

**ADPP-FACT Narrative Progress report No. 4**

1<sup>th</sup> of December 2008

**Jatropha oil for local development  
in Mozambique**

**Biofuel for Development and Communal Energy Self-Supply**



*The first lady, Mrs. Guebuza, accompanied by Erik Schurmann  
head of ADPP Bilibiza*

**July – November 2008**

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**ADPP project leader & FACT-Arrakis project coordinator**

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### Abbreviations:

EPF	Escola de Professores do Futuro - Teacher Training College
EW	Extension Workers
FC	Farmers Club
FCC	Farmers Club Committee
FEW	Field Extension Worker
HQ	Head Quarters of ADPP in Maputo
IIAM	Instituto de Investigação Agrária de Mozambique. Agricultural Research Institute conducting research on jatropha cultivation issues.
PT	Project Technicians (one water technician and one jatropha technician)
QNP	Quirimbas National Park
TT	Teacher Trainee - implementing community mobilising in rural communities during teaching practice period of 11 months
USDA	United States Department of Agriculture (co-funder)
SSCD	Sustainable Supply Chain Development (Company led by Ruaraidh Petre in Botswana)
BBC	Bilibiza Bio-fuel Center

# 1 Introduction

The main objective of the 'Jatropha oil for local development in Mozambique' project is to improve the self supply of energy of community members in the Quirimbas National Park (QNP), Cabo Delgado, Mozambique and in doing so, assist their income situation. Currently, farmers within the national park are isolated from many services, are subject to severe difficulties in farming due to conflict with the parks wildlife and have few income generating opportunities. Not much is known about viable cultivation of Jatropha cultivation in Mozambique, but the climate and soil in the project area appears well suited to its growth. Additionally, its low maintenance characteristics lend itself as an easy alternative source for energy for local subsistence farmers without compromising their primary need to produce food crops.

The first stage of the project is aimed at establishing the cultivation of jatropha within 25 communities within QNP.

This report overviews the progress of activities outlined for the period July – November 2008, and provides a reassessment of the activity timetable based on practical judgements from the field.

## 2 Progress per expected main result

### 2.1 Expected main results at end of project

Twenty five Mozambican rural communities will produce jatropha seeds sustainably for energy use on at least 250 ha.

### 2.2 What is going well?

- The rural communities in general have come to accept the project, the total number of FC producing Jatropha now is 32, therewith surpassing the target of 25, which is an over achievement
- Although the project started at a slower rate than planned, (the expenditures were only about 50% of the budget for the first year 2007) the project started gaining ground in the second year; even the level of implementation is improving both qualitative and quantitatively as demonstrated in the budget expenditure of the second year, which is expected to reach 85% of the budget.
- At present some 95,000 jatropha plants are growing, the equivalent of 95 ha.
- Enough seeds bought (1,800 kg) to achieve the target of 250 ha
- Combination of food, especially vegetables, with Jatropha is working well.
- Good stories can be told; One women chief of FC in Mizeze gained USD 3,500 the first year, by delivering vegetables to Beach Hotel and Shoprite ( a supermarket chain)
- The quality of wells and steel pumps is improving, for 14 FC the well plus pump are in order and providing water, even at the end of the dry season (in Oct)
- At the EPF school in Bilibiza the nursery is doing well, the agricultural school is learning from it, making demo plots also.
- Preparation of a 25 ha demo plantation at EPF school is done well, by preparing 16,000 seedlings in bags.
- An experienced person was found to start developing the Bilibiza Bio-fuel Centre (BBC). Francisco Dias from Montepuez.

- Relations with provincial and local authorities (DPA) are good, and support is given by them, amongst others, two treadle pumps, chemical fertilizer and in Nanjuba even money to boost their horticulture business (USD 2,000) were given for free to the FC's.
- Attention from the Government is good, even the first lady visited EPF and she was enthousiast about the activities done.
- The mid term project evaluation was executed by SSCD (Ruaraidh Petre) in November 2008 and the rather positive draft report is being commented upon by the project members.
- **Regarding ongoing research**

Some important findings:

- Seeds best be planted directly without pre-treatment
- When produced in nurseries, no shading is required
- By pruning the shrubs two to 3 times, the number of branches double and 87% more yield is obtained.
- Planting period has large effect on pests collected, eg planting in febr-march gave most pests.
- Also great variety in growth for different areas.
- Best areas are sandy and hot, but with sufficient rain, like Cabo Delgado (ca 1000 mm of rain) also Southern part of Manica and Tete.
- Planting by direct seeding best be done before start of rainy season in November
- Although cassava and Jatropha are of the same family of euphorbiae, no cases have been reported in which severe pest like mosaic virus have been transferred from Jatropha to cassava.

Trial plots have been established in order to measure yields of different jatropha varieties; Trial hedges have also been established to measure the impact of pruning to various shapes and plant forms, and the differences of using seedlings, cuttings and direct seeding.



***Hedge trial plot being planted.***



***Trial plot with different varieties***

- **Regarding market development**

No Jatropha oil is presently being produced in Moz, according to participants of the Seminar held in Chimoio, although a number of companies and projects have oil presses in place. Evretz in Chimoio is pressing cotton seed and uses the cake for fodder of his cattle and neutralizes the cotton oil into edible oil . They have also used the oil to make biodiesel which was blended 50% with fossil diesel and the tractor ran on it for a year without problems.

