



Sustainable Energy in Africa High Stakes



Cassava crusher powered by a replacement jatropha-based biofuel in Benin



"Sustainable energy for all is critical to achieving the Millennium Development Goals, as well as opening up new prospects for economic growth, development and prosperity throughout the world."

Kandeh Yumkella,
Director General of the United Nations Industrial Development Organization and UN Special Representative
for Sustainable Energy for All

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Energy Access in Africa: a priority for the next decade

Find GERES at Convergences, the global solidarity forum

Aubagne, 9 September 2013. Long neglected, **access to energy** is now recognized as key to human development. Convinced of the importance of meeting the global challenge of access to energy for all, GERES looks forward to seeing you at the Convergences forum on 18 September 2013 at the side event on **Energy Access in Africa**, organized jointly with the **NGO Africa Express**.

Between 17 and 19 September, more than 5000 French and international stakeholders will meet in Paris at the 6th Convergences 2015 Forum, seeking to build a sustainable, fair society together, reduce poverty and thereby achieve the Millennium Development Goals (MDGs).

Energy, a key development issue

More than 580 million people have no access to electricity in Africa. Dependency on fossil fuels has serious consequences for countries' economic activities. In sub-Saharan regions, biomass is the most important energy source. In Mali for example, wood accounts for 80% of energy consumption, so this forest resource is under serious threat.

In rural areas, residents have very limited and sometimes non-existent access to fuel, biomass or electricity. This **energy poverty situation hampers** economic development and **endangers health** and people's living conditions.

But there are solutions: use of renewable energy and better use of resources can improve access to sustainable, cheap energy solutions.

Having worked in Africa for more than 20 years, GERES is now developing techniques adapted to local circumstances in Benin and Mali, which have a beneficial impact on residents' health and local development.

The **side event** "Energy Access in Africa" will give us the opportunity to present our view on energy access issues, based on our field experience in West Africa, particularly through two projects: one focusing on **clean energy production** and the other on **energy efficiency**.

- Large-scale dissemination of improved stoves and sustainable fuels
- Support to a local farmer biofuel supply chain based on jatropha oil

After giving an overview of existing solutions, the NGO Africa Express will show a video on the results of a study conducted into **25 energy projects** in **22 African countries**. In Benin, the Africa Express team filmed the GERES project to set up a local farmer biofuel supply chain.

If you want to grasp the issues and take part in the debate, please come and join us.

Side event

**"Energy Access in Africa:
Keys to the successful development of sustainable projects"**
Wednesday 18 September – 9.30 – 11 a.m. – Palais Brongniart – GE9

-> A side event organized by Africa Express and GERES

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Dissemination of improved stoves



Energy efficiency is just as important as energy access. In this regard, the dissemination of improved stoves plays a huge role in preserving wood resources, reducing energy poverty and fostering local economic development.

In fact, as wood represents more than 80% of the fuel people use to cook, it is becoming scarce and expensive, a serious drain on the family budget. Deforestation results in a fragile and even hostile environment in the sub-Saharan region, which is now amongst those most vulnerable to the impacts of climate change.

Apart from the environmental aspects, health also poses a considerable challenge because pollution in kitchens is said to be responsible for 4 million premature deaths around the world *. Women and their children who stay close to inefficient traditional cooking appliances suffer from serious respiratory

problems. Consequently, the dissemination of efficient, low-cost stoves is a relevant way of optimizing household consumption and reducing indoor pollution. This is what GERES is doing through the CEnAO project and *StovePlus* initiative.

The CEnAO and *StovePlus* initiatives:

Following the success of the mass dissemination of improved stoves project in Cambodia, GERES is setting up large-scale programmes to optimize household consumption:

- ➔ **Begun in 2010, the CEnAO project** (Climate and Energy in West Africa) focuses on the structuring and continuity of supply chains (from production through to distribution) of improved **stoves** and sustainable **fuels**. This means private sector capacity- building and large-scale promotion amongst users.
- ➔ **In 2012, GERES launched *StovePlus***, which aims to disseminate **2 million stoves between now and 2017** in Asia and West Africa. This cross-cutting programme provides technical support to project developers working on clean cooking solutions.

