

**The GAIA-Movement Narrative Progress report No 1
November 2007**

**Project: “Jatropha oil for local development in Mozambique”
Sub-title: “Biofuel for development and Communal Energy Self-Supply”**

**Reporting period: January 2007 - November 2007
Author: Mr. Christian Fenger, General Manager**

Progress per expected main result

1. *Inputs given in design of the research program and contribution provided for coordination and monitoring, together with FACT.*

Planned results for 2007

A well designed research programme to assess knowledge on:

- a) most efficient *Jatropha* varieties and cultivation of these,
- b) the possibility of *Jatropha* acting as host for various agricultural pest organism, and
- c) combat of these with natural pesticides known

Actual results for 2007

Christian Fenger participated in several meetings and sessions with representatives from FACT, IIAM, HIVOS and ADPP to discuss and determine the best way to implement the research programme, as well as where it could be possible to obtain seeds. These activities have taken place in Central Mozambique as well as during the FACT conference in Eindhoven.

Since then CF has investigated the possibility of obtaining quality seeds in Zambia, and recommended to IIAM to import seeds from Golden Valley Research Institute. Contact has been taken with an Italian organisation in Quelimane, Central Mozambique, which has several hundred hectares of *jatropha* of locally collected varieties.

During a stay at the project location in Bilibiza, October-November 2007, CF has, through discussions with farmers and project staff, developed a model for additional research activities to take place as on-farm research.

It is for example very necessary under the project conditions within a national park and with human-animal conflicts, to develop *jatropha* fencing, which is both efficient in keeping out a number of animals as well as productive in seeds. Various pruning systems therefore need to be tested to select the best system(s) under the local conditions. The ADPP project staff will carry out this research by instructing Field Extension Workers on these systems and monitor the results.

CF participated in a training course with these farmers and jointly developed three different pruning models, which will be tested.

During the stay and the discussions it has also been determined that the main focus in the project area must be fences. The "model fields" will therefore to a very high degree be fences of *jatropha*, which will be intercropped with fences of sisal, espinhosa, msangu and tephrosia.

Seeds of tephrosia (*Utupha*) have now been found, and the farmers will be instructed in how to make biopesticide from this to reduce losses to pests in *jatropha* (until now a very small problem in the project area).

Planned for 2008

The GAIA-Movement will monitor the on-farm trial plots on pruning systems in order to ensure that the project promotes a system that is makes efficient fences and give good yields of seeds.

2. *Training material for community mobilisers, etc. produced.*

Planned results for 2007

The book “40 Acções do Movimento GAIA” (in English “40 Green World Actions”) published in a revised and updated version. The book contains many low-cost /no-cost environmental activities relevant for communities such as the Farmers Clubs in Northern Mozambique.

Actual results for 2007

The GAIA-Movement has produced new manuals (vermiculture, soap production) to be included in the second edition of the Portuguese book, and revised the manuals describing jatropa, moringa, conservation farming, water tanks, water filters, groundwater recharge, rope pumps, manual borehole drilling, etc.

The content has been tested and improved during training sessions with Field Extension Workers in Bilibiza during the stay in Oct-Nov. 2007.

Most of the layout work has been done, and it is expected that the book is ready for printing in India in December 2007.

The revised edition will also be placed on the GAIA website, and others who are interested.

Planned for 2008

The book will be printed end of 2007, start of 2008 and the project will be able to receive the book by March-April 2008.

As results are obtained from the above mentioned research activities - e.g. on best pruning practices, best systems to combat pests - this information will added to the existing description of jatropa cultivation and made into a small handbook (in Portuguese and Makua) on best Jatropa cultivation practices. This booklet will also contain sections on how to use the oil for soap production and make simple jatropa oil lamps.

The booklet will be distributed to the Field Extension Workers in each Farmers Club, farmers with model fields, project staff and other interested persons/organisations. It will also be placed on the FACT and GAIA websites.

3. *Contribution delivered on developing a booklet, radio programmes and a video film describing the best practices and the lessons learned on mobilising rural communities to establish energy self-supply systems. Together with ADPP and FACT.*

Planned results for 2007

No activity planned for 2007.

Actual results for 2007

The GAIA-Movement has gained valuable experience with mobilising rural communities to establish energy self-supply systems through a Zambian biofuel project funded through the Global Village Energy Partnership. Many of the activities in this Zambian project, which ended September 2007, were similar to the ones in the FACT project. The GAIA-Movement has made a presentation about the project and a presentation on why such a biofuel project contribute to local and global environment. These presentation have been shown to project staff and Community Animators of the FACT project, and have been placed on the GAIA website.

Planned for 2008

The GAIA-Movement will in 2008 produce informational material on environmental activities in Farmers Clubs and especially on jatropha production by smallholders in Northern Mozambique. This material to be placed on websites and used in presentations to Farmers Clubs in other parts of Southern Africa.

It is also planned that a film will be made on the activities of all the various Farmers Clubs in Mozambique. The GAIA-Movement will contribute to this production by checking and, if needed, revising the information on jatropha cultivation, pump production, small-scale irrigation, live fencing, etc.

Activities will be conducted during 2008 to develop the dual fuel system for stationary engines. The GAIA-Movement will produce informational material on the various systems that have been tested and (hopefully) describing a dual fuel system that is economically viable, safe to use and technically appropriate for the Mozambican village situation.

4. Assistance provided for holding a training course for project technicians form other ADPP/DAPP in Southern Africa to disseminate the self-supply energy technology. Together with ADPP and FACT.

Planned results for 2007

No activity planned for 2007.

Actual results for 2007

No activities realised in 2007.