There are sales ongoing in seeds and in seedlings.

## **Applied technical research; Development of a modification kit for diesel engines**

A workplan for investigation if a general applicable modification kit for diesels can be made available or developed was made by Arrakis and subsequently executed.

From the preliminary survey of diesel engines in Quirimbas park in 2007, further surveys in 2008 showed that a variety of engines is being used. The latest (youngest) models used by the maize millers however are Chinese copies of the 2 cylinder Lister Petter engine, (make Feidong) which is a qualitative good engine and quite reliable as well. Some millers had it running for over 4 years with no problems at all.

These engines are sold by dealers from Tanzania, who visit regularly the project area.

It was therefore decided to investigate whether a standardized modification kit for these types diesels could be developed in 2008.

The development of a modification kit for the diesel engines is well underway. The kit as developed by Groeneveld PPO has been tested on a Lister ST3 for 500 hours in the Netherlands and it performed well (see report on FACT website). A brand new Feidong diesel engine bought in July in Bilibiza by Arrakis and send to Chimoio to Brendon Evans of Evretz farm, who has also become a partner in this project activity. In November it is being modified by Ger Groeneveld with a similar kit and will be tested for 500 hrs on PPO (of cotton oil), under realistic load conditions. The second endurance test will continue into the first quarter of 2009, after which it will be clear if this kit is reliable and affordable and simple enough to mount by local mechanics.

See also the report of the Chimoio Seminar 7-8 Nov 2008 at FACT website.



***The Feidong diesel engine at Evretz***

An expert meeting was held in the NL on the 25<sup>th</sup> of Sept. to exchange experiences with technologies used in the 3 FACT pilot projects (see report at FACT website).

For a similar project in Zambia, the partner, the GAIA-Movement, has started a number of endurance tests of the dual fuel system running on jatropha oil at the Delhi College of Engineering in India under the leadership of Professor Naveen Kumar.

The first round of a 512-hour endurance test of a system where the oil is heated in a simple heat exchanger were very promising, and the tests have now been extended to a second round of additional 512 hours. There has been no problems so far. A slow-speed diesel engine, (typically used in Zambia) has been purchased to make a similar 512-hour endurance test running on jatropha oil in a dual fuel system. Exchange of experiences between the Delhi College of Engineering and FACT is taking place.

#### **Activity 4 dissemination of experiences**

A film script was made and a first draft video film was made (by Tiago). It needs to be further filmed and needs further editing.

The 4<sup>th</sup> **Seminar** on exchange of experiences between various organisations in Mozambique was held successfully from 7-8 Nov in Chimoio. Cooperation with GTZ-ProBEC was developed. Presentations are placed on FACT's website and findings will be shortly described in a small booklet that will be published by GTZ.



***Participants of the Seminar in Chimoio***

#### **Activity 5 additional proposals**

A link was established between SSDC of Rory Petre from Botswana for an EU funded project in which FC's produce trees, besides producing food crops for food security reasons. ADPP Bilibiza will be the partner for Cabo Delgado, while FACT will give technical advice and will monitor experiences.

Together with Hivos, GAIA developed a concept proposal for the EU for extension of the project. Unfortunately it was not selected for further completion, although it was very close.

A draft proposal for village electrification using diesel engines that can run on both PPO and gas produced from the jatropha cake was developed by Arrakis in cooperation with Klaus Hornberger of GTZ-AMES in Maputo, but finally GTZ Head Quarters did not want to develop it further.

#### **Activity 7 Extension to other provinces:**

This activity just started recently and is lagging behind due to late action by ADPP to request the funds from FACT.

The extension workers of Sofala and Itoculo came to the Seminar and gained from exchange of knowledge. The water team from Bilibiza that went for training to Itoculo, did take 30 kg of seed for Itoculo and one of the Bilibiza extension workers gave inputs for the program.

### **Activity 8: Developing the training center**

The building to host the pump production workshop and the oil producing unit Bilibiza Biofuel Centre is nearly completed. Also the improvement of guest rooms for training participants is well underway.

The Sayari oil press and the diesel gen set were finally bought in Dar es Salaam, but with a number of bureaucratic difficulties. The machines have not arrived yet in Bilibiza.



***The workshop has nearly been completed in November.***

### **2.3 What is going not so well?**

- In general the project is going at a slower rate than planned. However, this project is one of its kind, and being a pilot project it has no previous backing nor expertise in Mozambique, no previous experience or knowledge of any sort readily available, meaning that all that is taking place is purely new and needs to be considered
- Even with long working days, the project team did not spend much time on other main activities, like information, news articles, radio, TV, film etc. and other activities as well, which means that the project team is understaffed.
- The long travel distances to the clubs, which are spread over 4 districts, on often bad sandy roads, add to shortage of time and rather high costs on transport.
- The buying of major equipment for the Jatropha oil producing workshop (BBC) has been delayed significantly (over 1 quarter) due to several causes, within and outside the project.
- Nearly all the major equipment for the project has not been easy to procure, basically this has been associated to lack of existing information and knowledge on the matter, however, it still had to be procured from the neighbouring country Tanzania where there is existing experience regarding the field. We must admit that it has not been easier though importing these equipment due to existing import and export laws in place. The other factor owing to the derailment has been due to communication difficulties between the project team and the national office, as there is no reliable communication with the project site, this has meant that there has been an effective

communication from both sides especially when it comes to clarification of the requirements.

