

## UNITED NATIONS YEAR OF COOPERATIVES

# Jobs, food and energy thanks to jatrophanuts

**Is it possible to create jobs and economic growth through sustainable use of natural resources? That is the central question at the sixth edition of Floriade Dialogue. The project Mali Biocarburant is an example of new ways to produce energy with a positive impact on resources, creating significant new opportunities for economies and businesses.**

**MAARTJE SMEETS**

The sceptics had some tough questions about agricultural economist Hugo Verkuijl's renewable energy project Mali Biocarburant. His idea was to build a new factory in Mali, West Africa, for the production of biodiesel based on jatropha nuts. "Surely this is just another project that only costs money?" asked potential investors. Human-rights organisations were concerned that local farmers would have to make way for the production of jatropha nuts; food experts feared the sacrifice of agricultural land for energy crops; and agricultural experts warned about a monoculture that would demand water and nutrients from the rest of the environment.

### **Food versus energy**

Much of the criticism levelled at the cultivation of energy crops relates to the sacrifice of agricultural land originally used to grow food. Energy companies often buy thousands of acres of agricultural land, and local farmers have to make way for monocultures such as sugar cane and

palm trees for the production of palm oil. This is not the case with the Mali Biocarburant project. Verkuijl explains: "We help the farmers to integrate some trees with the food crops on their own land, aiming to stimulate food production. It may sound contradictory, because you cannot grow corn where a jatropha tree is standing. However, research at the universities of Wageningen and Burkina Faso has shown that jatropha trees in fact have a positive effect on these crops. "The leaves from the trees absorb the heavy rainfall, which prevents erosion and allows water to flow gradually into the soil. Moreover, the leaves on the ground form a layer of biomass, enriching the soil with valuable minerals." According to the researchers, this leads to an increase of 40 to 50% crop yield within four to five years. Mali Biocarburant is based on a model in which jatropha trees cover 20 to 30% percent of the land; the other 70% remains available for food crops such as corn, sorghum, onions, tomatoes, red chilli peppers and okra.

### **Profitability**

In Mali, and meanwhile also in Burkina Faso, approximately 8,000 small-scale farmers are working in cooperation with Mali Biocarburant. The company buys all the yield of the trees, earning each farmer an additional annual income of around EUR 150. Therein lies the danger of farmers planting their entire land full of trees because of the secure source of income. "I expect the farmers to keep producing multiple crops," says Verkuijl. Onions, for example, give a higher turnover than jatropha seeds. Moreover, the farmers are also entrepreneurs who need to spread risk." The farmers don't just profit from the guaranteed purchase alone, however. "We want the farmers to feel connected to the company," says Verkuijl. "Therefore we united the participating farmers in a union



## **Jatropha**

The seeds of the jatropha tree contain oils, 27 to 40% of which can be processed into biofuel. The trees can grow from five to eight metres high (16 to 26 feet) and grow well on poor soils. Press cake (seedcake) is left after the oils are pressed from the seeds. It contains a lot of nutrients and can therefore be composted and used as a fertiliser (green manure). Arid soils can become fertile again after six to nine years of fertilisation. Per acre, approximately 1,000 jatropha trees can be planted, and this should yield around 1,500 kilograms of seeds per year – which should in turn yield around 450 to 500 litres of oil annually.



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## How East African farmers benefit from the cooperative approach

Mali Biocarburant SA cooperates with several farmer unions and established cooperatives. It enables thousands of farmers in West Africa to improve their living standards in an environmentally and economically sustainable way.

1. Direct employment for more than 150 people and indirect employment for more than 8,000 farmers, impacting more than 80,000 people.
2. A state-of-the-art biodiesel processing unit in Koulikoro, Mali and Burkina Faso.
3. Oil extraction from jatropha nuts near the harvesting site and transportation by truck to the factory for refining, factory work and end-product distribution.
4. Transformation of the press cake into biogas, which provides electricity locally, and sale of 'liquid fertiliser' - a by-product from digestion of jatropha press cake - to farmers who use it as an organic fertiliser.
5. Production of soap from glycerin, another by-product from biodiesel production, by a local women's cooperative.
6. The development of small independent jatropha tree nurseries, where plants are sold to farmers for intercropping or replanting jatropha hedges.

### Hugo Verkuijl on the recent crisis in Mali

"Because of the coup there is a shortage of food and income for many people in the countryside. By buying jatropha nut, we can make a direct contribution to the farmers' earnings. Our campaign to buy jatropha nut however, has had a slow start due to the crisis. The promise of receiving a trade credit from the Bank of Africa has thereby become uncertain. However, important partners of Mali Biocarburant kept supporting our business. It seems that our company has survived the crisis without too much damage."

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1. Corn plants between jatropha trees
2. Independent jatropha tree nursery
3. Jatropha nuts
4. Oil extraction from jatropha nuts



which is a 20% shareholder of the production company of biodiesel. By making the farmers co-owners, they have an interest in a growing, profitable company.”

### Climate

Mali Biocarburant received approval from the CarbonFix organisation for its methods, as small-scale farmers contribute to CO<sub>2</sub> fixation by planting jatropha trees. The farmers receive *carbon credits* which they can sell on. Per acre, this amounts to another EUR 225 of extra annual income for each farmer. The planting of trees was financed for quite some time by car manufacturer Kia Europe in cooperation with Trees for All. It enabled the car manufacturer to buy off its excess CO<sub>2</sub> emissions and shape its sustainability policy. “On top of that,” says Verkuijl, “biodiesel results in a 73% reduction of CO<sub>2</sub> emissions compared to normal fuel. Mali Biocarburant sells biodiesel at a lower price than imported fossil fuel, which is also benefiting consumers. We use the byproduct of biogas to generate electricity. The factory is also hooked up to a transformer supplying electricity to the village’s energy network. What remains at the final stage of the production of biofuel is a nutrient-rich fertiliser that the farmers use to fertilise their food crops.”

### Finance model

Mali Biocarburant was set up with the help of private and public investors. “The money was largely used to invest in building the capacity of the locals. The factory is now fully run by Malians,” explains Verkuijl. It no longer depends on additional financial support. The biodiesel is sold to Grand Moulins du Mali and to a cotton factory, which uses it to power its generators. Small taxis are also running on biodiesel. “We have been able to fully live up to the ideal of local production, local processing and local consumption,” Verkuijl says. The company duplicated its methods to expand in Burkina Faso, using funds from a Private Sector Investment programme (PSI). At the moment, Mali Biocarburant is the first and only private company to receive a grant from the International Fund for Agricultural Development (IFAD). It aims at using the same approach to expand in Senegal, Ivory Coast and Guinea, through separate foundations. This project began in March 2012. ●

5. Jatropha nuts
6. Oil extraction from jatropha nuts near the harvesting site.
7. Local small-scale factory where oil is extracted before it is transported.



## 2012 United Nations International Year of Cooperatives

The United Nations General Assembly has declared 2012 as the International Year of Cooperatives. With the theme of ‘Cooperative Enterprises Build a Better World’, the UN-Year seeks to encourage the growth and establishment of cooperatives all over the world. It also encourages individuals, communities and governments to recognise the agency of cooperatives in helping to achieve internationally agreed upon development goals, such as the Millennium Development Goals.

Cooperatives are business enterprises owned and controlled by the very members that they serve. Their member-driven nature is one of the most clearly differentiating factors of cooperative enterprises. This means that decisions made in cooperatives are balanced by the pursuit of profit, and the needs and interests of members and their communities.