**Swiss Agency for Development and Co-operation (SDC)**

# Final Report

## of the external Evaluation of the Program Scaling-up of productive water (micro-irrigation) and safe water (households), Phase 1

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**Bern and Lindau, November 2012**

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# ABBREVIATIONS

| | |
|---|---|
| BDT | Bangladesh Taka |
| CBA | Conseiller Business Agricole (Burkina Faso) |
| CEPIRS | Centro Productivo para la Innovación Rural Sostenible (Honduras) |
| CHF | Swiss Francs |
| CMES | Centre for Mass Education in Science |
| C$ | Nicaraguan Cordobas (1CHF ~ 27 C$) |
| CWE | Clean Water Specialist |
| DA | Development Alternatives, India |
| DASCOH | Development Association for Self-reliance Communication and Health |
| ECCA | Environment |
| ENPHO | Environment and Public Health Organization, Nepal |
| EVT | Evaluation Team |
| HYSTRA | Hybrid Strategies Consulting |
| HWTS-N | Household Water Treatment and Safe Storage Network (WHO, UNICEF) |
| IDE | International Development Enterprise |
| INR | Indian Rupee |
| IPM | Integrated Pest Management |
| KHR | Cambodia Riel |
| MOU | Memorandum of Understanding |
| NGO | Non-Governmental Organization |
| NPR | Nepal Rupee |
| ODA | Overseas Development Assistance |
| ORS | Oral Rehydration Salt |
| PATH | US NGO, Catalyst for Global Health |
| PIYUSH | Chlorine solution of ENPHO, Nepal |
| ProDoc | Project Document |
| PROMIPAC | Programa de Manejo Integrado de Plagas en América Central |
| RP | Rupee |
| SANDEC | Research Centre Water and Sanitation in Developing Countries (EAWAG) |
| SCO | Swiss Cooperation Office |
| SDC | Swiss Agency for Development and Cooperation |
| SODIS | Solar Desinfection |
| SP | Service Provider |
| TARA | Society for Technology and Action for Rural Advancement |
| TOR | Terms of Reference |
| UNICEF | United Nations Children's Fund |
| USD | US Dollar |
| VBSK | Vertical Shaft Brick Kiln (project of SDC, SKAT) |
| WATA | Electro Chlorinator of Antenna Technologies |
| WATASOL | Chlorine solution of ECCA |
| WHO | World Health Organization |
| WI | SDC Water Initiatives |

Rate of exchange (October 2012)

USD 1 = CHF 0.94
USD 1 = BDT 82
USD 1 = NPR 85
USD 1 = INR 54
USD 1 = 3,977 KHR

# EXECUTIVE SUMMARY

## Background

In 2009, and in various steps, Water Initiatives (WI) of the Swiss Agency for Development and Cooperation (SDC) have launched the program Scaling-up of Productive Water (Micro-Irrigation) and Safe Water (Households). The total budget is CHF 4,880,000 over a three year period. Budgets are distributed as follows: 82% for the productive water, 18% for the safe water component. Pro Victimis and Caritas are co-financing the safe water component with CHF 182,000.

The irrigation component is implemented by International Development Enterprises (IDE), a US-based NGO and the safe water component is implemented by the Swiss Foundation Antenna (Geneva). Backstopper of both components is Urs Heierli, Msd consulting GmbH.

The overall objective of the External Evaluation was to assess the relevance and effectiveness of the program and to provide SDC and its partners with lessons learned and recommendations for the future of the Swiss engagement in this domain – the promotion of small-scale irrigation for small farmers and of safe water solutions for households.

The Evaluation Team (EVT) consisted of Juergen Roth (Agridea – Productive Water) and Pierre Walther (fast4meter – Safe Water). Each consultant visited a number of countries, to collect information about progress in the respective component. Chapters 5-8 were edited jointly.

## Productive Water Component

This component is financially much more important in the program and it is implemented exclusively by IDE. In the four countries visited, IDE has representations established, in most of these countries IDE is registered as an NGO, only in Nicaragua it is registered as a social enterprise, concept which is not well known in Central America, the most suitful form is entreprise with limited responsibility. In the specific context of Nicaragua, IDE was not allowed to sell irrigation systems without this type of registration.

This example constitutes an expression of the diversity in which IDE developed the program in the four visited countries. No program is equal to the others, which demonstrates the fact that IDE analysed the specific situations, before design its structure and detailed approach.

The common aspect in all the countries are; facilitate effective irrigation systems for smallholder producers who do vegetable production.

In Nicaragua, Honduras and Burkina Faso, IDE's country programs sell IDE's low pressure drop irrigation irrigation systems. In Burkina Faso until now, only systems imported from India are sold, in Nicaragua the systems – with nearly all their components – are produced locally. The Honduras' program is linked to the *global supply program* from IDE headquarter, which establishes the links between the demanding countries and the producers, mainly in Asia. In Honduras and Nicaragua, the nicaraguan systems are very appreciated by producers because of the thickness of the material.

In Ghana, the program does not specifically promote IDE micro irrigation systems. IDE's local collaborators work as advisors to farmers' groups in the most poor northern area of Ghana and function as brokers between farmers and loan institutions, in the beginning micro-finance institutions and now mainly the rural bank sector. The Ghana program seems to be more an agricultural development program. Nevertheless, local producers fabricate treadle pumps and when farmer groups demand for these pumps, the connection is established.

In a general manner the impression is that both (a) market approach and (b) micro-irrigation are efficient for improving livelihoods of small scale vegetable farmers, who constitute the main target group of the program. The program has mainly two advantages in comparison to

"conventional" firms which offer micro-irrigation systems; (1st) the offer of different sizes of micro-irrigation systems – other firms often only sell systems for bigger areas in general at least bigger than 500 $m^2$ , and (2nd) IDE's mission is not only selling, but also accompagnying and advising farmers and groups through technical staff in the field, in both installation and maintaining of irrigation technology as well as agricultural aspects.

**Safe Water Component**

With relatively little funds, and together with a large variety of partner organizations (NGOs, Social Enterprises), a lot of experiences have been gained about business models for the scaling up of solutions for Household Water Treatment and Safe Storage (HWTS). The time is ripe to make a balance.

Social enterprises are good partners for scaling-up. They consider the SDC contribution as an opportunity to establish their business, and not as a "classical project". The spill-overs of IDE, Hydrologic (Cambodia) and Springhealth (India) and the Social Enterprise of Development Alternatives (DA) are promising examples.

A number of problems (deficiencies in business models, technical, problems with partners) could have been avoided with more careful planning. In Bangladesh, opportunites to take advantage of a dynamic market were missed. ECCA (Nepal) has to change the strategy, as Antenna Technologies did not realize the need to stabilize the chlorine solution.

There are big differences between: selling of Ceramic Water filters (Cambodia), selling of chlorine solution (India-Delhi, Nepal), and selling of chlorinated water (Bangladesh, India-Orissa, Nepal). In all countries, and for all products, the partners of the SDC project face competition, sometimes also of organizations which would be good partners of the program (e.g. ENPHO in Nepal).

The initiative 300in6 keeps the vision alive. It is small but recognized by partners like the WHO/UNICEF HWTS-Network. 300in6 was a pioneer in bringing the issue of Carbon Financing for Household Water Treatment and Safe Storage (HWTS) on the agenda. Carbon Financing can be a big source for financing of social marketing activities. Once reached scale, social enterprises such as Springhealth or Hydrologic become eligible for venture capital.

The school programs implemented by ECCA (Nepal), SANDEC (Bolivia, Kenya) and Helvetas (Haiti) are impressive. The EVT recommends to integrate them into the global Blue School program which is presently under discussion in SDC WI.

**Program Management**

Program steering has to be strengthened substantially, also to avoid that the program becomes too much opportunity driven. The Steering Committee has to ensure that the program strengthens its profile and reduces its complexity.

**Challenges for Phase 2**

Concerning the productive water component the period has been very short, taking in account that the gretest advantage of drip irrigation in vegetable production consists in the dry season. If farmers are able to produce during this period, they will become very aware of the difference and the potential to generate additional revenues. To optimise the benefit from the advantages in the dry season, micro-irrigation has to be strongly linked to agricultural and entrepreneurial advise in order to chose adecuate agricultural techniques, the most promising crops and periods. Linkage to micro-finance sector or rural banks is also required.

It is expected that in the next dry season – first half of 2013 – a considerable increase of sold

systems will be produced.

The complexity in the safe water component has to be reduced. SDC co-financing should focus on marketing, social marketing, branding, direct sales, monitoring and evaluation. Comunication is also an important part. A budget of approximately CHF 650,000 per year appears necessary to create the momentum.

Building on the successes of phase 1, it is advisable to collaborate mainly with social enterprises (e.g. Tara, Hydrologic, Springhealth). 300in6 should develop into a platform which can give visibility to success stories and develop effective links to the global business community (e.g. World Economic Forum Davos, Global Compaq).

**Summarised Recommendations**

At the general level

1. The options for phase 2 should be discussed in a program design workshop. Results should be summarised in a planning platform paper.
2. Criteria for financing of partners have to be defined more clearly. Indicators for monitoring have to be developed.
3. Complexity has to be reduced, and the program should become more focused.
4. Exchange with thematic networks and regional cooperation of SDC needs to be intensified.

At the component level

**Productive Water**

- The IDE teams in the countries are very aware that the next dry season is very important for the further evolution. Drop irrigation makes most difference when water is scarce, so a big step can be done in first half of 2013.
- Numbers should be analysed consequently after the next dry season.

**Safe Water**

- The component has to become more focused.
- Nepal and in Bangladesh need to be re-designed, in Nepal, ENPHO should be welcomed as a partner. In Bangladesh, the activities with CMES can be stopped.
- 300in6 should also reflect on the results of this evaluation and sharpen its vision.

# 1. INTRODUCTION

## 1.1 Background

In 2009, and in various steps, Water Initiatives (WI) of the Swiss Agency of Development and Cooperation (SDC) have launched the program Scaling-up of Productive Water (Micro Irrigation) and Safe Water (Households). The total budget of the program is CHF 4,880,000 over a three year period. Caritas and Pro Victimis are co-financing the Safe Water component with CHF 182,000.

The irrigation component is implemented by the NGO International Development Enterprises (IDE), and the safe water component is implemented by the Swiss Foundation Antenna (Geneva). Backstopper of both components is Urs Heierli, Msd consulting GmbH.

The program wants to prepare the ground for scaling-up micro-irrigation technologies for small farmers and smart solutions for household water treatment through viable and profitable supply chains. While affordable micro-irrigation technologies are mostly promoted to imrove the income of small farmers, safe water at the household levels prevents families from water-borne diseases.

It is in both cases quite challenging to operate with a business approach, because markets have first to be created.

## 1.2 Mandate

The mandate is summarized in the Terms of Reference (TOR) in Annex 1. The Evaluation Team (EVT) consisted of Juergen Roth (agronomist, micro irrigation specialist) and Pierre Walther (geographer, water expert).

The overall objective of the External Review is to assess the relevance and effectiveness of the program and to provide SDC and its partners with lessons learned and recommendations for the future of the Swiss engagement in this domain – the promotion of small-scale irrigation for small farmers and of safe water solutions for households.

Specific objectives are:

1. To analyze the effectiveness and efficiency of the program: to determine whether market-based approaches can be and are an effective and efficient way to achieve a broadder dissemination in a sustainable way.
2. To assess the relevance and leverage of the program: to determine whether the interventions are relevant for achieving the objective of scaling-up and whether they achieve some leverage by being embedded in local, regional and national institutions and especially creating synergies with other SDC supported programs.
3. To recommend a possible future orientation: both components have a pioneering character and have therefore a strong learning aspect. The review should thus capitalize the lessons learnt and draw recommendations about what has worked, what has not worked, and what should be the focus of the future orientation.

While the analysis would be different in each component, the EVT should present a joint report with joint findings and recommendations.

### 1.3 Methodology and program of the mission

The program of the mission is presented in Annex 2. Each consultant concentrated on one of the components and visited a number of countries. After the field visits, the consultants edited the present report.

The mission consisted of the review of documents, interviews with partners of the projects, and field visits. Wherever possible, the Swiss Cooperation Offices (SCO) were visited for a discussion. Lists of interviewed persons and reviewed documents are presented in Annex 3 and Annex 4.

In the micro-irrigation component, the following countries were visited: Nicaragua, Honduras, Burkina Fasso and Ghana. In the safe water component, the consultant visted Bangladesh, Cambodia, India, and Nepal. He facilitated a workshop for the capitalization of experiences in Bubaneshwar (India), with representants from all partners of the component.

### 1.4 Acknowledgement

The EVT would like to thank the IDE teams in the visited countries, Antenna, Msd Consultants GmbH, the eight implementation partners, and the Swiss Cooperation Offices (SCO) for the exceptionally warm welcome and good preparation of the mission.

The following presents the views of the EVT which need further discussion and endorsement by SDC and the partners (Antenna Technologies, IDE).

## 2. BRIEF DESCRIPTION OF THE PROGRAM

### 2.1 General

After a number of pilot activities, coordinated by MSD Consulting GmbH, phase 1 of the program was formulated within a relatively short timeframe (few weeks) at the end of 2009. The program consisted of two components: productive water and safe-water. The period of this first phase was from November 2009 till the end of December 2013, with a total budget of CHF 1,850,000.

In late 2010, a supplementary credit proposal was signed. The budget covered the period 2010, 2011 and 2012, with a total amount of CHF 3,030,000. Minor amendments to the original Log Frame were made. Considering that the Swiss Parliament had approved these supplementary credits to the water sector under the condition that scale could be achieved. Therefore, an annex with quantitative targets was added for micro-irrigation.

Today, the program includes both elements - credit proposal, amendment. The total budget is CHF 4,880,000. It consists of two components: Scaling-up of productive water (micro-irrigation; 82 percent of the total program budget), and Scaling-up of safe water (households; 17 percent of the total program budget).

Contracts are signed with two executing agencies, both Non-Government agencies (NGOs): (a) IDE (for the productive water component); (b) Antenna Technologies (for the safe-water component).

Antenna signed two additional contracts for the safe water component: with Caritas Switzerland (CHF 82,000), and with Pro Victimis (CHF 100,000).

MSD Consulting GmbH played a key role in the design of the program, including the selection of implementation partners, and of intervention countries. It had to deliver the program document upon short notice of SDC. It continues to play a role as facilitator of program development, not as an implementor but as an advisor to the implementing agencies.

## 2.2 Scaling-up of productive water (micro irrigation)

The total budget of the productive water component was incremented from initially 1,2 million to 4'000.000 CHF (four million Swiss Francs).

The expected results are:

- To create in a first nucleus of 5 countries (Nicaragua, Honduras, Ghana, Burkina Faso, Kirgizstan) a market for a range of productive water technologies (low-cost drip irrigation, treadle and rope pumps, low pressure sprinklers, low-cost well drilling) and reach 300'000 poor farmers;
- To promote and influence the emerging global alliance "micro-irrigation" (Gates Foundation, DGIS et al) through showing that the "chosen approach" works and can fit as suitable approach in the planned global dissemination programme;
- To identify until end of 2012 (feasibility) up to 20 other countries, to be included in the global dissemination programme.

A total of 37245 systems were planned to be sold until 2012.

In the visited countries, the program is very diverse, in spite of being implemented by IDE in all the cases. In spite of this diversity, the common basis of the program is clear; strengthen small scale farmers (vegetable producers) through access to improved irrigation facilities, specially for dry season cultivation mainly of vegetables.

In Kirgizstan IDE intervenes through Helvetas Swiss Intercooperation and its programs, the other countries currently focussed by the program but not visited in the frame of this evaluation are Vietnam, Mali, Niger, El Salvador and Guatemala.

## 2.3 Scaling-up of safe water (household)

The total SDC budget of this component is CHF 830,000.- over the whole program phase (three years). It has the following components: (a) testing of business models in Asia (various partners; CHF 210,000); (b) development of new prototypes (Antenna; CHF 70,000.-); (c) participation in the global initiative 300in6 (CHF 250,000); (d) dissemination through school and emergency programs (SANDEC; CHF 300,000.-).

Expected results are stated as follows:

1. Partners in Asia can show business models to distribute safe water profitable to the poor (BOP).
2. Simplified chlorinators are tested in the field.
3. Scaling-up Initiative (300in6) has met with interest and is operational.
4. Additional support for 300in6 has influenced key players to scale-up
5. Improved emergency WATASOL package available
6. School package tested and ready for roll-out.

Testing of business models in Asia is done with partners which are quite different in their nature (NGOs, firms), but have potential for an outreach in their countries. They receive small amounts of seed money, to cover expenses for activities, regular reporting and partici-

pation in knowledge exchange workshops:

1. First round partners, working mainly with the WATA chlorinator produced by Antenna: ECCA (Nepal), CMES (Bangladesh), and DA (India, Delhi)
2. Second round partners, added after approval of the supplementary credit: Hydrologic Social Enterprise (Cambodia); Springhealth Social Enterprise (India, Orissa).

Caritas Switzerland is financing the CMES component (Bangladesh) with CHF 82,000.- – CHF 49,000.- for CMES (Bangladesh), and CHF 33,000.- for Antenna Technologies (budget 2010-2011).

Antenna Technologies also presented a proposal to Pro Victimis in late 2009. The total budget of the safe water component was presented (excluding the funding received from the additional credit proposal). Pro Victimis which had already supported WATA pioneer projects in Congo, decided to co-fund the Asia program with USD 100,000.-

**Important:** Apart from the contribution of Caritas, Antenna Technologies did not ask for overhead or direct reembursement of management services (e.g. regular visits to program partners; annual planning and reporting; coordination with SDC and other partners; financial costs). Given the many partners involved, this can be extremely demanding and appears to be quite unusual to the EVT.

# 3. PRODUCTIVE WATER: RESULTS AND ACHIEVEMENTS

## 3.1 General

The productive water component represents the bigger part of the budget in the global program. Several country staff members of IDE are financed through the project, but in each country IDE develops activities with other donors, too. Country representations are well organised and comprise a mix of technical, logistical and administrative staff.

As a technological productive factor, irrigation needs to be associated to agro-technical and farm business issues. Micro-irrigation isolated will not be enough sufficient in order to improve productivity and rentability of small farming systems. In a general manner both central american country programs developed strong links to agronomic partners, while both west african did not yet identify such strong partnerships. By contrast, in Ghana and Burkina Faso business aspects seem to be more developed – in Ghana this is reflected above all in the links to microfinance and the rural bank and in Burkina Faso in the focus of the elaboration of business plans. More systematic exchanges of experiences, at least among the countries in the same regions, but also among the regions should help to equilibrate this situation.

## 3.2 Targets and achievements

Regarding the quantitative targets of the productive water component the numbers fixed were very high and with regard to the current situation unrealistic. Market creation, establishment and registration of IDE in the countries tok longer than foreseen. Thus only 26% of these quantitative targets have been reached.

It would have been probably very different, if the mission had taken place after spring 2013, anyhow, the targets were fixed for march 2013, thus the numbers below are preliminary.

However, it seems not to be probable that these numbers will be reached.

Quantitative targets and level of achievement regarding sales of irrigation systems:

| Productive Water component | Targets 2012 (until March 13) | Total sales (until August 12) | Quantitative achievement % |
|---|---|---|---|
| Nicaragua | | 1507 | |
| Honduras | | 5410 | |
| El Salvador | | 4 | |
| Guatemala | | 1427 | |
| **Total Central America** | **23735** | **8348** | **35%** |
| Ghana | | 691 | |
| Burkina Faso | | 128 | |
| Mali / Niger | | | |
| **Total West Africa** | **12000** | **519** | **4%** |
| Kirgizstan | | 86 | |
| Vietnam | | 656 | |
| **Total Asia** | **1510** | **742** | **49%** |
| **Total all sales** | **37245** | **9609** | **26%** |

Different reasons can be mentioned;

- As the program pursues a double scaling up,: the market approach and irrigation technology, in some cases IDE had to renounce to some sale opportunities, because the methods of the potential client were too far away from IDE's and program principles.
- IDE in Burkina Faso is only functioning since one year and additionally preliminary work, above all in Mali, has been in vain, due to the current conflict situation in Northern Mali.
- In Central America, especially in Honduras, sales will increase in the next months, because of the important contract with the national agrarian institute.
- Additionallly, in Ghana the country program changed its focus a little bit. Judging the situation still too premature to disseminate micro-irrigation systems in the intervention zone, the poor northern region, IDE works more than a facilitator between rural banks and farmers' groups in order to achieve an improvement of their vegetable production systems, with a focus on water productivity, but nor necessarily through micro-irrigation or even treadle pumps.

