

# *inform*

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## Shea butter



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# Shea butter industry expanding in West Africa

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**T**raditionally used as a source of vegetable fat for cooking or as a moisturizer to stave off the drying effect of the West African winds, shea butter is an ancient African commodity that still plays an important role in village life even while gaining global popularity.

The shea tree (*Vitellaria paradoxa*, formerly known as *Butyrospermum paradoxum*) is the source of shea butter. It is one of the major components of the agroforestry parklands in the dry zone of sub-Saharan Africa and is the main indigenous oil-producing plant of this region. Indigenous to only Africa, its natural range is the semi-arid zone ranging from Gambia to Uganda. Two subspecies are taxonomically defined (*paradoxa* and *nilotica*) though genetic studies that my colleagues and I made suggest the need to reappraise this distinction. This variability, however, holds much potential.

Typically described as 'wild' and 'seldom planted,' the existence of almost plantation-like parklands demonstrates that for centuries naturally regenerating trees have been deliberately maintained, managed and even domesticated. Archaeological evidence and traveller descriptions during the last millennium reveal that this management system, and shea butter trade, was well established before Islam arrived in West Africa. Trade in this commodity may well be confirmed as even older, if ancient Egyptian artifacts made of shea wood and hieroglyphics showing trade in vegetable oil with the "Land of Punt" (potentially Northern Uganda), are proven authentic.

Visits to village markets across the Sahel-savannah zone and beyond reveal that



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*Young shea trees in northern Uganda.*

*Head-panning the fresh sheanut harvest.*

to be only 10-20% of the total with much of the crop totally inaccessible or left uncollected.

During the last century Western demand for shea kernel has been growing. Experienced traders estimate the current total at 150,000 metric tons (MT) of dry shea kernel exported from Africa annually.

The African demand is obvious, given the limited choice of oil or fat sources in the semi-arid zones of the continent. But what is it that has made shea butter so sought after internationally, despite globally available 'vegetable oil' alternatives and difficulties in trading with the African hinterland?

The answer lies in the fact that vegetable oil, rich in olein, is globally abundant, but commercial sources of vegetable fat, or 'stearin'

as it is known in the trade, are less common. Stearin is used in the confectionery industry for chocolates, cakes, etc., and for margarines. The most desired and well-known source of stearin is cocoa butter.

Sources allowable as substitutes for the production of cocoa butter improvers (CBI) in the European Union (EU) are shea, palm, illipe, kokum, sal and mango. Permissible use is now standardized at 5% maximum. In the United States, no 'non-cocoa butter' additions are allowed in products labeled as chocolate, though there is still a growing demand for shea butter.

Regrettably, this substitutable nature of stearin for CBI is the greatest threat to

little has changed and large quantities of shea butter are still sold. It was traditionally used as a source of vegetable fat in cooking (for frying or as a sauce additive), or as pomade for rubbing into the skin or hair to stave off the drying effect of the winds. Other uses include soap making, medicine, waterproofing for walls and lamp fuel.

With an estimated 500 million productive trees, an annual production of dry kernel across the whole range of this species may exceed 2.5 million metric tons (MMT). In high population areas, such as southern Niger and northern Nigeria, the majority of nuts are collected for locally consumed shea butter, though traditional utilization is likely



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*Traditional hand kneading to extract shea butter.*

## New markets

New markets for shea butter exist in the personal care industry. The main reason for this growing interest has been the recognition by the cosmetics industry (and its consumers) of shea butter's therapeutic benefits—ultra-violet light protection, anti-inflammatory, moisturizing, regenerative, anti-eczema and anti-wrinkle properties—due to the presence of a significant fraction of unsaponifiables (3–12%) that includes many bioactive chemicals, e.g. triterpene alcohols, phenols, sterols and the polyisoprenic hydrocarbon karitene.

The latest chapter in the demand for shea butter is the recent recognition by the market in the United States of these beneficial properties. To date it is estimated that the amount used in the Western personal care market is about 10% of the total African export, i.e. 5,000 MT of shea

butter (assuming an extraction rate of 33% by weight) with demand in the United States considered to be growing at 25% per annum.

Most recently, dietary-aid products have been developed from shea butter fractions for both humans and animals, and U.S. patents have been taken out for products that lower

cholesterol, reduce arthritis symptoms and have anti-diarrheal properties.

