

PRACTICA

FOUNDATION

ANNUAL REPORT 2007



PRACTICA Foundation
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The Netherlands

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Picture at cover page:

Hands-on Rota Sludge manual drilling training

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1. INTRODUCTION

1.1 General

In 2007 PRACTICA's main focus was on starting up the activities of the Path out of Poverty, also called the Rural Prosperity Initiative programme together with IDE. To that end a new office and workshop were opened at Papendrecht and new staffs were recruited. R&D activities on six technologies were continued under this programme: Micro diesel, solar pump, wind pump, 40 mm pump, rope pump and affordable wells.

2007 was the first year without the Thematic Co-financing Grant (TMF), received from the Netherlands Ministry of Foreign Affairs, which we received since 2004 and in 2006 still amounted to 176.600 Euro, then still 56% of the total PRACTICA budget. The final report on the activities funded from this subsidy was submitted and approved in the summer of 2007, and the retained amount of the subsidy was received subsequently. 2007 was also the first year without a separate Unit for Promotion and Awareness, which was mainly funded from TMF. Activities under this unit were continued by the other (technical) units.

The contribution in 2007 from the 4-year agreement with IDE on collaboration in the Rural Prosperity Initiative, more than compensated for the termination of the TMF subsidy, next to continued cooperation with UNICEF in Chad and Madagascar, with JICA in Ethiopia, and with various other partners on Madagascar like CARE and CSR, with the Spanish Cooperation in Mauritania and with various other partners in a number of countries.

The overall PRACTICA budget in 2007 was 473.129 Euro, slightly above budget and an increase with 34% compared to 2006. As expected we continued our steady annual growth in activities and budget which we realised since PRACTICA started in 2001.

In 2008 we are looking forward to continued cooperation with our partners and hope to realize an increased impact of our activities.

1.2 Examples of impact

For an organisation like PRACTICA to increase the impact of its activities, there are two ways of scaling up: autonomous growth through our network and cooperation with strong partners. Like in previous years, in 2007 PRACTICA has pursued both ways. Continued cooperation in our network allowed us to grow, on the other hand expanded cooperation with big partners like FAO, UNICEF, JICA and CARE allowed for enlarged impact.

Ceramic water filter research

The research project on ceramic pot filters that was initiated by PRACTICA in 2005 is one of the projects that not only impacts the lives of those in need of clean water in less developed countries. A secondary impact is that through this research, the Dutch water sector together with the Delft Technical University work together on low cost household level water treatment options. Having established this solid basis for research and promotion of the water filters, in 2007 the Dutch research group started working on improving the water filter quality and enabling knowledge sharing on the filters through a ceramic water filter conference and website.



ceramic filters ready for testing

Rope pump Ethiopia

Within the large training and implementation project in Ethiopia, PRACTICA has now trained 35 workshops in the production of rope pumps and by the end of 2007 some 1.200 rope pumps have been produced and installed in the field on family owned wells. Feedback from the field indicates that each rope pump serves 2 to 10 families, averaging in some 30 users per rope pump. Within this project, improved access to water has been established for some 36.000 people in Ethiopia. With the 35



rope pump trainees in Ethiopia

workshops trained, it is now the task of these workshops to continue producing rope pumps and to establish a sales network in their towns and villages. Our local counterpart JICA together with the Ethiopia Water Technology Center (EWTEC) will focus on promotion and advertising of the rope pumps as well as quality control and follow-up training.

Mauritania

Interview of Mr Youssouf Diallo, Chief of the component « Small surface irrigation » of the project « Valorisation de l'Irriguée pour la Souveraineté Alimentaire (VISA) », funded by the Spanish Cooperation (AECI) – Mauritania:

1. What do you think about your partnership with PRACTICA?

We appreciate our partnership with PRACTICA, which brings a lot of technical know-how and technologies to our project and specifically to our component “Small surface irrigation”

2. What is the strength of this partnership?

The guidance, monitoring and support in the implementation of activities are the strengths of our partnership with PRACTICA. PRACTICA is willing to give us technical support and answers to our questions even when staying away from us (trade from the Internet).

3. What do you think about technologies and methodologies used by PRACTICA?

The technologies used by PRACTICA are very suitable for Africa, because they are inexpensive, easy to implement and appropriate for the producers, even for less experienced. The methodological approach of PRACTICA is interesting because it involves the beneficiaries at all levels and takes into account all important aspects to develop technologies (information, awareness, demonstration, training, promotion and dissemination...).

4. Does PRACTICA reply to your expectations and to the needs of the poorest populations? If yes please give details?

PRACTICA provides us technical support at all levels, from the definition of our program until its implementation in the field through the strengthening of our capacities. At each mission of PRACTICA, the team of small-scale irrigation learns things that they are able to



mr. Youssouf Diallo

resume alone (definition of a coherent action plan and planning, put in places technologies like implementation of pumpset bench....).

Awareness of rural poverty: PRACTICA considers the cost of technology as one of the most critical factors in the choice by producers. As a result, poor producers can access to the technologies promoted by PRACTICA, while being able to ensure the sustainability and management.

5. Accompaniment, technology, experience, methodology, professionalism what are the strengths of PRACTICA compared to other organisations?

The strong points of PRACTICA are:

Rich experience in the field of low cost irrigation technologies

The PRACTICA methodology is adapted to the current development situation

PRACTICA's operational and effective intervention.

2. THE TEAM

The present Management Team consists of the director and four unit managers, for the units Energy & Engines (1), Manual Drilling & Wells (2), Pumps & Filters (3) and Small-scale Irrigation (4). Due to the end to the TMF subsidy by 1 January 2007 the activities of the Promotion & Awareness unit were spread over the other four units. From half way 2007 onwards the units manager Drilling & Wells and Pumps & Filters are employed on a permanent base, the unit managers for Small-scale Irrigation and Energy & Engines are still working on project/ contract base.