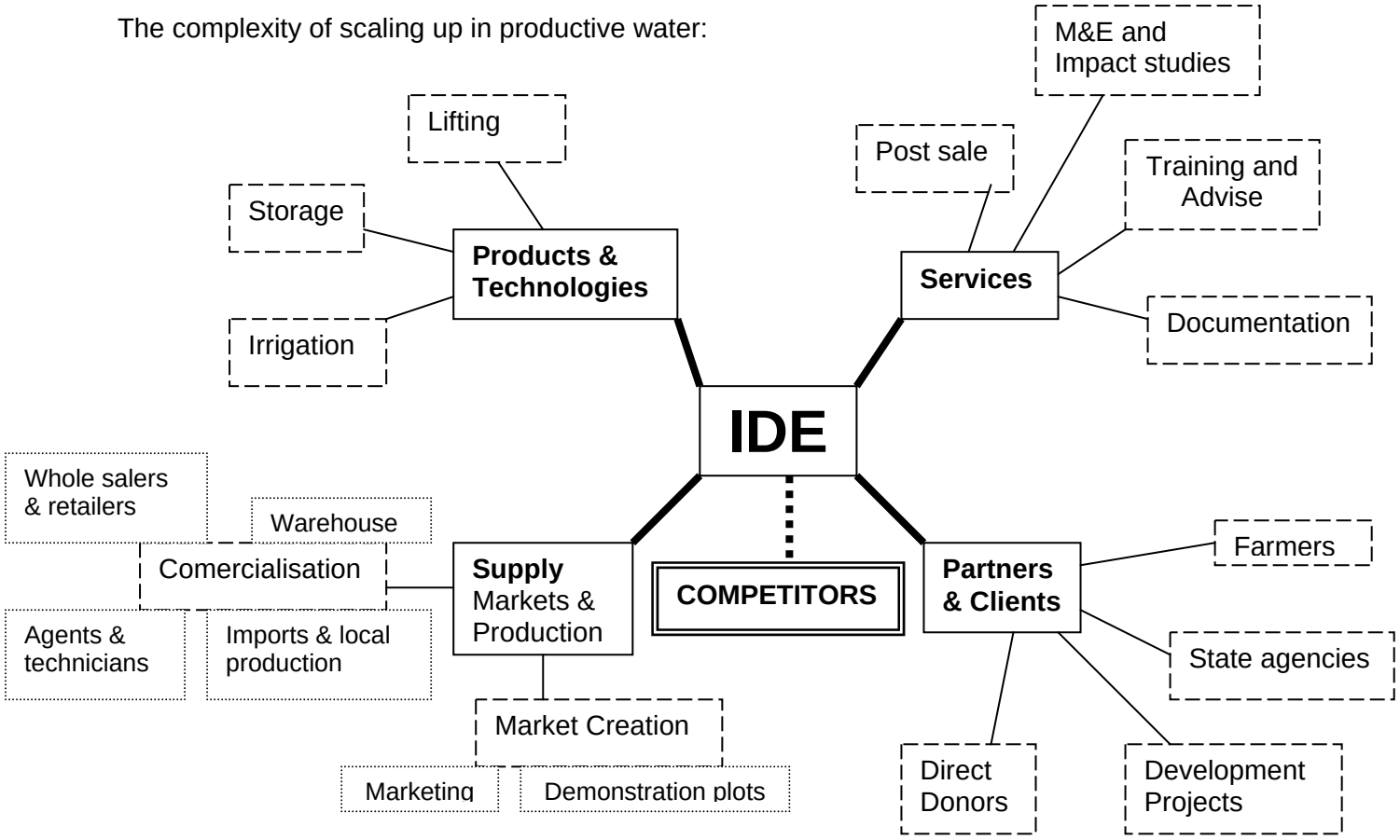
In order to increment outreach of the program in the near future, new methods and set ups for further scaling up have to be identified. Through the establishment of the IDE's global supply program, up scale will be possible without having the enterprise established physically in the countries.

A concept to disseminate both – technology and approach – should be developed in order to attract a broader group of new organisations interested in the theme.

### 3.3 Assessment of business models

The following scheme aims to give an overview of the complexity of the situation. Decesive elements will be further developed.

The complexity of scaling up in productive water:




#### 3.3.1 Products and Technologies

The catalogue of the products and Technologies is relatively clear.

IDE **micro-irrigation** is drip irrigation at low pressure. The systems cover different areas from 20 $m^2$ to over 1 ha. Although if it is drip irrigation, water is indispensable. Ideally water is available the whole year, especially during the dry season, where it will produce the strongest impact on additional revenue generation. For this reason it is of a very high importance to select the farmers taking in account possibility to supply water during the whole year.

As far as possible to judge at this stage, systems seem to work well, are easy to handle and to maintain.

Systems or components of systems, produced in Nicaragua are very well appreciated by central american farmers.

**Storage** systems are identified according to the context. Water bags for smaller systems ($\leq$ 100 $m^2$) are often imported from India, but bigger containers for bigger systems are searched in the local markets. In some cases, logistics to assure transport of these containers to the fields are representing a quite big challenge and their part in the total costs are elevated.

The different technologies for **lifting** depend a lot on the local context. Nowadays, pumps – electric or engine – are not so costly and often, farmers have some availability, or are already

disposing of pumps. Treadle pumps have not yet taken the expected outreach. In Ghana a local producer is installed but often clients do not demand treadle pumps in their investment or business plans to be submitted for loans. Other alternative technologies (solar pumps) are not yet very widespread.

> In Burkina Faso the government made an investment to create mobille pumping systems. Motor-tricycles are equipped with a motorpump for to ensure complementary irrigation. This model could be of interest in the broader business logic in order to set up such services for fulfilling storage systems during the dry season, where the concentration of farmers working with a similar system and similar constraints justifies such a model.

Concerning recycling of used plastic irrigation materiales, particularly tubes, a deeper reflection should be the subject within IDE. The nicaraguan factory has the infrastructure to recycle plastic materials, probably this will not be possible for the same type of materials, but maybe an effort can be made to recollect those materials which are not more usable to transform them in products which need lower plastic quality.

### 3.3.2 Services

IDE's added value consists in additional services which are not covered by conventional firms. Not only the installation and maintainance of the IDE technologies, but also after sale services, agricultural advise and training as well as connecting farmers to other actors, such as micro-finance institutions are very well appreciated by farmers.

Additionally IDE does monitor the clients and the performance concerning impacts on farmers' production and income. Thus far these data are positive, they should be systematisised in order to convince potential clients – farmers and decision makers at different levels.

> In Nicaragua it was shown that since the beginning of the internal monitoring 37ha have been equipped with micro-irrigation at a cost of 53.000 USD.
>
> Following the information of farmers this surface is able to generate revenues from 25.000 USD up to 75.000 USD (20-60000 C$ in ¼ of Manzana) in **only one cycle** depending on the moment of production and the crop. Considering 2 to 3 years of life of the systems and an average of at least three cycles per year, the return on investment during this period is very high [Total revenu generated (3 years x 3 cycles x 25.000 USD) = 225.000 USD – Investment = 53.000 USD => 172.000 USD/37 ha
>
> => 0,45 USD/$m^2$ generated income].

In order benefit from this potential, it is very important to ensure strong links to agronomic partners, not only technical, but also in terms of farm management and business.

In a general manner, IDE has to reflect, if the enterprise itself should provide the whole package of services or if potential partners exist locally who can fulfill these functions, following the principle of subsidiarity.

### 3.3.3 Supply

One of the most complexe issues is supply. As far as IDE did not exist in the countries before starting the program, or only with very reduced human and financial resources, the whole supply aspects had to been built up.

Different set ups have chosen in order to ensure the complete supply chain, these models are more or less labour intensive. While IDE in Central America works with relatively reduced teams and technicians in the field, in West Africa, the teams are relatively great in numbers.

On one hand this might be the result of salary levels in the regions, but on the other hand it also reflects the linkage to other partners, respectively more weak partnerships in these aspects. The Central American programs have well established relations to agronomic partners (INTA, INA, Zamorano school, PROMIPAC) which provide agronomic advise to the clients. These aspects are mainly provided by IDE staff in West Africa. Additionally, at least in Nicaragua, depending on local potential, IDE uses also cooperatives or farmer-comercials as important retail figures in the model. They accomplish a double or triple function, retail of IDE systems, inputs (seeds, fertilisers and other agro-chemicals) and advisory services.

On the other hand, the supply chain seems to be really decentralised in the case of Burkina Faso for example. In all the four regions visited, comercial retailers offer IDE systems and other inputs. They are connected to IDE Agricultural Business Advisors (CBA), which ensure technical and entrepreneurial guidance for farmers.

In this example and even more in Ghana, farmers consider IDE staff not as *the* micro-irrigation expert, but as a more general advisor.

Regarding marketing and and demonstration plots, decisive elements in market and demand creation, some aspects have to be outlined. Marketing should focus on the *whole* potential of micro-irrigation; labour efficiency, generation of additional income in dry season, complement irrigation in rainy season, and environmental issues such as water saving in it self. Marketing methods and tools should focus on potential clients at different levels, namely a strategy to address environmental aspects and therefore the link to climate change is not yet well developed. Partnerships with organisations working in this thematic area should be more developed.

Demonstration plots and technology centers are very attractive to interest diverse categories of potential clients, farmers and their organisations, technicians, retailers, national institutions, other projects or even donors. Thus, the location of these demonstration plots are a first element for their success in terms of accessibility and potential target groups. Probably a certain diversity of demonstration plots and technology centers is needed in all countries. During the field visits a huge variety of demonstration plots and technology centers have been visited in the countries.

> In Honduras the EVT assisted to the inauguration of the technology center (CEPIR) in Zamorano regional agricultural university. A great variety of disponible irrigation systems, storage facilities and pumping technology is exposed in this academic institution, plots are cultivated with different crops and installed systems are well described. It is surely an ideal location to address technicians and probably donors as the school is supported by various. With previous announcement, also farmers can visit the installation. The educational aspect for the students, making knowing them the systems represent another positive element.

Another very important aspect is the specific target group of the program; small scale farmers. This group is often not reached by other (micro and drip) irrigation suppliers. Often even micro-finance institutions do not consider this specific group, in Nicaragua, it was reported that credit is only available for micro-irrigation systems bigger than 500 $m^2$. In the meantime IDE is the only firm to offer small systems and thus to address the needs of this specific group. The entrance of competitors such as IDE can also affect price levels in the irrigation market. From Burkina Faso it is reported that average prices for irrigation systems dropped considerably after the establishment of IDE, this is undoubtebly a very huge impact which benefits farmers, although if IDE may not be able to attract all of them.

Another important element is the origin of the systems, if they have to be imported (mainly from Asia) or if local industries are able to fabricate similar products. In Nicaragua a big step is done with Grupo RC SA. IDEal has an agreement to be the exclusive client for the moment. Nearly all components of the systems are now produced locally, only the microtubes cannot yet fabricated in Managua. Grupo RC SA (factory which employs about

20 persons and occasionally mini-industries in houses) is not part of IDE, in this sense the program contributed to diversification, creation of local employment and income opportunities. Furthermore the quality of the items is well apprciated by the farmers and they are also proud to use nicaraguan made technology.

In all the countries, IDE uses local sources to complement the offer, especially concerning bigger water storage tanks.

This type of program has the potential to diversify offer or even make the offer available for small farmers, to create local employment and strenghthen local industries. The risk to create monopoly situations because of public co-funding is so far not given, but the finality of financial support must be well defined.

In the mid term after having proved the viability, the market creation efforts made by the program, will attract other players and reinforce competition.

### 3.3.4 Partners and Clients

Obviously the ideal situation would be that small holder farmers by themselves know where to find and can access micro-irrigation systems and spare parts at affordable prices. This situation is so far not yet given. Vectors and vehicules are needed to make the technology known (market creation) and the supply chain, identifying the adecuate actors in it, has to be built up. Often the linkage to credit opportunities constitutes a *condition sine qua non*.

In terms of program design, more details are needed, focussing mainly on sold systems currently, seems to be too restricted. Other indicators such as number of clients and area (newly put) under irrigation and contingently crop diversity should be included.

The program has to be more explicit in these aspects, what do we aim for?

40.000 systems sold to an International Development Agency to be distributed
40.000 systems of 20 $m^2$
40.000 systems for flower production (in greenhouses)

A mix of these figures will be the most realistic and feasible outreach.

IDE offers different sizes of systems, which fit to a big diversity of potential clients within the final target group, systems are complementary to existing conventional suppliers and inevitably clients which are not necessarily from the initially targeted group will become attracted by these systems. For example richer farmers who want to test the technology. In no case this shall be inhibited and – even more – these “final real” clients can play a decisive role in convincing other farmers.

A good vector to transmit and to disseminate the technology maybe national state agencies or pluralistic advisory service providers can who play an effective role. Nevertheless, the use for “political” issues may exist and has therefore consciously to be taken in account.

Accordingly to the rules, IDE did not accept all the opportunities to sell big numbers if the “intermediate clients” were applying an altruistic model of gifts. It constitutes a big challenge in this type of program and it is very difficult to maintain the equilibrium between reaching big numbers and make respecting the market approach.

### 3.3.5 Competitors

As mentioned in previous paragraphs, often IDE does not really compete, as it adresses a target group which is not really interesting other conventional enterprises. However, IDE may be percieved as a competitor and has to convince through the quality and relevance of its technology. Markets seem to be sufficiently big to offer place for different firms.

# 4. SAFE WATER: RESULTS AND ACHIEVEMENTS

## 4.1 General

With relatively small funding, and together with large variety of partner organizations (NGOs, Social Enterprises), a lot of experiences were gained in the first phase. In the eyes of the EVT, there is now a good moment to reflect on these experiences and to make a balance about what works and what doen't.

The set-up is more complex than in the productive water component. The implementation partner, Antenna Technologies (Geneva), is not represented with agents or offices in the countries. Therefore, the program collaborates with partners (Social Enterprises, NGOs), under collaboration agreement.

The following activities appear to have high potential for scaling-up: Hydrologic (Cambodia), Springhealth (India). Both partner organizations are spin-offs of International Development Enterprises (IDE). SDC supported social and direct marketing (Hydrologics) and a strategic evaluation of Springhealth's dissemination strategy, and this was a welcomed contribution. Financial support is likely to be needed for a short time only. Other, sustainable financing sources, are on the horizon: e.g. carbon financing, venture capital.

The program of TARA/DA also has a good potential to scale-up solutions for Household Water Treatment and Safe Storage (HWTS) in India. To become commercial, AquaPlus needs to be certified, and this issue is not resolved. Collaboration with ENPHO (Nepal) which succeeded to certify its chlorine solution (PIYUSH) is recommendable.

ENPHO (Nepal) is not yet a partner of the SDC program. But it is interested to explore possibilities to better reach poor customers with its already well branded and well sold product PIYUSH[1]. Such a collaboration would be a good starting point for a project which reaches scale in Nepal.

SDC co-financing of these activities is justified. The market for clean water still has to be developed[2], and studies show that there are no profitable businesses yet[3]. Yet, HWTS is a very important issue, also on the post-MDG agenda (water quality, health impact). This program is important to tackle the challenges in the sector.

The component has a global character as it attempts to link field experiences with regional learning platforms and with a lobbying for safe water at the global level. This could be further strengthened if the program would be more focused (e.g. social enterprises).

300in6 is a facilitator, to ensure that HWTS is kept on the agenda, often with innovative approaches. Its strengths are in conceptual contributions. There is limited capacity to make practical follow-up.

## 4.2 Impressions from the field visits

The EVT visited a large range of program activities in the field (see **Annex 5**). Here some of impressions from the field:

1. Partners need a business mission to be solid and sustainable partners for scaling-up. Good examples are: Hydrologic (Cambodia), Springhealth (India), TARA (India). Partners without this business mission are too dependent on the SDC funding.

[1] Break-even point reached; around 600,000 vials per year.
[2] HYSTRA study
[3] HYSTRA study

2. Selling of water filters, of chlorine solution, or of chlorinated water are quite different businesses. There are different issues involved, many of them quite technical and complex.
3. Chlorine which is sold in bottles (e.g. WATASOL, AquaPlus) needs to be produced in (centralized) laboratories with quality control. Stabilization and certification of the product is needed. Positive examples: PIYUSH, AquaPlus.
4. Phase 1 has shown that there are alternatives to working with WATA in such centralized production laboratories. ENPHO (Nepal) tested the WATA but decided for another procedure.
5. In Social Enterprises, where Products are produced and sold (e. g. ceramic filters, jerricans with chlorinate water), SDC can concentrate its support to financing of the following: background studies, knowledge exchange, social marketing, direct marketing in rural areas.
6. The WATA of Antenna Technologies can make a difference after all in areas where stabilization is not needed. Examples are selling of jerricans safe water (Springhealth), school programs, regular chlorination of tanks, or chlorine production in remote areas[4] (e.g. reservoirs in Nepal). The business model of Springhealth could be replicated in other countries. Other business models are not yet fully tested.
7. The school programs (ECCA-Nepal, Bolivia, Kenya, Bangladesh, Haiti) have the potential to become the backbone of a SDC global Blue School Program which is presently planned.
8. Programs in which sales persons receive a fixed salary without sales-based provisions, are likely to fail. Examples are: CMES (Bangladesh), NGOs in slums in Delhi.

The WATA of Antenna Technologies finds a market in the examples mentioned under points 6 and 7. It is also possible that the partners - in particular: the schools - will prefer to work with alternative devices – e.g. the Cascade (200 ml) of Cascades Design Inc. Antennna Technologies stays in contact with Cascade but has not yet found a modality for a fruitful collaboration.

Still largely un-explored are business models such as the chlorination of reservoirs and tanks, where un-stabilized chlorine can be used (e.g. construction sites, urban slums, mineral water companies, reservoirs in remote areas). There are good partners available - Springhealth, Helvetas, ECCA, MinErgy. These activities are largely in a start-up phase but would be of interest for Antenna Technologies.

### 4.3 Antenna Technologies – the implementation partner

Antenna Technologies is the main partner of SDC in this program. It collaborates with partner organizations in the target countries. In this respect, the project set-up of this component is more complex than in the productive water component.

In various discussions, Antenna Technologies has adopted a philosophy that different technologies, products etc. to clean water may co-exist – e.g. WATA, Cacade (electro-chlorinators), PIYUSH (chlorine solution). The EVT has the impression that this philosophy is good, but not yet always followed by heart.

[4] stabilization is here an issue. Collaboration with Health posts which have a laboratory, is advisable.

While e.g. the economic advisor (MSD consulting) would be in favor that Antenna Technologies and Cascade Design Inc. discuss options for joint ventures, Antenna Technologies is more reluctant to this[5].

This set-up creates an ambiguity in the program. Antenna's expectation that WATA sales will increase, is well justified as it does not receive payments for its services for program management from SDC. This is not acceptable. Managing this component is very demanding (many partners, many countries).

Whether the program will help to promote Antenna's WATA, is questionnable. Phase 1 has shown that there are alternatives. The problem of stabilization was under-estimated[6]. This was discovered recently and leaves some partners in the Asia component troubled (e.g. ECCA). A lot of efforts went into developing business models in which bottles with un-stabilized chlorine are sold (e.g. WATASOL). This is not realistic. Consumer goods (flasks) should only be produced in professional production units. Know-how and quality control are important.

### 4.4 Targets and achievements

Unlike in the productive water component where targets are spelled out for each country, the credit proposals do mention only one single target for the safe water component– 3 million households with access to safe water. This was a far too ambitious target.

Documents of partner organizations and the ones submitted to Caritas and to Pro Victimis, mention other, more specific targets. The EVT presents an analysis in **Annex 6**. The basis is a monitoring sheet which was received from Antenna Technologies.

A variety of indicators is presented. Achievements range from 30-100%. A system of accountability is difficult to establish as partner organizations receive only little financial contributions and have, therefore, to be motivated for this additional work..

The EVT sees a need to identify indicators which can be used by all partners. In such a scaling-up program, these should also be relevant for business controlling (e.g. sales figures, number of customers, drop-out rates, satisfaction of customers).

### 4.5 Testing of business models in Asia

A large variety of business models have been field tested in Asia, in quite different contexts, and with different products. There is a lot of documentation available.

This is, in itself, already a good achievement. Results have to be looked at in a broader context[7]. It has also to be taken into account, that many of the partners only received small amounts of seed monney. The EVT notes a lot of dedication of the partners.

The program developed bottom-up, with little intervention or checking in the planning or inception phase. Some problems (e.g. stabilization, limitations of some of the partners) might have been identified earlier if there would have been more time for planning.

Some general findings:

1. Successful models are identified (see Sections 4.1 and 4.2). The annual workshops in which partners exchanged experiences, had a positive effect to consolidate these experiences..

[5] A scenario in which Antenna Technologies helps Cascade Design Inc. to develop markets for the poor, and Cascade afterwards sells large bulks of eletrochlorinators to NGOs or UN organizations, is realistic and not in the interest of Antenna Technologies to promote its WATA.
[6] see Annex 7
[7] e.g. HYSTRA study

2. The attitude and mission of the partner is a decisive factor. NGO's (e.g. CMES, ECCA) often consider the program as a project, in which salaries are paid, and in which targets have to be reached. Social Enterprises (Hydrologic, Springhealth, TARA) see it as an opportunity to strengthen their business. The latter is a suitable basis for scaling-up.
3. Selling of a visible, "fancy" product like ceramic water filters or jerricans (with chlorinated water) is possible, though not easy. The demand is there. Whether people really need the products for their health and well-being, is not always documented[8]. But they want them.
4. In all countries, the partners face tough competition from other products[9]. Many of the competitors are subsidized by Government or by donors. It is not easy (but possible) to establish sustainable businesses in this context.
5. The least competition appears to face the selling of jerricans with chlorinated water, like in Springhealth Enterprises. Bottled water or jerricans with UV-treated water are considerably more expensive[10]. Springhealth reaches the poor.
6. Business models which fit the strength of Antenna's WATA - decentralized production of un-stabilized chlorine, which has to be used rapidly – are not yet sufficiently validated at the end of Phase 1[11]. There is room to consolidate these experiences during 2013.
7. The SDC program should have a clearer strategy what to finance and what not to finance. This policy is not yet defined. In some cases (e.g. Bangladesh), SDC financed e.g. salaries of sales persons, what set wrong incentives for the partner.

In the eyes of the EVT, design of the business models was not always done with care in the first round[12] (e.g. CMES). The following organizations – mainly partners of the second round - have a good potential to define business models: TARA, Hydrologic, Springhealth, VBSK. ECCA could also be added to this list, if the laboratoy team develops a business vision.

In emergencies, or where the chlorine solution can be used within 24 hours - e.g. in a service for companies; in desinfection of tanks in rural areas or in slums (direct chlorination) - WATA is a good solution. Small businessmen who take advantage of these opportunities, are not really frequent in this program. The program has not yet developed a business model for such target areas (e.g remote areas in Nepal).

In these potential markets, the WATA device stays in competition with other devices, e.g. from the US (Cascade Design Inc.). These devices may be cheaper, fancier, developed and marketed with more money. They might have technical advantages[13]. Cascade Design Inc. mentiones PATH[14] and World Vision as its partners.

Where the chlorine solution is filled in bottles, and bottles are sold or eventually used after 24 hours, stabilization of the solution is needed. Here, there is a questionmark whether WATA is really the best approach, or whether there are not alternative procedures, like e.g. chemical production with bleach (like PIYUSH). In Nepal. collaboration with ENPHO (PIYUSH) would be better than to finance the launching of a parallel product (WATASOL).

NGOs (CMES, ECCA) report that entering too much into the water business or selling chemicals might become a reputational risk for them. They also run into problems with the Government regulators who does not want that NGOs do business. These are limitations which might have been discussed in the planning phase.

