



ENERGY AND RURAL ECONOMIC DEVELOPMENT IN MALI

Improving renewable energy production and access to productive energy in rural areas through sustainable development of short biofuel supply chains.



Jatropha farmer, Konseguela area

CONTEXT AND ISSUES

Against a background of increasingly expensive energy that often constrains rural development in Africa, biofuel supply chains are seen as an opportunity to develop the supply of local energy services and improve community living conditions.

The ALTERRE Mali project is aimed at sustainable development of short biofuel supply chains and local energy services in south-eastern Mali. It seeks to establish a Jatropha seed production and processing value chain so that local economic operators can partially or totally substitute Jatropha Pure Vegetable Oil (PVO) for diesel in their productive activities.

The work of the ALTERRE Mali project began in 2008 in three different areas: the municipalities of Yorosso and Koury and 13 villages spread over the municipalities of Konseguela and Diedougou. A Jatropha-based short biofuel supply chain is being set up in each.



ALTERRE : AN INTEGRATED SUPPORT APPROACH

Driving the establishment of a new supply chain such as Jatropha means placing **special emphasis on guaranteeing the performance of each link in the chain and the chain as a whole.**

The project is therefore supporting stakeholders through five components:

Component 1: Production of Jatropha seed. This must be on a suitable scale to meet the needs of the target area. The programme assists volunteer farmers in growing this new crop.

Component 2 : Extraction of the Jatropha oil. The project supports the establishment of local entrepreneurs and helps to build their technical and managerial skills.

Component 3: Use of the oil in engines. The project finalizes the technical conditions for use and builds operators' capacity to ensure that the oil is used correctly.

Component 4: Structuring the supply chain. To ensure the sustainability of the supply chain, the programme helps the various stakeholder groups to get together and organize their operating model.

Component 5: Monitoring, evaluation and capitalization. The project is strictly monitored and plays a role in establishing technical/economic benchmarks for Jatropha-based farmer biofuel supply chains.



Miller using Jatropha PVO.

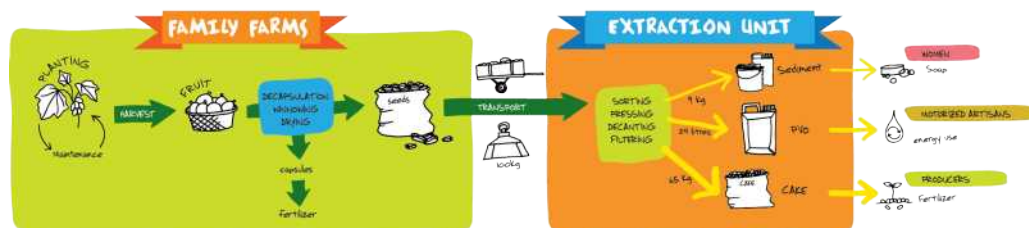
LOCAL BIOFUELS:

These are produced on family farms, using the farm's own resources.

Farmer biofuels are designed to meet the territory's energy needs (not for export). The added value created by this new supply chain is therefore exclusively local.

STAGES AND STAKEHOLDERS IN THE LOCAL JATROPHA VALUE CHAIN

FUNCTIONAL DIAGRAM



FOCUS ON JATROPHA CURCAS



Jatropha fruit.

Jatropha has been present in Mali for several centuries, being used as a crop protection barrier or by women in traditional soap-making. The shrub has many applications in the traditional pharmacopoeia.

An oil is extracted from its seeds which can be used as fuel in some diesel engines. This is known as **Pure Vegetable Oil (PVO)**.

PVO is produced using **simple cold extraction** (pressing) and refining (decantation and filtration) processes with no chemical treatment (e.g. esterification of biodiesel).

PVO can be used pure in **rustic diesel engines** without impacting their durability, by means of a simple, inexpensive adaptation. For more modern engines (generators), an adaptation kit is needed.

THE TARGET GROUPS

- **More than 1300 family farms.** Through the introduction of Jatropha hedging and agro-forestry techniques into their farming systems, they can produce the raw material without jeopardizing the food crops on which they depend.

- **3 extraction units.** Linking the upstream and downstream sides, the units not only ensure the supply of high-quality oil but also establish sustainable economic conditions for the supply chain. They are developed by local entrepreneurs and local stakeholders are consulted concerning their governance. The unit's economic profitability must be safeguarded whilst preserving that of farmers and consumers.

- **Some 300 local micro-businesses** using pure Jatropha vegetable oil, who are providers of motorized services such as mills and decorticating machines, oil presses, battery chargers and multifunction platforms, along with local artisans. Rural electrification businesses, especially SSD Yeelen Kura in the project area, are also interested in this supply chain, because access to a diesel substitute at an affordable, controlled cost meets the need for sustainability and development of their services in rural areas.

- **Women's groups in the area.** They use Jatropha sediment as a low-cost oil-bearing raw material to make soap for both family consumption and sale on the local market.

ACHIEVEMENTS SINCE 2008

- **1300** farmers, **750 000** plants **Jatropha seedlings** corresponding to the equivalent of 750 hectares.
- **2** extraction units built and 1 entrepreneur selected.
- **5 500 litres** of Jatropha PVO produced in 2013.
- **1 700 litres** consumed in 2013 in connection with engine trials conducted with five millers in the three project areas.
- A **quality standard** for the use of PVO in rural engines adopted in Mali.
- A **simple, inexpensive adaptation** (FCFA 6500) of engines in rural areas to use PVO without impacting engine lifetime.



Coloured Jatropha PVO.

AMBITIONS FOR 2015

800,000 trees - 1340 farmers -
215,000 litres PVO in the long run

TECHNICAL PARTNER

- ANADEB - Malian Biofuel Development Agency

FINANCIAL PARTNER

- European Union (Energy II Facility)
- FFEM - French Global Environment Facility
- ADEME - Environment and Energy Management agency
- Agentschaap NL - Daey Ouwens Funds
- TATE
- Prince Albert II of Monaco Foundation
- Veolia Environment Foundation

The ALTERRE Mali project is implemented by:



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