PRACTICA has a board of three which meets four times per year and works on a voluntary basis. The PRACTICA team in 2007 consisted of the following persons:

Board

Chairman of the Board

Frank van Steenbergem

Secretary/Treasurer

Wout Snijders

Member of the Board

David van Raalten

Management team

Director

Jan van der Wal

Unit Manager Energy & Engines

Gert Jan Bom

Unit Manager Manual Drilling & Wells

Arjen van der Wal

Unit Manager Pumps & Filters

Jan Nederstigt

Unit Manager Small-scale Irrigation

Stéphan Abric (Madagascar)

Project Management

Project Engineer Water & Energy

Don de Koning (since 1 June 2007)

Advisors

Joep Blom

Aske Tempelman

Administrator

Tanja Laan (till July 2007)

Associates

Henk Holtslag

Julien Labas (France)

Michael Schieman (Belgium)

Aris van Herwijnen

Jan de Jongh
Eric Oude Vrielink
Jos Besselink (Burkina Faso)
Merrick Lockwood (India)
Ron Rivera, (Nicaragua)

3. COOPERATION

In the Netherlands

PRACTICA participates actively in the NGO Platform of the Netherlands Water Partnership (NWP) with technical information, exchange of views and field experience in water issues. To further intensify this cooperation a Charter of this Platform was signed by all members, in which objectives, mode of operation, principles and a program of activities is agreed upon.

Together with Aqua 4 All and IRC, in 2005, PRACTICA took the initiative to launch the AT@work, a platform for promotion of appropriate technology, since then PRACTICA is a member of the Coordinating Committee of AT@work.

In the field of awareness creation, PRACTICA was active in the Dutch “Platform Millennium Goals” and “Maak het waar”.

At international level

PRACTICA continued cooperation with organizations in the South such as Enterprise Works/VITA in Niger, JICA (Japanese Development Agency) in Ethiopia, FAO, UNICEF, CARE and Medair on Madagascar and UNICEF in Chad. These organizations are the link between PRACTICA and the target groups in the field (see Annex 1 for the list of partner organizations).

Cooperation with IDE in R&D for the Rural Prosperity Initiative on agricultural options for small farmers started in December 2006.

Regarding point-of-use water treatment PRACTICA is an active member in the WHO network HWTS (Household Water Treatment and Safe storage).

4. ACTIVITIES IN 2007

Below the PRACTICA activities are summarized unit-wise. A detailed description of activities is presented in Annex 2.

4.1 Unit Energy & Engines

During 2007 this unit has been mainly concerned with R&D work on different models of solar pumps i.e. a deepwell pump (Volanta type) and a small portable suction type pump. A desk study was carried out, which revealed that currently available solar pumps are too expensive to be affordable and cost-effective for irrigation. It also revealed that at present there seems to be no ongoing research that could lead to significant cost reduction, other than

the solar thermal system that PRACTICA is working on. This underlines the importance of PRACTICA's research.

A desk study on small capacity wind pumps revealed that there are currently only a few wind pump designs that come close to being affordable for small farmers. Those designs are however proprietary and thus not freely available. Therefore, PRACTICA decided to engage a consultant to design a new wind pump from scratch.

Within the Rural Prosperity Initiative project, PRACTICA has further developed the 18cc fuel efficient micro diesel engine. The main focus was on production of new prototype engines that could be used for performance testing. Within this project, a 3D model of the micro diesel has been made and a high precision prototype was produced in the Netherlands.

We have established a relationship with Atmosfair, a German organization funding carbon saving projects. Together with Atmosfair, PRACTICA will explore the possibilities of large scale diesel irrigation pump modification in India to make these pumps more fuel efficient.

Within the range of renewable energy options for water pumping, PRACTICA has also started a trial with an animal drawn pump in Ethiopia. It is expected that with the rising fuel prices, using draught animals, as available in the rural areas, can be a viable option for water lifting. The trial in Ethiopia, that started early 2007, will not only yield information about the technical design, but more importantly it will give information about the social acceptance of the pump within the rural context of Ethiopia.

4.2 Unit Manual Drilling & Wells

Manual drilling in focus - Comparative testing

In the context of the IDE / RPI project PRACTICA is looking into the feasibility of manual drilling for water wells for small farm irrigation.

PRACTICA participated in a 'hand drilling expert workshop', organized by Enterprise Works/VITA in Southern Niger, funded by WAWI (West Africa Water Initiative).

Training Manuals

In 2007 the geo-hydrological manual for manual drilling teams has been finalized and is now called:

'Understanding Groundwater & Wells in manual drilling'.

In 2008 it will be published on the PRACTICA website for distribution and introduced in projects in, among others, Tanzania, Chad, Niger and Madagascar.

Manual drilling Chad

In 2007 a start was made with a large scale training project to professionalize the existing manual drilling sector and make them compatible with the mechanized drilling sector, who currently monopolizes the market. Through the creation of a quality control system, training and intensive supervision, PRACTICA and UNICEF Chad are working on improving the quality of manual drilled wells to the point that it becomes feasible and acceptable by donor organizations and the Chadian government.



hands-on geo-hydrological training

4.3 Unit Pumps & Filters

Within the unit pumps and filters, major works in 2007 have been on implementation of proven concepts as well as on development of new concepts. For the water pumps, most of the work focuses on hand pumps for drinking water and small scale productive water use on household and extended family level, especially for those areas where water tables are below suction depth.