[8] Monitoring would be important, to demonstrate the social character of the business.
[9] E.g. Ceramic filters, chlorine solution, bottled water.
[10] Factor 3-4
[11] Exception: Springhealth
[12] original credit proposal
[13] e.g. device shuts down when the needed concentration is reached; like a water boiler.
[14] Large US NGO; see Annex 7

At the end, the impression is that business models which really have a high potential for scaling-up are the ones which stay in competition with big players, like Mineral Water companies or Unilever. Springhealth sells clean drinking water for a fraction of the price of Mineral Water companies[15]. This is excellent. Whether products like PIYUSH or AquaPlus can beat the products of Unilever, is not clear.

### 4.6 Development of new prototypes

Antenna Technologies succeeded to improve its WATA. An amount of CHF 70,000.- was reserved for that. Apparently, only CHF 7,500.- were used, to buy and to test the SE200 of Cascade Design Inc.

The WATA stays in competition to this company in the US which produces also an electrochlorinator (SE 200), for the outdoor market and the military. This device is eventually well suited e.g. for school programs. It is simple to handle and produces a quantity of chlorine which is sufficient to chlorinate school tanks. On the other hand, Cascade Design Inc. has not yet a lot of experience how to work with the Bottom of the Pyramid (BOP).

In the eyes of the EVT, further contributions to WATA development are only justified if Antenna Technologies can demonstrate the added value of the WATA, compared to these other devices. A joint venture between Antenna Technologies and Cascade Design Inc. would be a good starting point.

### 4.7 Participation in the global initiative 300in6

300in6 plays an important role as a think tank on innovative issues. Despite limited funding[16], it succeeded to make pioneering contributions, in particular by developing the bridge into carbon financing for water treatment. These contributions are noticed positively by the Household Water Treatement and Safe Storage (HWTS) network of WHO and UNICEF.

Carbon financing has a potential. In the near future[17], it is a source for the financing of communication and social marketing costs of Social Enterprises who want to sell water filters etc., hereby helping to reduce carbon emissions, caused by burning of fire wood for water boiling.

Apparently, 300in6 was among the first organizations in the water sector which promoted and studied the potential of carbon financing[18]. This is a big achievement. The HYSTRA study in which it participated, was maybe innovative than the many research studies produced by WHO, UNICEF and others.

Experts believe that whether carbon financing in the water sector will be a success story, will depend largely on the future of carbon markets itself. There are a lot of political uncertainties. At present, there is evidence that Carbon financing becomes accessible not only to water filters (e.g. Hydrologics) but also to water kiosks and chlorination programs.

The analysis of 300in6 on barriers which need to be removed to succeed in scaling-up is also stimulating. The video[19] itself does not yet meet standards needed to bring the message really through to decision makers. A simpler approach (lobbying, leaflet, events, storytelling) might be more effective to reach this target group.

Limitations of 300in6 are probably more related to availability of key persons, budget, and capacity to give adequate support to remove the identified barriers for scaling-up. The author

[15] Middle-income families like Springhealth water; also for bigger quantities and events like weddings.
[16] Apparently, no real effort was made to increase funding.
[17] Hydrologic (Cambodia) already stays in contact with DHL.
[18] Source: author of the 300in6 carbon financing study.
[19] Video Delivering Desire – the prelude to the 300in6 video gallery. The EVT saw Version 0.

of the Carbon study, e.g., waits for a feedback on this study. The HWTS-N network would like to see 300in6 specializing in a few promising approaches, e.g. the carbon financing. Monitoring and evaluation is closely linked to this. The HWTS network has a working group on this issue. 300in6 could take the lead.

To give adequate follow-up to technical issues and demands from the field partners - e.g. elaboration of standards for chlorine solutions; establishment of national platforms - is probably beyond the present capacity of 300in6. Here, collaboration with the HWTS network of WHO and UNICEF would be important to have an effect.

300in6 is not a membership organization. But certainly, 300in6 and SDC expected that more partners would buy into the initiative. Till now, this did not yet happen.

### 4.8 Dissemination through emergency and school programs

Experiences in ECCA program showed that students can develop a much better understanding of issues around hygiene and safe water, if they produce themselves chlorine for the desinfection of water. The school programs in Bolivia, Kenya and in Haiti buildt on this insight.

The EVT is impressed about what has been achieved in these programs. In Bolivia, 40 schools are involved, in Kenya 30. In Nepal, Nature Clubs in 19 schools have achieved quite a consolidated program, chlorinating regularly the school tank. The program in Haiti was delayed[20].

The approach to integrate education on hygiene and practical programs for water treatment in the schools works. This is an excellent basis for the formulation of an attractive Blue School Program.

The following challenges are identified:

1. Strengthen the link between the schools and the community
2. Achieve stronger institutional support for such WASH activities in schools from the Ministry of Education.
3. Ensure sustainable management of the program, by the students or Nature Clubs themselfes[21].

The idea that schools could become production centers for chlorine, was not realistic. Limiting factors are: how to ensure chlorine production during holidays; lack of professional skills to stabilize the chlorine. What can be achieved is the production of chlorine for self-use in the school (tank, hygiene).

Parents meetings, awareness raising events in schools etc. are not sufficient to mobilize the community. Among others, the initiatives have to be linked to Local Authorities, local health posts (Ministry of Health)[22].

### 4.9 Discussion of results

Detailed results are presented in **Annex 5**. The following table presents the main results. At present, the Safe Water Component can not yet demonstrate the big scale-up success. The story of PIYUSH in Nepal show that this may take significantly more time[23].

[20] Late start after the holidays
[21] In some schools in Nepal, the program has become a „teacher program“. This has a limited benefit for education.
[22] In ECCA Nepal e.g., this relation is still quite loose.
[23] In NEPAL, around 15 years.

| Product | Sub-Projects | Assessment |
|---|---|---|
| Water filter | Cambodia (Hydrologic) | High potential for scaling up |
| Chlorine Solution | Cambodia (small NGO) | Small bottles: not stabilized<br>Distribution through "rural sales persons" can have a potential |
| | India (DA, TARA) | AquaPlus has a similar potential as PI-YUSH (Nepal).<br>TARA-Enviro Ltd. has a good laboratory in Delhi. Question whether the same formula and process as in PIYUSH could be applied instead of WATA chlorinator, needs discussion. |
| | Nepal (ECCA) | Small bottles: Direct competition with PI-YUSH which is a national brand. But does this make sense?<br>WATASOL one liter bottles: higher demand. If bottles are used as service to chlorinate water (see below; e.g. in schools), stabilization is not necessarily needed. |
| | Nepal: PIYUSH | Not a component of the SDC project. Produced b mixing of bleach with other substances and clean water.<br>Successful in Kathmandu Valley. Central production in a laboratory (ENPHO). Bleach imported. Quality brand. Well known, because marketing campaigns.<br>Collaboration with PIYUSH to serve the remote areas of Nepal could be an option. |
| Chlorinated water | Bangladesh (CMES) | Local production of Chlorine in a school. Household visits to chlorinate water (chlorination services).<br>Little potential in household visits.<br>Restaurant program could definitively profit from the Springhealth approach.<br>Business partner needed to make the approach work. |
| | India (Springhealth) | High potential for scaling-up.<br>Can attract venture capital once minimal size is reached. |
| | Nepal (VBSK) | Chlorination of tanks as a service.<br>Strong potential, if brick kiln owners or construction site managers will be forced by law or regulation to deliver clean water to workers.<br>Delivery channel eventually similar as in the slums. |

In the eyes of the EVT, planning of this component – identification of partners and of business models, technical issues – was deficient, and too much driven by opportunities. Some errors jeopardized the success of the component: e.g. underestimation of problem of stabilization of chlorine solution; payment of salaries to sales persons.

All markets - water filters, chlorine solutions, chlorinated water – are emerging and promise sustainable growth for social enterprises. Water filters e.g. have to be replaced after 2-3 years; flasks with chlorine solution and chlorinated water are consumer goods. In the eyes of the EVT, the development of such markets may require 5 or more years[24].

Launching a scaling-up business (any sector) can cause problems with central licencing authorities. This is particularly true in food sector and where chemicals are sold (e.g. safe water in jerricans, chlorine). NGOs are not an ideal partner as this business can cause reputational risks. CMES and ECCA are quite aware of this.

Accountable planning, reporting and monitoring mechanisms are not yet in place with all the partners. It would be good to develop a set of monitoring indicators which help to monitor the scaling-up process.

Working with Social Enterprises requires special know-how. The program is working in several countries. Regional learning events with partners are an important element. 300in6 might succeed to establish closer links of these field experiences to global business platforms[25]. All this justifies that the safe water component is funded by the SDC Global Division.

# 5. OVERALL BALANCE OF ACHIEVEMENTS

## 5.1 General

The EVT has the impression that the program is on track. The next 1-2 years will be decisive whether scaling-up through a market-based approach can work, not only in the productive water (micro irrigation) component, but also in safe water.

There is a big difference between the two components: (a) The productive water component is implemented by one partner, IDE. IDE seeks presence in the target countries. (b) The safe water component is implemented by a relatively small NGO in Geneva which collaborates with partners in the field. The latter model was not entirely successful (too complex, partners not always with the needed motivation).

Very high targets were stated in the credit proposal. Identification of partners was not always adequate[26]. In many cases, synergies with SDC Country Programs were not systematically developed, particularly in the safe water component. The latter would have been important to build on synergies to existing programs and partnerships.

A firm answer to whether the market-based approach works in productive water, can be given only in summer 2013, after the next dry season. IDE is aware that sales have to increase substantially in the forthcoming months (dry season).

The EVT does not have the impression that the program strengthens monopolies (e.g. IDE products) or distorts markets: (a) The production of kits for micro irrigation is outsourced to domestic suppliers, where opportunities are identified. (b) Making a business with safe water

[24] E.g. PIYUSH: 6-8 years; Springhealth: 5-6 years.
[25] Contacts to World Economic Forum or Global Compaq need to be stronger.
[26] It is important to note that neither Hydrologics nor Springhealth existed when the Safe Water program started. This also shows that the sector is rapidly developing.

requires in any case start-up financing[27]. (c) The SDC program supports Social Enterprises only with small amounts, justified by the fact that the Social Enterprises work in rural areas to reach the rural poor. Often, other enterprises or even NGOs do not reach this group.

The SDC program (productive water component) helped IDE to establish offices and programs in Central America and in West Africa. In that sense, it was a start-up support for an NGO.

## 5.2 Program relevance and leverage for scaling-up

SDC expected that the program will lead to rapid scaling-up. This needs to be seen in context. Rather, the program contributes to develop sustainable markets which will be of great value in the scaling-up process. 4-6 years are needed till a Social Enterprise stands on its feets.

Good examples are Springhealth (India) and Hydrologic (Cambodia). After Phase 1, they have reached more than 50% of the break even. Sales are increasing rapidly. At the end of phase 2, they should be established businesses and require no donor support.

The approach “that scale is not the problem but the solution”, is innovative and relevant. Scale spreads the costs, lowers the risks, creates opportunities. It creates jobs, sustaines services through value chains.

Working with Social Enterprises has potential to create sustainable supply chains and solutions for the poor. These enterprises also need a margin. At the moment, it is not yet clear what a “social margin” is. The program – and SDC in general – could help to clarify this. The definition of critieria is in the interest of SDC.

**Productive Water:** In the Productive Water Component, it is too early to identify leverage effects. Delays in the supply of micro-irrigation kits can be a limiting factor for scaling-up. Regarding first statements of clients and users a high potential is possible – possibly a little bit higher in Central America than in West Africa.

Linkages to climate change initiatives should be intensified. SDC (Water Initiatives and regional programs) has to play a role to facilitate contacts and facilitate exchange.

The return on investment calculations – very superficially tried to be done in Central America during the mission and based on clients informations – were very promising in this region. It was calculated that in one production cycle, the investment can be amortised. Considering the duration of life of the systems 8 to 10 productive cycles should be possible.

It is too early to verify if the systems in Central American and West African context and specific climate will reach this lifespan.

**Safe water:** Collaboration with business-oriented Social Enterprises (TARA, Springhealth, Hydrologic), and supporting them in comunication, social marketing, and access to financing (e.g. venture capital, carbon financing) to reach the poor (rural areas) is an effective approach.

Carbon financing and investment capital are likely to become available, once the business reaches a certain scale. This will leverage resources. The SDC program supports the partners (e.g. Hydrologic, Springhealth, Tara), to reach this threshold where it is possible to get access to these funds.

Relevance and leverage could be further increased by taking a more focused approach: (a) more rigid criteria for the selection of partners; (b) more effective follow-up on issues which really matter for the development of the businesses; (c) resources for the establishment of

[27] HYSTRA study

national platforms in which scaling-up issues are addressed – e.g. the negative impact of subsidized products for the development of sustainable supply chains[28].

The school activities are very relevant. It is important, to bring the Ministries of Education on board. The question how to sustain the programs and activities which started with great enthusiasm needs to be addressed in 2013.

Concerning productive water, in Honduras exists a collaboration with a school, too. In the frame of a FAO financed program in urban agriculture, a plot in this school was equipped with micro-irrigation technologies from IDE. In a complementary way this type of experience can also contribute to sensitise children, teachers and parents on effective use of water for irrigation in urban agriculture.

### 5.3 Program effectiveness, reaching the poor

The program is effective. It reaches rural communities, and these are – on average – relatively poor. It should be seen as an achievement, that the program tries to achieve scaling-up in such rural areas which are not attractive for commercial businesses.

Retailers are not the poor, but rather the better-off rural population. The end-customers are, however, in many cases the poor. Data from micro-credit organizations stipulate that, in the case of Ceramic Water filters (Hydrologic, Cambodia), only 29% of the customers are “not so poor”.

ODA funding for such programs requires that the program has to reach the poor. If public donors do not insist and monitor, Social Enterprises may well concentrate on areas where the conditions for business are optimal, in many cases the richer areas.

In both components, sales to intermediates clients (e.g. NGOs) still play quite a role, e.g. in Cambodia[29], in Central America. Partners like Springhealth (India) sell directly to end customers.

**Productive Water:** In the long term it is necessary, that really final clients – producers – become the financial basis of IDE in the countries. In order to progress towards this goal, an additional effort in sensitising other development actors is needed for to make more known the logic of market approach. New approaches are needed to make up-scaling more effective and efficient. A massive dissemination towards development organisations and moreover agricultural development programs or platforms can be helpful. Therefore, strategies have to be defined and target groups or initiatives identified.

**Safe Water:** Best performers are: Springhealth, Hydrologic. They both work in rural areas and can reach poor customers. Springhealth only sells to end-customers. In Hydrologic, sale to intermediates (e.g. NGOs) are high.

But also CMES in Bangladesh is effective in reaching the poor. But from the beginning, it was rather doubtful to all partners (including Caritas) whether the business model of CMES can work.

Poverty monitoring is done only in a few cases. Data from the Vision Fund in Cambodia indicate that the Ceramic Water Filters also reach the BOT. The same is reported by Springhealth in Orissa.

Whether the program contributed to outcomes (e.g. safer water in households), has not been analyzed systematically. A positive exception is the customer survey of Springhealth which shows that (a) 44% of the customers see a health impact. (b) 70% drink exclusivelyy Springhealth water.

[28] Cambodia is a good example.
[29] A large percentage of sales of Hydrologic Social Enterprises go to NGOs which, then, distribute the Ceramic Filters free of charge to the poor.

## 5.4 Program efficiency

The SDC policy in the two components was strikingly different: (a) In the Productive Water component, the SDC program helped IDE to establish offices and a program in new target countries[30]. (b) In the Safe Water component, Antenna Technologies did not even receive payments for management services.

**Productive Water:** In each visited country IDE disposes of other financial partners than SDC's Water Initiative. Honduras is the country with most opportunities, both national and international donors and clients. Nevertheless SDC's financing participates substantially in covering running costs of IDE's structures in the countries, above all, personnel costs. In order to reach a higher number of sales and final clients, the global supply program of IDE should help to increment scaling up. Not only through country offices, but through an efficient global marketing strategy, strategic partnerships with development organisations, water and climate change platforms. Such a strategy will contribute to increase program's efficiency.

**Safe Water:** A lot was achieved with a small budget (only 18% of the total program budget). In this sense, the program is highly efficient. This goes also to the credit of Antenna Technologies and of the partner organizations in the field.

If Antenna's own contributions would be taken into account, the total costs of this component would be considerably higher than stated in the budgets. The following were a burden for the efficiency: (a) many partners, receiving only small amounts; (b) activities spread over four countries; (c) a lot of grey papers; (d) difficulty to compile field reports of sometimes questionnable quality into consolidated reports to SDC.

## 5.5 Gender

It seems not be easy to reach gender equity in irrigation projects. In West Africa it may be due to field property aspects, often women are not the owners of the fields and have to ask permission to husbands to cultivate and even more to invest. In Central America, most farmer groups or cooperatives are still dominated by men and it is difficult to bring women in.

Additionally, most of the women receive (or buy) very small systems of 20m2.

Nevertheless, it has been proven that there are women interested in the systems, too. A specific effort must be done to collaborate with them. This might be another example to look for special alliances with other organisations in this issue.

The Safe Water component reached mainly women. Household water treatment and safe storage is the domain of the women.

## 5.6 Sustainability of the results

Supply chains are sustainable if the products and services can be launched successfully on the market. Sales figures need to increase, and figures for the drop-out of customers to be low.

In this program, there is much evidence that this is the case. Partners like IDE, Springhealth, Hydrologic, or TARA use these criteria to measure their performance. Many of the products (e.g. chlorinated water) are consumer goods which will require partners for supply.

The Micro-Irrigation kits have a duration of life two to three years. Environmental sustainable (plastic) is therefore a bigger problem in the Productive Water component than in the Safe Water component where only the Ceramic Filters have to be replaced or plastic bottles can

[30] E.g. overhead, management charges

be re-filled. Recycling fees would be a solution. In India exists an experience where producers can bring the systems to be replaced back to the retailer.

### 5.7 Global, regional nature of the program

The EVT finds a rational that the program is financed by SDC Global Division:

1. The program is active in a large number of countries.
2. Approach and partners are quite specific: Market development for social enterprises, which often have a global scope.
3. Learning in regional platforms plays an important role.
4. The safe water component has a policy dialogue element, 300in6. There is scope that this platform can tap innovative financing mechanisms for successful models (e.g. carbon financing, venture capital).

## 6. ORGANIZATIONAL AND FINANCIAL ASPECTS

### 6.1 General

As mentioned, the components of the program are implemented under quite different modalities. The approach itself – market-based solutions – is not yet a sufficient rationale to conceptualize this program as a "program". More stream-lining and programing is needed, to achieve more consistency and effects of synergy.

Particularly in the Safe Water component, the complexity is high (many partners, different contexts), and this does not increase efficiency. A lot of effort is needed to achieve proper planning, reporting and follow-up on partner's requests. Till now, Antenna Technologies is not paid for this considerable amount of work.

SDC WI has contracts with Antenna Technologies and IDE, two non-profit organizations. The motor behind the program is MSD Consulting GmbH, consultant to both of the implementing partners. This motor is a driver, a visionary, in a truly positive sense, with impact, leading to quality. Deep involvement with Antenna Technologies and IDE, beyond the present program, can be a problem when planning decisions have to be taken[31]. This should be respected by SDC.

In Safe Water, partners in the field are autonomous organizations, with capacity and well consolidated. In the Productive Water component, the situation is different. Some of the IDE offices have been established recently[32]. Sales in the forthcoming (rainy) season will show whether they can establish themselfes.

IDE is a strong partner. It has business development know-how. – e.g. formats for business reporting. Antenna Technologies, on the other hand, is more specialized in research and technology development. It has relatively little business development know-how. Here, it depends largely on MSD Consulting GmbH.

[31] Conflicts of interesta are difficult to avoid.
[32] The SDC WI program pays more than 60% in each of these offices.

## 6.2 Organization, program steering

To achieve consistency in planning, a good Steering Mechanism would be important. It would support the work of the SDC task manager to deal with the complexity of the program and to make follow-up.

Unfortunately, program steering is weak. The Steering Committee met only few times, and it does not seem to play a major role. Co-financing partners such as Pro Victimis or Caritas participated. IDE is represented by Urs Heierli, the country representative in Switzerland, and also consultant to Antenna Technologies.

The EVT sees a need for the following:

1. Strengthen steering: this is also important to keep the expectations at a realistic level, also in SDC[33].
2. Rationalize, simplify the set-up.
3. Define better criteria of what is financed and what not in this program, particularly in the safe water component
4. Sharpen the focus, e.g. on Social Enterprises only (again in the safe water component); supporting rural marketing only.
5. Develop criteria for planning and management.

## 6.3 Implementation arrangement

SDC WI has apparently questions about the appropriateness of the program framework. Some general aspects and the fact that the two implementation partners are quite different, have been described above.

Given the fact that program was developed opportunity-driven, it is understandable that there are two implementation partners. The EVT encourages SDC WI to imagine scenarios in which this is simplified[34].

The EVT is observes an inbalance. In Antenna Technologies, SDC, together with MSD, has a lot of influence on the organization (main donor). It contributes with know-how, but not with funding (overheads, management fees). In IDE, the situation is different: SDC itself has relatively little influence. It pays management fees.

## 6.4 Selection of partners, coordination with SCO

Not only in the productive but also in the safe water component, selection of partners should not be opportunity driven but a lot more targetted, at the basis of criteria. The focus should be on Social Enterprises with a potential to reach break-even[35], in countries where CSR makes a difference and where good conditions for a dialogue with Government exist.

Coordination with SCO was not ideal. In countries like Bangladesh or Nepal, the scaling-up program could profit from collaboration with existing SDC programs (regional cooperation) or program partners. In Nepal, such options have been discussed during the mission (Helvetas).

In the case of Burkina Faso, SDC regional cooperation already supported a program for micro-irrigation when scaling up SDC WI started with IDE. Nevertheless, synergy effects between both actions cannot be observed so far.

[33] SDC Regional Collaboration, Global Compaq, etc. could be involved.
[34] See chapter 7
[35] In Nepal, ENPHO had this potential when the program was planned.

