (only occurs in Gambela region)	None	None	None	Impossible due to insecurity	None
	Sudan	High	High	Many groups being trained for drying quality raw kernels for pressing. Range of fat profiles?	Ongoing fair-trade & good options for organic certification	Apart from NGOs, non-existent	Strong for those linked with NGOs, otherwise v. weak	V. difficult due to insecurity in southern Sudan	Only from manual presses (<100MT p.a.?)
	Uganda	Med	High	High olein varieties (liquid) but groups trained to dry raw & use mechanical presses	Good options for fair-trade & organic	Weak due to insecurity	One strong organisation if security allows - NUSPA	Insecurity & landlocked but East African trade links improving	From both manual & small scale expellers (<100 t p.a.?)
	Central African Republic (CAR)	Med.	Med.	R&D ongoing – probable high olein & good cosmetic types	None	None	None	Insecure & landlocked	None
	Dem. Republic of Congo (DRC)	Low	Low	Unknown – probable high olein varieties	Unknown	Unknown	Unknown	Insecurity in northeast & large distance to port	Unknown

Information sources: ETFA (1997), Ferris et al. (2001), Lovett & Walter (2004), Collinson & Zewdie-Bosuener (1999), Lovett (reports & pers. obs., 1994-2004), Jaeger (1999), Masters E. (pers. comm., 2004), Kassardjian K. (pers. comm., 2004), Regional Consultative Workshop On Shea Product Quality and Product Certification (Bamako, 6-8 Oct 2004)

3. PROPOSALS FOR WATH REGIONAL STRATEGY

In summary, a clear range of supply chain issues exist throughout the industry starting at the upstream end of the chain in order of importance are:

- Kernel “**Quality @ Quantity**” needs optimised post-harvest processing methods
- Need for standardised small-scale butter processing or storage methods
- Training on maintenance of butter quality to develop a “keep it clean” mindset
- Need for producer organisations and better information access
- Improve options for traceability to allow certification of systems or products

If organisations linked to the producers (NGOs, CGIARs, national institutions, etc.) currently formulating better mechanisms or research to address supply chain constraints, a need to address additional issues, in order of importance, further downstream presents itself:

- Options for capitalisation and credit for both producers and entrepreneurs in order to improve purchasing power or technology
- Information on the economics of medium- to large-scale processing in-country
- Improved transport within Africa and internationally (containers, border costs and delays, etc.)
- Better communication through improved telephone or internet links between producers and buyers
- Increased information on western market demand (what “**Quantity @ Quality**”?)
- Superior marketing to western consumers (packaging and advertising in importing countries)
- Investment opportunities for national and international entrepreneurs or companies

3.1 Recommendations for Interventions in the Shea Industry

When regarding opportunities for intervention in the shea sector by WATH, a choice of promising opportunities in some of the key West African shea producing countries exists. Developing strategic partnerships with key players in order to avoid duplication and to ensure that information is being shared as well as more focussed interventions represent a first step. Some potential partners and their roles appear in ANNEX 5. As the figure shows, a large number of players form the industry, and despite a repeated call to improve in organisational structure and traceability, there exist but a few stable linkages between the facilitators in the region.

Having established an interest, and a credible position in the shea sector, WATH's key roles need defining. The options for assistance are wide and must be chosen carefully to avoid duplication or over-extended resources. For example, the focus could be on training of producers in specific processing techniques, or linking them to markets, although this is probably best left to those with strong links to the grassroots shea production. Another option could be to focus on the training of trainers in business skills or processing techniques, although once again, it is thought that other well-established business development programs are already involved in these activities.

Some aspects, which appear to be underdeveloped in the sector, include the need for accessible and high quality information by both producers and middle-level entrepreneurs who hope to enter the western markets, in particular the US. A number of attempts have been made, but the information offered has often been either inappropriate to a specific group of end-users or not detailed enough for those wishing to learn about importation regulations. Furthermore, the fast-pace of market change has led to contact details and information about particular firms and technologies becoming out of date. This author strongly recommends the development of updated guidebooks on the shea sector, based on those developed by other initiatives²³, accessible by both producer and middle-level traders/entrepreneurs. Two short (20-25 minute) films – one for the village producer with a focus on improving “**Quality at Quantity**” and the other for the ‘in-country’ African entrepreneur who wants to learn about the production of shea, linking with women’s production groups and marketing a new quality product into the national or international markets. This would improve the information flow. Language options should be explored, e.g. Hausa, French, English, etc.

The options for dissemination of such information packages to upstream producers should be given to strategic partners who already work through existing networks, with capacity to reach those in need and who possess the needed equipment (videos, televisions, generators and 4x4 vehicles). Giving the strongest performing entrepreneurs opportunities for high-level training in marketing or other business skills, as well as offering visits to international trade shows or workshops, would further support production and export.

