



## Antenna Technologies

Research for progress

## 2010 Annual report

**Content** <sup>2</sup> Editorial <sup>3</sup> Facts and figures 2010 <sup>5</sup> Safe water <sup>11</sup> Nutrition  
<sup>15</sup> Agriculture <sup>17</sup> Medicines <sup>19</sup> Energy <sup>20</sup> Microcredit <sup>21</sup> Finances <sup>23</sup> Who we are



Our objective as Antenna Technologies is to reduce extreme poverty and public health problems in developing. We are registered as a Swiss charitable foundation.

## Editorial

### New evidence for spirulina in malnourished and HIV-infected patients

The nutritional value of spirulina, a micro-organism rich in protein and micronutrients, is now clearly established. NGOs and health institutions have been using it successfully for years to remedy mild and moderate malnutrition in developing countries. On the other hand, evidence confirming the effectiveness of spirulina also accumulates in the scientific literature.

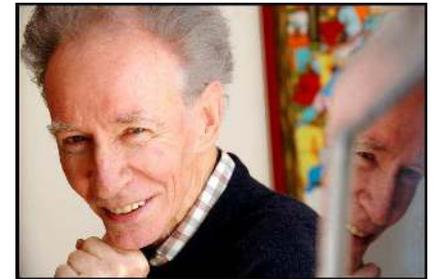
A new study\* conducted in Cameroon, published May 2<sup>nd</sup> 2011 in *Nutrition and Metabolic Insights*, is now showing its nutritional efficiency in terms of weight gain in malnourished people infected with HIV. This study also shows a revival of immunity-markers and a decrease in viral load, linked to the additional therapeutic properties of spirulina, a clinical observation of particular interest. The authors conclude that this new study "confirms the interest in considering this alga routinely for nutritional rehabilitation among this type of patients."

To date, though spirulina is recognized by field professionals coping with mild and moderate malnutrition and the fact that scientific evidence accumulates, major players in the fight against malnutrition remain silent about it.

Antenna Foundation and its partners in the development of this technology in developing countries, therefore invite you to give your support.

Help us increase awareness of the potential of spirulina against malnutrition. Make known its benefits and visit our website: [www.antenna.ch/en](http://www.antenna.ch/en).

I also would like to thank our partners and donors for their support. Thanks to you, Antenna can continue his work of technical cooperation and technologies transfer to the benefit of the poor.



Denis von der Weid  
 Director, Antenna Technologies

*\*Potential of Spirulina Platensis as a Nutritional Supplement in Malnourished HIV-Infected Adults in Sub-Saharan Africa: A Randomised, Single-Blind Study, Azabji-Kenfack et al. Nutrition and Metabolic Insights 2011;4 29–37*

## Research for progress

**Antenna enables the poorest of the poor to access simple, low-cost innovations for improving their quality of life.**

### Research and development

Together with our international network of scientists, Antenna conducts and promotes research and development on products and techniques which meet the basic needs of the poorest of the poor. These are simple innovations, low in cost and drawing on locally available resources.

After an initial phase of identifying technologies, we develop them further with our scientific partners, and validate them in the field.

### Dissemination: field programmes

Through our steady flow of field work, Antenna provides for an ongoing stream of knowledge transfer. We have thus already worked with some 60 development programmes in about 20 countries in Africa, Asia and the Americas in applying the technologies which we disseminate.

These programmes are implemented by our partners and the eight other Antenna organisations, all of them autonomous. When necessary, Antenna, and our peers Antenna France and Antenna India, make available a raft of technical, strategic and financial assistance, in the expectation that, in due course, the programmes will generate their own resources.

We promote social marketing activities, which contribute to a better dissemination of technologies and help create income and employment.

Alongside these programme activities, we proactively interact with governments and development organisations to encourage them to recognise and adopt these technologies.

### Partnerships

We are actively growing our network of partners, across research centres, international and governmental organisations, NGOs, businesses and foundations, to engage in research on new technologies and in disseminating them in the field.

In this, the direct involvement of local communities is essential. It is by developing their capacity and knowledge that we are enabling them to be more autonomous in terms of nutrition and health.

### Commercial activity

Although Antenna is a non-profit organisation, we market some of our research products, such as the electrolyser WATA, to partially cover the costs of our research and dissemination activities.

### 6 areas of activities



## Facts and figures 2010

### Research and development programmes

#### 5 areas

- > Water purification by chlorination: technically improving the WATA device
- > Spirulina: clinical tests on its effectiveness, enhancing cultivation methods and development of spirulina-based products
- > Micro-agriculture: growing techniques, micro-irrigation and organic fertilisers
- > Energy: developing solar lighting systems with LED lamps
- > Medicines: reverse pharmacology for developing plant-based medicines, such as *Argemone mexicana* used as a simple malaria prophylaxis

### Dissemination programmes

#### 4 areas

- > WATASOL: hygiene awareness and access to safe water
- > Production and distribution of spirulina (monitored by Antenna France and Antenna India)
- > Micro-agriculture: new projects including the creation of Ecoparc
- > Microcredit: Antenna Microcredit Network programme (Antenna India)

### 60 development programmes and partnerships to increase access to Antenna technologies

> in Afghanistan, Bangladesh, Burkina Faso, Cambodia, Cameroon, Djibouti, Guinea, Haiti, India, Kenya, Madagascar, Mali, Mauritania, Mozambique, Nepal, Niger, Pakistan and Togo.