SCO Dhaka stays in an intensive dialogue with CMES, the partner in the Safe Water component. Apparently, SCO is concerned that CMES depends too much of funding from SDC. It was also rather puzzeled to see that CMES, quite a traditional NGO with little expertise neither in safe water nor in business development, was selected as a partner for such a scaling-up program.

### 6.5 Monitoring, Evaluation

Partners submit reports to the implementation partners (IDE, Antenna Technologies) which, then, compile the reports for SDC WI. In the eyes of the EVT, the reports are of quite high quality. The LogFrame is not used as reference.

The EVT finds it important that the program develops a set of (relevant) indicators for monitoring. Sales figures are important. But it is also important to get a differentiated view on questions like: Are products sold to intermediates (e.g. NGOs) or to end-consumers – type and number of clients ? What is the performance of the products in the field? How much area is irrigated with the micro-irrigation kits? Do customers of the Safe Water program note a health effect?

Carbon financing gives the safe water component a perspective. It needs strong monitoring and credible partners of a certain size. Investments into monitoring can have a direct return for the strengthening of social entrepreneurship, leading to scaling-up.

The program has produced a number of interesting evaluation reports[36]. 300in6 plays a positive role in rationalizing experiences.

### 6.6 Options for rationalizing implementation

The EVT describes a number of options in **Section 6.2**, mainly related to steering, better planning and monitoring. It finds also encourages SDC and the program partners to discuss some more general options:

1. Concentrate on one component only, possibly the Productive Water Component, where the implementation arrangement is simpler.
2. Reduce the number of implementation partners and countries.
3. Define better criteria for financing – e.g. eligibility criteria for partner organizations; financing of social marketing in rural areas only.
4. Disclaim of any financing of institutional support of partner organizations, including implementation partners.

The Steering Committee is the right platform to launch this discussion.

## 7. PERSPECTIVES AND RECOMMENDATIONS FOR PHASE II

### 7.1 General

Where sales are increasing and break-even targets are in the reach, there is much rationale to continue with this program. Ideally, the approach and results can be given more visibility in platforms such as the World Economic Forum in Davos or Global Compaq, to attract venture capital.

[36] E.g. customer survey in Springhealth

In the Productive Water component, the balance can be made next Summer 2013 (after the rainy season). In the Safe Water component, Social Enterprises like Springhealth, Hydrologic, or TARA are ideal partners for Phase 2.

Social Enterprises need only little funding, mainly for marketing, social marketing. SDC co-financing, together with SDC support with regional exchange platforms, can make a difference.

Regarding implementation arrangement, issues have been described in Chapter 6. There is a need to simplify the Safe Water component. Antenna Technologies should be more clear about its future role in the program. It has little capacity in business development, and its prime interest is the promotion of a technology (WATA) which, as seen in phase 1, is a good but not always the only technology option.

There is a big potential to better link the programs with SDC country programs. A good example is found in Central America where the Productive Water component collaborates with the farmers field schools of PROMIPAC.

The program should be active in those countries where it can guarantee a minimal physical presence with a strong partner (eventually franchising). The approach to work in clusters – e.g. South-East Asia, Central America, West Africa – is efficient. Regional meetings help to share knowledge and could be itensified.

### 7.2 Productive water component (micro irrigation)

The upcoming dry season is decisive for IDE and the productive water component. In the next months a great step in terms of sales must be done, considering that drip irrigation has its most added value during scarcity of water periods.

A complementary scaling up strategy to country representations through global supply, strategic partnerships with organisations and thematic platforms must be defined and established in order to reach more clients.

A good timing is very important for effective work in micro-irrigation. When drip irrigation can be complementary during dry periods in the rainy season, its real added value consists in crops during dry season. Therefore in a first step, demonstration plots have to be very well exploited especially in this period of the year, showing the possible variety of crops and cultivating techniques.

In order to achieve the real potential of micro-irrigation, tight links to agronomical expertise is necessary.

### 7.3 Safe-water component (household)

To make a difference over several countries, the component should be around CHF 650,000 per year. This would include also contributions to 300in6, and eventually collaboration with the HWTS-N of WHO and UNICEF with the aim to establish closer ties between policy partners (e.g. national platforms, incolving also HWTS-N). The impementation partner needs to be paid for its services.

If this level of funding is not possible, the option to skip the program with the objective to concentrate all efforts on the productive water component, should be considered firmly. A safe water component needs to volume to have a voice.

The focus should be on strengthening Social Enterprises to reach the poor in rural areas (co-financing of direct marketing, social marketing, monitoring). WATA can play a role. But it should not be the only technology option. If this focalization is not possible, it is probably

better to skip the component.

Hydrologic, TARA, MinErgy (VBSK), eventually ENPHO, are motivated partners. In Bangladesh, a new partner has to be identified, and the EVT sees a lot of rational to make an effort to identify such a partner (a Social Enterprise). In Nepal, Helvetas might have an interest to collaborate with Antenna Technologies to develop business options in for the chlorination of reservoirs in remote valleys.

ECCA (Nepal) needs to define its role in phase 2 of the program:

1. Together with SANDEC, it could play a prominent role in a Blue School Program which would include also the present activities in Bolivia, Haiti, and Kenya. This needs further discussion.
2. It is possible that ECCA makes an effort to develop activities for the chlorination of tanks, e.g. together with MinErgy[37].

Carbon financing has a potential in the water sector. There is a potential that it will tap funding of communication, marketing. The main questionmarks are more related to the political question about which role carbon financing will play in 5-10 years. Unfortunately, there is not yet an answer found.

The EVT would be happy if 300in6 succeeds to establish stronger ties with the HTWS-N. There is room for initiatives: national platforms involving all actors and having the recognition of HTWS-N; leading of thematic working groups. Lobbying by 300in6 is needed to give the market approach in safe water visibility, also in the business community.

### 7.4 SDC Global / Regional Cooperation

This Scale-up program should be active only in countries in which SDC has a cooperation program. This will give opportunities to develop synergies and to take advantage of the SDC partner networks in the countries. The only exception might be India where SDC is in a phasing-out process.

Funding by SDC Global Division is justified[38]. There are global issues involved. The program wants to achieve visibility in global platforms. Regional exchange of experience is an important factor for the success.

Whether SCO have know-how and long experience in working with social enterprises in the water sector, is rather doubtful. Therefore, it might be premature to transfer some elements of this program to SDC Regional Cooperation.

SDC Regional Cooperation can play an active role in the following: identification of partners; joint planning, monitoring and evaluation; regular feedback to the Steering Committee of the program.

### 7.5 Program management

Program Steering and the implementation arrangement need review, also with the objective to reduce the present complexity. The issues have been discussed in **Chapter 6**.

Regarding implementation, the EVT considers the following options as feasible:

1. Continue as in phase 1 (IDE, Antenna), but give Antenna an adequate budget for program management.
2. Give the whole package to one partner, e.g. IDE

[37] It is also possible that MinErgy takes the lead, and ECCA becomes the competence center for Blue Schools.
[38] See section 5.7

3. Productive Water (IDE) and Safe Water to a partner like 300in6, to give the platform more weight in the international discussions.

The EVT does not recommend an option. What is required is that the EVT's concerns are discussed in an open and transparent way – see also analysis in **Section 4.2, Chapter 6**. This can clear the way for an even better collaboration.

Continuity speaks for option 1. The fact that IDE has a lot of business development know-how and is not fixed on certain technology options, speaks for option 2. And there are also reasons for option 3.

# 8. RECOMMENDATIONS FOR NEXT STEPS

## 8.1 General

1. The Steering Committee needs to be more pro-active. It should comprise also SDC Regional Cooperation Division. The implementation partners Antenna Technologies and IDE can be part.
2. Feedbacks of the partners (IDE, Antenna Technologies) to this report are welcomed and should be an integral part of the planning of phase 2. Antenna Technologies is invited clarify how it sees its role in the next phase.
3. The options for phase 2 should be discussed and further elaborated in a program design workshop, headed by the Program Steering Committee. Results should be summarized in a planning platform paper.
4. Criteria for financing of partners have to be defined more clearly. Indicators for monitoring have to be developed.
5. Complexity has to be reduced, and the program should become more focused.
6. Exchange with thematic networks and regional cooperation of SDC needs to be intensified.
7. Financially, the program should be more balanced. Safe water needs a higher budget. If this is not possible, it is better to focus on one of the components only.

## 8.2 Productive Water Component

1. As mentioned before a substantial number of different irrigation systems should be sold during the next dry season. Mid 2013 the numbers should be analysed and realisitc figures defined for the next phase.
2. Therefore an evaluation "light" or a well structured self-evaluation should be realised in mid 2013, also with the objective to increase exchange between regions and countries.
3. Links to international platforms have to be strengthened.
4. A complementary strategy to disseminate irrigation technology and market approach must be developed, this should no rely exclusively on country representations.

### 8.3 Safe Water Component

1. The program has to become more focused. Recommendations regarding program design and implementation arrangements need to be discussed (see **Chapter 7**).
2. There is good reason to re-design the components in Nepal and in Bangladesh (see **Annex 5**). In Nepal, ENPHO should be welcomed as a partner. In Bangladesh, the activities with CMES can be stopped by mid 2013.
3. 300in6 should also reflect on the results of this evaluation. In phase 2, it should not only be a thinktank, but apt to specialize on a few issues where it has capacity to make a difference (e.g. attract investment).

### 8.4 Annual Workplan 2013

1. Consolidation, planning is needed. Priorities are: (a) discussion of the issues around the implementation arrangements; (b) editing of a planning platform paper for phase 2, taking the results of this mission into account.
2. The option to transfer the school activities into a Blue School program needs to be more concretely discussed.
3. It would be advisable to make a balance whether sales of micro-irrigation kits have developed during the dry season in the Productive Water component. This can also be a self-assessment and consolidated report of IDE to SDC (June 2013). SDC Regional Cooperation could do random checking.
4. In the safe water component, it would be good, if business models, involving chlorination of tanks or reservoirs with unstabilised chlorine solution (WATA) could be documented more firmly till the end of the year.

### 8.5 Phase 2 of the Program

1. Financially, Phase 2 could be in the same order as in Phase 1. The potential for rationalization has to be used, particularly in the Productive Water component which uses the main part of the budget.
2. Results of the planning workshop (Summer 2013) should be summarized in a planning platform paper.
3. In **Section 7.5,** the EVT has discussed options for rationalizing the implementation arrangement. The issue needs to be discussed with the concerned parties.

# ANNEXES

1. Terms of Reference
2. Program of the Mission
3. List of interviewed People
4. Selected list of Documents
5. Safe Water Component
6. Technical Background Safe Water
7. Project Areas visited - Productive water
8. Summary Matrix per country, Productive Water

# ANNEX 1

# TERMS OF REFERENCE

**Scaling-up of productive water (micro-irrigation) and safe water (households)–Phase 1**

**Proposal for the Evaluation of both components**

## 1. Introduction

This project wants to prepare the ground for scaling-up productive water (micro-irrigation) technologies for small farmers and safe water (for household water treatment) by disseminating these two solutions through viable and profitable supply chains. While affordable micro-irrigation technologies are mostly promoted to improve the income situation of small farmers (or families with kitchen gardens), safe water at the household level prevents families from water-borne diseases. It is in both cases quite challenging to operate with a business approach because one cannot assume that there is an existing demand (market) and it is thus necessary to create the markets first and then setup a viable supply chain.

Market creation for micro-irrigation technologies requires a lot of demonstration especially among small and very small farmers, as it means introducing not only new technologies but changing their traditional patterns of growing food. The step from rainfed to irrigated farming is quite a change and usually, farmers want to see the results first with other farmers before they adopt such innovations. Even once they are convinced and if they desire to purchase, it may still take some more time to get access to financial resources. On the other hand, disseminating the technologies is only viable for private enterprises (manufacturers, dealers, installers) once a certain volume of sales is generated. The challenge is thus to create the hen and the egg at the same time.

This is even more the case for introducing safe water solutions such as chlorination or filters. While the introduction of bottled water has become a major lifestyle trend among middle classes, it is by far not common to care for safe drinking water among poor people, especially in rural areas. Considerable efforts of social marketing must go hand in hand with traditional marketing activities to disseminate safe water solutions. While cholera epidemics create an immediate demand for safe water – as long as people are afraid – it is much more challenging to build sustainable supply chains for “normal” situations.

Despite these difficulties, the present program has taken up the challenge to find ways for market based approaches creating profitable local supply chains and avoiding market distorting subsidies and prepare the ground for scaling-up proven solutions.

## 2. Objectives of the evaluation

The **overall objective** of the External Review is to assess the relevance and effectiveness of the program and to provide SDC and its partners with lessons learned and recommendations for the future of the Swiss engagement in the promotion of small-scale irrigation for small farmers and of safe water solutions for households.

More specifically, the review includes three **specific objectives**:

1. **To analyze the effectiveness and efficiency of the project**: This means to determine whether market based approaches can be and are an effective and efficient way to achieve a broader dissemination in a sustainable way;
2. **To assess the relevance and leverage of project**: this means to determine whether the interventions are relevant for achieving the objective of scaling-up and whether they achieve some leverage by being embedded in local, regional and national institutions

and especially creating synergies with other SDC supported programs.

3. **To recommend a possible future orientation**: both components have a pioneering character in their specific contexts (although they had been implemented and have been experimented in other contexts) and have therefore a strong learning aspect. The review should thus capitalize the lessons learned and draw recommendations about what has worked, what has not worked and what should be the focus of the future orientation.

## 3. Suggested Key Questions

The following key questions should be addressed by the review:

1. **Project effectiveness and efficiency:**
   - What are the major achievements of the project towards improving the lives of beneficiaries
   - What are major achievements in putting in place a sustainable value chain ?
   - Has the project achieved its outcome target? What are the key learning?
   - How sustainable is the program so far and what are the most promising chances to get it sustainable?
   - Analysis of the ratio costs and results, for the present phase and for the future if volumes may rise.
2. **Project relevance and leverage for scaling up:**
   - Recommendation for future orientation keeping in mind the following questions/issues:What is the relevance of the program at a macro level. What are the links between benefits at the household level and impacts at village, district and national level in terms of poverty reduction? Can such interventions make a significant difference?
   - Are the lessons learned conducive for further replications in other areas?

## 4. Suggested Methodology and review team:

Besides the description in the previous chapters, a detailed methodology and tools, travel schedules and other items will be proposed by the External Reviewers and discussed with the Global Water Initiatives division. It is proposed that the two reviewers work independently and have their own specific schedules and work programs, but will come together at the end and present common conclusions for both components.

### Composition and profile:

The reviews will be carried out by two independent experts (international/regional/national consultants), one for productive water and one for safe water. The profiles of the reviewers should be as follows:

a) **Productive water**: the reviewer should have a good understanding and field experience of economic aspects of agriculture, needs of small farmers and of supply chain issues and market-based approaches.

b) **Safe water:** the reviewer should have a good understanding of safe water issues and consumer behavior, economic aspects of market-based approaches and value chains and be a good facilitator with documentation skills for lessons learned by the partners in Asia.

### Scope of work:

The two reviewers should get a good overview over the total program within a limited time frame. In view of the character of global programs it is thus not possible to assess all aspects in great detail and it is essential to apply the so-called “Mut zur Lücke” (Courage to leave gaps open); otherwise, a review is not feasible.

It is proposed to visit for the productive water component at least the programs in Central America and in West Africa. For the safe water component, it is proposed to organize a common workshop with all partners and to draw joint lessons learned from the different partners.

## 5. Time Frame/Duration :

Time frame for this review is September to October 2012 for the information collection and visits, the report deadline is End October 2012. The Duration of each mission is as follows:

a) for the component productive water:

3 days for report reading, mission preparation
8 days for visiting the Central America program
5 days for visiting the West Africa program
2 days for global dissemination program

2 days for debriefing and conclusions (with the safe water component) and
3 days for report writing

b) for the component safe water:

3 days for report reading and mission preparation
5 – 8 days for field visits in Asia (Delhi, Orissa, Nepal, ev. Cambodia)
3 days for workshop in Asia and drawing lessons

2 days for debriefing and conclusions (with productive water component) and
3 days for report writing

## 6. Expected Outcomes

It is expected that the mission will produce a report with a focus on assessing what has worked well, what has worked less well and come up with conclusions how to proceed in the best way. More on the specific expected outcomes is defined in the specific sections of the two components (see below).

## 7. Documents for Review

Urs Heierli (International Development Enterprise) and Patrick D'Aoust (Antenna Technologies) will put a series of documents at the disposal of the reviewers for the respective components.

## 8. Relevant stakeholders to be consulted

The relevant stakeholders to be consulted are the following groups:

a) the respective customers of micro-irrigation technologies and safe water solutions
b) the members of the retail network and the supply chain
c) all the partner organizations
d) the responsible persons in charge of the projects at SDC, IDE and Antenna
e) relevant partner organizations of the programs such as SDC offices etc.

**The two components more in detail:**

**A) Component "scaling up of productive water" (micro-irrigation**

The component scaling up of productive water aims at initiating the global dissemination of affordable, water saving and income generating micro-irrigation technologies in different parts of the world. IDE has already a large experience in the dissemination of micro-irrigation technologies, although this component is not part of all programs of IDE worldwide (e.g. Cambodia is focusing more on WASH activities). The SDC project focuses geographically on projects of IDE in Central America (creation of IDEal Tecnologias in Nicaragua, Honduras, Guatemala and El Salvador), West Africa (Ghana, Burkina Faso and Mali) and in Asia (Kirgizstan, Vietnam). In addition, the strengthening of technology development and the piloting of global dissemination are pursued, and some communication activities in Switzerland (exhibition at the Tropenhaus and an international conference on water scarcity) will be organized.

It is proposed to evaluate the growth path of the activities in the different countries and to assess the potential impact of further scaling-up activities. As the activities are spread over a large territory, visits to the field may be needed to understand the potentials and obstacles for a large-scale adoption of the technologies and the creation of sustainable supply chains.

It is therefore proposed to design the evaluation as follows:

**Modus**: an evaluator should visit some of the projects in the field, namely Central America and West Africa, and gather the necessary information from the other projects by correspondence, skype and similar means.

**Partners/projects**:

- IDEal Tecnologias in Central America and its partners SDC, CODESPA, Retailers, Zamorano school, Fair Trade Cooperatives;
- IDE West Africa, mainly Burkina Faso, Northern Ghana and its main partners (SDC, others)
- Other IDE partners (Helvetas Kirgizstan, IDE Vietnam), the partners of the global technology and global supply component should be contacted by correspondence.

**Focus:** Strengths and Weaknesses of the different programs and approaches should be assessed (SWOT analysis) and potentials and obstacles for scaling should be identified. The potential reach but also the limits of a market-based approach should be analyzed.

**Output**: a report should take stock of what has been achieved and what can be achieved in the future. It should help to determine a realistic planning for the future.

**B) Component "scaling up of safe water" (households)**

This component aims at finding ways to scale-up safe water systems through social marketing and marketing approaches and to create sustainable distribution channels for safe water systems. Antenna had a surprisingly fast success in DR Congo with the Uzima project where the Uzima women were extremely successful with the distribution of WATASOL chlorine flasks by a kind of Tupperware marketing (door-to-door sales from women to women). However, this success was possible by a good demand (due to a cholera outbreak that could get rapidly under control thanks to the chlorine) and it depended – too much – on a charismatic leader (who suddenly received money from all donors and turned out to become tempted by corruption).

The objective of the project is to find out ways how such business models can be replicated through **existing** organizations and to clarify if established NGOs (with an inclination to innovative business approaches) can setup economically sustainable safe water supply chains. This is a difficult task because there is not a dynamic market for safe water at the base of the pyramid (quite in contrast to the exploding market for bottled water of the wealthier consumers). It has been confirmed by a recent study of Hystra that not a single project has attained commercial viability, so far, and successful models for scaling up safe water may need hybrid financing (grants for social marketing, loan investments for private

enterprises to deliver safe water in the form of chlorinated solutions or filters. Hystra also recommends to create national platforms where donors, NGOs, Government and private enterprises work together for a scaling-up with an orchestrated approach.
Initially, it was intended to work with 4 partners in Nepal, Bangladesh and India; two more partners were added – Hydrologic in Cambodia and Springhealth in Orissa - during a steering committee meeting.
In addition, the component aims to participate at the advocacy level in a multi-stakeholder platform "300in6" with the Dutch partner "Aqua4All". There are now a number of appropriate solutions and the House Water Treatment and Safe Storage network of WHO/UNICEF is still focused on the technologies and their impact; scaling-up will need to bring in other partners from the finance or social investment sector into the safe water constituency in order to address financial sustainability issues.

Moreover, experience has shown promising uses of the WATASOL technology in emergencies and for school education. As a consequence, these two sub-components were also added during the phase 1.

It is proposed to evaluate the different activities of this component with a focus on finding out "what works and what not" and on documenting the common lessons learned from the different activities.

As most of the projects are in Asia, it is proposed to organize a workshop in India or Nepal with all the partners and to draw the lessons learned with a common methodology and with the help of a good facilitator. This can be the same person as the evaluator. This person should also be able to document the findings so that they can be applied for scaling-up through other institutions.

**Venue**: Kathmandu, Bhubaneswar or Delhi with one of the partners.
**Partners**: ECCA (Nepal), Development Alternatives (Delhi, India), CMES (Bangladesh), VSBK, Nepal, Springhealth (Orissa, India and other states), Hydrologic (Cambodia)
**Dates**: 3 – 5 days in September 2012
**Focus**: "What works" for setting up a safe water business? Analysis of constraints, successful and less successful delivery models; needs for social marketing. What can be done with profit and what needs subsidies?
**Output**: Documentation "what works and what not?" What are potentials for scaling-up? How can scale be reached and with what type of organization?