- One internal cause has been to establish well functioning systems of communication and accounting between the project in Bilibiza and the ADPP-HQ in Maputo. This should now be functioning, so that situations will no longer occur, where activities have been delayed due to cashflow problems.
- The school centre at Bilibiza is located in a very isolated area far from any town or city. This puts severe pressure on the project staff and it is not easy to find efficient staff who can cope with such conditions. This has led to some changes in project staff.
- Finding of a Director of the BBC which can develop BBC into a good running business took a long time (up to Oct 2008, instead from January 2008)
- The support given by the local Govt, despite given with good intentions, is at the same time distorting the project, since it will give expectations to all other FC's that fertilizer and money is needed to increase the production.
- The GAIA-Movement, which is partner in the project, has had to reduce some of its involvement in the project due to other commitments. This has meant that Christian Fenger has not been able to visit the project in 2008. But input has been given through meetings with the project leaders and through regular telephone communication. Additionally the GAIA-Movement has started and follows up on the above mentioned endurance tests of diesel engines using the dual fuel system.

### **Solutions recommended**

- Adapt the plan realistically, eg by extending the project with another half year, to end 2010.
- Extend the project staff by attracting more project leaders for specific activities; eg. One for Main activity 4, and another one for Activity 5 and 8 (maybe Erik Schurmann as part time activity or Gian Borba)
- Improve the amount of working capital on the project bank account in Pemba to avoid demotivation of project staff and delay of running the project.
- Discuss with DPA to provide support to the FC's which is more in line with the program..

### **Challenges**

- To overcome traditional agriculture of shifting cultivation, using slash & burn
- Short overall project period to achieve all goals
- Finding good people for rural areas

### **Challenges of market development**

- To keep the farmers producing jatropha even at a lower price
- To develop a profitable BBC
- To produce plant oil of sufficient quality, using RK2000 standard for rape seed PPO, to be used in diesel engines.
- To develop other products and introduce these in the market, eg compost from press cake, soap, lamp oil.
- To find out if the farmers can themselves produce oil, by small diesel operated presses (buying the locally available Chinese oil presses or using a design imported from FACT Honduras project) and produce soap and lamp oil from it.

See Presentation Market aspects of JdJ during Seminar in Chimoio from 7-8 Nov. 2008

- The question arises how to introduce the PPO in the market, since after 2 years, at the end of the project, probably not enough jatropha seed and thus PPO to run all 20 diesel engines and the modified cars. Two strategies could be followed, either by blending with diesel and providing all 20 + modified diesel engines, or use 100% PPO on a few selected modified engines only, eg at EPF Bilibiza.
- Due to short period of the project within the provinces of the extension part to other provinces very little jatropha seeds and oil will be available in 2010. Therefore the most

realistic strategy is to concentrate on oil production and introduce soap making and producing oil for lamps. Experiences from the leading project in Bilibiza will clarify if the other provinces have the required conditions to also start producing plant oil for diesel engines which could be further developed after the project. It will, however, be important to set up at least some demonstration systems in the other provinces, so that people there can see how the dual fuel system can use a locally produced energy source. These systems will be set up as soon as a final modification kit has been successfully tested at the Bilibiza project. If it is not possible to acquire jatropha oil, then the systems can be demonstrated using sunflower or cotton seed oil.

### 3 Field visits

#### Findings from Field Visits

##### General:

Up to today 32 FC's are producing Jatropha plants which is 7 more than the project target of 25. showing that the project team is able to make the Farmers enthusiastic about it. This is also due to the fact that the project since July has purchased 1,800 kg of Jatropha seeds from the farmers. In addition 300 kg were obtained as a gift from the Government.

The project team is keeping track of the number of plants that actually are growing. They are counted by the extension workers.

At present 95,000 are reported to be growing (equivalent to 95 ha).

#### JATROPHA (LIVE PLANT)FIELD COUNT

DISTRICT	PLANNED – 2007-2008 (75% of 250000 plants)	ACHIEVED	CATCH-UP PLAN	
			DETAILS	TOTALS
P. METUGE	35 625 (19% of target)	18, 128	11250 (18%) + 17 497	28747
QUISSANGA	46 875 (25% of target)	26, 434	11875 (19%) + 20 441	32 316
MELUCO	33 750 (18% of target)	17, 672	15625 (25%) +16 078	31 703
ANCUABE	15 000 (08% of target)	4,376	18750 (30%) + 10 624	29 374
MACOMIA	56 250 (30% of target)	28, 764	5000 (8%) + 27486	32 486
<b>TOTAL ACHIEVED 2007/08</b>		<b>95 374</b>	<b>PLANNED TOTAL 2008/09</b>	<b>154 626</b>
% (Live Plants) PLANNED – 75		(187 500 Plants)		
% (Live Plants) ACHIEVED- 38.1		(95 374 Plants)		

October is the end of the dry season. It has not rained since March.

The fields in general do not produce vegetables any more, and look somewhat deserted, although the committee members still meet.

The Jatropha plants had leaves, in general no seeds, except a few, and flowering started. This is due to the fact that end September some heavy rains showers occurred which is rare, since normally the rain does not start before November. During 24 an 25 Oct some heavy showers fell during the day. The first rainfall started in Chimoio around 9 Nov.

