

**ADPP-FACT Narrative Progress report No. 3**

**15<sup>th</sup> of July 2008**

**Jatropha oil for local development  
in Mozambique**

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



**January 2008-July 2008**

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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)

# 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. While not much is known about the effects of Jatropha cultivation in Mozambique, the climate and soil 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 January – July 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 Main planned activities for first half year 2008

1. **25 Mozambican rural communities producing jatropha seeds sustainably on at least 250 ha for energy use (end of project)**
  - 1.1. 25 FCs established
  - 1.2. 2 Trainings given in first half year to 25 EPF teacher trainees and 25 field extension workers as community mobilisers on jatropha cultivation and general environmental awareness
  - 1.3. No new household surveys planned for 2008. The next ones will be made start of 2009
  - 1.4. All 25 FCs have wells with rope pumps for production of jatropha seedlings and vegetables. The project will install 25 pumps, corresponding to the number of nurseries
  - 1.5. 25 nurseries producing part of the seedlings for 125 km of jatropha fencing. The remaining fencing will be planted by direct seeding. New experiences gained from FACT, GAIA, IIAM and elsewhere transferred to FEWs
  - 1.6. Specific training sessions in jatropha cultivation held in all FCs and jatropha promoted at field days and community events
  - 1.7. 125 km of new jatropha fencing established (2 plants per meter). Equivalent to 250 ha. Existing fencing filled up by planting cuttings.

- 1.8. Harvest and sell seeds; An estimated 500 kg of seeds purchased from FC member communities
- 1.9. Bi-monthly planning meetings held with Project Leaders, Technicians and EWs  
Field days held in all FC's
- 1.10. 25 x 500 m established as trial fencing to assess various varieties (if possible), cultivation and pruning methods
- 1.11. Data on growth and (later) yields and pruning registered; Monitor jatropha research plots

Details of the project progress based on these main activities are listed in the table below.

### 3 Organisation

#### Changes in personnel

In the period November 2007 until February 2008, quite some changes in personnel of the project have been made:

**Henderson Maposa** took over as Project Leadership from Felicity Dennis ;

**Bachir Afonso** took over from Ernesto as the Jatropha technician;

**Jacob Menyani Zulu** was appointed as responsible for coordination of all FC's and also responsible for coordination of Activity 7, Extension of Jatropha production to Niassa,. Itoculo and Macuse.

**Francis Vitung** joined the projects as Administrator;

**Bachir** is overall responsible for the water supply, Quality control, wells and pumps with

**Seraphim** as the head technician, who joined from ADPP Itoculo.

**Nacir** took over pump production from Augusto and is the responsible man for the storeroom with all tools and equipment;

**Guiseppe Berlingeri** who designed the new workshop and has started to build it.

**Job descriptions** for Henderson, Bachir, and Francis were made by Jacob

#### Procedure for purchasing

The procedures for purchasing have been set by Head Quarters (HQ) and need to be followed by the Project team.

#### Reporting:

The Financial report 2007, Line based, and the Activity based one were not ready on the 1<sup>st</sup> of June and still not on the 15<sup>th</sup> of July. Henderson had prepared the draft, that needs to be completed by HQ in Maputo.

**Monitoring Plan** has been developed with Flemming in NL and was adapted with the team in Bilibiza. Monitoring of the Jatropha fields is done by Guiseppe, using a GPS, to locate all FC's, also by Bachir, who was trained by Guiseppe to use the GPS.

Then Extension workers are counting the plants in each FC field and report. Pumps and nurseries are also counted and reported, by the EW's. Guiseppe has already used the GIS software to prepare a report a with map of 14 FC locations with coordinates.

## 4 Field visits

During three days in June, FC's were visited for follow up purpose, to talk with FC members, to buy seeds, to check and improve the wells and pumps, etc.