An additional opportunity to increase exports of shea from Africa to the US would be the development of stronger channels between the producer network and the bigger refiners or buyers of shea butter, such as the larger players in the cosmetics industry, as shown in the chain of strategic partnerships below. An additional study, which is ongoing, identifies these players, their market needs and options for encouraging investment into the shea sector. The key missing link at the moment appears to be the development of effective upstream-downstream linkages. If the CGIAR managed initiatives can pull together the larger players at the upstream end, WATH is in an ideal position to help facilitate the downstream linkages. Institutional gaps still exist in certain countries, notably Ghana, where a strong trade in shea nut for industrial processing highlights the lack of support for women producers, and a need for an association of processors. These also exist in other countries, notably Burkina Faso, where a range of such institutions offers an interesting research opportunity and may provide an effective focal point toward which requests for information from the women, or demand for shea butter by international buyers, can be directed. Therefore, to better address the gap in knowledge, supporters of the shea industry must identify the strengths and weaknesses of existing institutions linked to other commodities with the aim of developing a working model for a national shea processors association, e.g. for support by initiatives such as the USAID funded MISTOWA program.

²³ Please contact the WATH office in Accra, if you are involved in developing such publications or films.

3.2 Summary of Proposed Interventions by WATH

This regional study on the shea supply chains of West Africa has highlighted how interventions by organisations such as WATH could provide the catalyst required to stimulate significant improvements to the shea industry in a number of key countries and in a range of areas. Some countries are well-developed in almost all respects, but still lack reliable trade in certain products. For example, most of the shea from Ghana, Mali or Burkina is still refined at later stages, due to poor quality of the initial product. This, and other gaps in the market, leave the women producers unmotivated to address the factors that determine product quality. Since recent research has identified the key quality aspects of shea butter production, opportunities exist to provide this information through more focused technical training by key partners in these countries.

In Nigeria and Guinea, where producers show great interest in developing a stronger shea sector, without even the most basic knowledge of kernel quality and demand by international markets, different interventions may be required. Senegal and Benin stand out as having a number of entrepreneurs with the ability to produce high-quality packaged products for international distribution. These seven countries described should therefore serve as the focus for WATH to develop models on different types and levels of intervention. If successful, other shea producing countries in the region can be invited into the program.

In summary, this study recommends the following options for WATH to intervene in the shea sector, given its goal of promoting both intra-African and international trade in shea kernels and butter, particularly to US markets. These are given in order of importance and recommended action:

1. Develop strategic partnerships in the shea sub-sector through linkages to and discussions with a range of players across the region – national institutions, producers, NGOs, CGIARs, donors, associations, etc. – in order to pinpoint a niche amongst the facilitators of the shea industry.
2. Identify suitable clients – entrepreneurs and companies, either export ready or already involved with shea butter entering the US personal care industry – and countries in which to be involved. Supply chain studies have highlighted that not all countries have reached the same level of development in the sub-sector and entrepreneurs should therefore be selected in a range of locations to ensure comprehensive support across the region. Based on political stability, shea sub-sector infrastructure and existence of known entrepreneurs, recommended countries currently include Benin, Burkina Faso, Ghana, Guinea, Mali, Nigeria and Senegal.
3. Through discussion and continued *in-situ* study with the selected clients, the key constraints and opportunities should be identified and solutions developed for a range of stakeholders and products (from large companies to individual producers).
4. Develop and instigate a training program that will focus on these solutions and expose entrepreneurs to the US market through visits to personal care product outlets and tradeshows. In addition, large US buyers and personal care companies should be linked to African producers capable of supplying high quality kernel or shea butter.
5. The key constraints of sourcing consistently high quality shea butter, transportation, customer demand and lack of information were discussed earlier. This study therefore recommends that the feasibility of a range of options be explored, such as, films, guidebooks, pamphlets, etc. in order to address these constraints. Further needs for regionally specific advice for processing shea butter, links to producers, information about export/import regulations, guides to options for transportation and links to some of the current key players in the industry must be addressed.

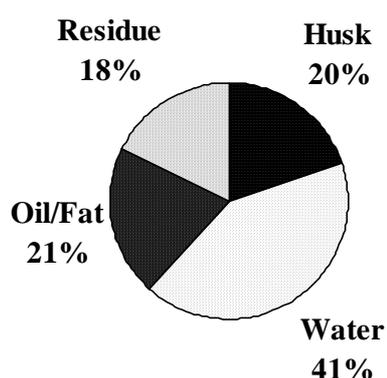
6. Through partnerships with IFDC through the MISTOWA project, national associations of shea butter producers should be supported throughout the region in order to build capacity for the supply of **“Quality @ Quantity”** shea butter and to offer a sustainable platform for linking upstream producers to the downstream market.