# ANNEX 2

## PROGRAM OF THE MISSION

**General**

| Date | Agenda |
|---|---|
| 27.8.12 | Kick-off meeting in SDC |
| Sept 12 | Report reading |
| 17.9.12 | Briefing SDC |
| 20.9.-5.10.12 | Field visits Safe Water to Asia |
| 17.10.-25.10.12 | Field visits Productive Water to Central America |
| 28.10.-3.11.12 | Field visits Productive Water to West Africa |
| 1.11.-8.11.12 | Synthesis, report writing |
| 9.11.12 | Debriefing SDC |
| 19.-20.11.12 | Report finalising |

**Field visits productive water**

| Date | Agenda |
|---|---|
| 6.9.12 | Briefing with MSD Consulting GmbH (Urs Heierli) Bern |
| 18.9.12 | Meeting with IDE country representatives and head quarter staff in Bern |
| 20.9.12 | Participation in Exposition in Tropenhaus Wolhusen |
| 12.10.12 | Flight ZRH to Central America |
| 17.10.12 | Arrival in Managua (Nicaragua), field visits in Tipitapa and Ticuantepe |
| 18.10.12 | Visit of Factory in Managua, RC Industrias SA Rafael<br>Field Visits in Rivas, Diriomo and Rancho Ebenezer |
| 19.10.12 | Visit to SDC office, interview with María A. Zelaya<br>Visit to warehouse in Managua<br>Meeting with IDE team – preliminary impressions |
| 20.10.12 | Travel to Matagalpa<br>Field visit in Terabona<br>Field visit producers from UCA San Ramón |
| 21.10.12 | Field visit of retailer in Sebáco<br>Field visit of woman in Estelí<br>Travel to Tegucigalpa (Honduras) |

| | |
|---|---|
| 22.10.12 | Field visit in San Lorenzo (Valle)<br>Fundación Agrolíbano<br>Various producers<br>Visit of Technology Centre of CARE in experimental station (Choluteca) |
| 23.10.12 | Field visit technology center in Zamorano university<br>Field visit to farmers groups in Talanga |
| 24.10.12 | Visit of school equipped through FAO urban agriculture program<br>Visit of warehouse in Ouagadougou |
| 25.10.12 | Synthesis, Reporting, travel back |
| 26.10.12 | Arrival ZRH |
| 28.10.12 | Travel to Ougadougou (Burkina Faso) |
| 29.10.12 | Visit of IDE Technology Center in Ouagadougou<br>Visit of Warehouse in Ouagadougou<br>Interviews with IDE staff<br>Meeting in SDC<br>Interview to retailer in Ouagadougou |
| 30.10.12 | Field visit to Koubri<br>Interview in Ministry of Agriculture<br>Field visits in Réo and Koudougou |
| 31.10.12 | Field visits in Ouahigouya and Ouagadougou |
| 1.11.12 | Travel to Ghana<br>Field visit in Garu (Upper East Region) – 2 visits to Farmers groups |
| 2.11.12 | Interview IDE representative<br>Visit of Farmers' day activities in Paga<br>Travel back to Ouagadougou |
| 3.11.12 | Debriefing with IDE team, Travel Back |
| 4.11.12 | Arrival ZRH |

**Field visits Safe Water**

| **Date** | **Agenda** |
|---|---|
| 10.9.12 | Meeting in Antenna, Geneva |
| 17.9.12 | Briefing MSD Consulting GmbH; meeting with SANDEC (school program) |
| 20.9.12 | Flight ZRH to Phnom Penh (Cambodia) |
| 21.9.12 | Arrival Phnom Penh; field visits with Hydrologic |
| 22.9.12 | Presentation and discussion in Hydrologic; discussions with resource persons |
| 23.9.12 | Flight Phom Penh to Dhaka (Bangladesh); meeting with CMES board and management; evening boat to Barisal |

| | |
|---|---|
| 24.9.12 | Field visits CMES in Barisal (several villages); discussion with CMES field team; evening boat to Dhaka |
| 25.9.12 | Arrival Dhaka; discussion with CMES board and management; meeting with Swiss Embassy |
| 26.9.12 | Flight Dhaka to Kathmandu (Nepal); meeting with staff and entrepreneurs in ECCA |
| 27.9.12 | Field visits to school program (school in Kathmandu; school outside Kathmandu); visit to a local mineral water bottling company; dinner with IDE regional meeting |
| 28.9.12 | Meeting with Minergy-Nepal; Meeting with Helvetas office in Nepal; visit to village and discussion with village committee; meeting with heads of schools; visit to ENPHO laboratory |
| 29.9.12 | Visit to slum area Kathmandu |
| 30.9.12 | Flight Kathmandu to Delhi (India); visit to two slum areas; discussion with NGO |
| 1.10.12 | Visit to Tara (production of Aqua+); meeting with Development Alternatives (DA) in Delhi office; Flight Delhi to Bubaneshwar |
| 2.10.12 | Workshop with all teams in Bubaneshwar |
| 3.10.12 | Workshop with all teams in Bubaneshwar |
| 4.10.12 | Field visits with Springhealth Social Enterprise; Flight Bubaneshwar to ZRH |
| 5.10.12 | Arrival ZRH |

# ANNEX 3

## LIST OF INTERVIEWED PERSONS

### FOREIGN AFFAIRS, SDC

Eggs, Ch., Water Initiatives, Deputy Head
Muenger, F., Water Initiatives, Head
Pitteloud, E., Water Initiatives, Program Officer
Herren, U., Ambassador, Dhaka
Tabet, T., Program Officer, SCO Dhaka
Zelaya, M. A., Program Officer, SCO Managua
Benz, J., SDC Tegucigalpa
Randin, N. SDC Ouagadougou
Von Schulthess, L. SDC Ouagadougou
Rouamba, P., Program Officer, SDC Ouagadougou

### IMPLEMENTATING AGENCIES, BACKSTOPPING

De Bazignan, C., Antenna, responsible water program
Daoust, P., Antenna, project coordinator
Duvernay, P.G., Antenna, technology advisor
Heierli, U., MSD Consulting GmbH, Berne
Suter, F., Fabian, Coordinator School Program
Von der Weid, D., Antenna, director
Andrezejewski, K., IDE HQ, Global Supply
Bürli M., IDE HQ, Global Supply
Enns, R., IDE Canada

### FIELD PRODUCTIVE WATER COMPONENT

IDE Field staff in Nicaragua, Honduras, Burkina Faso, Ghana
Producers in

- Tipitapa, Ticuantepe, Rivas, Managua, Matagalpa, Terabona, Estelí (Nicaragua)
- San Lorenzo, Talanga, Tegucigalpa (Honduras)
- Ouagadougou, Koubri, Réo, Kourou, Ouahigouya (Burkina Faso)
- Garu, Paga (Ghana)

Rafael, RC Industrias, Managua (Fabricante)
Vargas, A., Zamorano School
Rueda, A., Zamorano School PROMIPAC
Suazo, E., Fundación Agrolíbano
Gandema, B., Commerçant Ouagadougou
Commerçant Réo

**FIELD SAFE WATER COMPONENT**

**Bangladesh**

Al Mamum, Ayatullah, CMES, YSES project coordinator
Huq, Mofizul, CMES, Program Manager
Ibrahim, Muhammad, CMES, Chairman and Founder
Rafiqul Islam, Mirza, CMES, project coordinator
Consultant, BRAC program
Team CMES field
Restaurant and shop owners, client families

**Cambodia**

Luy, Chantrea, Hydrologic, Sales manager
Meas, Hem, Hydrologic, General Manager
Prseth, Sea, Hydrologic, Administration and Finance Manager
Sovannara, S., Hydrologic, Project Manager
Yang, KeAnna, Marketing and Sales Coordinator

Bunhon, Hann, Vision Fund, Office Manager Kampong Spen Branch
Genzink, Karin, Sales advisor
Gilles, consultant
Roberts, Michael, IDE, Country Director
Samrach, N., World Vision, Vision Fund
Client families

**India, Bubaneshwar**

Nanavati, Kishan, Springhealth Social Enterprise, CEO
Senapati, J.R., Xavier Institute of Management, Core Committee member
Client families

**India, Delhi**

Agarwal, Rachit, Tara, manager sales and marketing
Bountra, Siddhartha, DA, project coordinator
Chaturvedi, V., DA, Tara, Senior Program Director
Kumar, Pramod, Tara, Assistant Manager
Patara, Shrashtant, Tara, Chief Executive Officer
Prasad, S.N., DA, Lab Analyst

Anand, Mr., Coordinator NGO
Singh, Vijender, Bhanwar, Medical Doctor
Customer, sales persons in Delhi slum areas

**Nepal**

Khadgi, Shushila, ECCA, WATASOL project team
Shresta, Prachet K., ECCA, Chairman

Yogendra, ECCA, board

Acharya, Niraj, Helvetas, Senior Program Officer
Bagracharuga, N.C., School Teacher Tyagal
Bhatti, Madan, Helvetas, Teamleader
Dahal, Deepak, owner of mineral water company
Haroun, Mr., businessman, slum program
Kumar, Krishna, Teacher Lalitpur
Maharjan, Krishna Man, Environment Conservation Nepal, Chairman
Maharjan, Rojita, Minergy-Nepal
Manandhar, Usha Maskey, VBSK, Minergy-Nepal, Program Coordinator
Merz, Juerg, Helvetas, International Program Advisor
Shakya, Suman K, Enpho, Executive Director
Shresta, Mansuli, Teacher Lalitpur
Tuladhar, Asta Maya, local producer WATASOL
Shop owners, entrepreneurs, students, health posts

**Varia**

Cave, Mark, Pro Victimis Foundation
Galgani, Pietro, author of the study on carbon financing
Huerlimann, Maya, Caritas Switzerland
Montgomery, M., WHO, Household Water Treatment and Safe Storage (HWTS) network
Osborn, P., 300in6
Vousvouras, Ch., consultant

# ANNEX 4

## SELECTED LIST OF DOCUMENTS

### GENERAL DOCUMENTS


[1] SDC, 2009: Credit Proposal Scaling-up of productive water (micro-irrigation) and safe water (households), Phase 1 (1.11.2009 – 31.12.2013)

[2] SDC, Additional credit, 2010: Going to scale with safe water (housholds) and productive water (micro-irrigation) – 1.12.2010 – 31.12.2012

[3] SDC, 2012: Minutes of the Steering Committee SDC on Scaling-up productive water project. February.


### Workplans, Annual reports


[4] Antenna, 2009: Pilot programs for WATASOL – testing business models (document for Pro Victimis)

[5] Antenna, 2010: Testing business model for selling local produced chlorine or chlorinated water. Context, status, targets

[6] Antenna, 2011: First Operation Report, January 2009 to March 2011

[7] Antenna, 2010: Scaling up safe water: second operational report, first financial report, April 2010 to August 2010.

[8] Antenna, 2011: Second Operational Report, July to December 2010

[9] Antenna, 2011: Scaling up safe water, third operational report, January 2011 to September 2011

[10] Antenna, 2011: Second Operational Report, July to December 2010

[11] Antenna, MSD Consulting, 2012: Monitoring Sheet March 2012.

[12] Antenna, 2011: WATASOL Asia – Testing business models, May. Report

[13] Antenna, 2012: Scaling up Safe Water: Fourth Operation Report, January 2011 to January 2012

[14] Antenna, 2012: WATASOL Asia – Testing business models, February, PPT Presentation

[15] Antenna, 2012: Pilot programs for WATASOL – testing of business models; project extension March to December 2012 (document for Pro Victimis and Caritas)


### Technical Reports


[1] Bergamin, J., 2010: Local production of chlorine with WATA during flood emergency in Pakistan.

[2] Bergamin, J., 2012: Pilot programmes for WATASOL – testing different business models for selling chlorine in Nepal, Bangladesh and India. Field visit January 2012.

**Operational Reports**


[1] Antenna, EAWAG, 2012: Safe Water School Project – Mid-term Report 2, July 2012.

[2] CMES, 2012: Report July to December 2011. Dhaka.

[3] CMES, 2012: Report for the period of January to June 2012; including final report. Dhaka.

[4] EAWAG, 2012: Safe Water School Project – Mid Term report.

[5] EAWAG, 2012: Safe Water School Project – concept paper for the second phase 2013-2014.

[6] EAWAG 2012: Safe Water School Project. PPT Presentation

[7] ECCA, Antenna, 2012: Pilot program for WATASOL – testing different business models, July to December 2011. Kathmandu.

[8] ECCA, Antenna, 2012: Pilot program for WATASOL – Reporting January to mid July 2012. Kathmandu.

[9] Hydrologic, 2012: Final Report Microcredit-linked promotion of ceramic water purifiers, January to June 2012 (including financial report)

[10] Hydrologic, 2012: Proposed scale-up work plan microcredit-linked promotion of ceramic water purifiers, February to December 2012.

[11] Tara, Antenna, 2012: Provision of safe drinking water to bottom of the pyramid customers in India through enterprise mode using Antenna WATA. Fourth Progress Report, July to December 2011. Delhi.

[12] Varia, 2012: PTT Presentations of all project teams in the workshop for knowledge exchange in Bubaneshwar, October 2012.


**Internal documents**


[13] Amman, A. and Heierli, U., 2012: Marketing Research: Intermediary Report – Springhealth.

[14] Amman, A. and Heierli, U., 2012: Finding from a voice of the customer survey – final report.

[15] Antenna, 2010: Revised strategies – inputs on economical prospection and business models. Submitted to Pro Victimis.

[16] Antenna, 2010 ff.: Agreements with implementing partners (e.g. Hydrologics)

[17] Antenna, 2012: Guidance on the stability and best use of sodium hypochlorite produced on Wata devices.

[18] Galgani, P., 2012: Carbon finance for safe water projects. Paper for 300in6.

[19] Heierli, U. and Osborn, P., 2012: Going to scale with safe water – what changes are needed to remove the barriers to scale? Draft discussion paper for 300in6.

[20] Hydrologic, 2012: Clean Water Story Book – keep your family healthy.

[21] IDE, 2012: a draft strategy on free gifts.

[22] MSD Consulting, 2011: Field visit notes: Springhealth International safe water program in Orissa.

[23] MSD Consulting, 2012: A five year plan for WATASOL – reaching 70 million customer by 2017.

**Others**

[1] Cascade Design Inc., 2012: Electro-Chlorinator Development. PPT.

[2] Heierli, U., 2008: Marketing Safe Water Systems

[3] Lantagne, D., et al, 2011: Hypochlorite solution and stability in household water treatment in developing countries. Journal of environment engineering: 131-136.

[4] Pitteloud, E., 2012: Scaling up of water Asia – Mission note. SDC Water Initiatives.

[5] 300in6: Journal Upscale

[6] UNICEF, 2008: Promotion of household water treatment and safe storage in UNICEF WASH programmes

[7] WHO, 2011: Evaluating household water treatment options. Health-based targets and microbiological performance specifications.

# ANNEX 5

# SAFE WATER COMPONENT

## GENERAL

This annex summarizes the detailed results of the analysis of reports and results of the field visits.

The main conclusions are presented in **Chapter 4**.

## PARTNER, TECHNOLOGY

### Antenna Technologies

The implementation partner of the safe water component is Antenna Technologies, Geneva. The organization was founded by a group of scientists in 1989, committed to “research for development”. One of the founders (Denis von der Weid) is the director.

The organization recently (2010) changed from an Association to a Foundation. The administration has been strengthened. The change process also resulted in conflicts between different interests groups in the organization (research, distribution). These conflicts are, today, resolved.

It is reported that Antenna Technologies has stable funding sources, largely from rich and dedicated private donors (e.g. bankers). At present, three very experienced and dedicated people are involved in this Safe Water project.

Antenna Technologies understands itself as a network of “Antennas”. Beside Antenna Geneva, there are other Antennas (e.g. a research institute in Madurei, India), each of them represented in the Antenna Foundation, but acting relatively independently. Antenna Geneva supports these “Antennas” with capacity building, access to funding sources.

The organization has a culture of participation. Management is relatively loose. Collaborators are asked to take initiative. Volunteers play an important role.

Important topics such as patents for the technology which is developed or institutional relationships to donating organizations, are not always taken care of with the needed care.

### WATA-Technology, Product

WATA is a product of Antenna Technologies. It is an electro-chlorinator, allowing the production of sodium hypochlorite solution from salt water. The device has been developed by Antenna Technologies. It is relatively high-tech (production in Switzerland, using titan), but the application is simple and, therefore, appropriate technology.

Field and laboratory tests were carried out before launching of the product. Technical problems like corrosion in cables or deficiencies in the transformers, were resolved. Recently, the approach to granting of warranty to customers has also be changed: from 20,000 working

hours, to two years from purchase[39]. The first modality has been an error of Antenna Technologies. There is no means to control working hours.

There are no significant health or environmental risks related to this technology of chlorine production. Unhealthy emissions would be smelt before they can do harm. After successful pilots in Congo and Pakistan, the product is ready to go for scale.

Antenna Technologies also distributes chemical testing devices which allow to test (a) the chlorine content in the sodium hypochlorite solution which is produced, and (b) the residual chlorine in the water which is treated with chlorine. Both tests are important, to guarantee safe water.

Surprisingly recently (in March 2012), Antenna has started to address the problem of the stability of the sodium hypochlorite, produced by WATA devices[40]. While the production of the solution is easy, the stabilization of the solution requires laboratory skills and additional equipment (e.g. measurement of PH). Without stabilization, the sodium hypochlorite rapidly looses concentration (quality).

More technical details and information of competing products are presented in **Annex 7**. S similar device has been developed in the US for the use of military in 2003.

### Antenna's expectations from the project

Antenna Technologies closely collaborates with the main mentor and facilitator behind this program, Urs Heierli (MSD Consulting). The consultant has a lot of international connections and is an excellent networker.

Antenna Technologies expects that this collaboration will help it to develop and to document successful business models which will boost scaling-up of the WATA technology beyond the areas where it is already successful - mainly emergencies; cholera outbreaks.

Antenna Technologies reports to have sold till now around 2000 WATA devices. Most of them have been solid to disaster relief organizations. Around 120 Mini-WATA have been adsorbed by the different School Programs in Bolivia, Kenya and Haiti, and around 50 WATA in the Asia program.

According to the director, Antenna Technologies does not want to become a commercial organization. It is convinced that the WATA device will never become a commercial product.

Antenna is an NGO which sees its role is research and field-testing. Field-testing involves also the elaboration and testing of business models.

Antenna Technologies would like to see SDC more interested in research and development.

## DESIGN, PLANNING AND DEFINITION OF SCALING-UP TARGETS

The Safe water program has been planned in a relatively short time, taking advantage of various opportunities for funding, and building on requests from people and organizations (e.g. Caritas, CMES, ECCA) from different countries.

Later, the program evolved step by step. Spill-overs (Social Enterprises) of IDE - Hydrologic (Cambodia), Springhealth (India) – SANDEC and Helvetas-Intercooperation became partner of the program.

[39] Many of the products in the field still run on the old modality.
[40] See statement and instructions, 2012

The EVT finds it difficult to compile a table with targets and achievements. There is no document which provides an overview about all the targets. Achievements have to be analyzed at the basis of the individual reports of the implementation partners.

Here an attempt of the EVT, based on monitoring data and data from half-yearly reports of the partners:

| Project | Indicator | Target | Dec 2011 | July 2012 | % |
|---|---|---|---|---|---|
| CMES | No of villages | 30 | 30 | 20 | 66% |
| | No of persons reached | 8,000 | 6,211[41] | | 77% |
| Hydrologic | Direct Sales Q1/Q2 2012 | 8,007 | | 3,562 | 45% |
| | Direct Sales Total | 25,832 | | 8,408 | 34% |
| India - DA | No of slums | 10 | 11 | | 110% |
| | No of people (HHx5) | 25,000 | 7,500 | 18,940 | 76% |
| | No of flasks sold | | 1,500 | 3,788 | |
| India - Springhealth | No of persons served | 35,000 | 13,000 | | 38% |
| Nepal- ECCA | No of schools | 60[42] | 19 | | 32% |
| | Entrepreneurs | 5 | 4 | | 73% |
| | Persons reached | 100,000 | 73,750[43] | | 74% |
| NEPAL - VBSK | No of workers | 1,100 | 1,420 | | 127% |
| School program | No of schools | 100 | | 90 | 90% |
| | No of students reached | 50,000 | | 55,000 | 110% |

As can been seen from the table, the program has not yet lead to a break-through in terms of massive scaling up.

Data on sales figures is the most reliable indicator. It is provided by Hydrologic Social Enterprise (Cambodia), DA (India) and Springhealth (India).

## BUSINESS MODELS

The program tests a large variety of business models. The following table is an attempt to classify them.

| Product | Sub-Projects | Comment |
|---|---|---|
| Water filter | Cambodia (Hydrologic) | Water filters |
| Chlorine solution | Cambodia (small NGO) | Not a component of the SDC program |
| | India (DA, TARA) | Aqua+, bottles small size |
| | Nepal (ECCA) | WATASOL bottles small size<br>WATASOL liter bottles, for chlorination of tanks |

[41] dropping rapidly
[42] ECCA reports about a target of 20
[43] dropping rapidly

| | | |
|---|---|---|
| | Nepal: Pyrush | Not a component of the SDC program |
| Chlorinated water | Bangladesh (CMES) | Household visits; visits to restaurants; financed mainly by Caritas Switzerland |
| | India (Springhealth Ltd.) | Village kiosks; Sales of jerricans; franchising |
| | Nepal (VBSK) | Chlorination of tanks |

In the eyes of the EVT, it is quite a difference whether one tries to sell water filters, chlorine solution, or chlorinated water. Water filters or jerricans with chlorinated water are attractive, tangible products. Chlorine solution requires education of customers and may fall under national regulations for drugs and chemicals.

## PROGRESS IN BANGLADESH (CMES)

### Partner

The Center for Mass Education in Science (CMES) has been proposed by Caritas Switzerland as a business partner. It is a national NGO in Bangladesh which has been working over three decades. Its aim is to empower the disadvantaged people through an appropriate mass education and to take science and technology to them as a means of empowerment, also for income generation.

CMES is working in 22 different rural units in various regions in the country, serving more than 20,000 learners in rural schools. At present, CMES is highly dependent on SDC financing (Regional Cooperation). SCO Dhaka is discussing this issue with CMES management.

The SDC Safe Water program is working with three of these units, one in the North, and two in the Barisal province. The project is managed by a project coordinator. The Costal Belt appears to have favorable conditions for a safe water business as pond water is saline. This was the main criteria for selecting these areas.

### EVT Assessment of approaches, activities and results

The EVT visited the activities in Amtoli, Barisal. It held meetings with CMES management in a very collaborative and productive spirit.