### Safe water

Some **500** WATA devices were sold in 2010, lifting total sales to **1,400** in **70** countries, sufficient to produce safe drinking water for more than 10 million people (on the basis of 4 hours daily use).

### Nutrition

**4** tons of dried spirulina were produced in 2010 by programmes in Africa and Asia (monitored by Antenna France), of which **2.7** tons were provided to **13,000** children on a humanitarian basis. **10** new local jobs were created in spirulina programmes, on top of **58** existing ones. **1.5** tons of spirulina were produced by the programme in Madurai (managed by Antenna India), curing **15,000** children of light and moderate malnutrition in 4 to 6 weeks.

### Microcredit

**25,000** women benefit from the programme managed by Antenna India in Tamil Nadu.

Behind these figures lies the massive potential represented by our current research and development projects for developing the capacities of the poorest of the poor and empowering them to improve their quality of life in terms of nutrition and health.



**The WATASOL approach combines hygiene awareness with the purification of drinking water through chlorination. Our WATA technology allows local production of chlorine through electrolysis.**

Building upon the WATASOL strategy which we developed in 2008, the year 2009 saw the start of a number of projects to assess the role of WATA devices in long-term sustainable projects and the financial dimensions of local chlorine production. In 2010, this goal was continued further by a growing number of projects and enhanced monitoring methods, aimed at identifying best practices.

## SALES

Our central WATA sales service in the Antenna Geneva office, working with a strengthened WATA team, saw sales soar by 127% in 2010. From 287 devices in 2009, shipments rose to 494.

Surplus income from sales have been reinvested in field programmes, further research and technical improvements.

## COMMUNICATION

### Website

The Safe Water part of the website was refreshed with new content, emphasising the overall WATASOL approach and field programmes. Notably, it features a new Flash animation describing the 'Five Steps' strategy of WATASOL – demo, try-out, test, pilot and scale-up – together with a 'Toolbox' suite of practical documents for setting up projects.

### Presence at events

In February 2010, Antenna presented the innovative WATA technology at the

international scientific conference on 'Technology for Development' organised by UNESCO and EPFL, the federal polytechnic school of Lausanne.

A month later, in celebrating its 20<sup>th</sup> anniversary, together with World Water Day, the Hydraulique Sans Frontières association held an information event in Chambéry for the general public on water issues from a North-South perspective. We organised an information stand there on WATA.

Early September saw Antenna much in evidence at the World Water Week event in Stockholm, thanks to its partners in the 300in6 Initiative and Connect International. There, we came to appreciate that, to maximise our information presence at such events in the future, it will be important to have documented results available on field projects.

A week later, on 15 September, the Swiss Agency for Development Cooperation (SDC) held an information session for members of parliament about the role of Switzerland on global water issues. This was an opportunity for Antenna to communicate our commitment to improving access to safe water in developing countries, and we joined forces with other key sector NGOs in a common exhibit.

### International network for HWTS

Antenna joined the International Network for Household Water Treatment and safe Storage, which is run jointly by WHO and UNICEF.

## Press

Our WATA technology was included in a (French-language) guide to anti-poverty innovations which lists 100 'genial' inventions for the countries of the South. Entitled 'Guide des innovations pour lutter contre la pauvreté, 100 inventions géniales au service des pays du Sud', it draws on three decades of experience in Africa. The WATA is one of the highly-innovative solutions described in the guide, providing an effective and sustainable response to the needs of the people of the South.

A range of articles appeared in the media about WATA technology. You will find them at <http://www.antenna.ch/en/research/safe-water/weblinks>, and click on Articles.

## RESEARCH

### Partnerships

At the request of Antenna, two agencies – the Cascade Design company and the develop-



Testing rainwater, Pakistan

ment group PATH – field-tested new technology based on electrolysis.

Further the Swiss national laboratory validated the use of WATA technology in conjunction with the stand-alone portable solar system developed by the Iland Green Technologies company.

### Development work

The continued enhancement of WATA devices in field conditions is a key focus of our research work.

We are currently conducting tests to protect the power unit against the surges of unstable power grids.

A WATA diver has been finalised, with thermo-casing covering the electrodes: this single version now replaces the previous 'electrical' and 'solar' models. Users can henceforth the one device depending on what power source is available.

## FIELD PROGRAMMES

In the WATASOL approach, increased awareness of hygiene measures converges with the purification of safe water through local production of chlorine.

In the field, this means that NGOs need to bring together these two thrusts: social marketing in public health, and commercially-driven work to produce and distribute chlorine. In practice, it is often difficult to perform them together. By integrating them within an overall programmatic approach, the probability of success grows considerably.

## Asia

### Pilot project in India/Nepal/Bangladesh

The co-funding for this pilot project provided by the Swiss Agency for Development Cooperation (SDC), Caritas Suisse and the ProVictimis foundation has been confirmed until March 2012. The fundamental challenge in the project – a not inconsiderable one – is to design viable business models which combine affordable prices for consumer and adequate revenue streams for chlorine producers and vendors.

Two seminars were held in Delhi: in January, the programme was launched and the June session examined financial aspects in more detail. It was clear that the value of all the project stakeholders being able to meet and share their experiences cannot be underestimated.