*First time ever that Jatropha seed was bought from the FC in Xinavane, 1 July 2008-07-02; 12.5 kg @ 5 MT /k. The same day in total 51 kg was bought.*



*5 years old hedge total 680 m long, surrounding a coconut palm tree field of FC member Bacar Alumar at Xinavane*



*Very dense hedge, distance 0,2 m, and pruned as well at neighbour of Alumar. Bachir Afonso is the Technical project leader for Jatropha and training of FC's.*



*FC: 25 de Junio; pump installed well; Jatropha over 0,5 m high after 4 months (direct planting; Salads bought, 5 MTN/piece; farmers wanted drip irrigation plus wanted to buy more pumps for their own fields.*

## 5 Development of detailed workplans

The approach of the Workplan 2008 was discussed between Jan, Henderson, Bachir, Jacob and Francis during several sessions in June in Bilibiza, and worked out in detailed Plans for the main activities.

The approach for activity 3 Research part was discussed between Flemming, Henderson, Bachir and Jacob in April 2008 in Bilibiza.

### **Main Activity 2: Market development**

Question to solve: Shall we offer the farmers a fixed price per kg of 5 MTN (20 USD cents) (already promised earlier) and to buy all they produce? And for how many years? We need to investigate the market for excess seeds or pressed oil, e.g. to Diligent Tanz or to utility Petromoc.

Only after the 1st diesel at EPF Moageiro has been modified and runs on PPO, we are going to interest owners of SME's with diesels, to modify there diesels, which will be in 2009.

### **The technical part of Activity 2; Market Development.**

Since both Henderson and Bachir are mostly working on the agricultural part in the field and Francis Vitung the newly appointed administrator, since May 2008) has experience with procurement, it was agreed to the following procedure:

Francis obtains the Procurement Task for this part.

He will be supported with technical advice by Jan de Jongh from The Netherlands, so good and fast communication is required. Jan can make specifications for quotations, to be checked by Bachir and Henderson as well. Then Francis can ask for quotations, and when obtained mail these to Jan de Jongh for selection advise, needed for HQ (auditing requirements). After approval by all, this equipment can be ordered.

It concerns:

- the Generator set for the new workshop;
- 2 oil presses (for 2008), the first make Sayari from Tanzania; the other as a mobile unit (maybe for one of the three new provinces);

- 1 mechanical motor-driven sieve for sieving stones out of Jatropha seeds;
- Filter unit to purify the oil
- Storage and settlement tanks, and other equipment,
- Some laboratory testing equipment.

### **Development and testing of Modification kits for diesel engines to run on PPO.**

#### **Duration test of modified Diesel engine in Mozambique.**

Since Brendon Evans in Chimoio is willing to do a duration test on PPO with a diesel engine, search was done to find one of the newer types presently used in Cabo Delgado, a Chinese copy of a Petter, the Feidong. Already 4 Feidongs have been located in Quirimbas park. Since no dealers were found in Tanzania, we looked for contacts in Cabo Delgado. It was found that one of the owners of two Moageiras just had bought a new engine. These are provided by Tanzanian traders, who come from time to time to Cabo Delgado to sell them directly to owners. On Wednesday 25, (Independence day) the brandnew Feidong 295GJ (the same as the one in use at the Moageiro of EPF) was purchased by Jan for FACT-Arrakis, from the owner. Jacob provided transport, to bring it from Bilibiza to Chimoio.

#### **Main Activity 4: Development of information**

Plans were made to develop information for various target groups. E.g. for farmers to start with pamphlets with general rules with text and figures, plus translate in local languages: Makua, Makonde. Jacob has worked with a Spanish DI who has made a film already from the FC's in Moz. To be placed on website of ADPP. The 40 actions book of Christian needs to be handed out to the FC's.

The team agreed to hold a new **National Conference on Jatropha for local development** in Mozambique, November 2008. Again with ADPP in Chimoio, if possible.

It will be investigated if this can be done together with GTZ (contact person Anna Lerner) Program will consist of 1 day for separate workshops for all ADPP project leaders and extension workers. From the 4 provinces involved + parallel sessions of all researchers involved in Mozambique and neighbouring countries. Second day all together plus invite all parties involved in Jatropha in Moz, plus field visit to Brendon

**7. Extension of Jatropha production to Niassa, Itoculo and Macuse;** Jacob Zulu developed the **Workplan for Addendum**, in cooperation with Jan. He will stay in charge of the coordination of this activity.