The dissemination of efficient, low-cost stoves and the promotion of sustainable fuels offer genuine prospects for improving the living conditions of poor households, local economic development and environmental conservation in Africa.

Large-scale dissemination through:

- ➔ **Professionalizing entrepreneurs:** producers, tinsmiths and ceramists, by strengthening their production capacities and product quality (efficiency and quality assurance) and providing business management training.
- ➔ **Supporting the structuring of the supply chain**, by fostering synergy between producers and distributors to boost local marketing and large-scale dissemination.
- ➔ **Seeking innovative funding** capable of providing lasting support to the development of the sector and R&D by the businesses (carbon finance, solidarity finance, social entrepreneurship...)



Improved stove in Bamako



*result of a study published by the medical journal The Lancet in December 2012.



Short farmer biofuel supply chain



An original alternative to (polluting, expensive) diesel: local use and production of jatropha-based biofuels.

Jatropha is an oil-seed-bearing shrub occurring in Africa. Its fruits can be dried and crushed to extract the seeds from which pure vegetable oil (PVO) is produced.

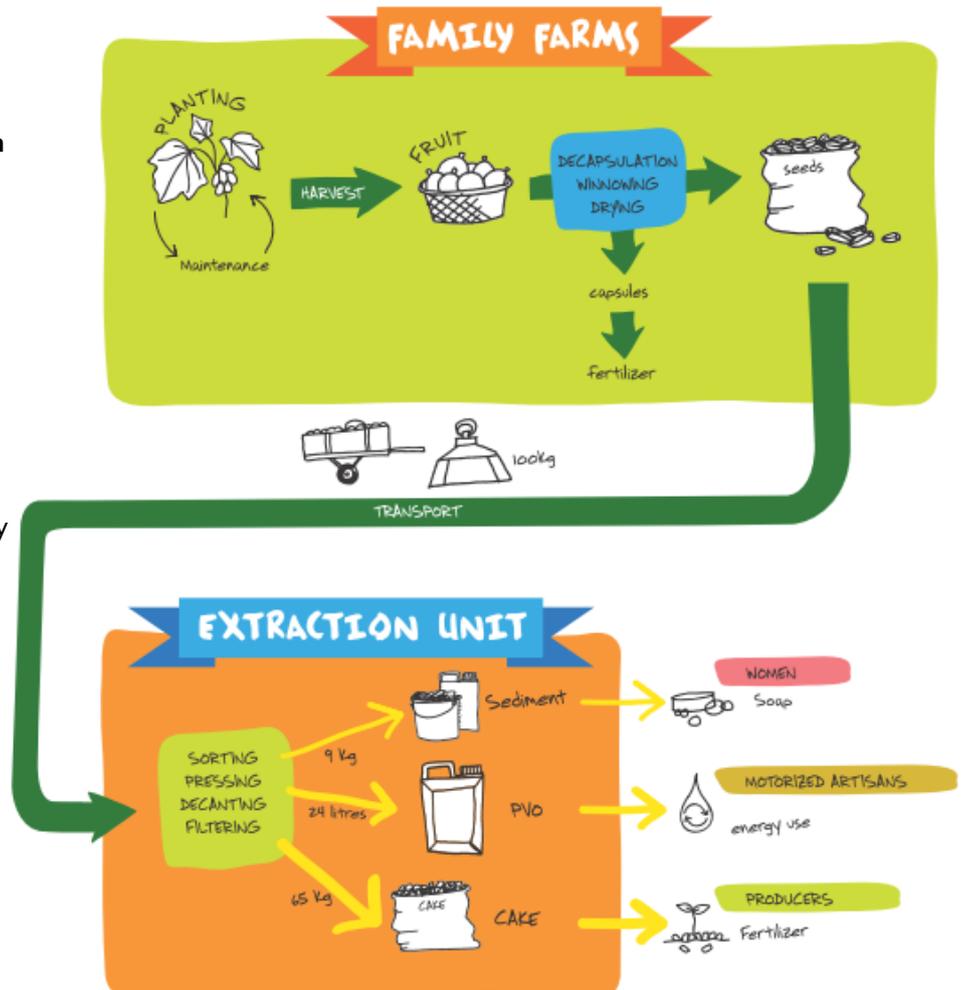
It is not a food plant and is therefore used exclusively as a fuel to power mechanical processes such as milling cassava or pressing oil.