### Pakistan

The floods in Pakistan were the worst for 80 years, and SDC moved to install projects for disinfecting drinking water in several regions. The facility to produce chlorine locally with WATA devices was assessed by SDC as being the appropriate low-cost solution for disinfecting and avoiding a cholera epidemic. The subsequent project visit by a member of Antenna staff, together with feedback from SDC experts, provided essential information for evaluating the relevance of WATA in such disaster situations.

## Africa

### Burkina Faso

In July 2010, two NGOs, Entrepreneurs du Monde and Afrique Verte, requested the cooperation of Antenna France in looking

after quality issues in training future producers of chlorine. A local representative was appointed, specialised in water and sanitation. As a result, a group of nine women in Banfora, in the south-west of the country, were trained in using WATA devices.

The Ministry of Health signed a partnership agreement with Antenna France for promoting the local production of chlorine and thus to improve access to safe water. In 2011, the directorate for public health and education will participate in a programme to install WATA devices in 63 health districts and nine hospitals.

### Cameroon

Having completed an initial phase of familiarisation with WATA technology, the PESSAF Group, a local NGO and partner of Antenna, started to produce and distribute chlorine on a successful basis. It is planning to further develop its work along two main lines. Their implementation strategy includes mobilising local communities through a structured use of mass media, and organising training programmes for producers, promotion agents and consumers.

### Guinea

It was in 2008 that this project was started by the Tinkisso NGO, and since then the number of people using their locally-produced chlorine has grown from 17,500 in the town of Dabola to 45,000 through the Faranah region.

With their average daily output of 200 litres, Tinkisso sells through health centres, pharmacies, markets and direct sales to the consumer at home. The cost-covering exercise employs nine staff and finances the sales network.

Tinkisso have reached an agreement with health authorities for providing chlorine to their health centres in the three prefectures of Dinguiraye, Faranah and Kissidougou. Under the deal, all cases of diarrhoea registered at the centres will be treated with chlorine (-purified water), and the solution is now stocked as an essential medicine in 45 centres. In addition, community leaders have trained 1,081 health agents and 116 para-medics in the use of chlorine and in best practices of hygiene.

In this, the role of Antenna is to continue supporting the awareness training which is necessary for securing lasting behavioural change in people.

### Mali

A project of our partner Formations sans Frontières (FSF) has successfully completed the installation of WATA devices in 10 health centres in the region of Mopti. They are now producing active chlorine with their own electricity supply. The experience gained will provide a sound basis for rolling out safe water activities elsewhere in the country.

This achievement, coupled with the priority given by UNICEF to proper storage of water in the home, has led to an assessment of the options for local production of chlorine and promoting its use in households.

### Mozambique

The 'Five Steps' strategy developed by Antenna was selected for a test project on selected site in Itoculo, Ramiane and Meulege and across the district of Monapo and in its central hospital.

The test phase, coordinated in 2010 by Connect International, was to determine if,

and to what extent, the WATASOL concept could perform in the given area. Two key indicators were used: the degree of acquired competence with the technology, and its acceptability, alongside the presence of a promising strategy for dissemination. The phase is continuing in 2011.

### Democratic Republic of Congo (DRC)

In 2010, Antenna provided support of US\$ 20,000 to the social marketing work of our partner Uzima Technologies Développement (UTD) in Goma and Uvira.

A variety of projects in local production of chlorine in DRC have grown on a wide scale and are now supplying safe drinking water to one million people. The challenge now is to embed this service on a sustainable basis in the region.

Atypical of this growth is the Mamas Uzima programme, based on the participation of women's groups in producing chlorine and selling it in small flasks door-to-door. Now an independent operation, the programme works through health workers and a massive awareness campaign on hygiene. A major project of Norwegian Church Aid buys in chlorine from the Mamas Uzima and distributes it through chlorinator agents who are positioned all along the shores of Lake Kivu.

### Togo

The year 2010 saw the successful completion of the test phase of a project led by two NGOs, Graine de Développement and Solidarité Afrique Développement, with five WATA devices being installed in the prefecture of Tchamba. The health authorities of the region, together with the Ministry of Health in Lome, issued authorisations for production and distribution.

## Americas

### Haiti

Following the earthquake of 2010, and the acute risk of cholera, demand for the WATASOL approach has sky-rocketed. One of the key advantages of WATA is that local production of chlorine is possible when grid electricity is not available, through using solar panels or generators. It can be used in areas where other products such as HTH and Aquatab cannot always reach communities.

By the end of 2010, more than 90 devices had been put into service by some 20 NGOs, and another ten were in preparation. Notably, the NGO Action contre la Faim has rolled out 30 devices in all since 2009. They are in operation in particular in the city of Gonaives, where women's groups are

successfully producing chlorine and testing distribution models.

## PERSPECTIVES FOR 2011

Our experiences with WATA in Haiti and Pakistan have shown the relevance of local production of chlorine in emergency situations. In this regard, Antenna is working on the aspects of sustainability, by defining the conditions under which the transition can be made from a humanitarian response to a developmental presence.

In Nepal, the programme has shown the potential of the WATA as a learning tool in schools. As well as purifying a school's water supply, the WATA is well-suited for use in the classroom. With support from SDC, Antenna plans to extend this experience in Africa and Latin America in 2011



WATA training, Mali



Water disinfection with chlorine, DRC



**Thanks to its high content of proteins and micronutrients, spirulina is an excellent dietary supplement. Given it can be grown locally, its health potential can make it a major player in combating chronic malnutrition.**

## SPIRULINA

Armed with our field experience of some 20 years, Antenna has developed a raft of tools and training processes for the production and dissemination of spirulina in developing countries.

