



# HYDROLOGIC – Infiltrating the Market

## *Evolution of a Social Enterprise*

Hydrologic is a for-profit company that manufactures, distributes, and sells water filters to Base of the Pyramid customers in rural Cambodia. As a social enterprise, Hydrologic has clear objectives for both financial achievement and positive impact on society. Hydrologic creates value for its customers—and for Cambodia as a whole—through improved public health, environmental benefits, stimulation of rural economic activity, and a commitment to ethical business practice. Hydrologic has sold more than 400,000 filters to date, benefiting nearly two million Cambodians.

Hydrologic's roots go back to a safe water program initiated in 2001 by the international NGO, iDE, to introduce affordable household water treatment options in rural Cambodia<sup>1</sup>. The program operated on a partial cost-recovery basis, using revenue generated from water filter sales to cover production and distribution costs and using grants to cover marketing and back-office costs<sup>2</sup>. By 2009, it was clear that the program had potential to operate sustainably as a private enterprise. iDE received technical and financial support to facilitate the transition from a grant-funded program to a for-profit enterprise<sup>3,4</sup>.

In 2010, Hydrologic Social Enterprise Co. Ltd. was formally registered in Cambodia as a wholly-owned subsidiary of iDE. Hydrologic expanded its production capacity, established a rural sales force, partnered with a micro-finance institution, obtained a loan from a private impact investor<sup>5</sup>, and became certified to generate and sell carbon credits. As a result, Hydrologic became profitable in 2012 and has remained so each year since.

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# Hydrologic Snapshot

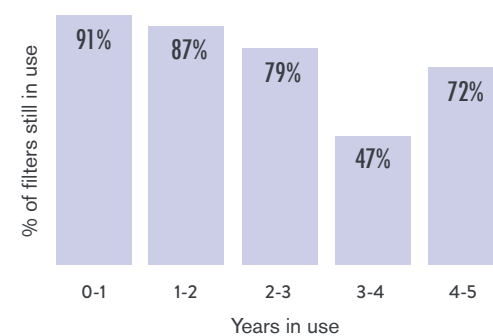
Hydrologic has clear objectives for both financial achievement and positive impact on society.

Abbreviated Timeline	2001	2010	2012
	iDE introduces ceramic water filter technology to Cambodia	Hydrologic registers as a private limited company	Hydrologic becomes profitable
Revenue	<b>400,000</b> Total filters sold since 2001	<b>\$18 and \$36</b> Retail cost of original Tunsai and Super Tunsai, respectively	<b>\$1.5 million</b> Annual turnover
Customers	<b>65%</b> Customers earning less than \$2.50/person/day	<b>66%</b> Proportion of customer sales on credit	<b>72%</b> Filters still in use after four years
Benefits	<b>US\$73</b> Annual financial benefit for a family using a filter	<b>3.5 per year</b> Deaths averted for every 1,000 filters in use	<b>95,000 tonnes</b> Annual reduction in CO <sub>2</sub> emissions
Other	<b>104</b> Number of Employees	<b>13 out of 25</b> Number of provinces covered out of total in Cambodia	<b>5,000</b> Pots pressed per month

All data are the most recent available as of mid-2015.

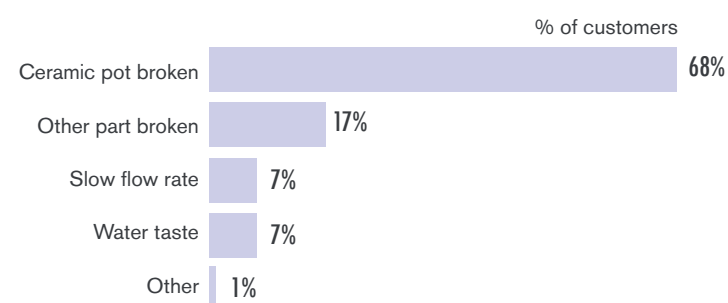
## Filter Usage Rates Over Time

Under Conditions of Rural Household Use [Ref 9]



## Reasons for Discontinuing Filter Use

[Ref 9]



# Products



The ceramic filter manufactured by Hydrologic is a point-of-use water treatment technology that enables families to effectively disinfect and safely store drinking water in their homes.