ANNEX 1 GLOSSARY AND DEFINITIONS

Shea fruit and Components

- **Whole fresh fruit** = includes sweet edible pulp and whole nut
- **Whole nut or seed** = de-pulped consisting of both kernel and husk
- **Kernel** = de-husked nut or seed (FAO recommends drying below 7%)
- **Shea butter** = oil/fat extracted from kernel

Figure 6 Mean Composition of Whole 'Fresh' Shea nuts



Chemicals in Shea Butter

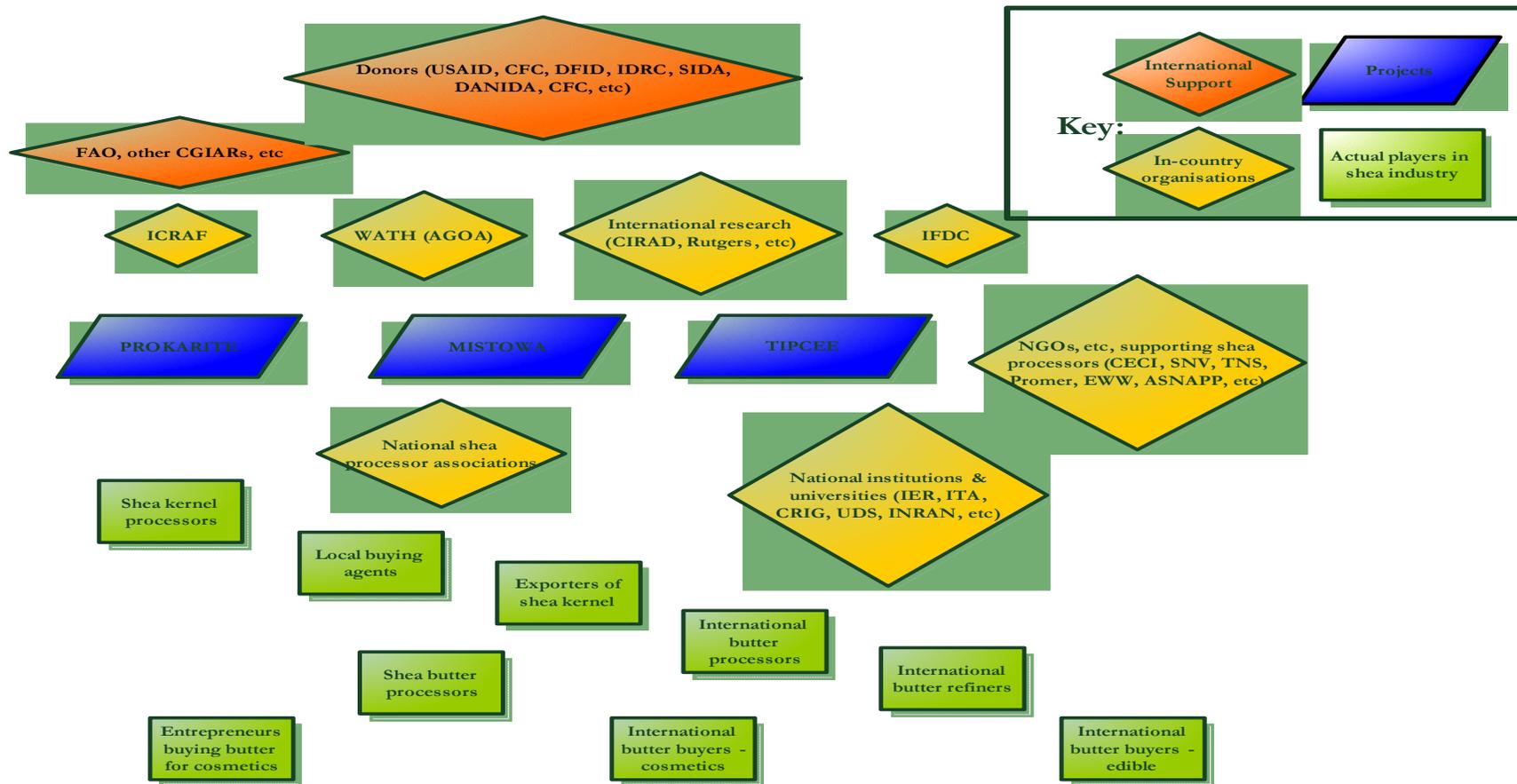
- **Fatty acids** = in shea these are mainly stearic, oleic, palmitic, linoleic, and arachidic and their relative concentrations are used to define the 'oil profile'
- **Olein** = low melting fraction (triacyl-glycerols high in oleic acid, e.g. O-St-O)
- **Stearin** = high melting fat fraction (high in stearic acid, e.g. St-O-St)
- **FFA** = 'Free Fatty Acids' that are indicative of degradation (separated through the hydrolytic action of enzymes – lipases – on the triacyl-glycerols)
- **PV** = 'Peroxide value' another indicator of degradation of the long fatty chains through 'auto-oxidation' into peroxides that can later break down into other chemicals including malodorous ketones and aldehydes. Formation often catalysed by heat, certain metals (e.g. iron and copper) and ultra-violet light.
- **Unsaponifiables** = a large group of chemicals found in high concentrations in shea butter (3-12%) that are credited with giving shea butter its therapeutic properties, e.g. antioxidants (oil-soluble tocopherols and water-soluble catechins) triterpenes such as butyrospermol, phenols, sterols and other substances such as karitene and allantoin.