Today, the local cultivation of spirulina conforms to developed standards and control practices. It enables the poorest of poor families to access a cure against nutritional deficiencies.

In the model we have developed, part of the production is distributed free-of-charge to children or is sold at close to cost price.

Some ten years ago, we were struck by the findings of laboratory research and nutritional trials on the rehabilitation of undernourished children in Madurai in India. Since then, we have pursued two main objectives: to determine the acceptability of spirulina as a foodstuff which can be produced by the affected people themselves, and to simplify the techniques of production.

## FIELD PROGRAMMES

In 2010, Antenna continued work on the transfer of technology and knowledge on spirulina production to the field.

The programmes concerned are managed exclusively by local associations and employees. Antenna provides a package of technical and financial support until a site has achieved financial viability.

### Programmes involving Antenna Green Trust: India

The Antenna Green Trust, one of our peers, runs the spirulina farm in Madurai in India. Its output in 2010 was 1.5 tonnes of spirulina.

Antenna Nutritech, the social marketing enterprise created by the Trust, distributes spirulina to children and sells it, in the form of powder, pills and sweets, on the local market through pharmacies and small local retail outlets such as kiosks. A cooperation agreement with the Child Fund India, a child protection NGO, has seen more than 70,000 children supplied with sweets; this is seen as a first step towards a wider dissemination of the product.

The Research and Training Centre on spirulina production is continuing its work on the product and the fight against malnutrition. It now supports two NGO-run production projects. It organises training courses in cultivation and supplies strains for starting up production.

To know more, please visit:  
[www.antennaindia.org](http://www.antennaindia.org).

### Programmes involving Antenna France: Africa and Asia

Antenna Technologies France, another of our peers, is responsible for following up progress and developments in the 16 spirulina production and distribution programmes in Africa and Asia.

In West and Central Africa, 2010 was above all a year of consolidation, aimed to further secure the long-term autonomy and continuity of the projects, this being our major goal. In the months ahead, the main priority will be to strengthen the distribution channels, both for humanitarian purposes and for sales on the local market.

### Overall results in 2010

- A total of 3,700 m<sup>2</sup> in active cultivation, 23% more than in 2009 (thanks in part to the integration of activities in the Central African Republic in the areas covered by Antenna France)
- Four tonnes of dried spirulina produced, some 40% more than in 2009
- Some 13,000 children received spirulina on a humanitarian basis
- Job creation with 68 productive positions, plus some 10 people earning supplementary

### 6 autonomous programmes

#### Burkina Faso

The two farms in Loumbila and Ouahigouya, launched in 2004, have now attained technical and financial autonomy. In 2010, they produced 875 kg of dried spirulina, of which 300 kg were distributed to 3,000 children. The remainder was sold on the retail market.

#### Mali

The two farms in Mopti and Bandiagara, launched in 2008, became technically and financially autonomous in 2010. With cultivation competence now complete, annual production reached 800 kg of dried spirulina. Of this, 576 kg were sold on the open market, and 224 kg were distributed to local NGOs, schools and rural women's groups for 1,700 children.

#### Niger

In 2010, the farm in Dogondoutchi produced 412 kg of dried spirulina, of which 170 kg were distributed to 1,700 children through the local hospital and feeding centres. Although market-based sales, mainly in Dogondoutchi and Niamey, have not yet fully taken off, the farm operation is showing a slight operating surplus.

#### Central African Republic

Launched in 1995 by our peer Kénose-Antenna, this site has become an important production centre, at the hub of a considerable network for mitigating the food crisis which is affecting the south-west region of the Republic.

In 2010, the farm became technically and financially autonomous, in terms of covering its daily running costs. It sold its entire production of 1.2 tonnes of dried spirulina for welfare ends, at little above cost price. Clinics and feeding centres in Berberati purchased 330 kg, thanks to an appeal for gifts. The remainder was sold through a network of 12 commercial distributors in Bangui. Rising demand has led to plans for two new farms, in Berberati and Boali. Land is being acquired and 100 m<sup>2</sup> has already been constructed on the Berberati site.

### Ongoing programmes

#### Madagascar

Together with our emerging peer Antenna Antsirabé, we are providing follow-up to the eight production and distribution units which produced 670 kg of dried spirulina in 2010. This was a year when their route towards autonomy could be consolidated. The commercial network has flourished with

more than 20 points-of-sale being opened in Antsirabé and Antananarivo, and the establishment of a fair trade network with the Daniel Jouvance wellbeing products company.

Antenna Antsirabé has trained 19 co-workers in spirulina cultivation. It also opened its first nutrition centre, known as the 'Maison de la Nutrition', in March, providing balanced, spirulina-enriched meals to 30 children a day. The centre also monitors each child's weight and size, and provides awareness lessons on (mal-)nutrition and hygiene to the children and their mothers.

## 2 new projects

### Cambodia

Building upon an earlier series of exploratory missions, Antenna and our partner Agricam are setting up a new spirulina farm near Siem Reap, and we have developed a web of contacts with NGOs for awareness building and spirulina distribution. Actual construction will start in the course of 2011, as will training courses in cultivation. Work A second farm will also get underway near Phnom Penh during 2011.