**General:** The EVT has the general impression that CMES is very committed to social goals, to make a contribution to improving the situation of the poor. For this cause, it develops some professional capacity in a range of areas, e.g. solar energy, home gardening, sewing. It is not committed to one of these areas.

Household water treatment and safe storage has been added to this list when the opportunity to get funding from this project came up. Whether the NGO will maintain this focus also after phasing-out of SDC support.

All activities in this CMES component are entirely salary based. Apparently, the Chairman insisted on that, because CMES policy does not allow that water is sold to poor people. The collaborators (e.g. sales persons) receive a salary, and they report sales figures to CMES management. It is is not clear to the EVT how this income is later used.

Control of quality of these reports is of some concern, also for CMES management. Indicators are difficult to control (e.g. liters of water sold). Field offices report about increasing sales figures.

Caritas invested into workshops, aimed at streamlining the business approach. Pricings do not include costs of WATA tester or salt.

The EVT has some doubts whether CMES management considers the project really a good project. Collaborators express concerns about the complexity of chemical process (use of the WATA). CMES management is reluctant to sell water (reputational risks).

Chlorine tablets can be bought in village shops, bleach in rural towns. Like in the other countries, there is also in rural Bangladesh a competition from similar products for water purification.

**General process:** Chlorine is produced in the local school compounds of CMES by (former) CMES students (mostly women). So-called Service Providers (SP) get the solution and chlorinate the water in households. Service in restaurants or small shops is similar, but not done by the SP (household visits) but by Core Technicians (CT) at the district level.

The process of water purification is quite lengthy. Prior to the visit of the SP/CT, the customer has to collect water from the pond. The water has to be filtered, to remove turbidity. In the restaurant component, young woman are exposed to the public, when they do this procedure.

"We tell them to carry clean water. But nobody listens."

Quality control of water purification is a problem in this project. SP and CT are not necessarily well trained, to guarantee quality of water in all circumstances (e.g. dirty pond water). The EVT checked several measurements. The results are not convincing.

At best, families can share some of the activities (e.g. filtering of water from turbidity), before the SP arrives. The SP will have just to add the chlorine. Nevertheless, it is time consuming, and it is also not easy to explain to a family why this chlorine solution is needed. A chlorine tablet or bleach might also do the job.

**Household sales:** According to figures[44], sales have been increased from 1300 to 1800 households. CMES reports that the drop-out rate is virtually zero. These figures show that there is a market for clean water.

Each SP is expected to visit 27 families per day. The target is 7 liter per day for each family. Payment is in the range of BTK 1 for a service (10-15 minutes of work).

At present, this allows to generate an income of around BDT 650 per month, equal to around 18% of the salary which the SP receives presently from CMES (respectively SDC)[45]. This shows, that the pricing strategy is not sustainable. There is no incentive for the SP to increase sales.

The EVT has the impression that people would be significantly more willing to pay for clean water in jerricans[46]. Co-financing of a container up to 50% seems to be feasible. A jerrican in the house is a status symbol.

**Restaurants:** Small shops like to have a jerrican with clean water in their premises, to serve customers and friends a glass of water. They have no difficulty to pay BDT 10 for a jerrican (20 liters)[47] of clean water.

It is encouraging to see – and yet another sign of the demand – that restaurants ask SP to help them to chlorinate water. This side business can be more profitable for an SP than the household visits in which only petty cash can be made with the present strategy.

One of the visited restaurants displayed the jerrican with the safe water prominently. On each table, there was a small water carafe, apparently with unsafe water. This case shows that the

[44] reporting only
[45] around BDT 3,400, or USD 40.
[46] This was confirmed in a number of interviews.
[47] The jerrican itself costs BDT 600. It can be bought on the market in the provincial town (Barisal).

message that safe water for drinking is important to prevent diseases, has apparently not yet reached the restaurant owner.

**Sustainability:** Activities in Elaipur in the Northwest of Bangladesh have been discontinued. Sales dropped to about 20% within two months. This shows that the project is not sustainable. Yet it is not known, whether CMES collaborators eventually started new activities with the WATA devices.

**Financial:** 79% of the budget is used for salaries of field workers. There is a tendency for under-spending which might be an indication that the project is of relatively low priority for CMES.

### Targets/Achievements

CMES reports detailed data on sales. The EVT has doubts whether the quality of this data is really reliable.

Important targets for the sustainability of the business model (e.g. monthly income for SP) are not met.

| Indicator | Target | Achievement |
|---|---|---|
| Monthly income for Service provider | 2900 | 650 |
| No of villages | 30 | 20 |
| No of persons | 8000 | 6211 |

### Strong Points

The EVT observes the following strong points:

1. Experiences so far clearly show that the market for clean water is vibrant in Bangladesh. There is a lot of evidence that a business model like the one applied in Springhealth (India) would work.
2. CMES reaches the poor families.
3. Daily demonstrations in households and/or restaurants over a longer period of time have probably a high impact in the promotion of issues of hygiene, and the value of safe water.

### Weaknesses

The EVT observes the following weak points:

1. CMES has not a business attitude. It considers the SDC program as a project, in which targets have to be reached. It is not necessarily a learning organization[48]. CMES management is reluctant against a policy to sell water.
2. The business approach sets the wrong incentives: e.g. payment of salaries, independently of sales. There is no pricing strategy. Where paying of salaries was stopped, sales collapsed within a few months.
3. The team has difficulties to handle the WATA technology. Stabilization of the solution would be beyond the capacity in CMES schools.

[48] Relatively top-down; collaborators follow instructions.

4. Till now, the project has not defined its place in the context of competing products (e.g. bleach, chlorine tablets, bottled water, water filters).
5. There is no independent controlling of the quality of data in reports. This leaves some doubts about whether sales figures are correct or not.
6. With these and other limitations, the project fails till now to take advantage of the vibrant market for clean water in Bangladesh.

**Collaboration with SDC Regional Programs**

The SDC Country program would have offered plenty of opportunities for developing synergies. SCO could have opened doors to interesting projects and partners, with a potential for scaling-up.

Examples of SDC co-funded projects are: the DASCOH projects in Low Water Table areas, e.g. with DPHE tube well mechanics; Wateraid; WSP horizontal learning program (sharing best practices among Union Parishad Chairmen).

It will be difficult to establish links to such initiatives ex-post.

**Potential for Scaling-up**

In the eyes of the EVT, Bangladesh is an extremely dynamic market to make a business with safe water. Population density is high. Many families are keen to increase their social status. The situation is quite comparable with e.g. Cambodia.

CMES does not appear the right partner to benefit of this potential. It considers the SDC contribution rather as a project (with goals, targets, terminated) than an opportunity to establish a sustainable social business. CMES management does not leave the impression that it is convinced that this is a good project.

CMES identifies a problem on the demand side (“rural people do not want to pay for chlorinated water”). This conflicts with the many observations of the EVT that people are easily paying for jerricans of clean water. Small bottles of water (0.5 liter) can be bought in village shops for BDT 15. CMES itself reports that there is virtually no drop-out of customers, what also shows the demand.

In the eyes of the EVT, the experiences in Barisal show that it is not easy to convince rural and poor people about the role of hygiene and safe water. People will buy jerricans with safe water probably for status reasons, and not for health reasons. The approaches used in Cambodia (Ceramic Water Filters) or in India (Springhealth: jerricans with clean water) could be very successful in this context.

**Conclusions**

Unfortunately, an opportunity has been missed. Identification of the partner and design of the business models were deficient.

A new partner is needed, to reach the market.

Follow-up in the CMES program could eventually fit the envisaged global Blue School Program (to be further discussed).

Till now, business models have been designed purely as social activity, also to avoid problems with Government and regulators. These problems[49] are yet to be faced if the models want to be scaled-up.

## PROGRESS IN CAMBODIA (HYDROLOGIC, NGO)

### Partner

Implementing partner is a spill-over firm of IDE, Hydrologic Social Enterprise, Phnom Penh (www.hydrologichealth.com). The firm could build on significant investments of IDE – a ceramic filter factory. The idea of ceramic filters was introduced from Nicaragua.

The SDC program (Antenna Technologies) supports Hydrologic Social Enterprise with the following: support to social marketing; financial support to Direct Sales. Income from Carbon Financing is likely to leverage this engagement in the future.

The EVT is impressed about the professionalism of Hydrologic Social Enterprise. The capacity for production, marketing and sales, and distribution is optimized according to business criteria.

Hydrologic Social Enterprise actively participates in a Forum which was recently established by the Ministry of Health. In this Forum, major programs and around 20 NGOs meet regularly (monthly).

### EVT assessment of approaches, activities and results

Hydrologic uses and tests a large range of sales channels: (a) NGO sales (50% of the sales), (b) direct sales (20% of sales), and retail sales (30% of sales).

Hydrologic understands itself as social enterprise. In Cambodia, it has a tough competitor, the Cambodian Red Cross, which produces Ceramic Filters, but not at a cost basis. The fact that the wife of the Prime Minister is leading the Cambodian Red Cross, does not make the job of Hydrologic Social Enterprise easy.

**NGO Sales:** Hydrologic sells the cheaper model (USD 12.5) – but not the Super Tunsai – in large bulks to partners such as NGOs. These partners (e.g. Plan International), then, distribute the filters mostly free of cost.

It is realistic that a similar contract can soon be signed with the labor union of the garment workers in Cambodia, which has about 500,000 members. If this materializes, sales figures could boost.

**Direct Sales:** These activities are sponsored by the SDC program. At present, Hydrologic is active in the following provinces: Kampong, Takeo, Kardal, and Kampong Cham. The EVT visited customers and a village sale meeting in the fringe of Phnom Penh.

The process is well defined: Hydrologic Social Enterprise approaches the village chief with Clean Water Specialists (CWE). Together, they organized a village meeting (ca. 1 hour). An estimated 60% of the families attend, and an average 30% of the participating families finally buy a Super Tunsai water filter (USD 23.5).

Till now, 500 villages were covered by such meetings. This is impressive and corresponds to the target. The CWE receives a small monthly salary (USD 40), and the rest is provision

[49] In another case, CMES wanted to transform pilots of honey production into a business. Bribing of Central Government was needed to avoid that the chairman was put into jail.

(USD 1.5 per filter). He/she has, therefore, an active interest to sell as many Ceramic Water Filters as possible.

A key factor is the close collaboration with a micro-financing partner, in the case of Hydrologic: the Vision Fund of World Vision. Around 90% of the sales are financed by micro-credit. Till now, more than 7000 credits have been granted for water filters[50]. These credits are a good business. Repayment is over a 6 month period. The monthly interest rate is 2.8%.

According to Vision Fund Management, there are hardly any unsuccessful credits in this water filter line. Nevertheless, the collaboration between Hydrologic and Vision Fund is not without problems. Some Examples: (a) around 3 percent of the credits cause problems, e.g. because of dissatisfaction of the client with the filter. In August 2012, a hotline was established, receiving around 30 calls per months. (b) The Vision Fund officer depends on having the opportunity to visit at least two village meetings per day. This is not always guaranteed. (c) Vision Fund has offices in only four provinces of Cambodia.

Sales figures are impressive. TV spots are planned. Women CWE are exceptionally successful. To boost the sales model in whole Cambodia, there are the following alternatives: (a) Hydrologic has to find collaboration with other micro-financing organizations; (b) Vision Fund increases its geographic coverage. Both options are explored.

The EVT observes that this sales strategy is relative aggressive, gender-balanced (women are good salesmen). The typical client of Super Tunsai is a rural family which has a family member working in one of the Garment factory (monthly salary of around USD 100). Hydrologic argues that only the more expensive model (Super Tunsai; USD 23.5; 14 liter) finds a market in direct sales.

Hydrologic does not actively promote the cheaper model (USD 13.5; 9 liter). Reasons are: Vision fund gives no credit; cheap model is perceived as cheap product; competition from NGO donations; poor design of the cheaper model.

Interviews with customers show that the rural families like the Super Tunsai as a status symbol, also to please people who visit their homes. Many of these houses have concrete tanks in which rainwater is collected, often polluted by insects. As an alternative, there is also tubewell water.

The EVT doubts that the Super Tunsai is affordable for the very poor families. On the other hand, Vision Fund monitors the wealth status of its customers. Regarding Super Tunsai, it provides the following data: poorest (24%), poor (47%), not so poor (27%, not poor (2%)[51].

Customers are aware that the “heart of the product” – the Ceramic Filter – can be replaced anytime by buying such a in the local shop for USD 6.5. The supply chain seems to be working.

One of the limiting factor and problems for Hydrologic Social Enterprise is the high turn-over in CWE. The motivation of Vision Fund field staff appears also to be quite low. They are not interested to get more work from this filter business.

**Retail Sale:** At present, there are 16 sales agents who collaborate with 600 retailers such as household shops, pharmacies, etc. (retailers do not have a contract with Hydrologic).

At the moment, there is little progress in this sale channel. More promotion would be needed (e.g. commercials on TV) to catch the interest of retailers. The margins for the retail shops are also low.

In the shops which were visited, the products of Hydrologic face hard competition, e.g. from a Vietnamese filter set (Miropor) which more difficult in handling than the Super Tunsai, but costs only USD 12.50.

[50] Total Micro Credits: around 20,000. This means that around 35% of the credits are issued for purchase of water filters.
[51] In a relatively rich areas, close to Phnom Penh

**Targets/Achievements**

| Sale channel | Q1 2012 | Q2 2012 |
|---|---|---|
| CWP Direct Sales | 1169 | 2393 |
| CWP Retail Sales | 6092 | 4000 |
| CWP NGO Sales | 2343 | 5876 |
| **Total Sales Ceramic Filters** | **9604** | **12,269** |

Figures show that sales of Ceramic Filters are increasing from month to month. The SDC sponsored Direct Sales channel has a potential, but it has not yet reached the figures which were promised in the Agreement (2,933 filters per month).

**Strong Points**

The EVT observes the following strong points:

1. Hydrologic Social Enterprise applies a rigid business approach, allowing full cost recovery in the near future.
2. Ceramic filters are eligible for Carbon Financing, and Hydrologic Social Enterprise, as a solid business, will meet criteria. This will give Hydrologic Social Enterprise funds to cover high marketing costs in the near future.
3. In each sale channel, there is potential yet to be utilized.
4. Close collaboration with micro credit organizations in direct sales is positive. It helps to develop the market. There are also monitoring data available, indicating whether the products reach the BOP.
5. High capacity of Hydrologic Social Enterprise to address and to solve problems (technical, business) with high professionally.
6. Data from Vision Fund show that Hydrologic reaches also the poor.

**Weaknesses**

The EVT observes the following weak points:

1. Business rationality can but a bias: Hydrologic Social Enterprise might have an incentive to favor the middle income and the rich customers in the long run. This is not in the interest of SDC.

**Collaboration with a local NGO**

Antenna Technologies also loosely collaborates with a local NGO which produces chlorine with a WATA and sells it in rural areas close to Phnom Penh (37 sales persons). These experiences are not documented, and there is also no contract between the NGO and Antenna Technologies.

The fact that the chlorine is not stabilized, is a limitation. Another limitation is that sales of chlorine collapse during the rainy season, when rain water is easily available from rain water harvesting.

According to the NGO, the sales persons should become “rural change agents”, selling not only chlorine but also soap and other hygiene products. In the EVT, this has a certain potential which merit further exploration.

**Conclusions and potential for scaling-up**

Unlike competitors e.g. from the Cambodian Red Cross, the price of water filters from Hydrologic Social Services covers the full cost, including the administrative fees. Hydrologic Social Services offers sustainable business.

In this business, sustainable supply is of key importance. After two years, ceramic water filters tend to clog, and have to be replaced by a new one (USD 6.5). Hydrologic Social Services offers this service.

Despite Hydrologic’s management expressing words of caution, innovation and professionalism in business development is likely to make Hydrologic Social Enterprise successful. Some seed money will still be needed to reach break even[52]. This can come, in the near future, also from Carbon Financing[53].

At the moment, the SDC program finances a few activities only. Income from Carbon Financing might soon play a major role.

At present, sales are around 4000 per month (30% retail sale; 20% direct sale; 50% NGO sale). To reach break-even, sales need to be the double (8000 per months). This is a realistic target, considering the potential for collaboration with organizations with national coverage (e.g. union of garment workers) and for scaling-up of direct sales to other provinces.

Monthly meetings of the forum established by the Ministry of Health can be used to discuss also pricing issues, despite the political barriers[54]. Around 20 NGOs participate in these meetings.

More needs to be done to reach also the very poor customers with direct sales. This will be probably also be needed when Hydrologic wants to enter the poorer provinces of Cambodia with this sales channel.

Hydrologic Social Enterprise argues that more marketing (TV spots) needs to be done, to make the products and the concepts - in particular: the advantages of the Ceramic Filter- better known on the market. Seed money of donors can make a great difference. Income from carbon financing is likely to leverage this funding.

NGO sales competes the other sales channels (direct, retail) directly because NGOs distribute ceramic filters almost free of cost.

The business model which Hydrologic Social Enterprise offers is attractive and sustainable. It includes all the elements: sustainable supply; effective sales channels; quality control; sustainable technical solution.

[52] According to the HYSTRA study, there is not yet a profitable HWTS business on the world. Hydrologic Social Enterprise could be among the first which reach break even.
[53] Apparently, DHL is interested to enter into a contract with Hydrologic Social Enterprise.
[54] Cambodian Red Cross dumps the market.

## PROGRESS IN INDIA - DELHI (DA, TARA-Enviro)

### Partner

Over the past 25 years, Development Alternatives (DA) has evolved as a premier resource center for sustainable development. It is committed to disseminate know-how and maintains excellent relationships and programs all over India.

Technology and Action for Rural Advancement (TARA) is the business wing of DA. Within this context, TARA-Enviro has been recently established. TARA-Enviro will focus mainly on the promotion of approaches to safe water and clean environment (among others, chlorination of water, good programs in water testing: www.taraenviro.com

Within TARA, 12 persons are working for this project. TARA is convinced that safe water is a business in India.

### EVT assessment of approaches, activities and results

TARA works in a number of so-called regularized slums in Delhi, with the support of local NGOs which it pays for this project. Regularized slums means that residents have no land titles, but the right to access to water, waste management, and other public services. The residents have a right to live in these areas.

The EVT visited two slum areas and the TARA laboratory where Aqua+, the chlorine solution, is produced with WATA. It held discussions with TARA management and staff as well as with the NGO, which supports TARA in the slum areas of Delhi, and with customers, medical doctors and shop owners (vendors of AquaPlus).

Unfortunately, the NGO has briefed and prepared counterparts in the slums before our visit. All sales points had AquaPlus vials prominently displayed. All bottles showed the same date (27 september 2012). There is much evidence that they have been distributed and placed there the day before our visit[55].

**Background studies, definition of business models:** TARA has carried out detailed customer analysis and background studies in the selected slums. 394 households were interviewed. Based on this, three business models were developed: (a) TARA selling AquaPlus to local entrepreneurs; (b) local entrepreneurs producing and selling AquaPlus; (c) entrepreneurs selling purified water using AquaPlus.

Apparently, the problem of stabilization was not considered yet, similar to Nepal. In a context in which stabilization is needed, only business models (a) and (c) are viable. Whether WATA will be used for the mass production of AquaPlus in the future, might be re-considered by the very professional TARA laboratory. It could well be, that TARA will change to a simpler methodology, e.g. the one applied by ENPHO for PIYUSH

**Promotional material for social marketing:** TARA has designed professional promotional material (sticker, poster, vials). The EVT notes here a great professionalism.

Recently, it was decided to change the old to a new design (two drops). The EVT is not convinced that this was a good decision since the original brand was quite convincing (red cross as a symbol).

There is no doubt that the AquaPlus brand has the same high professional standard as e.g. PIYUSH in Nepal. 90% of the customers are satisfied with AquaPlus. 81% said that they discussed the water chlorination with friends. TARA is collaboratoring with highly professional design and marketing firms.

[55] Beside the new bottles, the EVT also found old bottles, close to expiry date. It is not logic that the shops buys new stock, when the old bottles are not yet sold.

**Slum program in Delhi:** TARA collaborates with an NGO which had already been involved in a SODIS project[56] of EAWAG. The EVT has the impression that this is not the optimal partner (see observations above). Business orientation is missing. Collaborators receive a salary from the project[57]. As mentioned, vials have been placed before our visits, to give the EVT the impression that the business models are working.

Medical doctors are involved as change agents. This is a good idea[58]. Doctors report that they treat daily around 3 patients with diarrhea. They recommend to them to drink chlorinated or treated water. Apparently, many such customers buy AquaPlus once, but they do not come back to fill the bottle. Many have already bought a Water Filter with micro-credit (INR 1000)[59].

Advertisement for AquaPlus could make a difference. Medical doctors and sales shops report that people do not know yet the product, and that this is a major reason why they do not buy it.

A customer was formerly using SODIS and is now using AquaPlus for the past 5-6 months. The family is poor and can not afford a water filter. Whether the family uses AquaPlus in the correct way, to have a real impact on killing bacteria, could not be verified by the EVT. Apparently, this is, however, another challenge.

Chlorination is a matter of trust. The city of Delhi and politicians are regularly sending a water tank truck to the area, to fill the local tank. Residents have the impression that this water is treated with chlorine. They see no need to re-chlorinate it. They also ask whether AquaPlus is certified by the Government.

Whether a sales person is successful, largely depends on personality and training. The EVT is not convinced that the NGO has the right mixture of people.

**TARA Laboratory:** TARA has a very professional laboratory. As a side activity, it produces AquaPlus with a WATA. Stabilization has been introduced just recently. The EVT is convinced that TARA will handle this problem professionally[60].

Chemists are concerned that AquaPlus is not conform with the Government of India guidelines for the concentration of hyperchlorite solutions. The Indian Bureau of Standards wants 4% concentration, but WATA can deliver only 0.6%.

Certification is needed for the scaling up[61]. Otherwise, there will be permanent problems with the Government. TARA Laboratory states that it will only buy a Maxi-WATA if this problem is resolved. Antenna Technologies sees an option to get a general certification which is, then, accepted by the national Bureaus of Standards. The EVT has the impression that this will be very time-consuming.

TARA further proposes that chlorine concentration is regularly monitored in home of customers and users. This quality control would be important when the AquaPlus program is upscaled. Here, synergies could be developed to the water testing programs of TARA-Enviro.