## Original Tunsai

US\$18 retail price  
12 liter storage volume



## Super Tunsai

US\$36 retail price  
14 liter storage volume  
Aspirational styling  
Convenience features (elevated stand, storage space under filter)

Hydrologic currently produces two filter models sold under the brand name “Tunsai”, the Khmer word for “rabbit” (rabbits help humans to solve problems in Cambodian folklore). Both models use the same ceramic filter element and so are equally effective at removing pathogens. The original Tunsai was introduced in 2001. Users expressed high levels of satisfaction with the filter’s performance [Ref 10] but both retailers and customers noted that its appearance was plain and unattractive. Changing the receptacle to translucent plastic (the original color was red) helped somewhat but did not solve the problem completely—people still thought it looked like a rubbish bin.

The Super Tunsai, introduced in 2011, was designed to respond to user feedback and to the growing demand in rural areas for more aspirational products. Hydrologic worked with PATH to improve the product appearance and functionality through a rapid Human Centered Design approach. The resulting modifications turned the SuperTunsai into a prestige product that purchasers displayed proudly in their homes.

Aesthetic appeal is an important factor for Base of the Pyramid customers when deciding to make a purchase. In early market tests, when both the original Tunsai and the Super Tunsai were offered on credit—thus lowering the upfront cost barrier—more than 90% of customers

chose the Super Tunsai. In the year of its introduction, the Super Tunsai accounted for 17% of unit sales, rising to 49% by 2014.

The filter consists of a porous, pot-shaped ceramic filter element infused with silver particles. The clay pores act as a physical barrier to suspended sediment and micro-organisms and the silver acts to prevent bacterial growth.

The ceramic pot is set in a plastic receptacle tank with a lid and spigot to protect filtered water from recontamination.

Raw water seeps through the ceramic pot by gravity, filtering its 10-liter volume in 3 to 5 hours to produce safe, drinkable water. The filter produces 30 liters of water per day with three fillings.

Periodic maintenance is required when the flow rate slows. The inside of the ceramic pot is scrubbed with a plastic brush and rinsed with non-soapy water. The plastic tank is washed with soapy water.

The ceramic pot can remain effective indefinitely. In practice, however, the lifespan depends on the care taken to avoid breakage and the amount of suspended sediment in the source water. Over time, these sediments can clog the pores past the point that they can be brushed clean.



# Manufacturing

The manufacturing process is constantly evolving as problems are identified and solved. This ongoing learning has been facilitated by experience shared with other filter manufacturers in Cambodia and around the world.

Hydrologic manufactures the ceramic filter elements at a factory employing 35 workers and located in a rural area about 40 km north of Phnom Penh.

Local clay is mixed with powdered rice husks, pressed into a pot shape, smoothed by hand, and baked in a kiln for 12 hours at 830°C. The rice husks burn away leaving microscopic pores that trap micro-organisms. The pots are coated with silver nitrate, a bactericide that provides a second barrier against bacteria. Pots are discarded if they have defects or if the flow rate is outside the acceptable range of 2 to 3.5 liters per hour.

Plastic parts are produced by external manufacturers in Phnom Penh and Ho Chi Minh City, Vietnam. Each filter set is packaged at the factory with a ceramic filter element, plastic receptacle and lid (different for each model), plastic spigot, plastic scrub brush, and graphical instructions.

A few examples of how the manufacturing process has evolved over time are described below.

- An early challenge was to reduce the number of defective pots, which reached 30% of production in some months. This was addressed by ensuring more consistency in the manufacturing process by standardizing mix ratios and kneading time and modifying kilns for more uniform heat distribution. Wastage rates are now consistently below 10%.
- The original factory had a production capacity of only a few hundred pots per month. As demand grew, new equipment, kilns, and storage areas were added haphazardly and production became increasingly inefficient. In 2010, a new factory was built with a more logical production flow and enough equipment and space to produce 5,000 pots per month comfortably and up to 7,000 per month if pushed.
- Dust and smoke suppression equipment and practices were introduced to improve worker safety.
- When retailers reported that customers refused to accept filter pots that had even small imperfections, Hydrologic began rounding the edges of the rim and base during the smoothing process to minimize chipping.

