

# Efficient Stoves for Producing Shea Butter

BENIN

<b>Project name</b>	Energising Development (EnDev) Benin Programme of Conservation and Management of Natural resources (ProCGRN)
<b>Project region</b>	Benin, Atacora and Donga
<b>Lead executing agency</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Duration</b>	10/2009 – 12/2014

## Productive use of thermal energy

Alongside electricity and mechanical energy, thermal energy plays a key role in processing goods and offering services, particularly in remote areas where biomass and solar radiation are often the only source of energy available. Thermal energy – used for cooking, heating, drying and smoking – is an essential input for production processes in agricultural businesses, small industries and commercial services.

## The shea sector in Benin

Shea is a forest tree that grows only in Africa. Depending on the annual precipitation, a full-grown shea tree produces between 12 and 14 kg of dry nuts per year. These can be processed to shea butter, which is in strong demand by the international cosmetics, food and pharmaceutical industries. In 2009, shea was Benin's third largest agricultural export product, after cotton and cashew nuts.





In Benin, about 35,000 tonnes of dry shea nuts are harvested annually, with women constituting the major part of the work force. Most shea nut collectors have no legal employment status and earn low salaries. In the departments of Atacora and Donga in the Northwest of Benin, 28 per cent of all women engage in shea nut collection.

On average a woman harvests between 300 and 1200 kg of shea nuts annually, which generates between 100 and 400 kg of shea butter. In some areas, revenue from shea collection makes up around 55 per cent of the total income of rural women.

Of the total processed shea butter, roughly one quarter is set apart for local use, with three quarters being sold to professional processing units and exporters. On the local market, the price of shea butter varies between CFA 800 and 1200 (USD 1,60 - 2,40) per kg depending on the quality and season.

## Enhancing the energy efficiency of the processing procedure

The district of Atacora, is suffering from severe deforestation due to the rapid increase of its population and their energy needs. The Programme of Conservation and Management of Natural Resources (ProCGRN) under the Energising Development programme therefore engaged in the promotion of improved cookstoves in order to help reduce the amount of wood needed to produce shea butter.

As a co-benefit for shea butter producers, improved cookstoves generate fewer smoke emissions than traditional woodstoves, due to more efficient combustion. In order to spur the development of the local market for improved cookstoves, the project offered technical and business management training to stove producers and retailers. In order to improve the production process, 5,812 people invested in improved cookstoves between 2005 and 2009.

Additionally, the programme supported the producers of shea butter and soap to improve the quality of their products. It offered advice on the purchase of improved equipment for shea processing, as well as customer relations and marketing training.

## Providing efficient cooking technologies

The 'fixed rocket mud stove' is an improved stove for households and productive uses. It has one pothole where the pot sits within the stove body. It is built of a clay mixture, comprising mud and organic material such as chopped grass, sawdust or chopped dry banana leaves, which have an insulating effect to maintain the high temperature of the fire. The combustion chamber and the opening for the firewood are L-shaped; the distance between the bottom of the pot and the fire is clearly specified to guarantee complete combustion of the firewood and to avoid toxic fumes. An extra air inlet on the side creates an undercurrent of air for optimal combustion. If used correctly, the stove saves over 50 per cent firewood compared to a three stone fire. Investment costs for the purchase of the fixed rocket mud stove are around CFA 5000 and 7000 (USD 10 - 14). Assuming that the stove is used for three cooking cycles per day, the daily savings in firewood are equal to CFA 1,050 (USD 2.10). Thus, the amortisation period for an efficient stove is less than 7 days. Maintenance costs total between CFA 500 and 1500 (USD 1–3) per stove and year, depending on the materials used.

## At Soukatignina women earn more money and produce better quality

The enterprise SOUKATIGNINA is run by a group of 28 businesswomen and is located in Kouandé, a community in Atacora in Northern Benin.

Since the acquisition of an efficient stove, they have saved up to 50 per cent on fuel, which increases each woman's daily profit by CFA 350 (USD 0.70). The women have also extended their working hours: previously, there was one team of five maintaining just one three-stone fire.



Gathering fruits

Parboiling

Removing shell

Drying kernels

Storage

Cleaning

Crushing

Roasting

Grinding

Heating emulsion

Butter cleaning

*Steps of the preparation and processing of sheabutter and the thermal energy inputs in form of firewood (yellow).*

Ms Rebeka Boni, who is the president of the group, said: "We always had to be numerous women around the fire, as we always had to run the fire and to take care of our children to avoid burns."

Today, three teams of three people monitor three stoves. Thus, with the fixed rocket stoves, they have tripled their production. This has

approximately doubled the revenue of the company. They produce about 1,024 kg of shea butter per month.

The quality of the shea butter also improves by using a rocket stove, since it avoids the spread of ash on the butter in the last stage of processing, thus rendering a pure, white final product, which attracts higher sales prices.

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