#### **8 Setting up bio-fuel training center**

Priority was given on methodology to get a good technician/manager for the Training Center. A preliminary Job description was made. Giuseppe was asked if he would be interested, but he chooses another career path more in his own profession, Environmental civil engineer. Gian Gabriel Borba, Ceramic Engineer from Brazil, working as a DI, showed interest. (He went back home. An advert is being prepared by Jacob to be placed in the newspapers and the radio for this position)

#### **Presses**

Only one Bielenberg Handpress has been bought, with which it proved very hard to press the seeds. The Chinese Double Elephant press which can be bought from Maputo, is rather small and could be used to develop a mobile press from, if it performs well. Antonio Serra of Environtrade (Gorongosa) who has one, should be asked about his experiences with this press.

The Sayari press in Arusha with Diligent Tanzania performs quite well and is built and delivered in Tanz. Costs ca USD 4500, Also James, the workshop leader knows how to adjust it and can act as a trainer in Bilibiza.

A **skid based diesel driven oilpress** has been developed by the Tanzanian based Dutch Thomas van der Heiden, using probably the Chinese Double Elephant press and a filter for ca EURO 2000. Jan will take up contact with him again in the NL.

**Seed required for pressing oil**, planned to start from 1 sept, after oil press will have been installed. **300 kg is needed to press and use 200 kg of the cake for testing as pesticide** for new plants, by Flemming in November.

### New workshop

The authorities have finally approved the plans and the building has begun, cement stones are being made, under guidance of Giuseppe. 2000 stones ready for walls and about 1000 for foundation. It is expected to take about 2 months time to construct, so ready end august.



The piles of cement stones



The foundations for the building are made

**The generator set for workshop has** not been ordered yet, It took a very long time before a quotation came from ATA, supplier in Mozambique and it was without specifications. Henderson will ask more quotations of good makes (Japanese) in Malawi and Tanzania and buy one.

**Diesel survey. The first survey done by one extension worker of ADPP was** insufficient of quantity and quality. In June 2008 Bachir was instructed to take over.



In Aldeia de 25 de Junio we found one owner of a Moageiro who used a 30 years old 2 cylinder air cooled Lister, still working! Used ca 20 liters fuel/week and could maximally produce 3 tons of flower per day using 20 liters. He knew another place where there was a 3 cylinder Lister.

## ADPP PROGRESS REPORT Project: Biofuels for Development and Communal energy Self Supply

**1 JANUARY 2008 - 1 JULY 2008**

<i>Main activities for whole year 2008</i>	<i>Planned results up to 1 July 2008</i>	<i>Actual results up to July 2008</i>	<i>Variation</i>	<i>Explanation of variation, problems encountered. Solutions proposed</i>	<i>New estimate of results per Nov 1, 2008</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>	25 FCs established	25 FC clubs established and working very well. One new club was established.	A number of other clubs also wanted to have Jatropha, so now the total number of FC s that planted Jatropha is 31.	Due to training by extension workers and project leaders, Henderson and Bachir, the farmers saw results and started selling vegetables and became enthusiastic. Other new clubs wanted to join. Financial support is now directly given to the committee of the FC, instead of the President of the FC. This improved the motivation of the Clubs a lot and results were visible.	31 clubs still functioning well
<b>1.2</b>	<b>Train 25 EPF teacher trainees, 25 field extension workers as community mobilisers on jatropha cultivation and general environmental awareness</b>				
	25 Teacher trainees (TTs)	2 trainings per half year	In January 2 weeks training given and in April 2 days, at Bilibiza Bio-fuel Center; BBC	none	Another 2 training periods
<b>1.3</b>	25 Field extension workers (FEW) (are the FC chairperson)	Environmental awareness raised through training by TTs.	25 clubs have received training on the spot by EWs and PTs.		2 training sessions planned for the FEW at BBC. TT going to train in the field as well in their free time (when not teaching at school)
	<b>Conduct 250 household surveys and establish baseline</b>	None (No new surveys planned for 2008. The next ones will be made start of 2009.)	Household surveys done and reported in Exel sheet, but not yet summarised		Summarised HH survey done