## WHY SOCIAL ENTERPRISE?

Social enterprise fits in the space between traditional private-sector enterprises and public or NGO providers of basic services. It offers a model for financial viability on the one hand and clear social, environmental, and poverty reduction goals on the other. By transitioning from a donor-funded project to a social enterprise, Hydrologic became a sustainable self-financed entity that continues to deliver benefits to rural customers without continued reliance on donor support.

Several approaches were considered before deciding to pursue the social enterprise model:

- Transferring ownership of the filter business to a cooperative composed of program staff,
- Selling the filter business to an entrepreneur through a bidding process,
- Training and equipping a number of existing small-scale ceramic enterprises to produce and distribute filters, and
- Transitioning operations to an autonomous social enterprise.

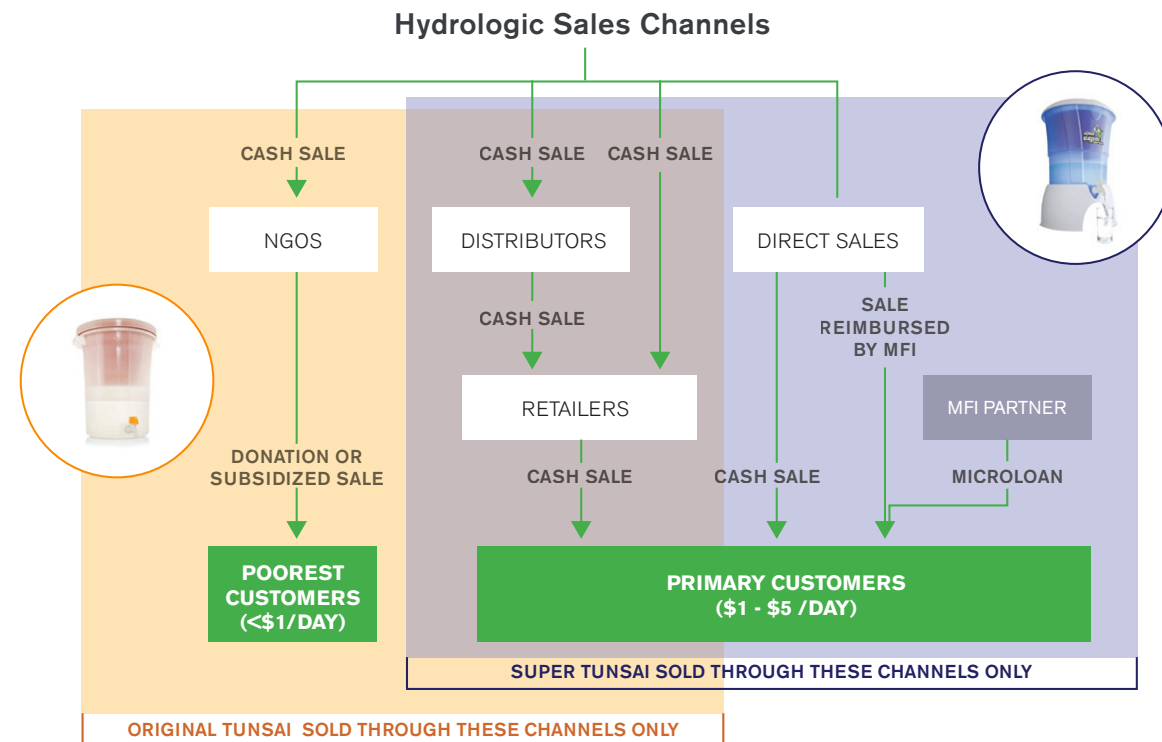


Factors affecting the decision included the scale and complexity of the production and distribution functions, the generally low level of development in the existing ceramics industry, the importance of quality control for a health-related product, and the lack of a strong regulatory environment to protect consumer interests. Addressing these market weaknesses directly would have required a program of larger scope, complexity, and cost than was possible with the resources that iDE was able to access. The social enterprise approach was deemed the most practical option for achieving sustainability while maintaining positive social impact.



# Distribution & Sales

**The Super Tunsai is differentiated as a premium product: something that you buy for yourself, not something that is given to you.**



Hydrologic sells water filters through three distribution channels: NGO, Retail, and Direct Sales. The original Tunsai is sold through the NGO and Retail channels but not the Direct Sales channel. Originally, the original Tunsai was offered through the Direct Sales channel also but customers virtually always chose the Super Tunsai and so the original Tunsai was dropped. The Super Tunsai is sold through the Direct Sales and Retail channels but not to NGOs. This is to differentiate the Super Tunsai in consumers' minds as a premium product: something that you buy for yourself, not something that is given to you.