**Field Visits:**

**Tuesday 21 Oct**, Metambo and Massasse, just opposite each other on the river banks. These places had been visited by the First lady, Mrs Guebuza and the hand dug wells which still contained some water at respect, 3 and 3.90 m from ground level, had been covered by wooden plank covers, while the one in Massasse had a steel hand rope pump that worked and was giving water. The nursery in Metambo still was well kept and several hundreds of various plants , including Jatropha were sprouting from plastic bags.

**Friday 24; Metambo, Koko, Xinavane, Nova Zambezi**

Metambo was visited first to pick up Serafim, who had to do the pump installation- and the well surveys. Three fresh made new concrete rings (for lining out the well) were standing, but uncovered.

**Koko:** At the demo plot, some 15 plants were pruned and the FC members were asked to plant the cuttings. On own initiative they had themselves already planted some rows of cuttings, one month ago, which did quite well. At date of arrival plants (some cabbages) were dying, because there was no water. The existing Jatrophas were doing well. Tiago made a film and the Well survey was done by Serafim.

**Xinavane:**

In the demo field some 100 jatropha plants in bags were doing well, and in the field jatrophas also ok. Not much vegetables present. Pump until one week ago provided water, but the rope was removed.

**Nova Zambezi:**

Nursery not very well kept, only 5 Jatropha plants in bags. Pump was locked, so shows that it is a valuable asset. Neighbouring Communal nursery is run by a local man who was paid 1000 MT (40 USD) per month by a company who is buying his seedlings. The nursery was very well kept, and with the trees of Guava in between, introduced by Umokazi a few years ago, were bearing fruits and the whole set up looked like an agricultural garden and was a pleasure for the eye.

**Sunday 26 Ngeu, Anjue, Anli**

Farmers knew about conservation farming, crop rotation, all FC had compost heaps, albeit a bit small. During the FC visits almost in all cases some vegetables were bought. In all three clubs the pumps were working

**Ngeu**

Nursery visit , selection of seeds by workers.  
16000 plants growing, including nursery.  
In the field of one farmer visited, planted in April, without water! height 20 cm, all over the field, in combination with cashew trees and cassava.  
After they moved from the far field to the village, around the Afridev pump, which they repaired with money from the project.  
Seed in Ngeu was given in August reason why they still had a lot of vegetables, compared to the other clubs who had got the seeds in April.  
Vegetables were selling at 25 MT or \$ 1 per cabbage, and  
5 MT piece of salad. , which means 1 \$ per m2 income , or \$ 100, 000 per ha!!  
We bought for 300 MT vegetables.

They need a 50 m hose to connect the Afridev under the street to the garden and nursery side. Promised to pay from the project. 2000 plants in the nursery  
Farmers in Ngeu wanted boots even on credit.

**Nanjua**

50 members, 2 to 3 ha.

Club started June 2007, started with garden and Jatropha.

Seedlings 2227 planted.

After the first season they had 5025 plants growing in the field., now 0,5 m high.

In 2007 they had not obtained enough seeds from the project due to problems with authorities.;

In 2008 much production, no spray, the whole club earned 2500 Mt. At present seedlings of 1 month old.



*In the morning 60 buckets of water had been pumped*



*Bachir encouraging the farmers club.*

### **Nanli**

Club started 2007, and in the club only grew vegetables. Before the club started they had never grown vegetables, that is not tradition in Cabo Delg. Tradition is maize sorghum and cotton, on large scale, introduced by Portuguese to supply to the rest of the country, in 2007 earned 1400 , bought field of 0,5 ha from private farmer for 700 MT.

In 2008 onion, salad, cabage, 4200 MT. They had bought useful things from it. 654 Jatropha planted and growing; in nursery 900 started day before visit. To plant in total in 2000 polybags. Total target for this club is 16000 Jatropha plants. They well get next weekend a bag with between 5 to 8 kg of jatropha,



*The jatropha plants doing well*



*FC members showing some of their products (water melons)*

## Water

The number of working wells and installed steel pumps are closely followed by the project team.

Of the 41 wells on which steel pumps have been installed, only 19 are ok, well and pump intact and providing water. The other 22 have some faults with either the wells, incomplete (eg not lined out, or dried out) or the pump is not working)

Since most of the wells were made at a time when the water level was still high, it proved to be difficult to estimate the number of manilha's (concrete rings) needed; in Metambo they had 4 manilhas; and needed 6; Massasse had 5 and needed 7.

A new questionnaire for well survey was developed, additional to the survey on Pump Installation, to be used as a planning tool as well.

All major dimensions have to be measured, well depth , water level etc, plus a sketch needs to be made of the well, allowing the water teams to design the well layout, and know how many manilha;s are needed and consequently calculate the amount of cement and stones etc, plus logistics.

## Monday 27

Both in 1e de Maio and in Petolia they had dug a second well since the well with pumps had gone dry, around aug sept. But also the new wells were totally dry until 2 days ago when we got 2 days of rain, which filed the wells a bit,

## 1 de Maio,

Water and elephants problems in 1 de Maio.

0,5 m water in new open well (well depth 2,20 m) and in Petolia 25 cm.