1.4	<b>Make 50 wells and install rope pumps for irrigation of nurseries</b>	All 25 FCs have wells with 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.	Less pumps installed than planned. The project has found that the former technician was not capable in production and installation of steel rope pumps. He was ensigned to an agricultural job, performing much better.	The pumps are of a better standard, after a new Water Technician Seraphim came, with more experience and better skills than the former technician. He started to replace wooden pumps which broke too often since each pump was used by 50 people or more, and improved the steel ones, although more improvement is needed to obtain long lasting quality..	11 new steel hand rope pumps of better quality installed and working on improved wells. Total nr of pumps will be 25.
					The new water technician has developed a drilling team of 5 men from Bilibiza who can either dig wells, or manually drill wels and provide concrete (bamboo reinforced) rings (of 1 m each) Another man makes the concrete rings. The new welder Nacir, trained last November produces all the pumps in BBC. Proper plans are made and written records of results achieved are also made.	

<b>Main activities for whole year 2008</b>	<b>Planned results up to 1 July 2008</b>	<b>Actual results up to July 2008</b>	<b>Variation</b>	<b>Explanation of variation, problems encountered. Solutions proposed</b>	<b>New estimate of results per Nov 1, 2008</b>
1.5	<b>Provide seeds and give training to farmers to start 25 nurseries</b>				
	- Set-up nursery at EPF	The nursery multiplies a number of jatropha varieties for distribution to FCs.	Second half of 2007, about 1800 seedlings were raised from 3 varieties, Guatemala, Tanzania and Mozambique. Early 2008 1200 of these were planted in 4 FCs. The remaining 600 have been kept in the new nursery of the Demo Garden of EPF.	In June 2008 Jan de Jongh brought 3 new varieties, from Indonesia, about 1 kg (via FACT), and some samples from Thailand and Mexico (non toxic) received from Diligent Tanzania.	At least 6 varieties produced as seedlings in the New Nursery.
	- EWs & FEWs trained on-farm and through joint training sessions	New experiences gained from FACT, GAIA, IIAM and elsewhere transferred to FEWs.	In May Flemming Nielsen visited the project again and provided inputs and in June Jan de Jongh also provided inputs, mainly learned from Arusha visit. 31 clubs have received training on the spot by EWs and PTs.		
	- Acquire seeds, preferably of different varieties	Sufficient seeds to plant the remaining 250 ha acquired (125 km of jatropha fencing)	The 300 kg of seeds available before planting season in Nov 2007 have all been given out to FC's and been planted.	Due to lack of large number of other varieties, only 1200 seedlings were planted of 3 varieties, see above	Sufficient seeds available, possibly from different varieties, to fill the gaps in the hedges and to complete the 125 km of hedges. These are plants raised

						from both seedlings and cuttings.
	- Seeds distributed & nurseries established	25 nurseries producing part of the seedlings for 125 km of jatropa fencing. The remaining fencing will be planted by direct seeding.	25 nurseries have been established as communal seedling production areas. Planting pots were bought for raising seedlings but more are to be bought in October from Malawi.			
1.6	<b>Sensitise and train 250 farmers to start cultivation of Jatropa</b>	Specific training sessions in jatropa cultivation held in all FCs and jatropa promoted at field days and community events.	25 club committees have been trained in Jatropa production in 4 sessions of three days each. They in turn have taught the rest of the members of their respective clubs in sessions attended by Extension workers. 27 Teachers trainees were also trained in February and are continuously training farmers on-spot.			

