

# GLOBAL HEALTH

## Innovation Insight Series

*A mother and child with their LifeStraw Family water filter in Kakamega, Western Province, Kenya*



Photo: Georgina Goodwin/Vestergaard Frandsen

## LIFESTRAW CARBON FOR WATER: Sustainable Funding for a Public Health Intervention

ESTABLISHED 1957

VESTERGAARD FRANDSEN

LAUSANNE, SWITZERLAND

MIKKEL VESTERGAARD, CEO

### THE PROBLEM/SOLUTION SPACE

In 2010, 780 million people lacked access to safe drinking water sources.<sup>1</sup> The problem has been particularly acute in sub-Saharan Africa where despite the success of efforts to improve access to safe water in regions targeted by the United Nations Millennium Development Goals (MDGs)<sup>2</sup> nearly 40 percent of the population still relies on unimproved sources of water, including surface water.<sup>3</sup> Accordingly, diarrheal disease, which is often caused by drinking contaminated water, is the second leading cause of death globally among children under five. More than one in five child deaths—about 1.5 million each year—are linked to diarrhea.<sup>4</sup>

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Providing access to safe water in impoverished regions is challenging because of the magnitude of investment required to develop the necessary infrastructure and to maintain those assets and related services over time. Although philanthropic funding continues to be a significant source of financing in the drinking-water sector,<sup>5</sup> the need to sustain these projects over the long term fits poorly with traditional development aid and foundation grants, which are generally designed to support short-duration (three- to seven-year) projects.

### ABOUT VESTERGAARD FRANDBSEN AND LIFESTRAW

Vestergaard Frandsen (VF) is a for-profit company that operates under a humanitarian entrepreneurship business model. Committed to supporting the achievement of the United Nations MDGs, VF creates and deploys technologies designed to improve the health of people at the base of the socioeconomic pyramid. The company's leading products include PermaNet long-lasting insecticidal nets and LifeStraw water filters.

In 2005, VF introduced the portable LifeStraw water filter. Designed for use away from home, the light-weight filter is shaped like a thick straw. As the user draws water through the tube, the filter removes bacteria and parasites, making contaminated water safe to drink. The product received numerous design and humanitarian awards, including "Innovation of the Year" from *Esquire* and *Time's* "Best Invention of 2005." However, it was criticized by some who found the idea of impoverished people sucking dirty water through straws demeaning.<sup>6</sup> Others believed it cost too much for its developing world target market.

Next, VF set out to help a potentially greater number of people by creating a complementary water filtration product that could be used by families in their homes. Like the portable version, VF wanted the

larger version of the LifeStraw to be durable and operate without electricity, moving parts, or chemicals (such as chlorine) that would have to be resupplied. The result was the LifeStraw Family, a point-of-use microbial water treatment system intended for routine use in low-income households. Using only the force of gravity, the LifeStraw Family purified up to 18,000 liters of water, enough to supply a family of five with clean drinking water that meets U.S. Environmental Protection Agency (EPA) standards for three years before the filters needed to be replaced.<sup>7</sup>

### ONE CHALLENGE: SUSTAINABLE FUNDING FOR A PUBLIC HEALTH INTERVENTION

VF was convinced that the LifeStraw Family could make an immediate and significant difference for households in developing countries. The challenge was how to make it affordable for its target audience. Like the individual LifeStraw, the Family product was "prohibitively expensive for this population, if they were to buy it themselves" noted Alison Hill, VF's Managing Director, Climate.<sup>8</sup> VF considered seeking donor funding to subsidize the product's cost. However, it had repeatedly observed



Photo: Georgina Goodwin/Vestergaard Frandsen

*A mother and child talk with a nurse at the Webuye Health Centre near Bunguma, Western Province, Kenya*

the fickle nature of philanthropic funding for point-of-use safe water programs. “The funding would support a solution for a small area over a period of three to five years, and then move on to another project or be discontinued,” related Hill. “But access to safe drinking water is a long-term investment that a community needs. And in the short run, we didn’t feel like these populations could wait.”