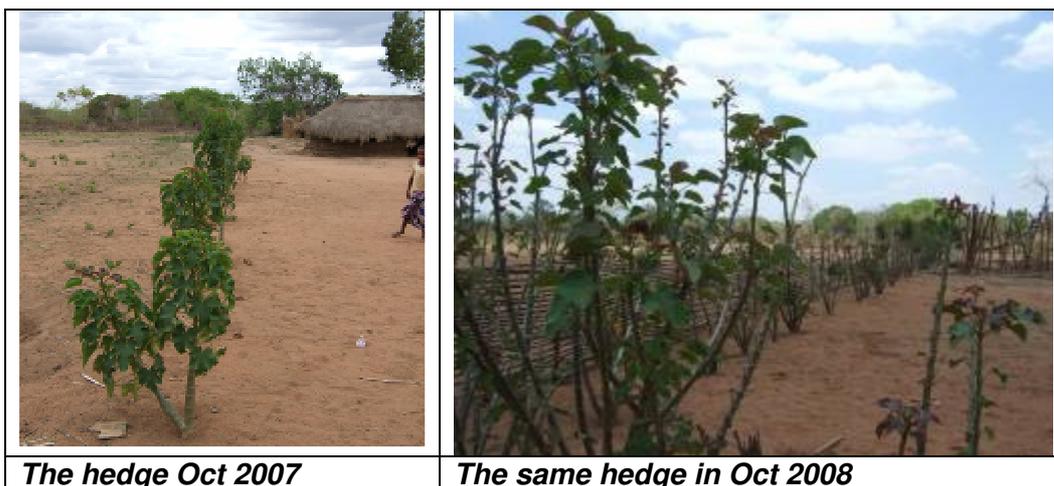
(Old well; depth 2 m and 20 cm water)

1o de Maio school, large plant from progress report in July had now doubled in seize, about 3 m heigh and they had plucked already 40 kg of seed the last year, now new seeds and flowers were forming already. Plants are going to be pruned.

The day before the visit they had sold 60 x 20 l water @ 1 MT. from the new well, because it was good quality, although across the street there has been a Afridev installed since Sept.

Depth 35 m and after 20 m they had encountered rock, according FC members.

Teacher from the school: Missituai Cachimo



***The hedge Oct 2007***

***The same hedge in Oct 2008***



***At the demo garden the fence was trampled by elephants. Mind the Chinese type compost heap right in front.***



***The nursery***

### **Petolia**

water is a great problem in Petolia

The old well with dismantled pump was up to 2 days before totally dry, now water layer was 25 cm, well depth 3 m,

The new well hand dug nearby, of 2,60 m depth and 1,40 m diameter had 10cm of water .The bottom of the new well was hard rock; Gneis, which is not permeable, and another rock type also quartz inside.

The villagers had a Afridev handpump, but that was giving quite salty water, and used open pit wells with little an dirty water. See pictures.

Still they had both nurseries with plants going, see pictures.

They had had also pest problems, so had not sold anything, but had eaten some vegetables.



***The nursery in Petolia***



***The Afridev giving salty water***



They wanted tools to dig through rock, promised long chisel from spring steel and tube. But best not to dig further in the new wells, but to remove the whole demo plot to lowest place as possible near open wells and dug that one deeper.



#### **4 Development of workplan 2009**

The basic Workplan 2009 was developed jointly by Henderson, Bachir, Jacob, Flemming and Jan during several sessions in in Bilibiza, and in Chimoio after the Seminar. Some main activities have been worked out in detail already.

#### **5 Table 2: planned results versus actual results and variations explained. See below.**

**ADPP PROGRESS REPORT Project: Biofuels for Development and Communal energy Self Supply  
1 JULY 2008 - 1 NOVEMBER 2008**

<i>Main activities for whole year 2008</i>	<i>Planned results up to 1 Nov 2008</i>	<i>Actual results up to Nov 2008</i>	<i>Variation</i>	<i>Explanation of variation, problems encountered. Solutions proposed</i>	<i>New estimate of results per July 1, 2009</i>
<b>1. 25 Mozambican rural communities producing jatropha seeds sustainably on at least 250 ha for energy use</b>					
<b>Select 25 interested farmers clubs (FCs)</b>	31 clubs still functioning well	One more club has been registered ( Muaguide), as its members expressed interest to grow jatropha. This has brought the total number of clubs growing jatropha to 32.	7 clubs on top of the actual 25 have their farmers actively growing jatropha, bringing the total number of clubs involved to 32. This is an over achievement!	This is mainly due to the fact that many people want to access biofuel, because mineral oil is quite expensive in the area. The Jatropha lamp and soap making demonstrations done impressed many farmers and therefore became willing to have their own plants.	All the 25 main jatropha clubs still running well and technical support given to the other interested 7 clubs.
<b>1,2 Train 25 EPF teacher trainees, 25 field extension workers as community mobilisers on jatropha cultivation and general environmental awareness</b>					
25 Teacher trainees (TTs)	One more training to be conducted for the 2006-2007 team and an introductory training conducted for the 2007-2008 team.	Training for the 2006-2007 team was conducted from the 17 to 19 October 2008. The introductory training for the 2007-2008 team is to be conducted from 15 to 20 November 2008.			Second and follow-up trainings for the 2007-2008 team
25 Field extension workers (FEW) (are the FC chairperson)	Environmental awareness raised through regular on-farm trainings by project extension workers and during district meetings (5 have been planned) which involves project leaders, extension workers and graduates from agriculture school.	3 district meetings have been held where FEWs have been trained on general tree ( <i>jatropha and forestry</i> ) production and management, group mobilisation. The result has been the establishment of nurseries in all the 32 clubs.	One district meeting not held (in the district of Quissanga).	Meeting schedule coincided with the visit of the First Lady of Mozambique to the center, who also visited the project and was impressed by the lamp and soap making demonstrations done.	All 32 FEW responsible for running jatropha clubs receive enough training and they are able to lead production activities in the clubs in the absence of a project technician.