<b>Main activities for whole year 2008</b>		<b>Planned results up to 1 July 2008</b>	<b>Actual results up to July 2008</b>	<b>Variation</b>	<b>Explanation of variation, problems encountered. Solutions proposed</b>	<b>New estimate of results per Nov 1, 2008</b>
1.9	<b>Plant seedlings and directly seeding plots of 10 - 20 ha at each Farmers Club</b>	125 km of new jatropha fencing established (2 plants per meter). Equivalent to 250 ha. Existing fencing filled up by planting cuttings.	76432 planted directly and growing as fences around farmer fields. and community gardens. 4300 planted as cuttings and growing as hedges around common gardens.	85000 not achieved due to scarcity of seeds	Could not manage to find seeds during the planting season as most plants were too young to produce plantable seeds. We have already started procuring seeds for the next planting season. Farmers are looking forward to planting more Jatropha in the next rainy season. Many clubs have fruit bearing jatropha plants from which seeds are being obtained.	85000 seeds distributed and planted directly as fences around farmer fields.
	<b>Harvest and sell seeds</b>	An estimated 500 kg of seeds purchased from FC member communities.	51 kgs bought from 2 FC's on 1st July.	??		
	<b>Conduct annual field days, planning &amp; review meetings</b>	Bi-monthly planning meetings held with Project Leaders, Technicians and EWs Field days held in all FC's	Bi-monthly planning meetings have been held every two weeks for the past six months. In these meetings, progress is discussed and planning for the the following two weeks done. A field day was held on 24 March in the district of Meluco where members from 7 clubs in the district visited fields of 3 farmers who with very good Jatropha plants District meetings are now being held in order to involve ore people in the planning and make more people understand the program. The meeting schedule is as follows:	Field day only held in one district. All clubs in the district participated but clubs from other districts could not, only their committees.	Club members from other districts did not participate due to long distances from their homes. There is need to organise one for each district.	Monthly meetings to involve club committees annual field days held in all districts

			13 september – P. Metuge 27 September – Quissanga 11 October – Macomia 25 October – Meluco 08 November - Ancuabe			
1.10	<b>Prepare and set up 25 on-farm jatropa research plots of 1 ha</b>	25 x 500 m established as trial fencing to assess various varieties (if possible), cultivation and pruning methods.				
	Train EWs, technician and 25 FEWs to set up trial plots	25 FEWs managing their trial fences successfully				
	Acquire different varieties	Fencing trials testing at least 3 jatropa varieties				
1.11	<b>Monitor jatropa research plots</b>	Data on growth and (later) yields and pruning registered.	Over 50% of all FCs demonstration fields (14) have been positioned with coordinates by GPS (Giuseppe's 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.	Jatropha research plots will be monitored on growth and yield, Pruning will be registered.

<i>Main activities for whole year 2008</i>	<i>Planned results up to 1 July 2008</i>	<i>Actual results up to July 2008</i>	<i>Variation</i>	<i>Explanation of variation, problems encountered. Solutions proposed</i>	<i>New estimate of results per Nov 1, 2008</i>
<b>6. Other expenses not directly related to project activities</b>					
annual audits	2007 accounts audited	2007 accounts being prepared	Not done before deadline of 1 June 2008	No sufficient attention was given by ADPP HeadQuarters in Maputo to the Team at ADPP Bilibiza. Also total change of Project Leadership from Felicity to Henderson and Jatropa Technician Ernesto to Bachir was disrupting the administration. A new Administrator Francis was appointed to work in Bilibiza, he started in January 2008. It is therefore expected that the Financial report will be audited in July. Jaco Zulu, the PL of all FCs in Mozambique will be based from July in Maputo to give explanation of the project activities to the administrators of HQ.	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.
motorbikes and bicycles	3 Motorbikes functioning	All motor bikes running well despite frequent breakdowns resulting from use on rough roads and long distances between clubs.	Bicycles not bought yet	The project has enough bicycles purchased from the EU budget, but shall buy new ones early 2009	3 Bicycles bought.
office equipment, 2 laptops 2 digital cameras	Laptops, cameras and PV system functioning	1 laptop not functioning well, and 1 camera stuck. Also the PV panel and the inverter stopped functioning. The scanner has also stopped working.	1 new solid camera was bought by JdJ and sold to ADPP for the project.	Equipment bought in Mozambique is often not of good quality. It is proposed that foreign partners buy and bring better materials when they come again to visit the project.	Laptops, cameras and PV system functioning