## NGO Channel

NGOs purchase filters in bulk for distribution to their beneficiaries, who typically include poorer, more remote, and more vulnerable households. NGO sales are one means by which Hydrologic water filters reach households that may not otherwise be able to afford one. Hydrologic recommends, however, that NGOs sell the filters to recipients for at least a nominal charge instead of giving them away for free. Research and experience show that people who pay for a water filter are more likely to use it properly, to use it longer, and to replace it when needed [Ref 1].

About 8% of NGO sales have been to institutional buyers from outside of Cambodia. Hydrologic has not proactively pursued international sales but has responded opportunistically to requests. The most concentrated period for international demand occurred in the two years following the 2004 Indian Ocean tsunami when 8,150 Tunsai filters were shipped to disaster relief agencies working in Sri Lanka and Indonesia.

## Retail Channel

The retail network currently consists of three provincial distributors, each supplying an unknown number of retail shops, and 40 additional retail shops supplied directly by Hydrologic. Retailers consist mainly of pharmacies and household-goods shops located in cities and towns. The size of the Retail channel reached as high as 800 shops in 2011 but sales did not keep pace with the cost of maintaining the extensive network. Traditionally, retail sales in Cambodia are very passive and Hydrologic never successfully convinced retailers to actively promote the filters. Thus, Hydrologic has shifted emphasis from the Retail channel to the more proactive Direct Sales channel.

## Direct Sales Channel

In the Direct Sales channel, sales agents known as Clean Water Experts (CWEs) sell water filters directly to end users. Compensation for the 36 active CWEs includes i) a base salary equal to approximately 1.25x the national minimum wage for garment factory workers, ii) travel and phone allowances, and iii) commissions that can reach up to 5x the base salary for top performers.

CWEs coordinate with the chief of the target village to set up a group sales meeting one or two days beforehand. In a typical meeting, 15 to 40 people will attend and 20% will choose to purchase a filter. CWEs also sell filters door-to-door in the village, meeting with one or two families at a time. Each CWE can cover about 20 villages per month. A provincial sales team consisting of four CWEs can visit every village in a province over a period of about one year, at which point they repeat the cycle. Sales rates during subsequent passes in a village are often better than the first time because more people are familiar with the product, having seen their neighbors use it successfully.

The CWEs are trained in ethical sales methods to help customers weigh the cost of action versus inaction and decide if a water filter will pay off for them<sup>6</sup>. The group presentations explain the health benefits of clean water and highlight the convenience and cost-saving of using a water filter compared to boiling. These factors are important to customers' rational mind but closing the deal requires an emotional trigger, which is most often provided by the prestige associated with owning the beautiful Super Tunsai product. If money is an obstacle (and it usually is) a micro-loan is offered to allow families to spread out the cost over time.

## Microfinance

Beginning in 2011, Hydrologic worked with a Micro-Finance Institution (MFI) partner to develop a model for selling water filters on credit<sup>7</sup>. At group sales meetings, immediately following the CWE's presentation, an MFI representative stands up and explains the credit offering. Customers can apply for a loan to cover the full cost of a Super Tunsai water filter: US\$36 at 2.8% per month interest over 6 or 12 months. Because the loan size is small, the MFI was able to streamline its process by requiring only one signature instead of two and allowing on-the-spot approvals instead of the usual 2-3 day processing period. Once the loan applications are processed, Hydrologic delivers the filters within 1-3 days. The MFI then pays Hydrologic directly, on a monthly schedule, for the total number of filters delivered minus a US\$1.50 processing fee for each loan. Thereafter, the MFI is responsible for loan collection.



To date, some 53,000 filter loans worth US\$1.9 million have been made with more than 99% repayment. A financial analysis of the MFI's operations showed that the filter loans are marginally profitable and have a number of additional benefits, including new customer introductions and contributions to the MFI's social mission.

