

The Shakapopela Association: Women using biofuels for locally generated power in Zambia



Author

Wendy Annecke

Monitoring and Evaluation, GVEP International, The Green Building, Westlake Park 7945, Cape Town, South Africa

Email: wendy.annecke@gvep.org

Figure 1: Women of the Shakapopela Association (Photo: GVEP International)

One of the outreach projects implemented by DAPP Child Aid in the Chibombo District in Zambia is the GVEP International - Gaia Movement's 'Community Generated Power: Scaling up biofuel production for local use in Zambia'. This involves both growing suitable plant, producing oil and using the oil in a diesel engine that has been adapted to run on a dual fuel system (according to tested specifications in another GVEP International project in India). The Shakapopela Association of women is showing the way in both regards, notwithstanding various obstacles which include a shortage of jatropha seeds and necessary adaptations to the hammer mill engine they operate. In this article the author presents a summary of both the project and a recent trip made to site.

Elizabeth Ndlovu is one of the women of the Shakapopela Association in the Chibombo District of Zambia who operates their hammer mill engine to grind the maize that farmers in the area grow. The Shakapopela women's group charges 2,000 kwacha per tin of maize and produces a good fine meal. The problem is that the women have not been able to raise the price of their service to meet the cost of running the engine.

This group of twelve enterprising women clubbed together in 2005 and in 2006 bought a hammer mill engine from the government – for which they have been

making monthly repayments ever since. For the first couple of years the engine ran on diesel and the women's group was doing very nicely until 2008 when the price of diesel started to rise sharply. By the middle of 2008, instead of buying 20 litres of diesel at a time which would last them two weeks, the women resorted to buying 5 litres at a time, because that was all they could afford. Joyce Chilambe, the secretary, was able to enumerate exactly how their profit margins have shrunk, and how, in fact they are getting poorer again.

Luckily DAPP Child Aid, which implements the GVEP International - Gaia

Movement project, 'Community Generated Power: Scaling up biofuel production for local use in Zambia', has been able to come to the Shakapopela Association's assistance. The women agreed to allow their engine to be used as one of the trial engines running on alternative oils such as cotton seed and the oil from *Jatropha curcas*. The project engineer, Albert Ngwira has rigged up a system whereby the engine is started on diesel and allowed to run for about 5 minutes while the jatropha oil is heated in a coil around the exhaust. The diesel is then switched off and the warmed jatropha is used instead. The trials are to find out whether using plant oil without additives leaves a residue in the generator. As part of the GVEP - Gaia Movement project a number of endurance tests of the dual fuel system running on jatropha oil are being done by the Delhi College of Engineering in India under the leadership of Professor Naveen Kumar. The first round of a 512-hour endurance test were very promising and a second round has begun. When the project receives the final results from the Delhi College of Engineering, and local Zambian tests show that the system works well under the local conditions, a number of village mechanics will be trained to adapt diesel engines to the dual fuel system. The system can then be

Figure 2: The hammer engine with duel fuel system
(Photo: GVEP International)

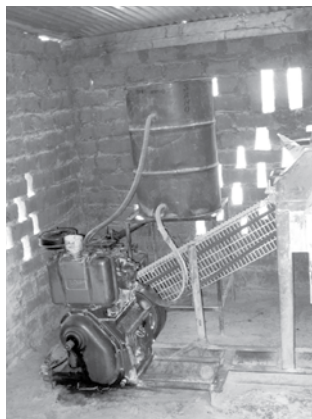


Figure 3: Mr Moyo and Mr Zulu with jatropa seeds a year after planting
(Photo: GVEP International)



more widely disseminated in Zambia as well as in neighbouring countries, where DAPP partner organisations operate.

At present GVEP International - DAPP is supplying the jatropa oil to the Shakaopela test engine, but the intention is that the women's group should be able to grow their own. To this end the women's group received training in growing their own *Jatropha curcas* from Morris Tembo the co-leader of project, who is dedicated to developing sustainable livelihoods. Each woman in the group received a kilogram of jatropa seed. As is the practice with all the project nurseries in the area, those farmers who have water available planted the seeds immediately and are enthusiastic about the rate at which they have germinated and grown. Those women who rely on rain should be able to plant their seeds soon, because the rain clouds were gathering even during the visit. Some of the jatropa we saw, which was well watered, was producing seed after only a year, but this is unlikely to be the case on all farms. Generally growers are advised that plants will take between two and four years to bear seeds, and all growers are advised to intercrop. This they are doing with onions, tomatoes, citrus trees, cabbages and pigeon peas. But the rapid production of seed is encouraging because at the beginning of the year seed was an issue because of a limited local supply.