### Mauritania

The programme in Nouakchott started in 2010 in partnership with the Mauritanian association Santé Sans Frontières (SSF). With an annual yield rate of 70 kg, productivity has not yet reached its targets. Measures taken to make the delivery chain of inputs more secure are expected to allow production, and thus distribution, to grow further.

## PERSPECTIVES FOR 2011

Our operational objectives for 2011 are:

- To consolidate projects so they can move firmly towards sustainability and autonomy
- Launching new projects in Cambodia, Laos, Mali and Togo
- Development of 'Ecoparcs' in Mali, Madagascar and the Central African Republic. These multi-purpose centres offer opportunities for cultivation and training in a range of Antenna technologies. Their package includes spirulina cultivation, market gardening in home gardens, courses in nutrition and gardening for nutrition, fish farming and production of chlorine for purifying drinking water.
- Strengthening distribution channels for spirulina



## TECHNOLOGICAL INNOVATIONS: CIRCULAR PONDS

A mission to Kenya by the technical director of Antenna France, Vincent Guigon, was an opportunity to review the work on circular growth ponds perfected by Pierre Marnier, an engineer with Antenna Kenya, just south of Mombasa. The undisputed qualities of this system include sound stirring and impressive washing procedures for the growth medium. It needs to be refined and made adaptable to other operating situations.

The same mission continued to India to start work on constructing a pilot circular pond in Madurai for the Antenna Green Trust. The Trust brings together in one structure all spirulina-oriented activities of Antenna in India (production, training, promotion, processing and distribution, from both social and commercial perspectives).

To know more, please visit [www.antenna-france.org](http://www.antenna-france.org), or contact us at [antennafrance@yahoo.fr](mailto:antennafrance@yahoo.fr)





**Local food security is the objective of Antenna providing technological solutions, with an eye on stimulating locally-focused agriculture. A raft of projects is being built.**

### Developing food security

There are several popular terms for 'proximity micro-agriculture': home gardens, household kitchen gardens, family gardens and micro-gardening all fit the bill, by and large. The practice is largely underestimated in strategies for reducing food insecurity and malnutrition in developing countries. Families with low-income and no land rights can grow their own fruit and vegetables and thus build up their own autonomy.

With our partners in Mali, since 2010, we are trialling new technologies for micro-agriculture in order to demonstrate that an alternative future food path is feasible.

### Appropriate, accessible agricultural technologies

A major problem in African agriculture is soil infertility, often aggravated by irrational use of chemical inputs. To overcome this, Antenna is working on the industrial-scale manufacture of a range of organic fertilisers known as Bioferty®. This will be a less costly and more ecological alternative to prevailing agricultural practice on the continent.

In Senegal, together with a team of researchers, we are putting this to practice through the development of industrial-scale manufacture of an organic fertiliser known as Bioferty®. This product contributes to sound and sustainable agriculture, while having lower costs and higher yields than chemical inputs.

Elsewhere, we have partnered with International Development Enterprises ([www.ideorg.org](http://www.ideorg.org)) in the dissemination of low-cost micro-irrigation systems for small farmers in developing countries.

Special irrigation techniques known as micro-irrigation have been developed which combine a low-cost profile with more productive use of water. They supply a correct amount of water directly to plant roots, thus limiting losses to evaporation and runoff. This results in higher crop yields, with water savings of 30% to 70% compared with classical watering techniques.

### Micro-agriculture project

Today, family gardens are seen as one of the most effective ways to overcome food



Pilot project with organic fertilisers, Senegal

insecurity and malnutrition. They increase the availability of fresh foods throughout the year and they reduce household expenditure on foodstuffs.

The prime objective of family gardens is to make a more varied and richer diet available for a family. In dealing with malnutrition, a holistic approach is called for, equally involving nutrition education, supplementary income generation and improvement in the position of women.

An initial field project is set to start in Bamako in 2011, with the aim of establishing a platform for technical training for people who will run community-based home gardens.

### Ecoparks projects, as centres for nutrition and training

In India, the Ecopark in Madurai is where sustainable development, technology and enhanced local traditions unite to combat dire poverty. Some 30 people work on the two-hectare site, on the following range of activities: spirulina cultivation, cultivating medicinal plants and herbs, market gardening in home garden, fish-farming, awareness building and, above all, training courses. The centre also makes it easier for rural women to access microcredit, in order to become more autonomous.



Ecopark in Madurai

Antenna is developing new Ecoparks in Mali and Madagascar. Trials will be held on various market-gardening techniques in micro-gardens, as well as those of micro-irrigation and organic fertiliser.

The protocols for initial tests have been drawn up in Dakar, and a working group is preparing the launch of the first project in Bamako, in cooperation with Antenna France and the NGO Formations Sans Frontières. Its goal is to install a training facility for these new technologies on unused land, for crop production and income generation.

In Rangaina, near Antananarivo, a new Ecopark has started operation, with support from Antenna France. During the first half of 2011, this centre for agricultural production and diversification will be endowed with spirulina production units, a nursery for the moringa tree, a market gardening zone and 16 beehives. It will run training courses in market gardening and apiculture, enabling local people to add this knowledge to their skill sets. The project aims at achieving financial autonomy within two to three years, and to create 12 local jobs.