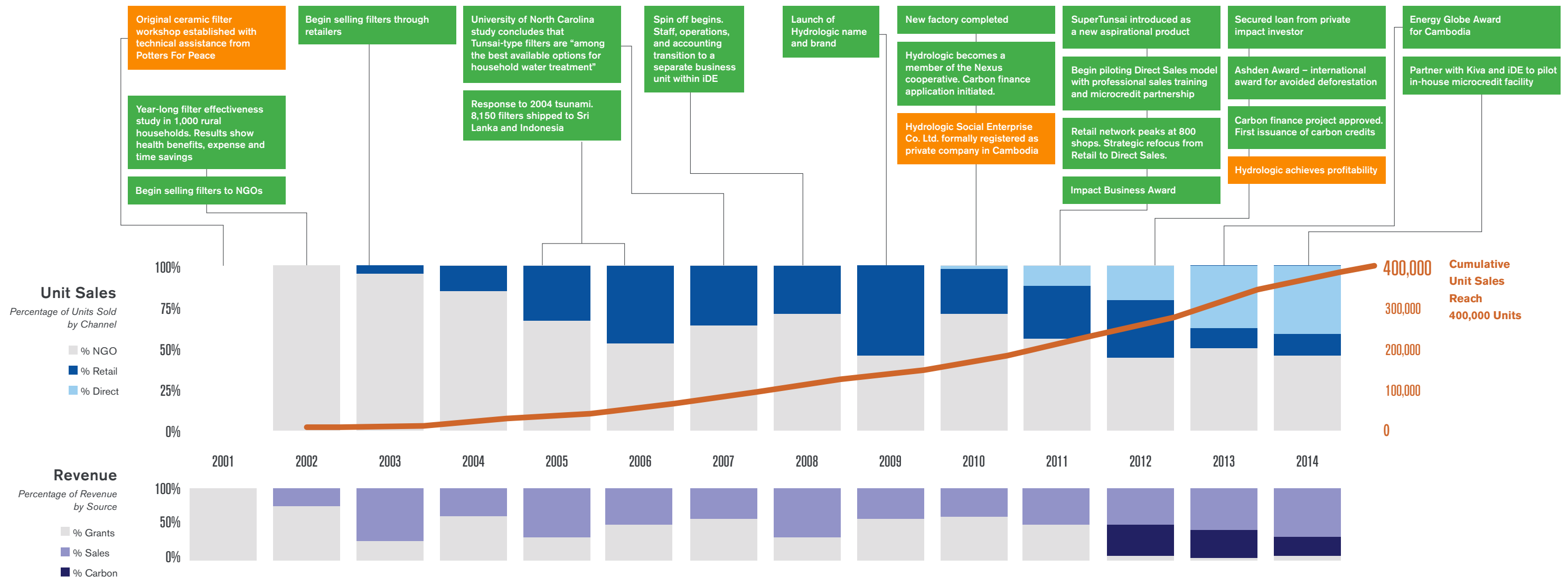
Previous attempts by some MFIs to sell products on credit to their clients have failed due to misaligned incentives and skill sets. MFI staff often see it as a distraction from their main duties and they may not be specifically trained to sell the product. One factor in the success of this model is that Hydrologic owns the sales function and the MFI deals with credit delivery and collections only.

The MFI collaboration has been fruitful for Hydrologic but there have been limitations also. Large MFI organizations with complex operations require long lead times and perseverance to introduce changes. The geographic coverage areas of Hydrologic and the MFI do not overlap completely. The MFI's ability to process loans is slower than the Hydrologic's ability to make sales, leading to lost sales. To manage their risk, the MFI enforces a ceiling on filter loans, limiting growth potential for Hydrologic.

To overcome these limitations, Hydrologic is working with iDE to develop an in-house credit facility<sup>8</sup> that can supplement the credit available through MFI partners. In-house credit offerings are designed specifically for products promoted by iDE Cambodia, including Hydrologic water filters. To date, about 4,000 filter loans have been issued through this facility with more than 99% repayment.

# Timeline

## HYDROLOGIC'S PATH TO PROFITABILITY



## LESSONS LEARNED

**Public funds for social enterprise.** Donor funding is justifiable for incubation of social enterprise models in challenging markets. The social return on investment can be very high for such investments. Over a 14-year period, US\$2.5 million in grants were invested in Hydrologic's development and the financial return to rural Cambodians was about US\$89 million.