Given this demand for shea butter on local, regional and international markets, the question arises: How to give the required quality in sufficient quantities while simultaneously increasing benefits reaching the producers, the rural women of the African savannah.

The trade in shea kernel is poorly organized and one that results in the women being price-takers and delivering an inconsistent product quality. Traders therefore enjoy almost total control of a market separated from production in both time and space, i.e. shea is harvested in rural farms in June, but dry kernel purchase is in urban centers in November.

In order to create a “win-win” development scenario, one must consider three important constraints. First, the shea crop is traditionally processed and utilized according to strong local preferences for methods and flavors, i.e. any impetus for change needs to be strong. Second, the competitive world market for stearin has few options to increase prices, i.e. buyers seek better quality shea but at the same cost. Third, the personal care industry is still only a niche market (although it offers the highest opportunities for value addition), i.e. returns to the producers will be limited only to a successful minority of producers.

When taken together, the three markets for shea can justify a sustainable tradition of shea parkland management, but if profitability starts to deteriorate, farmers soon turn to alternative and exotic tree crops on their land, such as cashew and mango.

Research in Ghana and Uganda, supported by the United States Agency for International Development (USAID), has

the fragile African shea industry. Despite being the preferred stearin source for CBI production, the quality, quantity and price of the shea crop are criticized as being erratic. Other constraints include the fear of political instabilities in producing countries (although the best sources of stearin-rich kernel—Ghana, Burkina, Togo, Benin and Mali—have recently been more stable), and the fact that shea kernels are high in gums, resulting in the need for complex and expensive solvent-based fractionation methods. Even with on-farm management, shea trees are at best only semi-domesticated and have many undesirable traits: trees take 20 years to mature, the seeds have short viability, the species is out-crossing and heterozygous populations produce a highly variable crop in terms of chemical profiles.

Given these constraints, it is understandable why buyers of stearin may be looking for more stable stearin sources. It has even been heard that the African shea industry must “buck-up” within five years, or risk being neglected as a source of this sought-after ingredient.

## information

With primary support from the Common Fund for Commodities, the *Projet d'Appui Technique à la Filière Karité* (ProKarité) is currently being implemented by the World Agroforestry Centre (ICRAF) in Senegal, Mali, Burkina Faso and Niger—a pilot platform from which to engage participation and technical collaboration across the African shea zone, including 16 countries from Senegal to Uganda. Building on simple methods of product quality control at the producer level and enhanced ‘trace-ability’ along the supply chain, the project is developing standard operating procedures for certified production of optimal-quality shea products, to increase profitability for the primary producers and rural processors, and to benefit the shea sector as a whole.

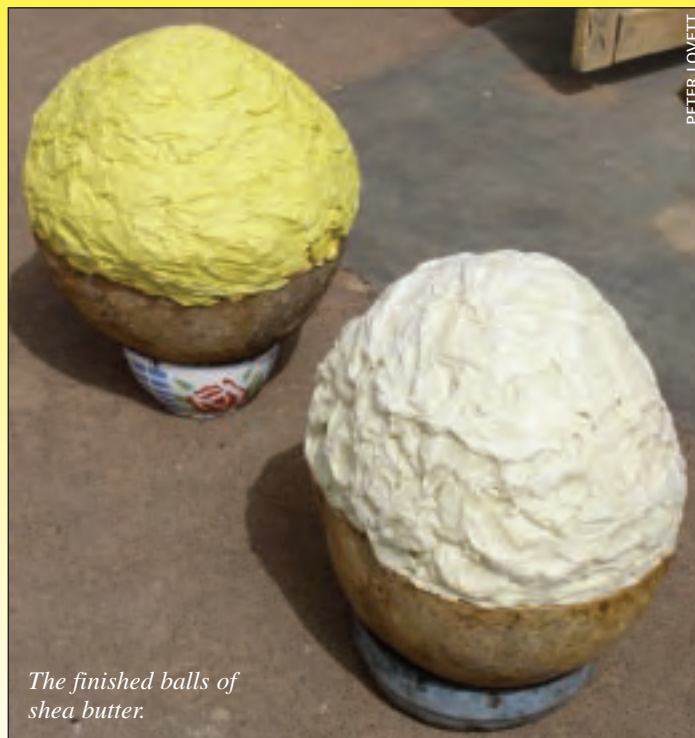
Through the *Vitellaria* Database, ProKarité has assembled existing data on characterization of shea provenances, based on the chemical characteristics or ‘signatures’ of shea products by geographic origin, which may add value for specific end-use applications. More information is at netlink: [www.prokarite.org](http://www.prokarite.org).