Whereas excellent quality community pumps as well as low cost household level suction pumps are readily available in most countries, low cost options for deeper water tables are limited. The rope pump is a proven concept for that, as it can be used for (extended) families and water tables up to 35m. In 2007, the rope pump has been introduced within different projects in different countries at different scales, including a continuation of the rope pump training and introduction programme with JICA in Ethiopia, R&D activities in the Rural Prosperity Initiative project with IDE and several smaller projects in Zimbabwe, Madagascar and India. Also technical input was given to an existing rope pump programme in Cambodia.

Within the RPI project, PRACTICA has further developed the small diameter hand pump or 40mm pump, referring to the 40mm outside diameter PVC rising main. This pump has the same range of application as the rope pump and has the advantages of requiring a smaller diameter borehole and the possibility of lifting water to an overhead storage tank. Testing of the prototype pumps was started in the laboratory in the Netherlands and has been extended to field trials in Madagascar, through enthusiastic and innovative farmers. This R&D programme will continue another three years.

In cases where drinking water pumps for community water supply are not readily available or expensive, or where special requirements apply for water depths or maintenance, PRACTICA advocates local production of the Volanata hand pump. Local production can also help to stimulate local economies, facilitate technical training and improve availability of spare parts. An existing producer of Volanta pumps in Niger has requested technical assistance for improving the production process and pump quality. Although the Technical Training Programme of the ETC Foundation was ready to fund the project, worsening security in the area has made it impossible to provide the training so far.



Volanta pump in Cameroon

In the field of household level water treatment and safe storage, PRACTICA has continued the research programme on ceramic pot shaped water filters. Based on the results of the first phase of the research, the research group has decided on focussing on product improvement (increasing the clean water output of these filters) and product uniformity (within and between different factories). This focus should eventually lead to standardization of the filters and filter production process and to a declaration of performance by the Dutch water sector. The research will continue in 2008. Implementation of water filter programmes was planned for Cameroon. Due to lack of funding opportunities, the local water filter production did not materialize in 2007.

4.4 Unit Small Scale Irrigation

PRACTICA Madagascar became a formal reality with the agreement of the Malagasy authorities received in October 2007, recognizing PRACTICA as an international NGO. This agreement will establish closer relations with our local partners involved in the water sector.

The work conducted by PRACTICA and FAO Madagascar in 2005 and 2006, capitalizing of experiences on small scale irrigation technologies, has borne fruits with the launch in January 2007 of a project “Utilizing small scale irrigation systems for household and market oriented agricultural production in Anosy (South Madagascar), implemented by CARE and funded by USAID. PRACTICA with his national consultants team provided technical support on the introduction (training) and dissemination (communication and marketing) of small scale irrigation technologies.

Another result of the earlier work conducted with FAO on small scale irrigation technologies is a request by the consortium BCEOM / IFRAMAD (French and Malagasy engineering company) to PRACTICA to undertake the design of the component “Experimentation of low cost irrigation technologies from the aquifer or the river Manombo” in the frame of the Advanced Project Detail of a large project of rehabilitation of the irrigated perimeter of Manombo (South Madagascar) funded by the African Development Bank.

Aware of the problems of salinity of the aquifer in southern Madagascar PRACTICA has conducted for CRS a feasibility study on a desalination process at low cost. The results of the study have rejected this inappropriate and expensive solution. However investigations in the area of intervention (South Madagascar) of CRS have shown possibilities of use of multiple techniques to improve access to water. These results have been used to produce a project proposal “Multiple use of water technologies in the Androy region “ which will be funded by OFDA (USAID). Implementation will begin in January 2008. CRS will ensure the implementation and PRACTICA will provide technical assistance on the water technologies introduced : rehabilitation of rain harvesting basin with PVC lining , training on manual drilling, training manufacture pump rope, introduction of treadle pumps for irrigation and methodological support for the diagnosis of water infrastructures.

UNICEF Madagascar, convinced of the value of the use of water at low cost technologies to achieve the MDGs in water infrastructure, entrusted PRACTICA a mapping study to identify suitable areas for the use of water low cost technologies (manual drilling and pumping) and the design of an action plan.

In the beginning of 2007, the Spanish Cooperation Agency (AECI) in Mauritania has requested the support of PRACTICA for the elaboration of the action plan (4 years) of the component “Small scale irrigation” of the project “Valorisation de l’Irriguée pour la Souveraineté Alimentaire “. A second technical support mission took place at the end of the year to set up demonstration sites, to train the project team on the design and installation of the Californian system (low pressure PVC pipe), supplied by small pumpset, and to set up a process of collection of technico-economic data.



Californian irrigation system

5. FINANCES

5.1 Funding

During 2007 PRACTICA received the following funding:

Donations for projects from non-governmental donors	€ 473.129
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5.2 State of finances

An overview of the state of finance and funding sources of projects in 2007 is given in Table 1. We are very happy with the growing tendency of our national and international partners to direct their funding to alternative options as promoted by PRACTICA.

A statement of approval on the accounts has been received from the accountant B&L Accountants, and is available on request.