- **PAHs** = 'Polycyclic Aromatic Hydrocarbons' form during smoking or roasting over open wood fires and will hinder entry into the 'edible marketplace' in Europe and US since these are known carcinogens and various legislations have been formulated that aim to reduce public exposure.

Processing Shea Butter

- **Process** - any stage by which the character of the shea fruit, nut, kernel or butter is altered in terms of chemical quality or physical appearance.
- **Harvest** - collection of mature shea fruit (picked from the ground by women)
- **Post-harvest processing** = the accumulation, heating (boiling or oven-roasting) and sun-drying stages required to produce dried kernel.
- **Maceration** - manual or mechanical breaking of kernel into small fragments
- **Milling** - mechanical method of grinding dried and macerated kernel into a thick paste (hand-ground on a stone quern).
- **Extraction** - separation of oil/fat from other components of the kernel.
- **Traditional extraction** methods (aqueous extraction) where water is used as the 'solvent'.
 - Kneading with water to produce a fatty-emulsion that is then boiled
 - Boiling paste with water in order that oil separates to surface
- **Mechanical extraction** methods
 - Bridge- or screw-press: pressure applied vertically on milled shea kernel, usually by means of a manually turned screw or hydraulic press.
 - Expeller: either small or large scale powered by an engine or electric motor, often with a method of heating the shea kernels (in a container or 'kettle' with a heated steam-jacket) prior to pressing.
 - Expeller plus solvent: the usual industrial method where the residue from mechanical extraction is treated with acetone or hexane solvents to increase extraction rates
- **Waste** remaining after extraction is often described as the 'residue', 'cake' or 'foots', depending on the process used.
- **Refining**: methods used to 'clean' the shea butter of unwanted chemicals
 - Neutralise: remove free fatty acids (and thus reduce acidity)
 - Bleach: method used to reduce the colour of the butter
 - De-odorise: method used to remove volatile chemicals
 - Filter: method used to remove insoluble impurities
 - Vacuum drying: method used to 'boil' at low temperatures to reduce moisture content.
- **Fractionation**: Method used (usually with the solvents acetone or hexane) to separate the olein (oil) and stearin (fat) fractions

ANNEX 1 STRATEGIC PARTNERS



ANNEX 3 CONTACT DETAILS OF POTENTIAL PARTNERS

Organisation: ABPJF: L'association pour la Promotion de la Jeune Fille du Burkina Faso
Contact name: Madame Nikiéma Assétou
Position: Présidente
Partnership: NGO association with rural shea butter producers
Address: 05 BP 6113 Ouagadougou 05, Burkina Faso
Telephone: +226 50 37 23 89
Cell: +226 70 26 65 66
Fax: +226 50 37 32 60
Email: nik_abpjf@yahoo.fr
Comments: Has long standing links with large numbers of women

Organisation: Action for Enterprise – Mali
Contact name: Eric Derks
Position: Country Director
Partnership: Grassroots NGO linking with Mali producers to encourage “Q@Q”
Address: AFE-Mali, Bamako, Mali
Telephone: +223 223 48 89
Fax: +223 223 48 90
Email: afemali@actionforenterprise.org
Website: <http://www.actionforenterprise.org/shea/index.htm>
Comments: Has successfully linked with large buyers of sheanut who in turn have agreed to assist women with technology required for high quality.

Organisation: AMPJF: Association Malienne pour le promotion des Jeunes Femmes
Contact name: Mme. Souadou Diabaté KONE
Position: Président
Partnership: Association supporting shea butter producers
Address: BP 4834 Bamako, Mali
Telephone: +221 671 4707
Email: ampjf@yahoo.fr
Comments: High quality shea butter from rural producers

Organisation: APRESTAS-IMEX
Contact name: M. Ludovic BAKYONO
Position: Manager
Partnership: Potential 'African-based' client
Address: 09 BP 282 Ouagadougou 09, Burkina Faso
Telephone: +226 70 23 91 67
Fax: +226 50 37 25 39
Email: ludovic.bakyono@caramail.com
Comments: Was with Projet National Karité, PNK, Burkina Faso