**Time to make mistakes.** Social business incubation requires a reasonable time horizon and a learning orientation. In the beginning, IDE aimed for eventual commercial sustainability for the filter program but did not know the exact pathway to get there. Time and flexibility were needed to allow for mistakes to be made and corrected along the way.

**Start-stop funding.** It was difficult to secure consistent funding during start up. From 2001-2008, the filter program was funded by 12 small, short-term grants leading to high transaction costs. The start-stop nature of the funding kept the staff in survival mode and made it difficult to build momentum and focus. The incubation period might have been shorter and more efficient with a smaller number of longer-term grants.

**NGO sales pros and cons.** Pros: bulk sales cost less to make than individual sales, NGOs can supply filters to those who could not otherwise afford one; bulk sales increase production scale and profitability. Cons: giveaways can undermine markets and cannibalize future sales; users who receive a free filter are less likely to use it properly or complain if they face problems; NGO sales are irregular and hard to plan for.

**Face-to-face marketing.** A number of mass media campaigns were implemented over the years, including TV and radio spots and billboards, but no strong correlation was noted between media spend and sales results. Hydrologic shifted its marketing effort toward group meetings and door-to-door sales. The personal connection is better at building customer trust and the link between effort and sales results is clearer.

**Understanding the customer.** People with low incomes like beautiful things too. They understand the health benefit but it does not move them to action. Prestige and convenience are better triggers because they connect at an emotional level. Good design responds to the deep motivations and daily realities of the end-user. This applies not only to products but to promotional messages, finance models, after-sale service—the entire customer experience.

**Professionalizing sales.** Selling is a hard job. Sales agents need to keep a positive attitude in the face of frequent rejection. Hydrologic worked with Whitten & Roy Partnership to craft tools and methods for making sales, monitoring progress, noticing problems early, and responding with solutions.

**Credit is king.** Access to micro-credit proved to be key to the success of Direct Sales. In one region where cash sales were attempted first, the addition of credit resulted in four times more sales. But be warned, once sales agents start selling on credit it is hard to motivate them to go back to selling on cash.

**The rollercoaster ride.** Nurturing a social enterprise from start-up to maturity requires commitment and tenacity. The enterprise stood on the verge of failure numerous times. Crisis events included cash flow pinches, a grant cancellation due to slow progress, an asset ownership dispute, personnel conflicts, and a year-long delay in the carbon finance application.



# Value Creation

A cumulative total of 400,000 water filters have been sold since 2001. Based on filter usage rates measured in the field, Hydrologic estimates that at least 200,000 filters are still in use. Assuming that each filter serves one family, more than 900,000 individuals—six percent of Cambodia’s population—are currently receiving tangible benefits from Hydrologic’s business activity<sup>10</sup>.

## Health and Financial Benefits

*Average health and financial benefits experienced by households using a Hydrologic filter.  
[REF 1, 7, 10, 11]*

### Users that previously boiled drinking water

- Reduction in time spent collecting firewood and boiling water. **Save 22 hours/month.**
- Reduction in fuel expenses. **Save US \$1.40/month.**
- Improved air quality in cooking areas. 78% of users report less exposure to harmful smoke.

### Users that did not previously boil drinking water

- 46% reduction in number of diarrhea cases.
- 63% reduction in diarrhea treatment costs. **Save US \$1.20/month.**
- 76% reduction in number of school/work days missed due to diarrhea. **Save 1.15 days/month.**
- 44% fewer deaths from diarrheal disease. **Save 3.5 lives/year per 1,000 households.**

**US\$73 PER YEAR**

*Average financial benefit realized by filter users when compared to similar households not using a filter.*

**US\$89 MILLION**

*Total financial value created for filter users since 2001.*

## Environment — Reducing Deforestation & Carbon Emissions

Hydrologic water filters provide an alternative to boiling as a water treatment method, thus reducing the use of wood and charcoal. The average filter-using household saves about 730 kg of wood each year, 73% of which comes from non-renewable sources. The total reduction in deforestation amounts to about 49,000 tonnes of non-renewable wood per year [Ref 8]. This is roughly equal to the biomass contained in 230 ha of mixed forest in Cambodia [Ref 12].