**In the area of public health, Antenna promotes traditional practices and the use of locally-produced medicines. Our research programmes focus on community involvement in dealing with malaria.**

### Argemone mexicana, a simple malaria prophylaxis

Work has been underway in Mali on two new clinical studies on the anti-malarial efficiency of a traditional therapy based on the *Argemone mexicana* plant also known as the prickly Mexican poppy. The research programme is part of the collaboration between the NGO Aidemet, the department of traditional medicine of the Government of Mali and university teams in Geneva, Lausanne and Oxford, with inputs from Antenna.

The study findings emphasise the importance of the work of Antenna in researching safe and effective local resources for first-line anti-malarial treatment. The use of *Argemone mexicana* is especially interesting in this regard for people with only limited access to pharmacological therapies.

The first study assessed the anti-malarial effectiveness of *Argemone mexicana*. A study was made of malarial patients who either received a treatment based on *Argemone mexicana* or underwent a pharmacological artemisinin combination therapy (ACT) which is one of the most effective of contemporary anti-malarials (Graz 2010)<sup>1</sup>. It showed that the improvements in the health of patients in either sample were comparable.

The second study examined the implications of residual parasitemia after a first-line therapy with either *Argemone mexicana* or artemisinin (Wilcox 2011)<sup>2</sup>. It

found that residual parasitemia was not of any major importance in the rate of recurrence of malarial episodes in regions with high malarial transmission. These are important findings in that they open up new perspectives. Notably, some anti-malarials which had demonstrated effectiveness whilst not totally eliminating the parasite could henceforth be considered as appropriate in regions with high malarial transmission. Further, they could offer a useful approach in mitigating the growing emergence of resistance to artemisinin, which has become a cause for concern.

### Methodology developed by Antenna

A recent publication on 'reverse pharmacology' has highlighted the research methodology applied in work on *Argemone mexicana* over the last few years in Mali. The method of selecting local and traditional resources known as 'reverse pharmacology' has been shown to be particularly productive, through linkages of traditional medicine and therapeutic research (Wilcox 2011)<sup>3</sup>. As stated in the abstract of this work, the approach has four stages:

1. Selection of a cure by means of a retrospective study of treatment and outcome;
2. A dose-escalating clinical trial, to show a dose-response phenomenon and to help select the safest and most effective dose;
3. A randomised controlled trial to compare the phyto-medicine with standard first-line treatment;

4. Identification of active compounds which can be used as markers for standardisation and quality control.

This example of 'reverse pharmacology', continues the abstract, shows that a standardized phytomedicine can be developed faster and more cheaply than conventional drugs. Even if both approaches are not fully comparable, their efficiency in terms of public health and their complementarity should be thoroughly considered.

### Prospects and perspectives

In 2011, a new study will be embarked upon, to identify the active substances of *Argemone mexicana* and their quality. It will be conducted in Geneva, in collaboration the Medicine for Malaria Venture and the University of Geneva. With support from the Swiss Agency for Cooperation and Development – SADC, it will be linked up with a research project in Mali being undertaken with the Malaria Research Training Center (MRTC) of the University of Bamako. This will allow a pilot project to be launched on a wider scale, whilst verifying that a strategy involving *Argemone mexicana* has clear gains in terms of public health.



Collection of medicinal plants, Mali

In this undertaking, Antenna will prioritise the growing autonomy of local communities, and the gradual adoption of the research and implementation programme by our Malian partners, namely the department of traditional medicine in Bamako, the MRTC and the national programme to combat malaria.

### Publications

<http://www.antenna.ch/recherche/medecine/publications>

- Graz B, et al. *Argemone mexicana* decoction versus artesunate-amodiaquine for the management of malaria in Mali: policy and public-health implications. *Trans R Soc Trop Med Hyg.* (2010); 104(1):33-41.
- Wilcox M, et al. Is parasite clearance clinically important after malaria treatment in a high transmission area? A 3-month follow-up of home-based management with herbal medicine or ACT. *Trans R Soc Trop Med Hyg* (2011); 105(1):23-31.
- Willcox et al. A "reverse pharmacology" approach for developing an anti-malarial phytomedicine *Malaria Journal* 2011, 10(Suppl 1):S8



Everyone has a right to light as a public good, and this goal can be reached with simple, low-cost lighting systems. In India, Antenna has launched a programme to assess and refine LED technologies so that they can meet the needs of the poor.

### The glowing appeal of LED

Many isolated regions in the world are not connected to a stable, or even an operational, electricity grid. And yet access to electricity and light is essential for school-going children, for household activities and for personal safety, especially when main roads pass through villages. Light is important too as a social tool in creating meeting places.

Over the last two decades, a large number of pioneering organisations have been very successful in introducing solar lighting systems in India and elsewhere. However, with their relatively high cost, they have principally benefitted the rural middle classes.

A more affordable alternative is fast emerging in the form of Light-Emitting Diodes (LED). Their energy (lighting) output is ever rising, using low power sources and their costs continue to fall. They represent a huge potential for making solar lighting systems accessible to the poor.

All the same, even it is using LED lighting for its output, the initial investment in solar energy is much too high for many families. This is particularly the case in Africa where total expenditure – some 38 billion dollars – on energy such as kerosene and candles is even higher than it would be with solar systems. This paradox arises from the fact that solar requires a large up-front investment in a lump sum, whereas kerosene and candles can be bought as and

when needed, in small amounts, for just a night or a week.