<i>Main activities for whole year 2008</i>	<i>Planned results up to 1 July 2008</i>	<i>Actual results up to July 2008</i>	<i>Variation</i>	<i>Explanation of variation, problems encountered. Solutions proposed</i>	<i>New estimate of results per Nov 1, 2008</i>
<b>8. Setting up of Bio-fuel Training Center on bio-fuels in Central Mozambique</b>					
<b>8.4</b>	<b>Improving existing school building into centre and mechanical workshop</b>				
Improvement of dormitories	Dormitories up to standard	All dormitories have been painted and double beds fixed. Two more new rooms have been refurbished and are ready for use.	Some window panes missing and water not running	The pipes supplying water to the hostels had rusted and new ones were bought but could not reach all the hostels.	Well refurbished hostels with all facilities in place.
Construction of new toilet and bathroom facilities	A building with toilet and bathroom facilities in use.	A plan for the new toilet and bathroom facility has been produced by Giuseppe and construction commences after the workshop building which ends in August.		Could not dig a pit for the toilet during the rainy season.	A spacious toilet and bathroom facility constructed next to the hostel rooms.
Construction of workshop for water pump production and jatropha oil production.	Workshop for pump production constructed.	The construction plan was approved by Government in March and construction commenced in May. 3 men employed and bricklayers and 4 men working as helpers. 3 men making cement blocks. The construction work is progressing well and is expected to be finished by end August.	Only the begin of the building was made		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.	Not purchased yet	Still collecting quotations from Maputo and neighbouring Malawi.	The company ATA in Tete did not respond properly. Quotations are now being asked from Maputo and neighbouring Malawi from dealers of Japanese equipment..	A generator running the workshop and as back-up for the school

						centre.
8.5	<b>Purchasing and installation of equipment, such as: oil press, bio-diesel production unit, cab-truck, etc.</b>	The cab-truck functioning well.	The cab truck functions well, but requires full service which is more expensive than the amount in the budget, which is quite low, considering the fact that it is a second-hand car and is used to cover very long distances on rough roads. One manually operated oil press had been bought (Bieleberg type). Try outs proved that it was very hard to press Jatropha, and it seems not to be a viable option.	Very little equipment bought yet	Too early to buy all equipment, since the building is still under construction.	All necessary equipment bought and installed and oil production started.

## 6 Conclusions

There has been quite some changes and additions in the whole project staff, from project leaders to extension workers, and it is turning out that this staff is doing quite well.

The agricultural part with the farmers clubs is doing very well. Due to training by extension workers and newly assigned project leaders, Henderson and Bachir, the farmers saw results and started selling vegetables and became enthusiastic. Other new clubs wanted to join and in July 31 clubs in total were planting Jatropha..

The general organization of the farmers has impressed the government so much that the clubs are now being given farming equipment by them, like pumps and also money to invest in their farming activities.

Training is given on all levels In January 2 weeks training given and in April 2 days, at Bilibiza Bio-fuel Center; BBC. 25 clubs have received training on the spot by the Extension Workers and the Project Leader Henderson, who has good practical knowledge of agriculture and the Project Technician Bachir, who's knowledge of the local languages proves to be a great advantage.

Less pumps for the nurseries have been installed than planned, although several nurseries have access to open water sources nearby, which still made it possible to establish in total 25 nurseries as communal seedling production areas.

Up to now 14 steel rope pumps have been installed, which are of a better standard, by the new Water Technician Seraphim. Wooden pumps were replaced by steel ones, since they broke too often since each pump was used by 50 people or more. Still more improvement is needed to obtain long lasting quality.

The development of the Training Center is behind schedule, but that is not a serious problem. The Workshop building for the Processing of the PPO, containing the equipment as oil presses, etc and also for production of the pumps is finally under construction, but ordering and obtaining of equipment is difficult and takes much time. Luckily Diligent Tanzania is nearby and is willing to support.