[56] The EVT saw only a few SODIS bottles during ist 1.5 hour visit to the slum. Reasons are difficult to list, but could be related also to the project set-up.
[57] INR 3000 per month (field staff)
[58] ORS is e.g. prominently displayed on all shelfs. Medical doctors use it daily 10-15 times.
[59] Shop keepers apparently give credit.
[60] Whether this will lead to changing the procedure (without WATA, like in PIYUSH) is an open question but not unlikely.
[61] TARA explains the procedure: (a) Tara fills an application; (b) Bureau of Standards will visit TARA laboratory and take samples; (c) if conform to standards, TARA will receive a certificate for one year.

**Targets/Achievements**

DA/TARA invested quite some time in studies, to define its business models. Field activities just started a few months ago.

| Indicator | Target | Achievement |
|---|---|---|
| No of slums | 10 | 11 |
| No of people | 25,000 | 7,500 |
| No of flasks sold | | 1,500 |

DA/TARA is presently expanding partnerships with powerful organizations in India which could significantly contribute to scale-up sales of AquaPlus. It has defined sales targets of 103,000 till March 2013[62].

**Strong Points**

The EVT observes the following weak points:

1. DA, TARA, and TARA-Enviro have a professional approach, and staff is dedicated: laboratory (centralized production), marketing, customer surveys.
2. DA has also a large network of organizations which can help in scaling-up of sales for AquaPlus.
3. There is a market for such a product in Rural India.

**Weaknesses**

The EVT observes the following weak points:

1. How to get certification from the India Bureau of Standards for AquaPlus is a problem and an uncertainty. TARA could here learn eventually a lot from ENPHO in Nepal. This could lead to the decision to abandon WATA technology and to adopt the procedure which applied by ENPHO.
2. Collaboration partners (NGO) in the slum areas are not yet convincing. The NGOs are paying salaries and have not a genuine interest to make successful business. New modalities have to be found (e.g. provision-based salaries).
3. The strategy how to reach customers at the BOP is not yet convincing.

**Conclusions and potential for Scaling-up**

Conditions for scaling-up of AquaPlus are ideal. What is now needed is marketing. Here, TARA could learn from the experiences of ENPHO (Nepal) in the launching of PIYUSH.

Salaries of sale promoters have to be provision-based.

A product like AquaPlus has to be produced in a central laboratory, and it has to be certified by the Indian Authorities. TARA has the production facility. Exchange of experiences with ENPHO (Nepal) might be of benefit for both sides.

Certification causes more problems. To elaborate a new standard will need time and willingness of Government authorities. The SDC project could assist to elaborate a “standard template” which can be used also in other countries.

[62] Looking at experiences of PIYRUSH in Nepal, this is not unrealistic. A lot of marketing will be needed.

Unilever will launch “Pure”, which combines flocculation and chlorination. This will be a high competition for AquaPlus.

## PROGRESS IN INDIA - ORISSA (SPRING HEALTH WATER PRIVATE LTD.)

### Partner

Spring Health Water Private Ltd. (in the following: Springhealth) was founded by Paul Pollak who succeeded to win a dedicated and highly professional team for the start-up of this firm – e.g. the CEO is a former manager of a franchising company for pre-paid phone cards in Rural India[63].

Springhealth has one mission: Selling of safe water. Monitoring of sales figures is rigid, on a daily basis (sales teams report per SMS to the manager).

The conditions for such Social Enterprises is good in India. Corporate Social Responsibility (CSR) is taking off since the companies can deduce these expenses from takes. Springhealth Social Enterprise is already negotiating with banks to get venture capital for its business.

### EVT assessment of approaches, activities and results

The EVT visited two villages (water kiosks) and discussed with sales managers, delivery boys, and customers.

**Business Model:** In each village, Springhealth identifies an entrepreneur who is willing to invest into the business (Water kiosk). The village entrepreneur receives a three-year franchising contract. He constructs the premises and receives from Springhealth a 1000 liter tank which is chlorinated daily, a pump, filters, and the plumbing work.

At present, Springhealth is active in 27 villages. Villages of less than 300 households are not viable for Springhealth. Around 100 villages would be needed to reach break-even and to become attractive for larger investors. Entrepreneurs are certainly the better off in the village. Good village entrepreneurs are key to make the business successful.

The village entrepreneurs deliver jerricans (jeerycans) of chlorinated water to customers in the village[64]. Springhealth has designed a special jerrican (branding) which the customers have to buy. Empty jerricans are collected and refilled.

Income from this business is devided between the entrepreneur (25 percent) and Springhealth. When the village entrepreneur reaches a target, he receives a 3000 liter tank, and income is split (50/50).

The business model is highly professional. Sales figure are steadily increasing. Unsatisfied customers can address complaints directly to the Springhealth sales manager. So far, This has not yet lead to the discontinuation of a franchising contract.

Technically and economically, the weak point of the business model are the costs for the home delivery. Water is available, and chlorination in-house would be possible. Delivery boys work mainly with tricycles – loads of 220 kg; for 6 hours. They are paid by the village entrepreneurs.

Management of a village water kiosk is often a side business. Often, women do the job. Income can be in the order of INR 300 per day or more.

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[63] Quote: „When I quit this job for Springhealth, my mother said: have you run our of your mind to give up such a good position.“

[64] E.g. around 600 jerricans per week.

There is no need to stabilize the chlorine, as the solution is used shortly after production with the WATA.

Springhealth operates in an area where (safe) tubewell water is available. Bleaching power can also be bought. Nevertheless, it succeeds to make business. Water in Springhealth jerricans is sold for INR 4 (10 liters), and this is much cheaper than bottled water. Customers like to offer visitors safe drinking water. Business boost in the dry season when many of the tubewells fall dry.

Springhealth organizes “water melas”, to mobilize the villages to drink safe water. This is very innovative. At such events, people can get their water tested by Springhealth people. The “water melas” succeed to mobilize the community, similar to door-to-door visits.

Village entrepreneurs argue that marketing should be more often and more aggressive, also using TV spots. In the eyes of the EVT, this makes sense.

The main risk for this business model is reputational. Chemically, there is not much difference of adding bleaching powder to water, and the water which Springhealth delivers. This has to be taken into account when designing marketing strategies.

**Targets/Achievements**

| Indicator | Target | Achievement |
|---|---|---|
| No of persons | 35,000 | 13,000 |
| No of water kiosks | | 27 |
| Average sales per kiosk | | 723 liters/day |
| Customer base | | > 3000 households |

Springhealth is confident that the business model can be replicated in other provinces with venture capital. The EVT shares this optimism.

**Strong Points**

The EVT observes the following weak points:

1. The business approach (top-down) is based on a lot of experience how to do business in rural India.
2. All elements (technical, chlorination, distribution, contracting of partners, complaints service) are highly professional.
3. The model defines clear rules for all partners.
4. CSR and venture capital is likely to be available if Springhealth can show more scale (around 100 villages needed).
5. Stabilization of chlorine solution is not needed.

**Weaknesses**

The EVT observes the following weak points:

1. The model needs very dedicated people, difficult to find in these remote areas. Management has to be top-down (daily monitoring of sales figures).

### Conclusions and potential for scaling-up

In the eyes of the EVT, this model has a high potential for scaling-up in densely populated rural areas like India, Bangladesh, Vietnam, Cambodia.

## PROGRESS IN NEPAL (ECCA, VBSK)

### Partner

The NGO Environmental Camps for Conservation Awareness (ECCA) is the main partner. It was founded by a number of dedicated partners in the mid 80-ties, with the mission to create nature clubs in schools, promoting conservation awareness. Today, ECCA has an Environmental Resource Center and is active with Nature Clubs in many schools all over Nepal.

In 2008, ECCA bought a number of WATAs, because it was convinced about the potential to use them for hygiene promotion and environmental education in schools. This was the start of this collaboration.

Beside Safe Water, ECCA has expertise in other areas. Examples are clean energy, gardening, rainwater harvesting.

Antenna Technologies collaborates with a second partner, the follow-up organization of the SDC funded brick kiln project (VBSK). This consulting firm – MinErgy initiatives – has a lot of know-how and excellent relationships to the construction and the brick kiln sector. It collaborates with 103 brick kilns (out of 700 in Nepal). At this stage, it does not receive funding from the SDC program.

### EVT assessment of approaches, activities and results

Similar to CMES in Bangladesh, ECCA has a social, and not a business mission. It considers the Safe Water project as a welcome opportunity to gain know-how in an area which could have a potential for its main partners, the Nature Clubs in the schools. Safe water is a project and not necessarily an opportunity to develop business.

**WATASOL production:** ECCA has a small laboratory and a team which is skilled to produce larger volumes of chlorine with WATA. It has started a branding process (WATASOL). Stabilization has only recently been identified as a problem. The EVT is confident that the problem can be handled by the team, but not without additional training.

Large bottles for entrepreneurs are produced in this laboratory. The Nature Clubs also produce WATASOL in each of the 19 schools, for the disinfection of the school water tank, and for filling of small WATASOL bottles.

The EVT has the impression that the ECCA team is not entirely convinced about the WATA approach. Doubts expressed are:

1. ECCA has bought 40 WATA, but it was not yet able to sell them to customers. It also gets the impression that these “older WATA models” had some technical problems. It is a little bit disappointed that Antenna Technologies does respond more pro-actively to its customers (ECCA).

2. WATASOL has important competitors, PIYUSH and Waterguard. PIYUSH is already well branded in Kathmandu valley[65]. Chemically, PIYUSH is more or less identical to (stabilized) WATASOL. It is produced centrally in a professional laboratory, ENPHO, which has a long collaboration with SANDEC.

   Apparently, ENPHO also used first a WATA, but found the production too complicated. It, then, shifted to another process (chemical; mixing imported bleach). The PIYUSH program received a lot of support from US NGOs like Plan International. Today, around 600,000 small bottles are sold per year. According to ENPHO management, the break even point is reached.

**WATASOL branding:** A lot of effort went into branding of WATASOL, almost a duplicate of PIYUSH. The EVT has the impression that PIYUSH is a much stronger, more convincing brand – aesthetics of designs, professionalism of customer information, message design, warrant. WATASOL looks like a cheaper product and cannot be found in local shops. Quality is not warrantied.

WATASOL is also marketed in larger bottles (1 liter). This seems to be successful, mainly to chlorinate tanks. PIYUSH will soon launch a 200 ml bottle in shops, apparently to better reachj families.

Certification of the product becomes an issue. PIYUSH is certified. It gives 18 months warranty, WATASOL only 6 months.

**ECCA Business models:** Business models of ECCA are: (a) Nature Clubs in schools produce WATASOL, disinfect the school tank, and sell WATASOL bottles to the community (pocket money for the Nature Club); (b) ECCA or entrepreneurs collaborating with ECCA, chlorinate tanks of customers, e.g. in urban slums.

The material costs for the small bottles (NPR 10 per bottle) are significant. ECCA also reports that, to develop a distribution network for WATASOL will be costly. "The beauty of the WATA device is that chlorine can be produced locally, for local use.[66]" At present, there are 76 Mini WATA and 10 Standard WATA in Nepal. ECCA has still 40 WATA on stock.

**School program:** The WATASOL program is active in 19 schools. The EVT visited two schools in Kathmandu, in better-off neighborhoods.

The EVT was impressed about the dedication of the Nature Clubs[67] which handle the program and produce chlorine in the schools. The other students use the service, but are not directly involved. In some schools, the program is handled by the teachers and not by the students.

Power cuts cause problems for WATASOL production. Each day, 100 ml chlorine has to be added to the tanks. The Nature Clubs also produce un-stabilized chlorine bottles for local customers. In some of the schools, it started to collaborate with sales agents who receive a basic salary (NPR 1000) and sell chlorine to the community.

Though "customers are difficult to convince", this seams to be a profitable business. This might be the reason why the teachers take the lead in some of the schools in this program. In one of the schools visited, only two members of the Nature Club seemed to be familiar with the procedure to produce WATASOL.

ECCA has an MOU with each of the schools. The school is the owner of the WATA, and income is split as follows: 30% production costs; 30% for sales persons; 30% for the Nature Club. This is a fair distribution.

[65] Pyrush can be bought in most pharmacies. The shops which the EVT visited report that they sell around 3 bottles per day.
[66] Without stabilization: use within 24 hours.
[67] In one of the schools, 30% of the students are in the Nature Club.

The program has apparently effects. It is a source for fund generation for the Nature Clubs[68], the prime partner of ECCA. Some schools have reported decrease of absentees in schools due to sickness. In a few cases, WATASOL bottles were stolen in the schools, to inform parents about the benefits of chlorinated water[69].

The EVT sees these activities very positively, for long-term capacity building. As the chlorine is not stabilized, it should be used for the disinfection of the school water tank only. Filling in bottles and selling them is probably not a good idea as the chlorine will rapidly loose concentration.

In Nepal, there are 350 schools with a Nature Club. There is, therefore, quite a potential for the scaling-up of a smart school program in Nepal.

Whether WATA is the ideal device for these school activities can be debated. The Cascade device (see Annex 7) is simpler to use and produces smaller volumes of chlorine (200 ml). This should be considered when defining the future strategy.

**Chlorination of tanks:** ECCA collaborates with entrepreneurs who use 50-60 liters of WATASOL for the disinfection of tanks in four urban slums in Kathmandu. The large bottles are sold for NPR 50. ECCA presently collaborates with three entrepreneurs in Kathmandu and with one in Eastern Nepal.

In this model it is the service of the entrepreneur which counts. He/she or his/her collaborators and contact persons personally do the service (chlorination of the tank).

Monitoring of the work done in slums is weak. Some of the tanks in the visited slums are broken. More care is needed to chlorinate the tanks correctly. The EVT observed that the chlorine was added at the end instead of at the beginning of the filling of the water tank. The result is clear: all chlorine went into the overflow.

The EVT also learned new opportunities, the chlorination of water tanks in small Mineral Water Companies around Kathmandu[70]. The owner of the company treats the water with UV. But as he has to comply with Government regulations (water is regularly tested in laboratory), he prefers to chlorinate as well. Apparently, he tried bleach, but this blocked the machine.

If 2-3 such companies follow, students of the ECCA family can make a good business[71]. This creates enthusiasm and is a good starting point.

**Community Groups:** The EVT visited a women's group who runs a soap production workshop in village close to Kathmandu. The group now also produces WATASOL. Stabilization is not realistic. Production started recently and is at a very low level. 10 women participated in a two day training.

The women find it difficult to sell chlorine, since people do apparently not like the smell.

**VSKB Business models:** VBSK has concentrated on how to serve the temporary communities of brick kilns of in construction sites, in collaboration with the community and with the brick kiln owners.

The EVT sees a lot of potential in these activities, particularly if the program succeeds to convince Government to pass regulation which forces brick kiln and construction site managers to provide clean water to workers. This seems to be realistic.

"Pride is the carrot. Regulation is the stick".

There are an estimated 48,000 migrant workers in Nepal. This will definitively be a market, particularly if the program succeeds to collaborate with water tank truck operators who pro-

[68] Example: NPR 1,000 in the cash box in one of the Nature Clubs.
[69] Quite positive
[70] Selling Jerricans and bottled water, with Government certificate
[71] 50-60 liter WATASOL per month per company, each of them for NPR 50.

vide the water to the construction sites. Migrant workers will spread the messages in their villages.

**ENPHO:** ECCA has not yet started to collaborate actively with its competitor, ENPHO, a laboratory, producing PIYUSH. ENPHO has a long collaboration with SANDEC and works with a range of options for household water treatment: e.g. bio-sand-filters, Ceramic filters, SODIS, chlorination. PIYUSH (bleach, mixed with hypochlorite) is on the market since 2004. Presently, PIYUSH is produced by a team of two persons[72]. A Ceramic filter is locally produced and sold for NPR 500.

ENPHO is convinced that more social marketing is needed to reach the poor. Here, it would have a strong interest to collaborate with the SDC program.

ENPHO worked tested the WATA, but found it too complicated. But recently, it was approached by a donor from Czech Republic which wants to support small towns in Nepal to chlorinate drinking water. Apparently, electro-chlorinator technology is high on the agenda of this donor. This could be a good entry point for Antenna Technologies to start a collaboration with ENPHO.

**Other plans:** Helvetas does not yet collaborate with the program. It has good contacts to village WASH coordination groups in four Districts of rural Nepal (Mid Western). Some of them face water scarcity.

The role of these committees is described in the National Water Supply Plan. Chlorination of water reservoirs in remote valleys is a problem to which WATA could be an answer. Contacts to the National Wash Committee are excellent. Helvetas is member of National and Regional Committees.

Rural water supply systems often have difficulties to collect revenue for operation and maintenance. On average, committees collect NPR 400 to 4000 per month, 10 to 50 NPR from each family. This is very low. It is questionable whether additional costs for chlorination will be accepted.

### Targets, achievements

In terms of physical targets, achievements are good but not overwhelmingly impressive. More would have to be done to achieve a scaling-up effect. ECCA has the potential to reach many more Nature Clubs in the country.

Data on persons reached is not reliable.

| Indicator | Target | Achievement |
|---|---|---|
| No of schools | 60 | 19 |
| Entrepreneurs | 5 | 4 |
| Persons reached | 100,000 | 73,750 |

### Assessment by the ECCA Team

The EVT asked the ECCA team to assess its own program. During the meeting, each collaborator wrote his points on a sheet which was afterwards handed over to the EVT.

[72] High seasonal fluctuations in demand for Piyush are reported.

| Question | Answers by ECCA staff |
|---|---|
| What do you like about the WATA project? | The project shows the value of safe drinking water. Technology fits in context of Nepal. It is important for human beings. The project is a social service. It empowers the community. People have more knowledge about safe water. Students learn about science. People get the concept of safe drinking water. Technology is easy to use. Multiple use of WATASOL. Efficiency of WATASOL. Makes Nature Clubs in Clubs sustainable. Local production. |
| On a scale 1-10, how confident are you that WATASOL can be a profitable business in 3-4 years? | 5 / 10 / 7 / 5 / 6 / 6 |
| What do you need to see that you could give a higher number? | More sale figure. Standardization of the product. Better geographic coverage. Good and more promotion. More advertisement in TV and radio for WATASOL. WATASOL should be easy available in shops. Intensify social mobilization. Advertisement in Nepali. WATASOL ambassador. |
| What do you need from SDC to achieve this? | Support to marketing (remote areas). Funding of promotion. Support to promotion in different parts of Nepal. Better technical inputs and back-up. Support for campaigns. Funding of promotion. |

**Strong Points**

The EVT observes the following strong points:

1. ECCA and Nature Clubs are a solid basis for the development of a nation-wide school program (Blue School). A smart program would include the following changes: Cascade instead of WATA; no more selling of bottles with un-stabilized chlorine.
2. WATASOL (un-stabilized) can be used to chlorinate water tanks, as a direct service. There are successful approaches (also in India-Springhealth). The concept is to sell chlorination of water (or chlorinated water).
3. ECCA has a professional team which can manage also the stabilization process. It can be a competent partner in a national or regional dialog or program, together with ENPHO or TARA (Delhi).
4. VBSK and Helvetas are interested partners for the future. They offer opportunities for new business models: e.g. chlorinated water on construction sites; chlorination of reservoirs. In the case of VBSK, the program can build on already tested business models. To be successful it would be important, that national regulation is passed.
5. ENPHO could be an ideal partner for a national safe water program.

**Weaknesses**

The EVT observes the following weak points:

1. Whether ECCA is an interested partner apart from the school program, needs more discussion.

2. The partners of ECCA are the Nature Clubs. Whether the school program reaches also the other students, is debatable.
3. To promote and to sell un-stabilized WATASOL to customers is not a good strategy. This is not the mistake of ECCA, but rather of Antenna Technologies[73].
4. The leading player, ENPHO, which produces PIYUSH is not yet part of the this program in Nepal.
5. Monitoring and communication in the slum component is poor (outdated posters). Chlorination of tasks was also found deficient.

**Conclusions and potential for scaling-up**

The EVT sees some evidence that ECCA is not fully convinced about the project (see also self-assessment above).

Apparently, the information that WATASOL is similar to a "bleach solution" was new to ECCA. ECCA has difficulties to sell the 40 WATAs in their stock. The stabilization issue has put the strategy to sell WATASOL through schools, at stake. WATASOL bottles and communication material need to be redesigned. To invest into a WATASOL marketing campaign does not make really sense.

This is an immediate problem. Partners who started to sell WATASOL need to be informed. There are WATA on stock.

More forward- looking, the new situation could help to consolidate the strategy of the SDC program in Nepal:

1. The school program has a good potential, also for larger replication in Nepal. The Nature Clubs are a strong organization, with national outreach. WATASOL (un-stabilized) could remain to be the self-made brand of schools. Stabilization is not needed.
2. Developing WATASOL as a parallel commercial (stabilized) brand to PIYUSH with ODA funding does not make a lot of sense. Rather, the strategy should be to collaborate with ENPHO and PIYUSH, exploring new business opportunities.
3. In case that ENPHO does not want to collaborate, the also well designed brand of Tara (India, Delhi) – AquaPlus - could be copied – with technical support from the Tara Laboratory in Delhi in stabilization (regular quality control).
4. Certainly, a business challenge would be how to reach remote areas in Nepal, where e.g. many small reservoirs have to be chlorinated. How to respond to needs of brick kilns and construction sites is another interesting challenge. Helvetas and MinErgy are interested to collaborate.

To summarize, both product lines – un-stabilized, stabilized chlorine solutions – could play a role, depending on the specific needs. Un-stabilized chlorine can be used to develop a chlorination service (see also Springhealth, India).

The idea that local entrepreneurs produce their own chlorine (un-stabilized) for the local market (e.g. chlorination of tanks, reservoirs) is still not tested. In the eyes of the EVT, it should be tested. It has a potential in Nepal. ECCA could be asked to give training courses for interested entrepreneurs.

Considering that there are stakeholders with experience and interest in HWTS (e.g. ECCA, ENPHO, VBSK, Helvetas, UNICEF), the option that a national platform for HTWS is established, is realistic. Such a platform could lead to a more orchestrated approach.

[73] As seen in Annex 7, the problem of stabilization was underestimated by Antenna Technologies.