Organisation: ASIECRU
Contact name: M. KONE Hamza
Partnership: Potential 'African-based' client
Address: 01 BP 986 Bobo-Dioulasso, Burkina Faso
Telephone: +226 20 97 01 47
Cell: +226 76 63 32 32
Fax: +226 50 30 15 53
Email: hamco5@hotmail.com and asicru@hotmail.com
Comments: Supplying bulk shea butter, has links with associations

Organisation: ASNAPP
Contact name: Mrs. Julie Asante-Dartey
Position: Coordinator for Ghana
Partnership: NGO also working on promoting shea butter exports from West Africa
Email: julie@asnapp.org.gh
Website: <http://www.asnapp.org/>
Comments: ASNAPP first developed by staff at Rutgers Univ.

Organisation: CEAS: Centre Ecologique Albert Schweitzer
Contact name: Dr. M. Amidou Ouattara
Position: Chargé de Projet Karité
Partnership: NGO supporting environmental projects at grassroots
Address: 01 BP 3306 Ouagadougou 01, Burkina Faso
Telephone: +226 343 008
Fax: +226 34 065
Email: amidouattara@yahoo.fr
Comments: Enthusiastic on shea quality R&D

Organisation: CECI-Mali
Contact name: Mme. Sabine KONÉ – Hirsiger
Position: Responsable Projet Karité à Siby
Partnership: Canadian NGO.
Address: B.P. 109, Bamako, Mali
Telephone: +223 221 48 44
Fax: +223 221 65 23
Cell: +223 675 12 33
Email: cecimali@cefib.com; sabinekone@cefib.com
Website: <http://www.ceci.ca/>
Comments: Linked to a very active shea butter processors group near Bamako

Organisation: Entreprise Guinéenne d'Entretien et Maintenance, (EGEM)
Contact name: Lamine Traore; Mouctar Diallo
Partnership: Potential 'African-based' client
Address: BP 4689 Conakry, Guinea
Telephone: +224 11 59 88 51
Cell: +224 13 35 16 01
Fax: +224 46 72 36
Email: laminetraore2004@yahoo.fr and mctar2003@yahoo.fr
Comments: Supplying bulk shea butter, has links with USAID-Conakry

Organisation: FAB A AIBA Import & Export
 Contact name: Mme. Adja Binta BALDE
 Position: President
 Partnership: Potential 'African-based' client
 Address: Hamdallaye Pharmacie, Route de Prince, Conakry, Republic de Guinee
 Telephone: +224 22 21 53
 Fax: +244 43 01 27
 Cell: +244 21 51 39
 Email: fabaaiba@yahoo.fr
 Website: www.fabaaiba.com
 Comments: Actively exporting shea butter from Guinea.

Organisation: Fanning Corporation
 Contact name: Frank Fanning
 Position: President
 Partnership: Potential 'US-based' client – large shea distributor in US
 Address: The Fanning Corporation, 2450 West Hubbard St., Chicago, IL 60612-1408
 Telephone: +1 312 563 1234
 Fax: +1 312 563 0087
 Email: Frank@fanncorp.com
 Website: <http://www.fanncorp.com/>
 Comments: Willie Dankwah is the MD in Accra, Ghana
 (Tel: +233 21 23.27.16; Cell: +233 244 32.35.92)

Organisation: Haymor Natural Cosmetics
 Contact name: 1) Joseph Hayford, 2) Mr Fozi Mortada
 Position: 1) M.D., 2) Technical Director
 Partnership: Potential 'African-based' client
 Address: PO Box 3298, Accra-Ghana
 Telephone: +233 21 225 221/ 228 893/ 222 371
 Fax: +233 21 222 371
 Email: hnc_sheaba@yahoo.com
 Comments: Already producing export ready shea butter cosmetics

Organisation: IFDC / MISTOWA
 Contact name: Patrice Annequin
 Position: MIS Unit Manager
 Partnership: NGO in a strong position to support formation 'shea associations'
 Address: P.O. Box 1630 Accra, Ghana
 Telephone: +233 21 763 890
 Cell: +233 244 067 658; +228 903 36 78
 Fax: +233 21 780 829
 Email: pannequin@ifdc.org
 Website: <http://www.ifdc.org/>
 Comments: Potential for strong partnership with WATH to develop regional trade in shea as a component of the MISTOWA program

Organisation: ICRAF-SAHTEL (manages **ProKarité** project)
 Contact name: Dr. Amadou Niang
 Position: Regional Coordinator for the Sahel
 Partnership: Link to CGIAR member supporting regional R&D shea program
 Address: Samanko, Mali BP 320
 Telephone: +233 222 33 75
 Fax: +223 223 50 00
 Email: a.niang@icrisatml.org
 Website: <http://www.worldagroforestry.org/>
 Comments: Opportunity to link market demand directly with rural-based R&D and a network in four pilot countries (Senegal, Mali, Burkina Faso and Niger)