1.3	<b>Conduct 250 household surveys and establish baseline</b>	Survey data analysed and survey report produced.	Household surveys reported in Exel sheet, but not yet summarised	HH surveys not summarised	Survey data not yet summarised due to short duration of stay of volunteers in the project. This shall therefore be subcontracted to other people in Chimoio.	250 HH surveys finally analysed and survey report produced.
1.4	<b>Make 50 wells and install rope pumps for irrigation of nurseries</b>	All 25 FCs have lined out wells with steel rope pumps for production of jatropha seedlings and vegetables. The project will install 25 pumps, corresponding to the number of nurseries.	14 FCs have steel hand rope pumps and improved wells, working ok. 22 wells have been equipped with steel pumps, but not ok, problems with well, no water, or pump not in order.			In total 41 steel hand rope pums have been fabricated and 19 of the 22 installed are working properly.
<b>Main activities for whole year 2008</b>		<b>Planned results up to 1 Nov 2008</b>	<b>Actual results up to Nov 2008</b>	<b>Variation</b>	<b>Explanation of variation, problems encountered. Solutions proposed</b>	<b>New estimate of results per July 1, 2009</b>
1.5	<b>Provide seeds and give training to farmers to start 25 nurseries</b>					
	- Set-up nursery at EPF	At least 6 varieties produced as seedlings in the New Nursery and 15000 pants raised in the nursery for planting as part of the 25ha local plantation	3 new varieties(Thailand, Mexico and Indonesia) acquired and 4 other different varieties (Guatemala, Tanzania, Mozambique and Malawi) raised in the nursery, and 12000 seeds sown in plastic pots to be used in the establishment of a 25ha plantation at the center.	3 new (Thailand Mexico and Indonesia) vareties acquired but not yet planted.	2 varieties (Mexico and Thailand) pending trials in Chimoio, one variety (Indonesian) raised to be part of the varietal trials in Bilibiza.	12000 more seedlings to be raised to complete the 25ha plantation target
	EWs & FEWs trained on-farm and through joint training sessions	A local training field established at EPF for Extension Workers, and knowledge ad experiencs transferred to FEWs during	3 on-farm trainings for extension workers conducted and knowledge transferred to FEW during weekly meetings and field visits in the clubs.			2 trainings (pruning and seed collection and storage) are done.

		weekly training sessions by the extension workers.				
	- Acquire seeds, preferably of different varieties	Sufficient seeds available, possibly from different varieties, to fill the gaps in the hedges and to complete the 125 km of hedges, totalling 250,000 plants	1800 kg of Jatropha seeds bought from farmers in Meluco and Macomia. Plus additional 300kg given by government in support of the program	Only Mozambican varieties obtained.	Acquisition of seeds of other varieties from other countries quite slow but progress is being achieved. So far 8 different varieties acquired	1800 kgs planted as seedlings as well as directly sown. A total of 200 ha planted with seeds of different varieties.
	- Seeds distributed & nurseries established	2000 kgs distributed and already sown in 25 communally managed nurseries within the club.	800 kg distributed and 50000 seeds sown.	Only 50000 seeds sown	Each club has a limited quantity of planting pots (2000) due to scarcity in Mozambique. The alternative is direct seeding but this shall be done with the very first rains.	25 communally managed nurseries producing healthy seedlings for distribution to club members.
<b>1.6</b>	<b>Sensitise and train 250 farmers to start cultivation of Jatropha</b>	Specific training sessions in jatropha cultivation held in all FCs and jatropha promoted at field days and community events.	2 field days held in the districts of Macomia, Pemba metuge and Meluco where presentations have been made about Jatropha. 25 agriculture students were sent out to the 25 clubs as community mobilisers during their practice period.	Farmers have a single row-hedges only	Failure to get more seeds to plant double-row hedges which offer better protection of fields from invasion by wildlife, and also results in increased amount of harvestable seeds per unit area.	Farmers increase the number of their jatropha plants/ plant the second hedge
<b>Main activities for whole year 2008</b>		<b>Planned results up to 1 Nov 2008</b>	<b>Actual results up to Nov 2008</b>	<b>Variation</b>	<b>Explanation of variation, problems encountered. Solutions proposed</b>	<b>New estimate of results per July 1, 2009</b>
	<b>Plant seedlings and directly seeding plots of 10 - 20 ha at each Farmers Club</b>	85000 seeds distributed and planted directly as fences around farmer fields.	Live plant count done towards the end of October 2008, 95374 counted live plants in all clubs	Not many cuttings planted	Late preparation of fields and attention given to food crop production.	