Steps in the process 2013 could be:

1. Kick-off workshop: who is doing what? What needs to be done? What works? TOR for a study.
2. Workshop, to discuss the results of the study. Goal: get commitment.
3. Piloting of additional activities.
4. Document, to ensure supply, financing.

**POTENTIAL OF THE BUSINESS MODELS**

| **Product** | **Sub-Projects** | **Assessment** |
|---|---|---|
| Water filter | Cambodia (Hydrologic) | High potential for scaling up |
| Chlorine Solution | Cambodia (small NGO) | Small bottles: not stabilized<br>Distribution through "rural sales persons" can have a potential |
| | India (DA, TARA) | AquaPlus a similar potential as PIYUSH.<br>TARA-Enviro Ltd. has a good laboratory in Delhi. Question whether the same formula and process as in PIYUSH could be applied instead of WATA chlorinator, needs discussion. |
| | Nepal (ECCA) | Small bottles: Direct competition with PIYUSH which is a national brand. But does this make sense?<br>WATASOL one liter bottles: higher demand. If bottles are used as service to chlorinate water (see below; e.g. in schools), stabilization is not necessarily needed. |
| | Nepal: PIYUSH | Not a component of the SDC project. Produced b mixing of bleach with other substances and clean water.<br>Successful in Kathmandu Valley. Central production in a laboratory (ENPHO). Bleach imported. Quality brand. Well known, because marketing campaigns.<br>Collaboration with PIYUSH to serve the remote areas of Nepal could be an option. |
| Chlorinated water | Bangladesh (CMES) | Local production of Chlorine in a school. Household visits.<br>Little potential in household visits.<br>Restaurant program could definitively profit from the Springhealth approach.<br>Business partner needed to make the approach work. |

| | | |
|---|---|---|
| | India (Springhealth) | High potential for scaling-up.<br>Can attract venture capital once minimal size is reached. |
| | Nepal (VBSK) | Chlorination of tanks as a service.<br>Strong potential, if brick kiln owners or construction site managers will be forced by law or regulation to deliver clean water to workers.<br>Delivery channel eventually similar as in the slums. |

General conclusions:

1. Selling of a tangible product (water in a jerrican, Ceramic water filter) or of a service (regular chlorination of tanks just in time) is easy.
2. Selling of chlorine is more difficult and needs trust of the customer, developed by intensive marketing campaigns (e.g. PIYUSH in Nepal).

## SCHOOL PROGRAM

### Project Development

Based on the successful experiences of the ECCA School Program, Antenna (with support of MSD Consulting) developed new partnerships with Helvetas (Haiti) and EAWAG-SANDEC (Bolivia, Kenya). Decisions about the component are taken jointly among all partners. The partnership is reported to be a success and inspiring.

### Achievements, results of the pilots

Like in Nepal (ECCA), investments into these activities can proof to be quite successful. To some extent, schools become hotspots and change agents for behavioral change, needed to develop a market for hygiene and safe water. The transformation of a society, to pay more attention to hygiene, safe water, and sanitation is likely to last a generation.

**Bolivia:** The program in Bolivia (SANDEC) is active in 108 schools, already reaching 60,000 students. An innovative manual has been produced. Events and roadshows have proven to be quite effective. More than 2000 parents have been oriented.

SANDEC could build on the good relationship to the Vice Minister of Environment and Water and its long collaboration in the context of SODIS projects. Apparently, the project can be soon handed over to the local authorities.

According to SANDEC, the schools in Bolivia are very receptive to this program. How to reach the broader community is still an issue. Apparently, meetings with parents, awareness raising events in the community, home taking messages etc. are not sufficient to mobilize the communities. Additional activities and collaboration with health services are needed.

**Kenya:** Some activities have started. Events and roadshows were effective. Very positively, the participating schools in Kenya invested in wash infrastructure (20 liter tanks for each class room).

**Haiti** (Helvetas): The start of the activities was delayed, due to the late start of the school year. Activities just started recently (September 2012).

### Where does the program stand

Till now, the school program consists mainly of pilots in different countries. All of them show the potential of the approach. The next step is to develop a more formal community of practice among the different actors in this school program.

The focus on the pillars (a) infrastructure (tanks), (b) capacity building, (c) using the schools as a hotspot to communicate messages for behavioral change, and (d) integrating the topic of hygiene in biology and chemistry teaching, is considered a success. Elements of sanitation and hand washing could be included as well.

In this respect, and in the eyes of the EVT, achievements and lessons learnt in this program provide an excellent basis for the development of the global Blue School program, presently discussed in SDC Water Initiatives. The program could build on successful pilots on all continents - Bolivia, Nepal (ECCA), Kenya, and Haiti. A global community of practice should be developed.

### Lessons learnt (e.g. for Blue School)

Results of this program provide an excellent basis for the launching of a global Blue School program (see above).

The idea that schools could become production centers for chlorine, was not realistic. Limiting factors are: how to ensure chlorine production during holidays; lack of professional skills to stabilize the chlorine.

Parents meetings, awareness raising events in schools etc. are not sufficient to mobilize the community. Among other, the initiatives have to be linked to Local Authorities, local health posts (Ministry of Health)[74].

To be sustainable, schools need WASH management. This needs a step towards institutionalization, e.g. with the Local Government, the Ministry of Education, or the Ministry of Health. Furthermore, it needs instruments and some means for planning, implementation and monitoring of WASH activities.

## CONTRIBUTION OF 300in6 TO THE PROGRAM

### Origin

At the 5th World Water Conference in Istanbul (2009) many felt that safe water did not receive the needed attention. At the Bottom of the Pyramid (BOP, an estimated number of 40 million people were using new household water treatment systems such as chlorine, SODIS or filters. In business-as-usual scenarios, this would have grown to 150 million by 2015.

300in6 was founded to double this growth to 300 million people. The core group of 300in6 was formed, with professionals from the Dutch NGO Aqua for all, Antenna, and others. It received seed money from various sources, though it is not a membership organization.

[74] In ECCA Nepal e.g., this relation is still quite loose.

### Results

Main achievements are: presentation in Stockholm Water Week 2011; regular meetings of the team; journal Upscale (two editions till now); studies; communication material such as videos; a number of interesting conceptual papers.

Till now, 300in6 has not yet become movement on which major players like UNICEF, WHO etc., with the capacity to make a difference, embarked. It has relatively little capacity to achieve that the messages reach others.

Compared to HWTS, 300in6 is a rather small initiative. It can be characterized as a think tank. Recently, it produced an interesting study on the potential for carbon financing in the water sector. It also participated in the international HYSTRA study which analyzed successful business models for scaling-up.

The paper on the main barriers to successful scaling-up provides an excellent analysis. Barriers are: affordability, profitability, market distortions, demand, regulation, misunderstanding money, etc. With the video “Delivering Desire”, 300in6 intends to communicate this message to a broader audience.

### National Platforms

With the exception of Cambodia and Malawi, the EVT was not aware that national platforms are already active. These platforms would be needed, to give HWTS a higher status, to discuss pricing issues, etc.

300in6 raised the issue at the Annual Conference of the HWTS-N in October 2012.

### Analysis

To give household water treatment and safe storage a voice and advocacy in policy, platforms like 300in6 are important. At the household level, it is decided whether clean water makes a difference in terms of health impact.

The most prominent voice is the Household Water Treatment and Safe Storage Network (HWTS) of WHO and UNICEF. This network comprises around 165 member organizations. 300in6, Antenna or IDE Nepal are members, Hydrologic or Springhealth, other partners of this component, are not.

The new funding proposal[75] of the HTWS asks for approximately 1.5 million USD per year. Activities are e.g. production of scientific evidence; promotion materials; support to national initiatives; national advocacy events; studies. An estimated average of 30% of the budget is for staffing in WHO and UNICEF.

The HWTS network could make a difference e.g. in encouraging Governments to elaborate standards for the certification of chlorine solution like AquaPlus (India). These are important bottlenecks where time-consuming follow-up is needed.

300in6 does not give the impression that it has time and resources to make such technical follow-up. It is more a facilitator of the market approach. To strengthen the link between the HTWS and 300in6 should, therefore, be discussed. 300in6 could become the leader of a thematic group on scaling-up and new financing mechanisms.

The author of the study on Carbon Financing sees 300in6 as a pioneer. In 2011, there has been only one organization be interested in this topic (lifestraw). In June 2012, there were 10 projects. In September 2012, there are already 20 projects (e.g. Kenya, South America). 300in6 appears to be among the first organizations from the water sector who embarked on this topic. Organizations like Wateraid are not yet active in this topic.

[75] WHO, UNICEF, 2011

Similar, 300in6 can make a difference in mobilizing venture capital for successful business models. Apparently, this is already the case in Springhealth (India).,

300in6 is aware of all these opportunities: micro finance, insurance finance, internet fundraising, carbon finance, capital venturists, new methods (e.g. mobile phone payments, data collection and reporting through smart phones).

There is hope that more will be heard about 300in6 – hopefully in pragmatic support to keep the HWTS agendas moving in Bangladesh, Cambodia, India, and Nepal.

# ANNEX 6

# TECHNICAL BACKGROUND SAFE WATER

## TECHNICAL INPUT ENVIR'EAU

Quand j'ai pris connaissance la première fois du produit et de ses descriptions sur le site Internet d'Antenna, ma première réaction a été de me dire que le problème de la stabilité générale du chlore dans la solution concentrée potable n'avait pas été suffisamment considéré dans la documentation WATA. Effectivement, plus tard Antenna a approté des compléments à ses procédures.

En tout premier il faut savoir que chaque eau réagit de manière différente, et que dans les conditions qui peuvent être celles des pays où le WATA est appliqué, dans bien des cas la qualité de l'eau (organique et chimique) utilisée pour la production de l'eau de Javel ne permet pas une stabilité du chlore à moyen ou long terme dans la solution concentrée. Je recommanderais vivement de n'utiliser qu'une eau pure (pas seulement claire comme indiquée dans la documentation WATA [MANUEL WATA] pour la production de Javel. Les responsables de la production d'eau de Javel doivent tester la qualité de l'eau pure, en vérifiant sa stabilité au chlore libre. Une fois qu'ils ont trouvé la bonne eau de process (test WataBlue après une demie heure le résultat doit être soit bleu clair ou encore mieux bleu foncé), ils doivent toujours utiliser celle-là. Certes l'ajout de NaOH amène une amélioration de la stabilité qui doit être finalement contrôlée avec des procédures relativement compliquées ; mais est-ce qu'on doit nécessairement produire de l'eau de javel en quantité et la stocker pour plusieurs mois ? Je pense qu'il serait préférable de réduire la production et le temps de stockage à des quantités et durées sûres. Le « Manuel-Chloration-desinfection.pdf » sur le site Antenna recommande : La concentration de chlore diminue avec le temps en fonction des conditions de stockage. **Il est recommandé d'utiliser le chlore actif dans les 24h suivant sa production et de régulièrement contrôler sa concentration avec le WataTest**. Cependant les tests effectués par Richard et Duvernay visent des stabilités beaucoup plus longues. Le prix à payer pour celles-ci est un contrôle très fréquent et compliqué. Il me semble que si l'eau qui sert à la production de l'eau de Javel est bien choisie, on doit pouvoir obtenir une solution concentrée stable sur plusieurs semaines, en voyant les résultats des travaux Richard et Duvernay. En résumé, utiliser une bonne eau en la sélectionnant avec des tests et utiliser toujours la même eau, réduire le stockage avec une marge de sécurité par rapport au point de fléchissement de la stabilité (p.ex. point de fléchissement 100 jours, pratiquer 20 jours de stockage maximum), cette procédure permettrait de se passer de tests compliqués fréquents pour assurer la qualité de l'eau de Javel.

J'ai essayé de trouver des simplifications dans les procédures, mais je suis désolé je n'en ai pas trouvées. Alors ou bien on produit plus souvent des petites quantités, oubien on investit dans des contrôles de laboratoire. Pour chaque cas il faut évaluer la situation.

L'autre aspect, primordial à mes yeux est d'obtenir une concentration de chlore libre stable dans l'eau potable. L'obtention de la concentration de chlore libre nécessaire est dépendante de la consommation de chlore par les impuretés organiques de l'eau à traiter. Je connais bien des cas où ce problème est dramatique. Le seul moyen de connaître le dosage approprié est de procéder à des tests de Breakpoint (Please see http://water.me.vccs.edu/concepts/chlorchemistry.html ). La seule désinfection efficace est celle réalisée avec un résiduel de chlore libre, stable, donc au-delà du Breakpoint, il faut donc absolument déterminer ce Breakpoint pour les eaux à désinfecter, de manière à dépasser ce point. Le test WataBlue semble être approprié pour la majorité des cas. Pour une

bonne désinfection en cas de forte contamination fécale, je recommanderais cependant une plus longue durée de test, p.ex. 1 heure au lieu d'une demie heure, avant de déclarer l'eau potable (see attached publication CHLORINE INFORMATION PAPER).

J'espérais pouvoir simplifier la procédure de contrôle pour la stabilité du chlore dans l'eau de Javel produite. Je n'y suis pas arrivé. Mais si l'on fait attention à la qualité de l'eau pure servant à la production d'eau de Javel, je suis sûr qu'on peut obtenir de bonnes conditions de stabilité que devraient conduire à une réduction des contrôles nécessaires, surtout si on connaît bien cette eau pure.

J'espère que cela pourra t'être utile.

Cordiales salutations

**Jean-Louis Walther**
Expert, Ing. Rural Dipl. ETHZ

**ENVIReau**
Sur la Côte 216
CH-2905 Courtedoux

## INFORMATION ON CASCADE DEVICE

**CASCADE:** The CASCADE Electro-Chlorinator was developed in 2009 in a CalPoly Senior Design Project. Cascade Designs Inc. (CDI) itself has 35 years of experience in developing innovative commercial and military products. It ius located in Seattle, the center for global health initiatives (Gates Foundation, PATH, World Vision).


CDI claims to have over 35% share of the outdoor water purification market. It is providing lab and technical support to PATH's Safe water efforts. The SE200 Electro-Chlorinator is developed with ODA assistance in Africa.

CDI launched a first water purifier to the outdoor market in November 2003. It became the number one selling purifier in its first year on the market. Support from PATH and the Lemelson Foundation enabled CDI to adapt the technology for developing world applications.

The wholesale cost of the SE200 model is USD 100. Compared to WATA of Antenna it has the advantage that handling is simpler.

**PATH:** A strong partner Cascade is PATH, a globally operating NGO which intends to transform global health through innovation. The NGO takes an entrepreneurial approach to developing and delivering high-impact, low-cost solutions, from vaccines and devices to collaborative programs with communities. It has also special know-how in advocacy.

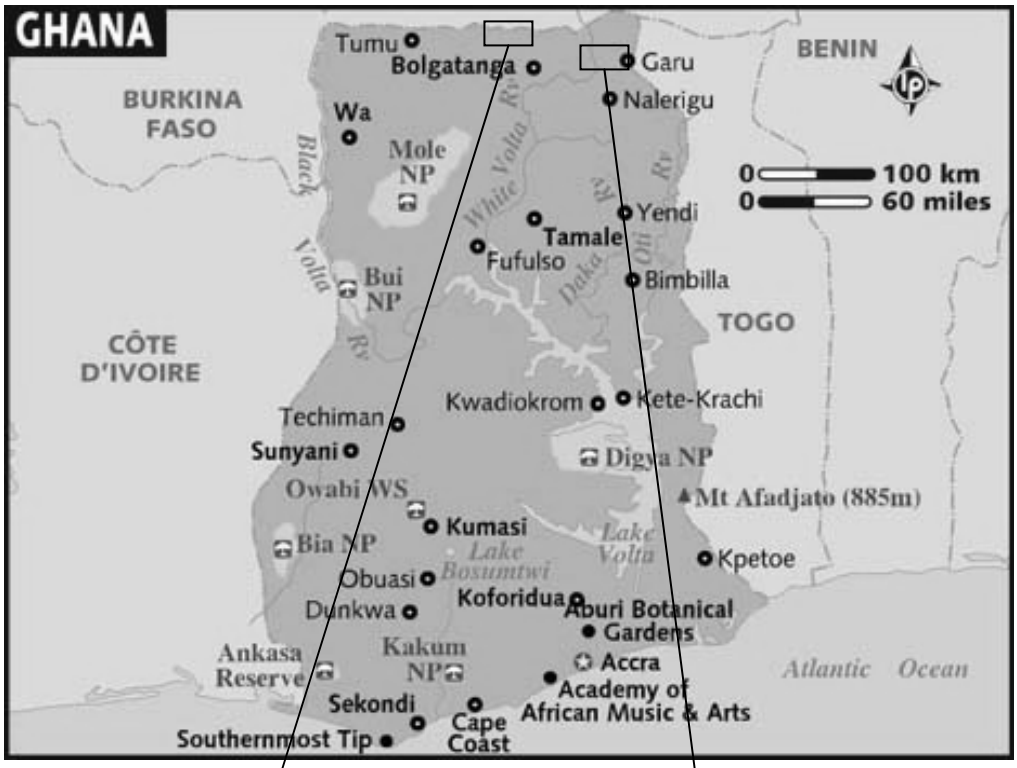
The revenue of PATH is USD 280 million, 13 % of it used for health technologies.

# ANNEX 7

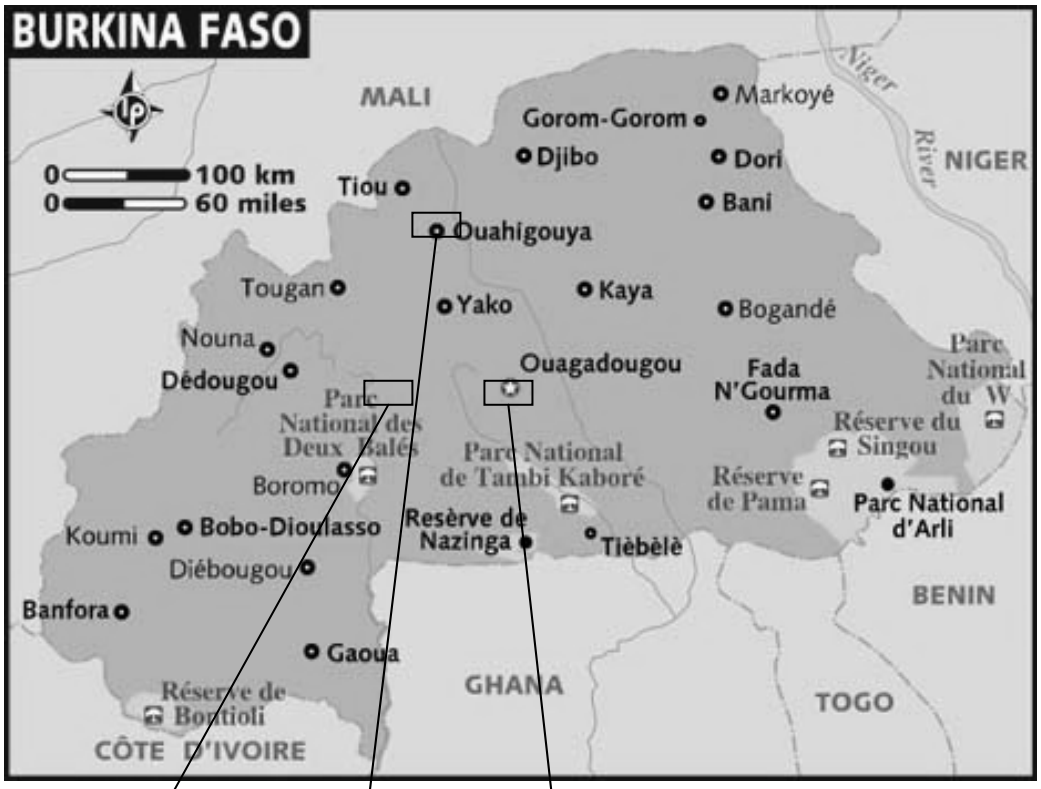
## PROJECT AREAS VISITED – PRODUCTIVE WATER


Fundación Agrolíbano / CARE  Zamorano University  Talanga


Estelí  Managua  Rivas  Terabona ´  Sébaco  UCA San Ramón




Paga Garu




Réo / Koudougou Ouahigouya Ouagadougou / Koubri

# ANNEX 8

## SUMMARY MATRIX PER COUNTRY – PRODUCTIVE WATER

Most **positive aspects** in the different countries, regarding the different

| Country | Products and Technologies | Services | Supply – Markets and Production | Partners and Clients |
|---|---|---|---|---|
| Nicaragua | Local products well appreciated by the clients in the region | Very well functioning alliance with agronomic projects and initiatives (PROMIPAC) | Local production of most parts of the irrigation system<br>Producers and cooperatives as retailers | |
| Honduras | Technology center in ZAMORANO school is excellent | Very well functioning alliance with agronomic projects and initiatives (PROMIPAC and Zamorano)<br>Great number of technicians in the field | | Very diversified clients<br>From national governmental entities (INA), international dev. Organisations (GIZ, CARE, FAO), private sector (Agrolíbano, COOP) and educational institutions |
| Burkina Faso | | | Network of retailers very decentralised and organised | Good diversity of clients |
| Ghana | Technicians do not link their services with IDE products | Well developed relations with the finance sector | Local production of treadle pumps | Target group of final clients – poor small holder farmers – very well identified |

**Aspects to be improved** in the different countries

| Country | Products and Technologies | Services | Supply – Markets and Production | Partners and Clients |
|---|---|---|---|---|
| Nicaragua | Consolidate local production and guarantee quality | Team is reduced, are their enough capacities to expand towards new clients and increase volume<br>Economic aspects in the advisory have to be improved | Producers and cooperatives as retailers, but they need support to accomplish these functions | Current clients relatively reduced |
| Honduras | | PROMIPAC is to be finished, identify alternative partners | In some regions the articulation between client towards IDE relys completely on technicians<br>Identify more retailers | It may be a challenge to satisfy the diversity of clients |
| Burkina Faso | | Agronomic aspects have to be improved through building alliances with specialised organisations | | |
| Ghana | Is the profile sharp enough? Teams are functioning more as brokers between farmer groups and finance | Team members have to be trained continuously in agronomic aspects | | |