Table 1: Overview PRACTICA state of finance & funding sources

Description	Budget 2007 (€)	Performance 2007 (€)
Total income (donations for projects)	455.512	473.129
Bank cost/ interest		-102
Non-project cost		
General cost		39.907
Salaries		107.068
Total non-project cost		146.975

Table 2: Details PRACTICA state of finance & funding sources

Projects	Budget 07	Performance 2007		
		Project cost (excl. general cost & salaries)	Donations received	Donor
Unit Energy & Engines	109.190	94.320	189.027	
Solar pump		22.591		IDE*
Micro diesel		44.150		IDE*
Wind pump		3.851		IDE*
IDE general		9.187	177.615	IDE*
Nepal		13.587	10.011	Sofreco
Energy 2006			1401	Various
Fuel efficient irrigation pumps India		954		FAO India
Unit Manual Drilling & Wells	176.318	53.052	98.866	
Geo Hydrological Manual		552	16.956	ETC
Manual drilling Chad		50.400	81.910	UNICEF Chad
Affordable wells		2.100		IDE*
Unit Pumps & Filters	81.326	48.055	58.310	
JICA Ropepump Ethiopia I		10.838	11.035	JICA

Animal traction Ethiopia		12.873	15.397	JICA
JICA Ropepump Ethiopia II		2.195	10.916	JICA
Motorized rope pump Niger		6.437	7.382	EW/VITA
Filter mission Cambodja		628	12.023	A4A
Cambodja mission Rope pump		124	1.557	Water-Right
Unit Small-scale Irrigation	88.678	66.238	86.395	
Watsan Madagascar		24.294	29.231	UNICEF Mad.
Manual drilling Madagascar		2.100	2.646	BCEOM
Valorisation of irrigation Mauritania		14.960	21.017	CEM
Feasibility study desalination		4.119	4.809	CSR
Improvement vegetable production		20.765	28.692	CARE
Various project cost/ donations		500	379	Various
Other projects		35.050	40.152	
Farmer club impr. food prod. Zimbabwe		12.250	14.000	DAPP
Green Post Tsunami India		22.800	26.152	HPP
Total projects	455.512	297.215	473.129	

* IDE contribution is totalized under IDE General

As can be derived from the figures in the table quite some amounts were budgeted but did not or only partly materialize, while others were not expected but did materialize. The realized overall amount is close to the budgeted amount (+4%), the increase compared to last year was 34 %.

6. FUTURE

Technologies

The focus in 2007 was the Rural Prosperity Initiative programme with IDE, with continuation and expansion of almost the whole R&D program. In 2008 this will continue to be the case.

Cooperation

PRACTICA will remain active within the NWP / NGO platform and cooperate with organizations such as IRC, Aqua for All, AID Environment (RAIN), WASTE, ETC and others.

Prospects to extend the cooperation with international organizations like UNICEF and FAO to more countries in Africa than Chad and Madagascar look promising. EW/VITA, CARE and CSR are a few examples of our international colleague NGO's. Below Annex 1 presents the full overview.

ANNEX 1 list of partner organizations

LATIN AMERICA

Nicaragua,

CESADE (Centro d'Estudios Agricolo et de Desarrollo). An NGO providing loans and extension to small farmers. CESADE disseminates products such as micro irrigation, rope pumps, motor pumps, wind-pumps, animal traction pumps, and executes water well drilling. UNAG. Somotillo. Farmers cooperation providing technical assistance and loans, on among others small scale irrigation.

AMEC. Local workshop that works on development, production and installation of all rope pump models, storage and drip irrigation systems and making wells

FILTRON. Local enterprise producing ceramic water filters. In 2004 FILTRON received a first prize in a UNDP contest as being the most innovative product of the year

Bolivia

Baptist Foundation. A Baptist mission that disseminates extremely low-cost well drilling, water pumping and harvesting technologies. A successful activity is the training of well drillers that make low cost boreholes by manual drilling on a commercial base assisted by the future owners of the well.

El Salvador

CORDES. One of the biggest NGO's in El Salvador. CORDES is now making the ceramic water filters.

ASIA

India

CDHI (Centre for Development of Human Initiatives), Jalpaiguri, West Bengal. Staff of about 10 people. Involved with women groups, rural mechanic cooperatives, introduction of ceramic filters, fuel efficient irrigation pumps and manual drilling techniques.

BIRDS. An NGO based in Nandyal, Andhra Pradesh. With a staff of about 80 people, BIRDS is the leading partner in a FAO financed project to execute the "Farmer Managed Ground Water Management" Project. Much attention is also directed at introducing environmentally friendly fertilizers and pesticides.

China

The Hangzhou University of Technology, Dept. of Mechanical Engineering. Collaboration on the development of the micro diesel engine and later on other products.

Nepal

IDE Nepal. In the context of the "Rural Prosperity Initiative" we cooperate with IDE Nepal.

AFRICA

Burkina Faso

Centre Sainte Famille, Saaba. Manufacturer (metalworks and Volanta pumps) cum technical training center. Established in 1960. Staff of about 10 permanent and 10 apprentices. Annual turnover about €500.000 from Volanta pumps and related equipment.

Ghana

Ceramica Tamakloe. A local ceramics workshop that started the production of ceramic water filters with the assistance of PRACTICA and Potters for Peace.

Senegal

Enterprise Works/VITA. An organization with presence in several African countries, working on the large scale dissemination of, among others, fuel efficient stoves and treadle pumps. After PRACTICA training, EW now disseminates manual well drilling, hand rope pumps and motor rope pumps.

Ethiopia

Selam, an NGO, are running a technical school (about 5000 pupils), an orphanage (about 200 orphans), a factory for roof tiles, building bricks and pumps, and a training restaurant. Established in 1975, permanent staff some 200. Funding mainly through charities and donations.

JICA (Japan International Cooperation Agency) and EWTEC (Ethiopia Water Technology Center), run by the Ministry of Water Recourses) work with PRACTICA to introduce rope pumps and motor rope pumps.

IDE Ethiopia. In the context of the “Rural Prosperity Initiative” we cooperate with IDE Ethiopia.

Chad

UNICEF. Working with PRACTICA to reduce cost of wells for drinking water.

Kenya

ApproTEC. Dedicated to the development and marketing of low cost, money making technologies for small farmers. The main products are a range of treadle pumps (Moneymaker) and sprinklers.