Planned for 2008

During the stay at the project location in October-November 2007, discussions were held between FACT, ADPP and GAIA on conducting some of this training in connection with some of the meetings of Farmers Club Project Leaders held twice annually in Zimbabwe. Christian Fenger plans to attend one or two of these meetings in order to conduct training on jatropha cultivation, uses of oil and (when developed) the dual fuel system for stationary engines.

5. Possible positive and negative environmental impact of scaling up production of plant oil assessed. Together with ADPP.

Planned results for 2007

No activity planned in 2007.

Actual results for 2007

No activities realised in 2007.

Planned for 2008

Scaling up the production of plant oil depends to a large extent on the possibility of processing and using the oil locally. The preliminary survey of diesel engines in the project area show that most engines used in grinding mills are Chinese and of the Direct Injection type. It is therefore very necessary to develop a dual fuel system which can be easily adapted to the local machines.

During the stay at the project location in October-November 2007, discussions were held between FACT, ADPP and GAIA on using Euro 5,000 of these funds for testing various dual fuel models in India, China or other countries where they have the expertise, equipment and these can be conducted at a low cost.

In close cooperation with FACT, persons/institutions will be found to conduct these endurance tests.

The GAIA-Movement has already, as part of a biofuel project in Zambia, established a good contact with Professor Naveen Kumar of Delhi College of Engineering. GAIA organised that he led an endurance test of 512 hours of an air-cooled 1-cylinder Kirloskar engine (commonly used for grinding mills in Zambia) adapted to a dual fuel system with unheated jatropha oil. The result showed clearly that the system needs improvements, and a second endurance test will be conducted, where the jatropha oil is heated by coiling around the exhaust before entering the engine.

6. Agreed on cooperation with other governmental and non-governmental partners operating in Mozambique on scaling up the project model and large-scale proposals prepared. Together with ADPP and FACT.

Planned results for 2007

No activity planned in 2007.

Actual results for 2007

No activities realised in 2007.

Planned for 2008

Essential for preparing large-scale proposals is that an economically and technically viable dual-fuel system has been developed. This is expected to be ready at the end of 2008. At that time The GAIA-Movement will, together with ADPP and FACT, contact potential partners and start the process of developing large-scale proposals for scaling up the project idea.

7. Funding opportunities found together with potential partners and proposals submitted. Together with ADPP and FACT.

Planned results for 2007

No activity planned in 2007.

Actual results for 2007

The GAIA-Movement has developed a proposal to EU for a 3-years food security project in Cabinda, Angola, which has been approved. Farmers are assisted to use their forest resources sustainably and increase forest over. One of the elements is to promote jatropha and to set up model engines that use the dual fuel system.

Another proposal to EU for a 3-year food security project in Malawi has been developed by GAIA and also been approved. Several hundred self help groups will be assisted to set up irrigated gardens and to plant jatrophas as live fencing as protection of the gardens.

The GAIA-Movement has finally submitted a proposal to Global Village Energy Partnership (GVEP) International for a continuation of the existing community development project involving the promotion of jatropha and its use in stationary engines in Zambia (USD 118,000). GVEP has indicated that there is a good chance of funding, and an answer is expected before the end of the year.

Planned for 2008

The GAIA-Movement will in 2008 continue the activities of finding potential partners and submit proposals

8. Developing curriculum and training material. Together with ADPP, Flemming Nielsen and FACT.

Planned results for 2007

No activity planned in 2007.

Actual results for 2007

No activities realised in 2007.

Planned for 2008

As mentioned under item 2 - production of training material for community mobilisers - The GAIA-Movement in 2008 expects to be able to make a booklet on jatropha cultivation under the local conditions in Northern Mozambique.

The GAIA-Movement will make a proposal for training material to be used at the Training Centre regarding the agricultural issues of the project. This proposal will be discussed with ADPP, FACT and Flemming Nielsen.

Production of material regarding engine adaptation and oil production will most likely only be done in 2009.

Other activities:

a. Procure low-cost and appropriate oil presses and develop the oil handling system

Planned for 2008

The GAIA-Movement will actively take part in selecting the most appropriate oil press for the project area, as well as organise testing (e.g. in India or China) to determine the chemical and physical properties of the jatropha oil and the influence of various handling systems (filtering, heating, etc.) on these properties.

The most appropriate handling system will be developed based on these results. GAIA will also assist in finding locations in Mozambique or a neighbouring country where training of the oil press operator can take place, or from where a person can be sent to conduct training in Bilibiza.

b. Select and train a person to lead the jatropha training activities at the Training Centre and elsewhere.

Planned for 2008

The GAIA-Movement will take part in procuring and selecting a technically skilled person to be able to train project leaders, extension workers and staff from other NGOs, as trainers in jatropha production, processing and use.

Some of this training will take place at the Training Centre in Bilibiza, but the Centre Leader should also travel to other projects and conduct training there.

Finally this person should be able to lead the production of rope pumps at the metal workshop at Bilibiza as well as train persons in production of rope pumps, manually drilling techniques, etc.

c. 25 Mozambican rural communities producing jatropha seeds sustainably on at least 250 ha for energy use

Actual results for 2007

Several meetings have been held with Project Leaders, Felicity and Ernesto to discuss progress and find solutions to some of the challenges. Such meetings have been held twice in Zimbabwe in April and October, in Chimoio in April 2007, and in October-November at Bilibiza, where the new Co-project Leader Henderson also participated.

Planned for 2008

The GAIA-Movement will in 2008 continue to assist the project by having monthly email or telephone contact with the Project Leaders.

Christian Fenger also plans to make at least one visit to Northern Mozambique during 2008.