Zambians, like many of their neighbours, have grown jatropa as hedges for many years, and although some knew the value of the oil and have been using it for soap and lighting, there was little demand for harvesting. All this changed rapidly in 2006/7 when oil prices soared, estimations of peak oil absorbed us, the surging demand for energy and the threat of climate change were high on the agenda and bio-fuels, in particular growing such crops as *Jatropha curcas*, was widely held to be the next development panacea. Several international companies leased land in countries including Zambia, and would-be growers soon reported a shortage of seeds and seedlings. Some commercial growers imported seed from India, but reportedly the seed yield was very low and the Zambian government subsequently refused to allow further importation.

Jatropha seeds suddenly had commercial value, and ordinary farmers and NGOs had to compete with the big companies to procure them. The companies let it be known that they would buy seed at 5,000 to 10,000 kwacha per kilo (\$1.20 - 2.50), thus further stimulating the market, harvesting and hoarding activities. Those in the Chibombo project area, for example, who had harvested seeds, held on to them in the hope that the price would go up further, or that they would be able to sell to those offering a high price rather than to an NGO. In many cases the seed was not stored in a shady dry place, but simply left it on the ground so that when it was finally sold to DAPP for around 3,000 kwacha per kilogram, it was found that germination rates were relatively low. Producers are now taught how to store their seeds correctly.

As I write the global focus has shifted from energy and climate change: with the collapse of banks in the north and the global economic slow-down the price of oil has fallen from nearly 150 USD a barrel to around 60 USD. While at this price oil is still expensive, and the fall in the value of currencies might see little real relief to developing countries, it does not appear as if the jatropa craze is as strong as it was three months ago. This is probably just as well for those who, as in the GVEP International- DAPP project, believe that the most benefit is to be had from local beneficiation and use.

When we visited the Shakaopela Association, I asked the women about their concerns and problems. The subsequent discussion showed exactly what their priorities were and how business minded they were. The questions asked included whether the jatropa nurseries could be given fertilizer to make the plants grow better, what the best time was for harvesting seed for maximum benefit from oil and germination, what price they would be paid for the seed they harvested, whether DAPP would buy their seeds.

In response we said DAPP has good contact with the local branch of the Department of Agriculture which teaches farmers how to make and use their own compost, and DAPP will arrange such training again. The second question was easy for Morris to answer because he has taught it often. The seeds

should be harvested when the husk turns black and is ready to drop from the tree. It is at this stage that the oil content is at its highest and the seed is best for pressing or storing carefully for germinating when there is water or rain. The next two questions were more difficult to answer. I said that my observation of DAPP was that it is an organization devoted to local empowerment, so although DAPP, as an NGO, were not rich, they would pay a fair price for seed. However the aim of the project was for local farmers to be self-sufficient, so ideally they should crush the seed to produce oil for their own use: in the generator, as lamp oil, to make soap and even to sell on, or they could germinate some seed and sell seedlings because it is best to 'add value' to whatever they have before selling it. This they understood well.

All in all, valuable experience in community generated power is being gained in this project, and biofuel production and use is being scaled up to the benefit of local people in Zambia. I thank all the others also involved, Kenneth Mutibo, Mephias Shanobe, Simon Chipoya, John Bwalya and the staff at Children's Town for their parts in improving the lives of the Chibombo District community.

Profile of the author

Wendy Annecke has a special interest in gender issues, low-cost electrification, renewable energy and biofuels. She has worked in Africa, India and Latin America in energy research, policy development and planning, specialising in participatory methodologies and qualitative research design. Wendy lives in Cape Town, South Africa and works as GVEP International's Monitoring and Evaluation specialist.

www.hedon.info/NXPA

- * Full article online
- * Author profile and latest contact details
- * GVEP International website

Meet us @HEDON