revealed some interesting results in regard to producing high-quality shea kernel and the means to improve resource management. Put simply, research shows that degradation is minimized when freshly harvested kernels are boiled using iron-free water and then dried more efficiently than current sun-drying in the rainy season allows. With low free fatty acid levels (< 0.5% is possible), extraction and refining is more efficient and the costs to pay for drying equipment can be justified. Although higher prices would not be paid for the crop, the provision of equipment that halves the drying time, increases extraction rates and can guarantee sales has already been seen by some rural women as sufficient justification to start changing their traditional ways.

In Uganda and Ghana, after only a few years of USAID project work, these types of incentives encouraged increased protection of shea trees and significantly more young trees were maintained in the farmed parklands where the projects were operational.

Furthermore, introducing quality-improving drying technology helps link the market closer to production, offering opportunities for improved traceability. This will be critical for African crops entering EU markets, since all food products put on the market must be traceable under European food and safety regulations that took effect in January. Traceability is also a prerequisite for organic certification, fair-trade and quality assurance. Premiums available with these systems can then offer possibilities for increased returns to the producer.

During the last 20 years, studies have been conducted to identify genetic variation, methods of propagation and varieties with superior characteristics (fat content and profile, unsaponifiable content, growth rate). It has been possible to demonstrate wide variability in *Vitellaria paradoxa*, for virtually all characteristics studied. It has also been possible to develop a range of successful vegetative propagation methods for multiplication of superior varieties. The range of markets—traditional, CBI and personal care—coupled with the variability of shea butter's characteristics, make this a very interesting species to be working with. For example, varieties in the central areas (Ghana, Benin, Togo and Burkina Faso) have



*The finished balls of shea butter.*

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high stearin levels and are the traditional source of raw material for the international oils and fats processors such as Aarhus United A/S based in Denmark, Karlshamn AB in Sweden and Loders Croklaan in The Netherlands.

Shea butter from the eastern and western edges of the range have been typically avoided since they have higher olein content and lower melting points, for instance, varieties in Burkina Faso produce 'hard' shea butter with a melting point of 37°C whereas those in Uganda produce shea 'oil' that is liquid at 25°C (sought after for making 'soft' shea butter cosmetics). Furthermore, certain areas, many of which have not been well researched and are also away from the high stearin zones, have revealed varieties with

significantly higher levels of bioactive chemicals (triterpenes, tocopherols and catechins).

The improvements to the production of large quantities of high-quality raw materials for the edible fats industry combined with the growing trend to experiment with crude shea butter extraction closer to source (to add value and to reduce transport costs) other options for developing the high-value personal care industry become available, such as in-country refining. The current methods for refining shea butter, with expensive and complex equipment, do not currently encourage investment in Africa. Species variability may provide an opportunity for selection of varieties that could simplify this process. For example, use of raw material with lower gum content would allow dry fractionation techniques that are cheaper and more suitable

in tropical regions than those that use inorganic solvents.

Despite the constraints still facing the shea butter industry, it can be seen that new and exciting options exist for this ancient commodity of Africa. Improvements to quality control, a growing range of marketing alternatives and the use of appropriate technologies should soon make it possible to develop the African shea industry for the benefit of all.

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## information

The West Africa Trade Hub (WATH) is a trade facilitation and development project of the West Africa Regional Program of the U.S. Agency for International Development. WATH's primary mandate is to facilitate West Africa's international trade and to help businesses take advantage of the U.S. African Growth and Opportunity Act, which allows duty-free, quota-free imports of many products into the U.S. market. WATH promotes the export of shea butter, among other products, to the United States. Demand for shea butter in the U.S. natural beauty care industry is growing fast. On the supply side, shea butter results from processing of the nut of the shea tree, which grows mostly in West Africa's savannahs, harvested by women who carry out the initial processing locally. For more details, visit the WATH website at netlink: [www.watradehub.com](http://www.watradehub.com).