Organisation: IDEAL Providence Farms
 Contact name: Georgina Koomson
 Position: M.D.
 Partnership: Potential 'African-based' client
 Address: POB CT 1225, Accra, Ghana
 Telephone: +233 21 812 736
 Email: ginakoomson@yahoo.co.uk
 Comments: Arranging organic shea butter supplies

Organisation: INRAN
 Contact name: Dr. Larwanou Mahamane
 Position: Researcher
 Partnership: National research institute in Niger
 Address: BP 429 Niamey, Niger
 Telephone: +227 973 442 / 742 967
 Cell: +227 797 3442
 Email: m.larwanou@coraf.org
 Comments: Actively supporting a new R&D program on shea in Niger

Organisation: La Maison du Karité
 Contact name: Taïb Chérif DIOP
 Position: MD
 Partnership: Potential 'African-based' client
 Address: BP 5008, Dakar-Fann, Senegal
 Telephone: +221 823 18 29
 Email: maisonkarit@yahoo.fr

Organisation: Naasakle Limited
 Contact name: Eugenia Akuete
 Position: CEO
 Partnership: Potential 'African-based' client
 Address: P.O. Box 841, Accra, Ghana
 Telephone: +233 21 411 270, +233 21 414240
 Mobile: +233 20 818 9212
 Email: motherakuete@hotmail.com; best_sheabutter@yahoo.com
 Comments: Small-scale processing of butter in Accra for export

Organisation: Natura
 Contact name: Gilles Roger Adamon
 Position: Founder
 Partnership: Potential 'African-based' client
 Address: BP 1798, Cotonou, Benin
 Telephone: +229 30 08 14
 Cell: +229 06 57 59
 Email: naturacosm@yahoo.fr
 Comments: Actively buying shea butter from a women's groups in Northern Benin, producing export ready shea butter cosmetics

Organisation: PAFBF: Projet d'appui aux filières bio-alimentaires
 Contact name: Dr. Jean-Baptiste ZOMA
 Position: Director
 Partnership: NGO association linking rural producers
 Address: BP 13725 Ouagadougou 10
 Telephone: +226 314 052
 Email: pafbf@cenatrin.bf
 Comments: Supports large group of organic producers

Organisation: PhytoPharma
 Contact name: Mme. Marie DIALLO
 Position: Pharmacien Directeur
 Partnership: Potential 'African-based' client
 Address: BP 10935 HLM, Dakar, SENEGAL.
 Telephone: +221 835 28 92
 Email: phytopha@refer.sn
 Comments: Already producing export ready shea butter cosmetics

Organisation: PROMER
 Contact name: Hyacinthe Modou MBENGUE
 Position: Directeur technique
 Partnership: Governmental organisation
 Address: BP 158, Tambacounda, SENEGAL
 Telephone: +221 981 1101, 981 2036
 Fax: +221 981 1232
 Email: promerdp@sentoo.sn, promertb@sentoo.sn
 Comments: Acts like an NGO in S.E. Senegal working directly with women's groups processing shea butter

Organisation: The PURE Company
 Contact name: John Addaquay
 Position: Director
 Partnership: Potential 'African-based' client
 Address: P O Box 15088, Accra North, Ghana
 Telephone: +233 244 360 457
 Fax: +233 21 220 198
 Email: johnaddaquay@yahoo.com
 Comments: Aiming to produce bulk 'pure' mechanically extracted shea butter

Organisation: Songtaaba
 Contact name: Mme. Marcelline OUEDRAOGO,
 Position: President
 Partnership: Potential 'African-based' client
 Telephone: +226 50 34 19 74
 Cell: +226 70 21 28 98
 Email: songtab@fasonet.bf
 Website: <http://www.songtaaba.com/>
 Comments: Actively producing 20-30 t organically certified shea butter per annum

Organisation: Somm Naturel
 Contact name: Arsha Taimoko
 Position: MD
 Partnership: Potential 'African-based' client
 Address: Hse No 11, Abokobi Road, East Cantonments, Accra, Ghana
 Telephone: +233 244 218 228
 Email: sommarsha@yahoo.com
 Comments: Small producer of bulk and some finished shea butter products

Organisation: SNV-MALI
 Contact name: Bernard CONILH de BEYSSAC
 Position: Conseiller Technique Senior - Développement économique rural
 Partnership: International NGO
 Address: BP 2220 Bamako, Rue 17 Porte 305 Badalabougou Est, Bamako, Mali
 Telephone: +223 223 33 47 / 223 33 48
 Fax: +223 223 10 84
 Email: Bernard.deBeyssac@snvmali.org
 Comments: Supporting shea butter associations in Central Mali