Tanzania

SHIPO(through Connect International) Staff of about 8 persons. Engaged with rural development including water supply. Works with PRACTICA for introducing manual drilling and rope pumps.

Zimbabwe

Pump Aid. A small but successful NGO working in rural development . Pump Aid introduced the rope pump, (locally know as the Elephant pump) in Zimbabwe some years ago. There are now around 1000 pumps installed, serving around 200.000 people.

Cameroon

Prescraft. A large pottery workshop supported by the Presbyterian church where ceramic water filter production will be introduced in the coming years.

ADEID. Local NGO based in Bafoussam. Cooperation on the introduction of ceramic water filters in the western part of Cameroon.

ORWDAP. An umbrella organization based in Buea of women groups in South and South West Cameroon working on social development and agriculture.

Centre Technique de Garoua (CTG). A center including a school to train young people from the street in basic skills (sewing, metal-works, car mechanics) linked to workshops to produce clothes and textiles, of agricultural tools and machines, and to do car maintenance.

Madagascar

FAO. Working with PRACTICA on the introduction of low-cost and small-scale irrigation technologies.

UNICEF, Working with PRACTICA on the introduction of manual drilling.

Medair, working with PRACTICA on the introduction and improvement of manual drilling.

Niger

Enterprise Works/VITA. An organization with presence in several African countries, working on the large scale dissemination of, among others, fuel efficient stoves and treadle pumps.

After PRACTICA training, EW now disseminates manual well drilling, hand rope pumps and motor rope pumps.

Acrema. A workshop in Tahoua fabricating agricultural implements and Volanta pumps.

Zambia

IDE Zambia. In the context of the “Rural Prosperity Initiative” we cooperate with IDE Zambia.

INTERNATIONAL

Germany

Atmosfair. An NGO funding carbon emission reduction projects. A collaboration is being prepared in India to reduce carbon emissions from diesel irrigation pumps.

USA

International Development Enterprises (IDE). An NGO introducing income generating low cost technologies in the field of agriculture. Collaborates with PRACTICA on the development of new technologies, in the context of the “Rural Prosperity Initiative”.

Enterprise Works/Vita. Collaboration with PRACTICA mainly on low cost manual drilling projects.

ANNEX 2 description of activities in 2007

Unit Energy & Engines

Solar pumps

Solar pumps costing not much more than a diesel pump but without fuel costs. This makes it suitable for widespread application for pumping drinking- or irrigation water. The technology is relatively simple and local production in developing countries is a real possibility. Maintenance too, is not difficult.

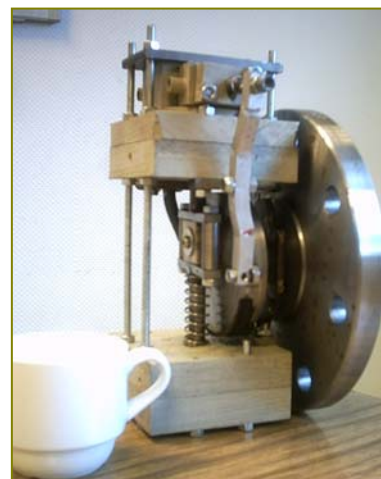


Status

In 2007, the design of the solar pump was changed from working on Pentane to working on steam. This significantly enhances the scope of this pump because the working fluid is now water. This makes it more tolerant for small leakages and obviates the need for an elaborate condenser. A prototype was tested in Burkina Faso but the efficiency still needs to be improved.

With the change to water as working fluid, the development of a portable micro solar pump (as a step-up from treadle pumps) became possible. Such a solar pump has the potential to serve a very large number of small farmers. It is expected that a pump delivering 4m³ of water per day from a depth of 5m, should not cost more than \$100-150.

A first prototype of such a pump has been built and is currently in the stage of testing and improvements. The concept of this micro pump is such that it can be up-scaled to larger capacities so that it can eventually compete capacity-wise and cost-wise with diesel pumps. These models however will not be portable anymore.



Envisaged work for 2008

Improve the efficiency of the deep well Micro solar pump, prototype

solar pump and continue field testing in

Burkina Faso. Continue testing and improving the micro solar pump in the Practica workshop in the Netherlands. Make a preliminary design for a 20m³/day solar suction pump, based on the same concept as the micro solar pump.

Solar pumping Nepal

PRACTICA was invited to cooperate in a large project for the installation of photo voltaic solar pumping schemes in Nepal. PRACTICA has been involved in drafting a requirements document and design criteria document. Also work has been done on dimensioning of the solar systems.

Status

The assignment has been finished in 2007.

Envisaged work for 2008

No further work on this project is planned for 2008.



Micro diesel engine

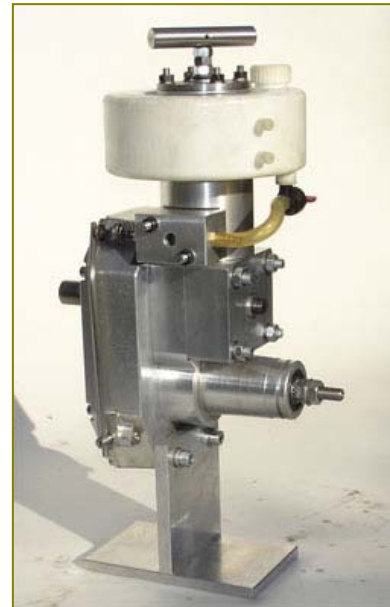
Diesel pumpsets currently available on the market often do not match the needs of the small farmers. In this context, PRACTICA started the development of a small, cheap and fuel efficient, 0.7hp, multi-fuel, 2-stroke diesel engine.