1.8	<b>Harvest and sell seeds</b>	Sell all the seeds harvested to other interested parties and to the roject for redistribution to other farmers.	1800 kg of Jatropha seeds bought from farmers in Meluco and Macomia. 300kg given by government insupport of the program	Not all the seeds harvested have been bought	Long distances to farmers, but they were advised to keep the seeds very well and bring the seeds with them during distric meetings	All seeds harvested are bought and well stored
1.9	<b>Conduct annual field days, planning &amp; review meetings</b>	Monthly meetings to involve club committees annual field days held in all districts	Project Council meetins held bi-weekly and three district meetings so far conducted within the period.	2 district meetings not yet held	Program coincided with the visit by the First Lady to the center who also visited the project and was impressed with the lamp and soap making demonstrations done. The two meetings are to be held on 15 November (Meluco) and 13 December (Quissanga) 2008	An annual field day done and a second round of district meetings (5 in total) as well.
1.10	<b>Prepare and set up 25 on-farm jatropa research plots of 1 ha</b>	5 trail plots will have been established in 5 places representative for the different zones, which is sufficient, no need for 25. Further more 5 hedge trails have been set up.	Established 3 trial plots of 16x 16 m, with 4 varieties each.Each plot of the 4 has 9 plants . % Hedge trail plots have been set up, 3 at EPF Bilibiza and 2 at different farmers clubs.	2 trial plots not done yet. 9 hedge trial plots not done yet	protocols had to be changed + short time	5 trial fields will have been established. Plus 14 hedge trials of which 3 at EPF and rest at individual farmers divided over the FC's
		Train EWs, technician and 25 FEWs to set up trial plots				
1.11	<b>Monitor jatropa research plots</b>	Jatropha research plots will be monitored on growth and yield, Pruning will be registered.	All research plots have been positioned by GPS. 14 FCs demonstration fields have been positioned with coordinates by GPS (Giuseppe) Global Positioning System) and fed into a simple GIS system.	Data on growth have not been taken yet, it is early since trees are giving hardly seeds yet. Also the change from plantations to hedges require different protocols than the ones prepared earlier by FNR.	It is quite early to register growth data, since trees are giving hardly seeds yet. Also the change from plantations to hedges require different protocols than the ones prepared earlier by FNR. New protocols will be made by Flemming and explained during his next visit in November.	First data collected

<b>Main activities for whole year 2008</b>	<b>Planned results up to 1 Nov 2008</b>	<b>Actual results up to Nov 2008</b>	<b>Variation</b>	<b>Explanation of variation, problems encountered. Solutions proposed</b>	<b>New estimate of results per July 1, 2009</b>	
<b>4. Information made public</b>						
<b>Information in the form of training and informational material, stories of change and best practices on the communal energy self supply model made public through manuals, pamphlets, posters, internet, radio programmes, video films and conferences</b>						
4,1	<b>Produce training material for community mobilisers, etc.</b>					
4,1		Books, similar to 40 actions	No books compiled yet, but local experiences and best practices have been registered	No books compiled	To be subcontracted to somebody who can work full time on it.	Books, similar to 40 actions
	<i>Develop training material for EWS</i>	Different Large posters with EPF TT students PP presentations	Small posters produced  Not yet developed but pictures are available, only need to selected.	Not fully developed	To be subcontracted to somebody who can work full time on it.  To be subcontracted to somebody who can work full time on it.	Different Large posters with EPF TT students PP presentations  Distribute pamphlets in FCs and explain text to Farmers, 40x50 copies in each ;anguage
4,2	<b>Produce a number of newspaper articles + webpages</b>	Not planned for this period	Not planned for this period	Not planned for this period	Not planned for this period	A fully developed web page with best practices, stories of change amongst farmers and various other presentations on it.

4,4	<b>Collect stories of change and best practices among the 25 FCs</b>	Best practices and stories of change gathered from the farmers clubs, used as motivational experiences for other farmers in other areas.	5 production experiences so far registered from the group of farmers growing jatropha around their fields	Stories of change not yet recorded	Period quite short for stories to come through	A full compilation of experiences and best practices on production of jatropha, community mobilisation and general club management from farmers User-friendly booklets produced and a well structured radio program broadcast every week.
	<b>Produce a booklet, radio programmes and a videofilm describing the best practices and the lessons learned on mobilising rural communities to establish energy self-supply systems</b>	Not planned for this period	Not planned for this period	Not planned for this period	Not planned for this period	
	Produce a <b>booklet</b> , describing the best practices and the lessons learned on mobilising rural communities to establish energy self-supply systems	Determine who is going to read this booklet, probably similar NGO's as ADPP. In 2008 describe first chapter on best practices and lessons learned on setting FC's and motivating them to grow Jatropha	Best practices collected but not compiled in a booklet	No booklet compiled yet	No booklet produced, this shall be subcontracted to someone fully responsible for the whole information part of the project.	A booklet produced
	Produce <b>radio programmes</b> describing the best practices and the lessons learned on mobilising rural communities to	Radio programme for rural farmers. Have 2 broadcast minmally, in July and in Oct?	No radio program organised	No radio broadcasts	Program had to be introduced to the district officials first before spreading any project activity in form of radio programs.	