Antenna is therefore working on business models for solar lamps which have a system of payment whereby each instalment paid is no higher than what people pay for their kerosene or candles.

### Innovative lighting systems

In partnership with the Biel School of Engineering and Architecture (Switzerland), Caritas (Switzerland) and Solar Electric Light Company – SELCO (India), Antenna is involved in a research project to adapt LEDs to situations of deep poverty, especially in slum areas. Prepayment systems are being developed which make the solar systems accessible to the maximum possible number of people.

In Bangalore in India, we are contributing to solar lighting systems in schools, so that each student can have a simple desk light at home which is charged up at school. A small storage box has been developed and tested *in situ* in cooperation with the Biel School.



Antenna Green Trust is managing our first microcredit programme. It enables rural women to have the means to develop income-generating activities.

The poorest of the poor, misunderstood by conventional banks, do not normally have access to bank loans at low rates on interest. When they can borrow, it is from local money-lenders whom they often cannot repay in full. This downward spiral of indebtedness casts them cruelly into even more abject poverty.

### Antenna Microcredit Network

The Antenna Microcredit Network (AMCN) is a savings and microcredit programme of the Antenna Green Trust (AGT), in the State of Tamil Nadu in India. Today, it employs a staff of 60 people.

The network aims to enable rural women to free themselves from the stranglehold of local money-lenders and to set up small businesses such as market gardening, livestock, trading and brickworks. In just four years, it has grown considerably, growing from an initial portfolio of 50 women borrowers to 25,000 loans in 2010. With a loan interest rate of 8% to 12%, which is notably low compared with prevailing market rates, total amount of credits have now risen to US\$ 3.7 million.



Antenna Microcredit Network, India

Loans are obtained, distributed and managed by the intermediary of mutual support groups. The group guarantees timely repayments and a productive use of the loan. A network of local NGOs supports the borrowers in all aspects of savings and borrowing.

The Network has now standardised the loan process, which operates under three conditions: selection of borrower groups by AMCN on the basis of the technical and financial viability of the activity for which the loan is requested; a recommendation by the counselling NGO working with the network; and a guarantee from the members of the group, from the group itself and from the NGO.

In its responsibility to form the loan capital for the groups, AMCN manages the microcredit fund according to the regulations of the Reserve Bank of India. At the same time, the Network assumes responsibility the social protection of the beneficiaries – at the end of 2010, this applied to 22% of beneficiaries.

### Social responsibility of AMCN

It is through its social responsibility that AMCN differentiates itself from traditional microfinance institutions. Thus it finances a range of activities set up through the NGO network, such as nutrition projects (distribution of spirulina), education work (school support, scholarships) and financial interventions (business counselling and support).

## Financial report

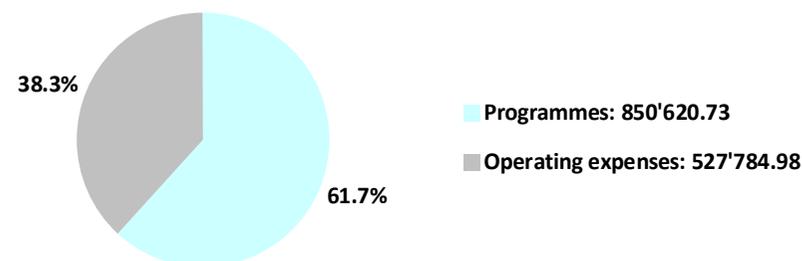
### Balance sheet as of December 31, 2010

ASSETS	CHF	LIABILITIES	CHF
<u>Current assets</u>		<u>Third-party</u>	
Cash at bank and in hand	800'684.05	Debtors	-6'727.35
Designated project cash funds	134'420.14	Accrued expense and deferred income	34'716.28
<u>Tangible assets</u>		Social insurance payments due	15'973.35
Accrued income and prepaid expenses	52'852.97	Donations received in advance	740'510.42
Anticipated tax refund	156.15	Provisions for third party projects	37'886.07
<u>Fixed assets</u>		Outstanding salaries	192.20
Reserves	191'000.00	Provisions for salaries	3'880.00
<b>TOTAL ASSETS</b>	<b>1'179'113.31</b>	<u>Own liabilities</u>	
		Capital	25'000.00
		Profit and loss deferred	262'155.65
		Net income	65'526.69
		<b>TOTAL LIABILITIES</b>	<b>1'179'113.31</b>

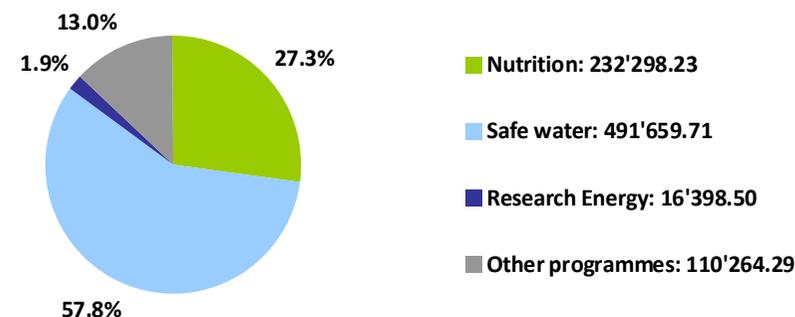
### Profit and loss statement for the year 2010