Status

In 2007, much effort has gone into optimizing the design of the engine based on 3D models. With this improved design, a new prototype has been produced in the Netherlands, which will be used for extensive performance testing.

Envisaged for 2008

In 2008, extensive testing of the prototypes will be done in the PRACTICA workshop in the Netherlands. These tests should lead to further improving the engine. Based on the test results, a go-no go decision will be made whether to continue with the development of the micro diesel engine.



Volanta irrigation pump, India

In the dryer regions of India, water for irrigation is generally pumped by submersible electric pumps. As the power supply is erratic and the grid is overloaded, farmers face difficulties of uncertain water supply and high cost of repairs. The Volanta pump (upgraded for higher capacity) and driven by a small diesel engine or eventually a solar engine, gives the farmers control over their water supply and avoids high repair costs.

Status

Work on this pump has been suspended for the time being due to the departure from India of the PRACTICA associate Merrick Lockwood, who executed this project.



Envisaged work for 2008

Find a suitable partner in India to continue this development.

Long term perspectives

The Volanta irrigation pump may eventually replace a substantial part of the about 12 million electric irrigation pumps used at present in India. If the solar option is successful, this will significantly reduce gas emission, contributing to mitigate the greenhouse effect, and relieve the overloaded Indian electricity grid.

Afridev hand pump spare parts

In Ethiopia, the most popular hand pump is the Afridev. However, spare parts for this pump are hard to find. For this reason JICA Ethiopia asked PRACTICA to assist with the design of a test rig and the development of alternative locally produced spare parts.

Status

Work on this project has been suspended because of lack of funds.

Envisaged for 2008

Look for further funding.

Long-term perspectives

If successful, the maintenance situation of Afridev pumps in Ethiopia will be much improved. Eventually this could be replicated in other countries.



Animal traction pump

Due to ever increasing fuel prices, it is worthwhile to look for alternative energy sources for water pumping. PRACTICA has experience with animal powered pumping systems that are appropriate in areas with a history and habit in using animal draught power.

Status

The animal driven pump has been built locally in Ethiopia and installed in Butajira. It is being used mainly for drinking water.



Envisaged for 2008

Follow-up on the performance of this pump and user satisfaction. The results of this study and the availability of funding will determine if and how to take this product further.

Jospump (screw pump)

A high capacity low lift irrigation pump has been developed to provide a low cost and simple alternative for the commonly used Archimedean screw pumps in the Sahel. The advantages are that it has a lower fuel consumption, is relatively cheap and can be locally produced and maintained.



Status

Work on this product has been suspended for lack of funding.

Envisaged work for 2008

Look for further funding

Motor rope pump Burkina Faso

The motorized rope pump is a low-cost option for motorized pumping where water tables are lower than 8 metres. The motor rope pump combines the locally appropriate design of a rope pump with the low cost and fuel efficiency of a Chinese engine. This pump is suitable for small scale irrigation applications.



Status

Some three pumps have been sold and are used by small farmers. The technology appears to be mature but more effort is required on the introduction and marketing side.

Envisaged work for 2008

Secure funding for a marketing effort.

Unit Drilling & Wells

Manual drilling in focus - Comparative testing

Machine drilled wells are very high in quality, but also very expensive. The cost of a machine drilled well varies between countries and will generally be in the range of US\$ 5000 – 10.000 for a 30 meter deep well. Hand dug wells are very useful when low permeable formations exist due to their capacity to store water which will leak in overnight. However, the total yield /day may be low. Hand dug wells exist in a whole range of price categories. In some countries hand dug wells are dug in clay without any lining. These have a very low cost (US\$ 100) and a very low yield. When a hand dug well is put in a permeable layer lined with concrete rings, the yield will be high, but the price will come close to that of a machine drilled well.



In many countries manual drilling techniques are used as an alternative. Costs of 30 meter deep wells vary from about US\$ 100 – 2500, depending on geology, country and application (small scale irrigation or high quality community wells for potable water).

Status

In the context of the IDE / RPI project PRACTICA is looking into the feasibility of manual drilling for water wells for small farm irrigation. Manual drilling may be more feasible and/or cost effective than the other two alternatives, machine drilled wells and hand dug wells. In 2007 a desk study and an inventory of existing manual drilling techniques, available information, uncertainties, experiences and practical application of the different manual drilling techniques has been done.

In June 2007 a 'hand drilling expert workshop' was organized by Enterprise Works/VITA in Southern Niger, funded by WAWI (West Africa Water Initiative). During this 10 day workshop a group of 9 international drilling experts and 4 local manual drilling teams exchanged information.

Envisaged for 2008

Comparative testing of different manual drilling techniques in the IDE / RPI countries Ethiopia and Zambia.

Training Manuals

Training manuals are a very important tool in the introduction process of low cost water technologies. These manuals are intensively used during training sessions and left behind, preferable in the local language, as guide book, and reference for the local trained enterprises, individuals, NGO's and organizations.

Status

In 2006, with funds from ETC's Technical Training Program, a first draft version of a drilling manual on geo-hydrology was written. This manual has its focus on Geology, Hydrology, Hygiene, Well logging, Well design and Well development, written in simple and understandable language for manual drilling teams. This manual was translated in French and field tested on projects in Chad and Niger.

In 2007 the geo-hydrological manual for manual drilling teams has been finalized and is now called: 'Understanding Groundwater & Wells in manual drilling'. It will be introduced in projects in, among others, Tanzania, Chad, Niger and Madagascar. It will be published on the PRACTICA website for distribution.



Envisaged for 2008 and beyond

In the IDE/RPI project, production and operation manuals will be produced by PRACTICA for a number of manual drilling techniques, used for the production of irrigation wells (2008-2010).