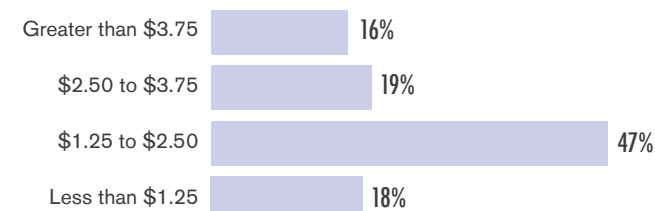
Reducing the use of non-renewable biomass also results in carbon emission reductions equivalent to 1.03 tonnes of CO<sub>2</sub> per year for each Hydrologic filter in use. Total emission reductions reach approximately 95,000 tonnes per year [Ref 8], which is roughly equal to the carbon emitted from 20,000 cars in the same period [Ref 14].

## Rural Employment & Economic Activity

The production and distribution of water filters generates rural employment opportunities for Hydrologic staff and others in the supply chain. In addition to the 36 CWE sales agents noted above, Hydrologic employs 35 factory workers earning salaries at least equal to the national minimum wage for garment workers but without the expense and social disruption of migrating to cities. In addition to direct employment, dozens of micro and small rural enterprises benefit from the trade in water filters including retailers, distributors, transporters, and suppliers of filter production inputs.

### Customers

*Breakdown by Income Level (US\$/person/day) [REF 3]*



## IMPACT ON WOMEN AND CHILDREN

The benefits of safe water in rural Cambodian households are biased toward improving the situation of women and children. Hydrologic water filters lower the risk of waterborne disease—which is highest in children under the age of five—and reduce or eliminate time-consuming and hazardous tasks often undertaken by women and girls.

Rural women and girls are responsible for fetching and boiling water and gathering fuel wood. When boiling water, they are exposed to harmful smoke and, when gathering wood in isolated areas, they face increased risk of snake bite, robbery, and sexual attack. When family members fall ill due to waterborne diseases, it creates additional work for women who must care for the sick.

As the traditional managers of day-to-day family expenses, women also benefit directly from reduced expenditures on medical treatment, charcoal, and wood (when wood is purchased instead of gathered).



Consumer research and experience shows that women are important decision makers in the purchase and use of water filters. Accordingly, Hydrologic’s marketing strategy has been tailored to engage with women. For instance, most consumer sales are made through village group meetings, which are attended largely by women. Women make up 78% of the customers in this channel.

Women make up 47% of Hydrologic’s staff, including 60% of top-level managers and 60% of the rural sales force. Although women face more cultural barriers in taking up the sales agent role, they tend to be more effective than their male counterparts largely due to their ability to relate to female customers on issues such as health and raising children.



# Carbon Finance

**Hydrologic is the first Asia-based carbon project approved for the clean water sector.**

Hydrologic generates a portion of its revenue from the sale of carbon credits. The credits are issued by the Gold Standard certification body based on reductions in carbon emissions that result from people filtering their drinking water instead of burning wood or charcoal to boil it. Hydrologic began the certification process in 2010 and received approval two years later, becoming the first Asia-based organization to have a carbon project approved in the clean water sector<sup>9</sup>.

The approval process required detailed field studies and household surveys to quantify the amount of water used by rural households; the amount of wood or charcoal used to boil water on typical Cambodian stoves; household demographics; and practices related to water and energy use. Hydrologic also had to show how the carbon project would benefit the rural customers who actually create the reductions in carbon emissions by

changing their boiling practices. Hydrologic achieves this by using carbon revenues to fund i) a warranty policy that allows filter owners to receive one free replacement pot when it is needed, and ii) research to improve the filter product. Hydrologic undergoes an annual independent audit to verify the number of carbon credits generated each year.

Hydrologic sells its carbon credits on the voluntary carbon market, which has been trending downward for several years. Between 2012 and 2014, prices dropped 46% for credits sourced from household devices (water filters and cook stoves) [Ref 6]. Nevertheless, Hydrologic has retained a strong position in the market due to well-documented social impacts, which many buyers value in addition to the environmental benefits<sup>11</sup>.



## THE TOLL OF UNSAFE WATER

In Cambodia, untreated water and poor sanitation cause an estimated 10 million cases of diarrhea and 10,000 deaths each year, mostly in rural areas among children under the age of five [Ref 13]. Diarrhea and other waterborne diseases impose a heavy economic burden due to healthcare expenses, lost labor productivity, and missed school days for children [Ref 15].