<p>establish energy self-supply systems</p> <p>Produce a <b>videofilm</b> describing the best practices and the lessons learned on mobilising rural communities to establish energy self-supply systems</p> <p>4,5 <b>Hold 2 dissemination seminars for local leaders, governmental staff, private business, NGOs and microfinance institutions on low-cost energy self supply systems.</b></p>	<p>In 2008 buy video recorder and learn to use; appoint two talented persons and let them follow a good training course in Harare? HQ, or Maputo.</p> <p>First Seminar in November 2008 in Chimoio of 2 days,</p>	<p>Di Tiago Started to make video film. Video Recorder bought from Holland;</p> <p>Preparation was done and cooperation was made with GTZ. Will be held from 7-8 Nov.</p>			<p>Video film ready</p> <p>Booklet of first seminar produced by GTZ and distributed. Second Seminar in November 2010</p>
<b>Main activities for whole year 2008</b>	<b>Planned results up to 1 Nov 2008</b>	<b>Actual results up to Nov 2008</b>	<b>Variation</b>	<b>Explanation of variation, problems encountered. Solutions proposed</b>	<b>New estimate of results per July 1, 2009</b>
<b>5. Large proposals</b>					

<i>Main activities for whole year 2008</i>	<i>Planned results up to 1 Nov 2008</i>	<i>Actual results up to Nov 2008</i>	<i>Variation</i>	<i>Explanation of variation, problems encountered. Solutions proposed</i>	<i>New estimate of results per July 1, 2009</i>	
<b>6. Other expenses not directly related to project activities</b>						
	annual audits	Annual audits will be produced on time. The administrative system will function well. Each month a financial report will be produced and send to HQ and FACT-Arrakis. Also the Financial report on activity basis will be worked on each month.	2007 accounts have been audited by KPMG, September 2008/	2007 account report not done before deadline of 1 june 2008/No activity based report has been made/No monthly financial reports send to Arrakis		Line Based & Activity based financial reports over 3/4 of 2008 ready by Nov 2008; 2008 Annual Financial report ready by January 2009; Audited Annual 2008 Financial report for Donors ready by 1 June 2009..
	motorbikes and bicycles	3 Motorbikes functioning, and 3 bicylces bought	All motor bikes running well despite frequent breakdowns resulting from use on rough roads and long distances between clubs.		The project has enough bicycles purchased from the EU budget, but shall buy new ones early 2009	All bicycles and motor bikes running well. One new motorbike bought for BBC head.
	office equipment, 2 laptops 2 digital cameras	Laptops, cameras and PV system functioning	Laptops functioning well, and the project has 2 digital cameras and a new video camera, all in good working condition.			2 Laptops, 2 cameras and PV system functioning
<b>8. Setting up of Bio-fuel Training Center on bio-fuels in Central Mozambique</b>						

Improving existing school building into centre and mechanical workshop						
	Improvement of dormitories	Well refurbished hostels with all facilities in place.	Scraping of walls and painting in progress. New doors, windows and beds being made.	Hostel refurbishment taking longer time than previously planned	The building caught fire, hence the need to refurbish the whole structure. More technicians have been hired to do work faster.	3 dormitories ready for use
	Construction of new toilet and bathroom facilities	A spacious toilet and bathroom facility constructed next to the hostel rooms.	No toilet built yet	No toilet done yet	Contractor occupied with construction of workshop building	A building with toilet and bathroom facilities in use.
	Construction of workshop for water pump production and jatropa oil production.	A well finished workshop building, with all the equipment installed.	Wall structure finished, electrification done, roofing, painting and flooring in progress	Workshop not fully finished within the planned period	Late aproval of construction plan and difficulties in acquiring construction materials within the province. Materials have to be bought in Nampula, 600 km away. All materials secured now.	A well finished workshop building, with all the equipment installed.
	Centre generator	A generator running the workshop and as back-up for the school centre.	Generator bought, being transported to the project.	Generator bought late	Difficuties in getting the right generator and quotations within Mozambique.	A generator running the workshop and as back-up for the school centre.
	<b>Purchasing and installation of equipment, such as: oil press, bio-diesel production unit, cab-truck, etc.</b>	All necessary equipment bought and installed and oil production started. Bio-diesel demo unit and bio-gas demo unit not yet	The cab truck functions well, only the Sayari oil presss has been bought from Tanzania, plus oil filters viaJdJ from Holland	Very little equipment bought yet	Difficuties in getting the right equipment and quotations within Mozambique. Furthermore difficult bureacratic procedures to import the machines from Tanzania.	The fully equipped workshop is producing the first oil and starts operating as an Oil producing factory: BBC

## 6 Conclusions

All major components of the project to develop a local market of diesel engines running on PPO of Jatropha are starting to come together now;

- The agricultural part with the farmers clubs is still doing very well. 32 clubs in total were planting Jatropha. Practically all clubs had generated some income from the vegetables and jatropha sold.
- An experienced leader for the Bilibiza Bio-fuel Center (BBC) was found.
- The Workshop building for the Processing of the PPO, containing the equipment as oil presses, etc and also for production of the pumps is nearly finished.
- Obtaining of equipment is underway, but takes much time.
- The diesel engine duration test with modification is going to be tested in Chimoio.
- The first 1800 kg of jatropha seeds have been bought,
- Research results are promising, showing that jatropha can be grown quite well in Cabo Delgado.

Water and elephants remains a problem in the area, requiring more training of farmers and investigation into solutions.