This pure vegetable oil is used in mills or the engines of multi-service food-processing platforms. GERES is helping to establish an integrated supply chain to ensure the continuity of the project.

The Alterre-JatroREF project: Begun in 2008, the Alterre-JatroREF project draws on pilot field experiments undertaken by GERES in Benin and Mali and a network facilitated by IRAM. This project advocates:

- **Short supply chains** to increase local **added-value**.
- **Rational implementation** to ensure that production follows the logic of sustainable development.
- An **approach scaled to meet** the needs of the municipal territory.
- **Rigorous monitoring** to establish technical/economic **benchmarks** for jatropha-based farmer biofuel supply chains (JatroREF network).

FUNCTIONAL DIAGRAM



Benefits at every stage of the supply chain

ADVANTAGES



PLANTING



- Reafforestation
- Erosion control

For the environment

Jatropha plantations have an effect on soil stability and slow down the process of erosion.

SEEDS



- INCREASED FARM INCOME (CASH FLOW)
- Improved living conditions

For the farmers

Selling the seeds provides them with additional income which is vital in the hungry season.

PVO



- Local availability
- Price

- EASY ACCESS TO ENERGY (REPLACING DIESEL)
- Labour saving
- Time saving
- Cost control
- Product quality

For the villagers

Self-sufficiency in energy means the ability to light homes, power food-processing platforms managed by co-operatives (wheat and maize flour, cassava paste, palm and groundnut oil).

This generates new (service) jobs and reduces the food insecurity of the municipal territory.

CAKE



- Local availability
- Price

- IMPROVED SOIL FERTILITY (ORGANIC FERTILIZER)
- Increased farm productivity

For the farmland

Composted waste (jatropha cake) provides a good natural fertilizer for the land, boosting production of both energy and food crops.

SEDIMENT



- Local availability
- Price

- RAW MATERIAL SOAPMAKING
- Time saving in soap production
- Labour saving

For the women

The proceeds from sales provide additional income for women producing jatropha-based soap.

An ethical, responsible supply chain

To get a proper grasp of the issues, it is essential to distinguish between local farmer biofuels and globalizing industrial cash-cropping of biofuels:

Local farmer biofuels	Intensive biofuel monocropping
<ul style="list-style-type: none"> - Rationale: family-level energy access - Short, local supply chain - Cultivation of small areas (0.5 - 1 ha) - Little or no irrigation - No use of harmful organic inputs - Association with other crops, interstitial planting, natural barriers - Participatory, concerted governance - Transport confined to local territory - Boost food security 	<ul style="list-style-type: none"> - Rationale: investment, capital and profit - International export supply chain - Very large areas (50 - 300,000 ha) - Pumping and forced irrigation system to improve yields - Monocropping: use of pesticides, fungicides and other chemical inputs to optimize production - Little consultation, land grabbing - Significant transport requirements - Weakens food security

An integrated approach



Jatropha plants in Benin

ASSESSMENT - The project is primarily based on an in-depth assessment of stakeholders in the supply chain which aims to **meet demand** from the **local** communities.

ENERGY INDEPENDENCE - By totally or partially replacing diesel with pure jatropha vegetable oil, mechanized artisans **reduce their dependency on fossil fuels** and can rely on a constant price for their production. The challenge is therefore to ensure a secure local supply of pure vegetable oil.

VOLUNTARY COMMITMENT - GERES, IRAM and their partners have geared their approach towards **voluntary commitment by farmers** to produce jatropha on areas of farmland corresponding to fuel demand from local economic operators.

Control of energy costs, access to processing services, improved diet, job creation, increased income... When the supply chain is tailored to local realities, the economy can be developed by and for the benefit of local communities.

ZOOM IN ON THE SETUP PROJECT IN BENIN

A sustainable food-processing model



Cassava crusher

Since the early 2000s, GERES has been working in Benin to support the small-scale food-processing sector.