Organisation: ULPK: Union Locale des Productrices de Karité
Contact name: Dramane Keita
Position: Agent commercial
Partnership: Potential African 'client' association
Address: Dioïla, Région de Koulikoro
Telephone: +223 225 61 87
Email: conseil@afribone.net.ml; ulpkdioila@yahoo.fr
Comments: Linked to 40+ groups in Mali alongside SNV

Organisation: Vermont Soapworks
Contact name: Larry Pleasant
Position: President and founder
Partnership: Potential 'US-based' client – sourcing shea in Northern Ghana
Address: Vermont Soap Organics, 616 Exchange Street, Middlebury, VT 05753
Toll-Free: +1 866 SOAP-4U2 (+1 866 762 7482)
Local Phone: +1 802 388 4302
Fax: +1 802 388 7471
Email: natural@vtsoap.com
Website: <http://www.vermontsoap.com/>
Comments: Keen to set up larger scale organic and fair-trade production of shea butter

ANNEX 4 PROVENANCE VARIABILITY OF SHEA BUTTER

During the last decade or so, researchers have investigated the identification of genetic variation, potential methods of propagation and varieties with potentially superior characteristics (total fat content, fat profile, unsaponifiable content, growth rate, etc.). To date wide variability is proven to exist in all characters across the species range of *Vitellaria paradoxa*. A number of tools, including rooting cuttings, tissue culture and grafting (required for the successful multiplication of superior varieties) have been used successfully with this species. Genetic data (Fontaine et al., 2004) suggests the existence of two weakly separated 'populations', probably split by unfavourable climatic changes during the last 20,000 years in the dry zone of central West Africa (The 'Dahomey Gap'). The fat profile data (Maranz et al., 2004) demonstrates the existence of three main 'varieties'. (See Table 3.) These varieties are simplistically defined as: 1) The hard-butter 'high stearin' varieties in Burkina Faso and Ghana with St:O ratios of >1; 2) The soft-butter 'mid-range stearin varieties with St:O ratios between 0.7 and 1.0 both to West and East of the hard butter zone; and 3) The very soft-butter or liquid-oil 'high olein' varieties with St:O ratios < 0.7 that occur along the southern edges of the eastern side of the shea zone, such as those found in northern Uganda.

The existence of these 'soft-butter' varieties, in areas not being fully exploited for the stearin trade to the EU, offer exciting opportunities for the selection of areas in which the focus can be for high value cosmetic products for export to cooler northern hemisphere markets. In addition, other notable research (Maranz and Weizman, 2003) also demonstrates that the unsaponifiable content can be higher in some of these under-commercialised areas, offering further competitive advantage to proposals for a new cosmetic industry.

Table 3 Mean Fat Profile by Country²⁴

Country	Location in Shea zone	N	Stearic	Oleic	St:O ratio	Palmitic	Linoleic	Arachidic
Ghana	Central-West	15	45.6	43.3	1.05	4.0	6.3	0.8
Burkina Faso	Central-West	137	44.1	44.0	1.00	3.8	6.4	1.5
Mali	West	141	42.4	45.5	0.93	3.8	6.9	1.5
Guinea	West	29	41.3	47.2	0.87	4.5	5.4	1.2
Nigeria (NW sites)	Central	47	40.8	46.6	0.88	3.9	7.1	1.5
Senegal	West	7	39.0	47.0	0.83	5.0	6.5	1.1
Ethiopia	East	1	37.4	49.8	0.75	5.5	5.5	1.4
Gambia	West	2	37.1	49.3	0.75	3.8	7.7	1.4
Cameroon	Central	19	34.6	51.9	0.67	5.5	7.8	0.4
Chad	Central-East	2	32.3	54.8	0.59	5.4	8.1	1.3
Uganda	East	32	30.7	57.4	0.53	4.7	5.7	1.0

²⁴ Data from ProKarité website (<http://prokarite.org/vitellaria-dbase-EN/>), compiled by Dr. Steve Maranz, 1999-2004. The trivial names of the fatty acids are used for sake of simplicity in place of the systematic names (usually named after first finding in a particular crop). The St:O ratio refers to the Stearic acid content divided by the Oleic acid content, e.g. a high value predicts a low melting point and high St:O content (the triacyl-glycerols most highly valued in formulation of CBIs). For further information the reader is recommended to recent and more detailed texts on the subject (O'Brien, 1998; Gunstone, 1999; Timms, 2003).

ANNEX 5 SHEA STAKEHOLDERS

I. Industrial Processors and Major Importers

Aarhus United (Denmark)
(<http://www.aarhusunited.com/>)

Biochemica International Inc.
(<http://www.biochemica.com>)

Britannia Food Ingredients Ltd
(<http://www.britanniafood.com>)

Fuji Vegetable Oils, Inc. (Japan)
(<http://www.fujioil.co.jp/>)

Foods Fats & Fertilisers Ltd (India)
www.ibf.com/bo/foodsfats.htm

Fanning Corporation
(<http://www.fanncorp.com/>)

Kassardjian Industries (K.I.)