INCOME	CHF	EXPENSES	CHF
<u>Donations and grants</u>		<u>Programmes</u>	
Private donations	1'062'709.45	Nutrition	232'298.23
Public grants	229'323.00	Safe water	491'659.71
<u>Sales</u>		Research Energy	16'398.50
WATA and other products	183'178.73	Other programmes	110'264.29
<u>Other income</u>		<u>Staff costs</u>	
Bank interest	428.29	Salaries	312'936.30
Advances for WATA	-31'707.07	Social insurance contributions	55'263.85
<b>TOTAL INCOME</b>	<b>1'443'932.40</b>	Civilian service fees	7'218.20
		Training	950.00
		<u>General expenditure</u>	
		Office premises	30'835.15
		Marketing	9'947.87
		Administrative expenses	83'088.60
		Travel costs	27'545.01
		<b>TOTAL EXPENDITURE</b>	<b>1'378'405.71</b>
		<b>NET INCOME FOR THE PERIOD</b>	<b>65'526.69</b>

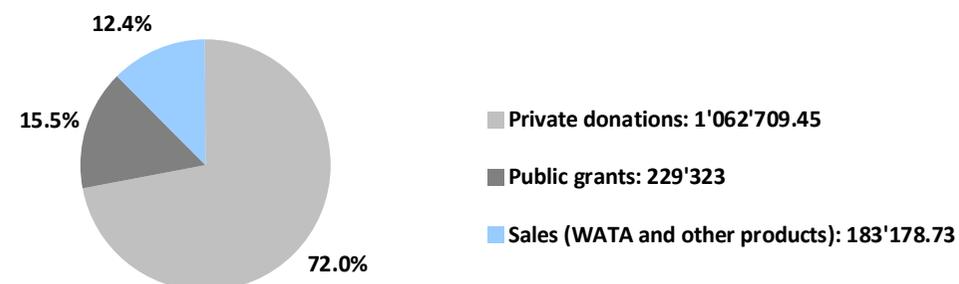
## Expenses in CHF



## Expenses by programme in CHF



## Income in CHF



## Who we are

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### Team

#### **Denis von der Weid**

Founder and director, Antenna Technologies

#### **Carole de Bazignan**

Safe water manager

#### **Julie Bergamin**

WATASOL projects coordinator

#### **Fanny Chavaz de Kalbermatten**

Communication manager

#### **Pierre-Gilles Duvernay**

Technical advisor and projects coordinator

#### **Adriana Ramos Verdes**

Administrative and logistical coordinator

#### **Abel Silva**

Accountant

#### **Bertrand Graz**

Consultant, Doctor

#### **Urs Heierli**

Consultant, Economist

### Foundation Board

#### **Yves Burrus**

Chair

#### **Diane Labruyère-Cuilleret**

Member

#### **Marc Odendall**

Secretary

### Antenna Network

#### **Fondation Antenna Technologies**

Geneva, Switzerland

#### **Association Antenna France**

Paris, France

#### **Fondation Antenna Pays-Bas**

Nijmegen, Netherlands

#### **Antenna Green Trust**

Madurai, India

#### **Antenna Nutritech**

Madurai, India

#### **Antenna Kenya**

Mombassa, Kenya

#### **Kénose-Antenna**

Bangui, Central African Republic

#### **Antenna Technologies Antsirabé**

Antsirabé, Madagascar

#### **UZIMA Technologies Développement**

Goma, DRC

### Partners

#### **Swiss Agency for Development and Cooperation and the Aguasan network** (Switzerland)

#### **UNICEF**

**Agri-Cam** (Cambodia)

**Aidemet** (Mali)

**Association Tinkisso** (Guinea Conakry)

**Caritas** (Switzerland)

#### **Centre for Mass Education in Science**

(Bangladesh)

#### **Centre Régional pour l'Eau Potable et**

**l'Assainissement** (Burkina Faso)

**Connect International** (Netherlands)

**Development Alternatives** (India)

**Direction Nationale de l'Hydraulique** (Mali)

**ECCA** (Nepal)

**Ecole d'ingénieurs de Bienne** (Switzerland)

**Enfants du Soleil** (Madagascar)

**Entrepreneurs du Monde** (France)

**Formations sans Frontières** (Mali)

**Graine de Développement** (France)

**GRET** (Mauritania)

**Groupe PESSAF** (Cameroon)

**Idées Elles - Solidarité internationale Suisse-Mali**

**Institut National de Recherche en Santé publique** (Mali)

**International Development Enterprises** (India)

**Malaria Research Training Center** (Mali)

**Mairie de Mopti** (Mali)

**Research Initiative on Traditional Antimalarial**

**Methods** (Buckingham, UK)

**Santé Sans Frontières** (Mali)

**Sikasso Hospital** (Mali)

**Solar Electric Light Company – SELCO** (India)

**Solidarité Internationale Suisse-Mali** (Switzerland)

**Tarbaya Tatali** (Niger)

**University of Bâle** (Switzerland)

**University of Lausanne** (Switzerland)

**University of Geneva** (Switzerland)

**Vertical Shaft Brick Kiln** (Nepal)

### Donors

#### **Individual donors and foundations**

**Swiss Agency for Development and Cooperation**

**Caritas Suisse**

**Foundation Pro Victimis**

**Foundation Robin des Bois**

**Chancellerie d'Etat de Fribourg**

**Phytolis**

**Renalco SA**

**SIG**

**WISE**

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IMPRESSUM

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