In the envisaged UNICEF/EW/VITA/PRACTICA project production and operation manuals will be produced by PRACTICA for a number of manual drilling techniques, used for the production of potable water wells (2009-2010).

Manual drilling Chad

In 2005 UNICEF Chad asked PRACTICA to assist with the introduction of manual drilled wells for drinking water. It became apparent that there is substantial scope for manual drilling in Chad. The cost will be reduced from \$ 12000 to \$ 4000 on average, for a high quality communal used water point. Also, already a number of 40 manual drilling enterprises are active in Chad.



Status

In 2007 a start was made with a large scale training project to professionalize the existing manual drilling sector and make them compatible with the mechanized drilling sector, who currently monopolizes the market. Through the creation of a quality control system, training and intensive supervision, PRACTICA and UNICEF are working on improving the quality of manual drilled wells to the point that it becomes feasible and acceptable by donor organizations and the Chadian government. The World Bank is involved in the project to provide business skills training through the local partner CDE. Through the project about 1000 sustainable water points will be created in the next 3 years. 16 manual drilling enterprises have entered a solid technical and business skills training program.

Envisaged work in 2008

Another 16 manual drilling enterprises will enter the intensive technical and business skills program, while the first 16 enterprises will be half way towards their certification.

Unit Pumps & Filters

40mm pumpset

Most hand pumps at present require an inner diameter of borehole casing of 80 to 115mm. This means that the well diameter should be at least 100-120mm. The 40mm or small diameter pump fits small diameter wells which can result in a considerable cost reduction of the well-pump combination.

Status

Testing with prototypes in the Netherlands has resulted in a solid design. With this design, several prototypes have been installed in Madagascar, in cooperation with innovative farmers. Testing and follow-up in Madagascar has further improved the design of the pump.



Envisaged work for 2008

Testing in Madagascar will be continued and expanded to testing in Ethiopia. Further product development will take place in the Netherlands, focussing on a new pump rod design and a pump rod seal.

Ethiopia Rope pump

JICA Ethiopia, the 'Ethiopia Water Technology Center (EWTEC)', run by the Ethiopian Ministry of Water Resources, and PRACTICA are working on a three year rope pump training project, where private workshops in different areas of Ethiopia are trained in the production, installation and maintenance of rope pumps. The network of private workshops throughout the country will enable large scale introduction and use of the rope pump in Ethiopia. In addition a substantial number of governmental 'water desk' officers have been trained in use and installation of the rope pump. In 2005 and 2006 training courses have been conducted in Addis Ababa and Awasa. Intensive quality monitoring and follow-up training has been provided and local trainers have been trained.



Status

In 2007 another two five-week training courses have taken place in Bahir Dar and Waliso. To date, 35 private workshops have been trained. Follow-up training sessions and quality control by local trainers will assure the quality of the produced pumps. In the first three years of the project an estimated number of 1200 Rope pumps have been produced and installed in Ethiopia.

Envisaged work in 2008

In March 2008 the JICA/EWTEC program will come to an end. PRACTICA will conduct a last training mission in February 2008 as part of this project. In a new 3 year JICA/EWTEC project a large scale promotion and quality control component will be included.



Zimbabwe Rope pump

In an EU funded programme DAPP Zimbabwe and PRACTICA cooperate in conducting rope pump training and training in other low-cost technologies.

Status

One rope pump training was given to a group of technicians in 2006. A follow-up mission has been undertaken in 2007.

Envisaged work for 2008

No further work is planned within this project for 2008



CSF filter research

In cooperation with different partners, PRACTICA has initiated research on the performance of the ceramic silver water filters, which should improve the scientific knowledge base of the filter performance and filter mechanisms.



Status

Laboratory tests of the filters and water samples have been finalized. The research has yielded new insights that lead to phase two of the project, focussing on improving the filter performance and standardization of the filter production. Within the context of the project, three water filter producers in Cambodia have been visited.

Envisaged work for 2008

The research on water filters will be continued in 2008, where the focus will shift from performance testing to improvement on the production side of the water filters, including standardization of production. Most of the R&D work will be done in cooperation with RDI Cambodia, where a test plant will be built. Other strong focus will be on the marketing of the filters, which will include field research in Cambodia.

CSF Cameroon

The organization ADEID in Cameroon had requested for assistance in setting up local production of ceramic silver water filters. During a visit to Cameroon, the potential for production has been evaluated.

Status

ADEID has a strong local presence in the Baffousam area in Cameroon. This organization is expected to be a strong partner in quality control and marketing of ceramic filters once a production has been established.

Production of filters should preferably be done by an existing enterprise. The PRESPOT pottery centre in Bamessing has been identified as a potential partner for production of ceramic filters.



Envisaged work for 2008

Starting up production is planned for 2008. However, this depends on the availability of funds. Production and marketing of filters shall preferably be combined with writing of a production manual for ceramic water filters.

Unit Small Scale Irrigation

Small-scale irrigation Madagascar

Status

Fruits and vegetables in the Anosy region are scarce, and demand is high—particularly in the Ft. Dauphin market. Vegetable production in the region, with the exception of some adjacent communes to Ft. Dauphin, is negligible, and that of fruit is only somewhat better. Neither is sufficient to meet annual demand in Ft. Dauphin. Growth in demand is outstripping that of supply, as a result of the increased activity and interest in the region.

One of the targets of the project is to increase the regional production and consumption of fruits and vegetables via introduction of affordable and appropriate small scale irrigation technologies.