Rural households get their drinking water from multiple sources that vary by location and season. Common sources include rivers, lakes, ponds, wells, rainwater catchment, and local vendors who deliver water by pipe, truck, or wagon. These sources are often contaminated due to poor sanitation, unsafe storage, and fouling by animals.



About 72% of rural households treat their drinking water by boiling it [Ref 4]. This can be effective but, in practice, boiling is usually not done properly or consistently [Ref 2]. Boiling also comes at an environmental cost. The majority of rural households use wood or charcoal as fuel, resulting in greenhouse gas emissions and increased stress on forest resources in a country that already has one of the highest rates of deforestation in the world [Ref 5].



# Future

Hydrologic’s stretch goal is to serve one million households by the end of 2020.

Hydrologic continues to build and streamline its business operations to improve efficiency, scale, and profitability. Hydrologic is also in the process of identifying and assessing new products as the current product line is not sufficient to ensure long-term business viability.

Hydrologic has benefitted from opportunities to share experience with other organizations across the globe that are working to deliver beneficial products to Base of the Pyramid markets. Increasingly, Hydrologic is finding opportunities to return the favor by offering technical support and inspiration to others seeking to accomplish similar goals.



## Endnotes

- 1 Potters for Peace, an NGO that was promoting the pot-shaped filters in Nicaragua, introduced IDE to the technology and provided technical support during visits to Cambodia in 2000, 2001, and 2003.
- 2 Donors included AusAID, CIDA, UNICEF, Plan International, NZAID, Canada Fund, Manitoba Council for International Cooperation, iDE Canada, and iDE U.S.
- 3 Technical and financial support was received from the US-AID-funded Water Sanitation and Hygiene Enterprise Development project implemented by the University of North Carolina; the Safe Water Program funded by the Bill & Melinda Gates Foundation and implemented by PATH; the Scaling Up Safe Water project funded by the Dutch MFA and implemented by Antenna; an Ashden Award sponsored by the Waterloo Foundation; and the Finland Futures Research Centre funded by the Nordic Climate Fund.
- 4 Initially, Hydrologic was formed as an informal joint venture with Hagar Cambodia, an NGO with a safe water program that it was also looking to spin off as a social enterprise. Within the first several months, however, it became clear that the commercial models for the Biosand filters promoted by Hagar and the ceramic filters promoted by iDE were not very compatible. The two programs split ways amicably and Hagar subsequently spun off its program as the social enterprise Clear Cambodia.
- 5 In March 2012, after careful due diligence, Geneva-based Impact Finance provided debt financing to Hydrologic, repayable over 42 months.
- 6 Hydrologic and iDE have worked with sales consultants Whitten & Roy Partnership to develop the Human Centered Sales™ approach, a set of tools and techniques adapted from professional sales practice in the U.S. and the U.K. and applied to “last-mile” customers in Cambodia.
- 7 The MFI partner was VisionFund Cambodia. Technical and financial support for developing the micro-finance model was provided by PATH. The PATH personnel involved in this work have since formed a separate consulting company, Amplify Markets.
- 8 Capital for the in-house credit facility is provided by Kiva. The facility is housed within iDE Cambodia.
- 9 Hydrologic is a member of the Nexus Carbon for Development cooperative. Nexus assisted Hydrologic throughout the development of the carbon finance project by providing at-cost technical assistance, up-front financing for application costs, and carbon credit sales management services.
- 10 The average rural household in Cambodia has 4.6 people (2008 Census). The vast majority of filters are purchased for household use. A minority are purchased for use in institutions (schools, clinics, restaurants, factories, offices, etc.) where the number of users per filter is greater.
- 11 Major buyers of Hydrologic carbon credits include Deutsche Post DHL, Veolia, Coca Cola, Sustainable Travel International, and Intrepid Travel.

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iDE is an international not-for-profit NGO dedicated to creating income and livelihood opportunities for the rural poor. For 31 years around the world—and 21 years in Cambodia—iDE has pioneered innovative market-based solutions to improve access to safe water and sanitation and increase agricultural incomes. To date, iDE has brought significant improvements to the lives of more than 20 million people globally.

[www.ideorg.org](http://www.ideorg.org)



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Hydrologic is a wholly-owned subsidiary of iDE.

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