Karlshamns AB (Sweden)
(<http://www.karlshamns.com/>)

Loders Croklaan (Holland)
(<http://www.croklaan.com/>)

L'Occitane
(<http://www.loccitane.com>)

Olam International Limited
(<http://www.olamonline.com/>)

The BodyShop
(<http://www.uk.thebodyshop.com>)

II. Commercial Certification Companies

ASBI	American Shea Butter Institute (US) (http://www.sheainstitute.com/)
Ecocert	Ecocert (France) (http://www.ecocert.fr)
IMO	Institute for Marketecology (Switzerland) (http://www.imo.ch/)
Lacon	Lacon-Institute (Austria) (http://www.lacon-institut.com)
SGS	Société Générale de Surveillance (http://www.sgs.com/)
Skal	Skal (Holland) (http://www.skal.com/)
Soil Association	The Soil Association (UK) (http://www.soilassociation.org)

III. Donors, Non-Profit Organisations and Institutions

AFE	Action for Enterprise (http://www.actionforenterprise.org/shear/)
AMPJF	Association Malienne pour le promotion des Jeunes Femmes
ASNAPP	Agribusiness in Sustainable Natural African Plant Products (http://www.asnapp.org/)
CEAS	Centre Ecologique Albert Schweitzer (http://www.ceas-ong.net/burkina.html)
CECI	Centre Canadien d'Etudes et de Coopération Internationale (http://www.ceci.ca/)
CFC	Common Fund for Commodities (http://www.common-fund.org/)
CGIAR	Consultative Group on International Agricultural Research (http://www.cgiar.org/)
CIFOR	Centre for International Forestry Research (http://www.cifor.cgiar.org/)
CNSF	Centre National de Semences Forestières
DANIDA	Danish International Development Agency (http://www.um.dk/en/menu/DevelopmentPolicy/)

DFID	Department for International Development (http://www.dfid.gov.uk/)
DTA	Département de Technologie Alimentaire (Burkina Faso)
EC	European Community (http://europa.eu.int/)
ECOWAS	Economic Community Of West African States (http://www.ecowas.int/)
EPOPA	Export Promotions of Organic Produce from Africa (http://www.grolink.se/epopa/)
EWV	EnterpriseWorks Worldwide (http://www.enterpriseworks.org/)
FAO	Food and Agricultural Organisation (http://www.fao.org/)
FDA	Food Drugs Administration (http://www.fda.gov/)
FLO	Fairtrade Labelling Organisation International (http://www.fairtrade.net/)
FOSFA	The Federation of Oils, Seeds and Fats Associations (http://www.fosfa.org/)
GTZ	German Technical Co-operation (Deutsche Gesellschaft für Technische Zusammenarbeit) (http://www.gtz.de/)
IDRC	International Development Research Centre (Canada) (http://www.idrc.ca)
IFDC	International Fertilizer Development Center (http://www.ifdc.org/)
ICRAF	World Agroforestry Centre (http://www.worldagroforestry.org/home.asp)
INRAN	Institut National de Recherches Agronomiques du Niger
IRSAT	Institut de Recherche en Sciences Appliquées et Technologies
ITA	Institut de Technologie Alimentaire (Sénégal)
MPFEF	Ministere de Promotion de la Femme, de l'Enfant et de Famille
NOP	The National Organic Program (US) (http://www.ams.usda.gov/nop/indexIE.htm)

OXFAM	The Oxford Committee for Famine Relief (http://www.oxfam.org.uk)
PAFBF	Projet d'Appui aux filières Bio-Alimentaires du Burkina Faso
PNK	Projet National Karité (http://courantsdefemmes.free.fr/Assoces/Burkina/Karite/projet_national_karite.html)
PROMER SIDA	Projet de Promotion des Micro-entreprises Rurales (Sénégal) Swedish International Development Cooperation Agency (http://www.sida.se)
SNV	Stichting Nederlandse Vrijwilligers (Foundation of Netherlands Volunteers) (http://www.snv.nl/)
Songtaaba	Association SONGTAAB-YALGRE (http://www.songtaaba.com/)
TNS	TechnoServe-Ghana (http://www.technoserve.org/africa/ghana-1.html)
UNDP	United Nations Development Program (http://www.undp.org/)
UNIFEM	United Nations Development Fund for Women (http://www.unifem.org/)
UNIDO	United Nations Industrial Development Organization www.unido.org
USAID	United States Agency for International Development (http://www.usaid.gov/)
WATH	The West African Trade Hub (http://www.watradehub.com/)

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