Activities in 2007

- PRACTICA brought during 7 months a none permanent technical assistance to CARE.
- Training local workshops how to make and repair treadle pumps and drilling equipment
- Training local drillers on how to make manual drilling by the rota sludge method
- Follow-up on original training and monitor quality control of workshops
- Training CARE and its partner organizations in the necessary skills and competencies to assume control of the monitoring in the long-term
- Training on the installation and design of small scale irrigation technologies

Long term perspective

CARE can bolster its integrated programming base that already operates in the region. The activities proposed would add tremendous value to its on-going projects in the region and the introduction of appropriate technologies that will further improve living conditions for some of the region's poorest households



Chinese pumpsets Madagascar

Status

Since 2005 with the support of FAO about 70 pumps are in use. With the support of PRACTICA one local dealer has been identified and oriented to the Chinese provider. 50 pumps have been imported and marketed by the local dealer. PRACTICA brought in support by writing a user manual and promotion materials.

Activities in 2007

Now this business works alone without support. The Malagasy dealer has ordered in China 50 more pumps showing the interest of farmers for this low cost and appropriate pumpset.



Treadle pumps Madagascar

Status

The quality and the design of the pump called MAHASOA has been improved to be adapted to the needs of farmers. A quality control convention has been signed by two workshops. Tests on the performance of the pressure pump have been realised.

Perspective 2008

Follow-up on the production, quality control and marketing with the various partners.



Purification of water by UV treatment Madagascar

Status

A French NGO “1001 Fontaine pour demain” wants to introduce in Madagascar an ultraviolet water treatment system, powered by solar energy, for small rural isolated communities (villages, schools, health care dispensaries) to independently produce the drinking water they need, using surface water. A first experimental project was conducted with Cambodian communities and has confirmed the feasibility and the adequacy with beneficiaries’ needs.



Activities in 2007

PRACTICA brought its technical support for the design of the project which will be funded by the French Embassy.

Long term perspective

In 2008, 1001 Fontaines will start the implementation of the pilot project with their national partner NGO Frères Saint Gabriel

Desalination process Madagascar

Status

Subsurface water can be accessed in the great majority of the South, although the quality, quantity, and depth vary greatly from place to place.

Underground water is often shallow but it has a high salinity level. The aim of the feasibility study was to analyse the possibility to install a community level desalination system by reverse osmosis powered by solar energy.



Activities in 2007

The study showed a prohibitive investment cost not appropriate for the poor community in the zone covered by CRS. Beside this study PRACTICA identified other appropriate alternatives for multipurpose use of water technologies :

- Low-cost rehabilitation of impluvia (underground water catchment basin) using PVC liner
- Low-cost boring through the rota-sludge technique
- Low-cost pump installation (rope pump, treadle pump)
- Low-cost drip irrigation techniques

Long term perspective

A project proposal (2 years), titled “Multiple Uses of Water in the South of Madagascar “, has been submitted in June 2007 by CRS to USAID/DCHA/OFDA Annual Program Statement (APS) for Supporting Food Security for Extremely Vulnerable Communities in Southern Africa. PRACTICA has been associated as technical partner to reinforce the capacities building of CRS and their partners in the necessary skills and competencies related to the water technologies introduced.



Design of Small Scale Irrigation project Madagascar

Status

In the frame of the elaboration of the advanced project detailed (APD) of a large project of rehabilitation of the irrigated perimeter of Manombo funded by ADB it has been requested to PRACTICA to propose an experimentation of low cost irrigation technologies from the aquifer or the river Manombo.



Activities in 2007

PRACTICA studied :

- The potential of proposed technologies
- The technical feasibility
- The financial interest for the farmers and the country
- The appropriation by the farmers

A complete project proposal has been written integrating planning , budget and detail of activities.

Long term perspective

This study will contribute to give a guidance in the future implementation of projects planned in 2008.

Mapping on low cost water technologies Madagascar

Status

UNICEF Madagascar, convinced of the value of the use of water at low cost technologies to achieve the MDGs in water infrastructure, entrusted PRACTICA a mapping on 3 regions (North Madagascar) on the feasibility of use of manual drilling and pumping.

Activities in 2007

- Thematic mapping areas suitable for drilling and manual pumping
- To make product sheets for the existing water low cost technologies
- To identify the main actors able to provide products or knowledge in the water sector
- To develop an action plan for development of low cost water technologies to achieve the strategic objectives of the Malagasy government on drinking water infrastructures (70%)



Long term perspective

Unicef will implement the action plan to develop the use of appropriate manual drilling and pumping in their area of intervention. Other partners will be interested to extend the mapping to others regions of Madagascar in order to get a better knowledge of the potential of these technologies for Madagascar.

Small Scale irrigation Mauritania

Status

Irrigation in Mauritania is conceived with high investment, 10 000€/ha, and large infrastructures with uncertain profit. The small scale irrigation component wants to promote small scale irrigation systems at low cost , less than 1000€/ha, adapted to small holders linked with production oriented to markets and diversified.



Activities in 2007

PRACTICA brought a technical assistance trough 2 shorts missions :

- Elaboration of an action plan with detail of activities and budget, for the next 4 years, for the component in charge of the promotion of small scale irrigation technologies
- Training national project team and associates NGO on the design and installation of small pumpset (3HP) and water distribution with low pressure PVC pipes (the Californian system)
- Elaboration of methodology for the technical and economic follow up of pilot sites.

PRACTICA will bring, for the next 4 years, two support missions per year.

Long term perspective

The investment cost for irrigation has been divided by 10 (700€/ha) compared to the current practice. In one year 50 farmers have been equipped with small pumpset and californian systems. The challenge for the next 4 years is to extend the practice of these low cost technologies and to increase the access of irrigation for small holders in the Senegal river basin.