In order to tackle energy shortages, GERES offers access to energy services in rural areas through the activities of the **SETUP project** (Energy and Technical Services for Productive Uses).

The project supports the installation of **multi-function platforms** to process farm produce.

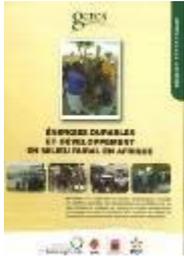
Powered by a diesel engine, a **multi-function platform** is a set of machines used for a series of processing activities, either complementary within one farm produce supply chain or diversified to encompass various types of production. The engines will eventually be able to run on jatropha oil.

Machines commonly used include: mills (for cassava and maize flour and groundnut paste), cassava graters, palm oil presses, palm nut crushers, hullers, mixers used to make groundnut paste cakes

These platforms offer a **concrete**, structured, overall **solution** fostering energy independence and, as a knock-on effect, the economic development of communities in Zou.

Rural micro and small enterprises can then grow and prosper in a more favourable environment. Activities can become more structured and people can finally have access to more efficient mechanized processing techniques.

FURTHER INFORMATION



Energies durables et développement en milieu rural en Afrique (Sustainable energy and development in rural Africa) – in french only

2009, paper or CD Rom (€20), available from GERES on request

- **10 fact sheets** presenting energy needs, current solutions for improving living conditions and decision-making criteria with a view to optimum use of renewable energy and enhanced energy efficiency.



Mise en place d'une filière jatropha au Bénin (Setting up a Jatropha supply chain in Benin) – in French only

2009, GERES production in partnership with FUPRO and GRSTER, made by e-Sud

- **2 participatory videos**
 - 1. Consultation on jatropha Curcas (38')**
Shows meetings and exchanges between stakeholders in the field
 - 2. Investigation of jatropha Curcas (40')**
Helps to visualize all the stages in a local supply chain



Les enjeux des agrocarburants pour le monde paysan au Mali (The challenges of biofuels for small farmers in Mali)

2009, produced by GERES, written by Géraldine Pallière and Swan Fauveaud (48 pp.)

- Cross-cutting study and discussion of the risks and opportunities of Jatropha supply chains. The first stage of the "**challenges for small farmers**" project wanted to allow local stakeholders' voices to be heard.



Jatroref.org

Published by IRAM, web design and web development by Terre nourricière

- **Website** of the JatroREF network, which aims to foster operational exchanges between jatropha project developers in West Africa and institutions, researchers and support organizations, concerned with biofuel development issues. The information will then be disseminated to a wider audience through various publications.

ABOUT GERES



Set up in 1976, the French NGO **GERES** (Group For the Environment, Renewable Energy and Solidarity) mission statement includes helping to preserve the environment, limit climate change and its consequences, reduce energy poverty and improve people's living conditions.

Operating in more than 14 countries in Europe, Africa and Asia, GERES tailors its activities in the field to the various socio-cultural contexts, in both North and South, taking a professional approach to solidarity. Its work is always carried out in partnership with local communities and stakeholders.

Open to co-operation with companies and public authorities, it seeks to give beneficiaries a role in the development of their own territories, through exchanging experience and transferring skills and ownership of technologies.

5 operational themes lie at the heart of GERES mission: Clean Energy Production; Energy Saving and Efficiency; Economic Development; Local Policy and Territory; and Climate Change.

www.geres.eu

ABOUT AFRICA EXPRESS



The NGO Africa Express, founded in June 2011, devotes itself to studying energy projects in Africa and is directed by Jeremy Debreu and Claire Guibert.

Africa Express's mission for 2012, in connection with the International Year of Sustainable Energy for All, included the study of 25 energy projects in 22 African countries.

Specifically, this great adventure took place between April and December 2012 in the form of a tour of Africa by train leaving from Paris via Tangiers to the Cape and then finally Cairo. During the trip, 25 renewable energy projects were studied and the eight-month mission is the subject of a video documentary.

Back from the mission, the good practices observed and lessons learned can be seen for the first time on video. Project developers, private enterprises and specialist international solidarity NGOs bring their insight to bear on the realities of the field.

www.africaexpress.org