While VF considered its options, CEO Mikkel Vestergaard Frandsen decided to launch an integrated campaign to help prevent the spread of malaria, diarrheal disease, and HIV in Western Kenya. It was timed to be the cornerstone of the company’s 50<sup>th</sup> anniversary celebration in 2008.

Participants were offered HIV counselling and testing services, as well as a free preventative CarePack that included condoms, an insecticide-treated bed net, and a household water filter.<sup>9</sup> Working in partnership with the Kenyan Ministry of Health, VF preceded the launch with six weeks of radio ads and road show presentations, collateral distribution, and public health education in order to inform, prepare, and mobilize the community. During the campaign, all participants who attended and met the age criteria were offered counselling and the option to be tested for HIV. Regardless of their decision about whether or not to test, they were given the CarePack. This inclusive approach significantly reduced



Photo: Georgina Goodwin/Vestergaard Frandsen

*The LifeStraw Family in a typical Kenyan home*

the stigma associated with HIV testing. In total, the campaign reached more than 80 percent of the target population (nearly 50,000 people) within a single week. According to Hill, “It demonstrated that an integrated, community-wide approach to disease prevention that provides the right incentives can increase demand for voluntary testing and counselling services,” as well as stimulating desired behavior changes.

Witnessing the success of the program, the Kenyan government asked VF to scale it up across the Western Province. However, identifying traditional forms of funding for point-of-use water filters at scale remained a challenge. “While traditional donors accepted that it was valuable to provide access to household water treatment, most of their water budgets were focused on infrastructure, point-of-source solutions, or sanitation,” Hill explained.

### THE SOLUTION: A CREATIVE USE OF CARBON FINANCE

Based on this experience, VF set out to maximize the impact of the LifeStraw Family by achieving full coverage in the communities where it was deployed. “In order to reach the poorest and most vulnerable households and achieve an equitable distribution, we felt the best option was to provide the LifeStraw at no cost to households. This meant we needed to seek financing that could cover the cost of the LifeStraw and the ongoing operations

of the program,” said Hill. VF eventually came up with the idea of linking carbon finance to providing safe water at the household level.

Carbon finance allows developing-country projects that reduce carbon emissions to earn carbon credits based on the volume of emissions they prevent (e.g., a company that builds a wind energy plant earns carbon credits for providing an alternative to energy

generated by burning coal). Corporations in developed countries can purchase those credits to offset their own emissions, or to improve their environmental profile. The monetary value of each carbon credit varies; however, the most valuable are “voluntary offset credits” certified by the Swiss-based Gold Standard Foundation. To achieve this Gold Standard designation, the project creating the credits must provide a direct benefit to and promote sustainable development in the community where it is based.<sup>10</sup>

Although carbon credits had never before been used to finance a water project, VF and its partners, including Manna Energy,



Photo: Georgina Goodwin/Vestergaard Frandsen

*A woman washes sugar cane with purified water*

determined that the company could follow a methodology originally designed to calculate credits for improved cookstoves that reduced the demand for wood fuel. An existing addendum explicitly allowed the methodology to be applied to safe water technologies. Following these guidelines, VF could install LifeStraw Family water filters in homes without access to municipal water sources. In exchange, the company would earn carbon credits based on the premise that the filters made it unnecessary for recipients to boil their water for safety, thereby preventing current and future carbon emissions.<sup>11</sup>

The undertaking, subsequently named the LifeStraw Carbon for Water program, pushed the limits of existing carbon finance projects. Not only was a water application unprecedented, but Africa’s share of the carbon market to date was very low (less than 3 percent).<sup>12</sup> Additionally, it was clear from even the earliest stages that this project would generate an exceptional volume of carbon credits. “A fairly large cookstove project in Africa could generate 120,000 credits a year,” explained Hill. “LifeStraw Carbon for Water was originally estimated to generate closer to 1.5 million tons per year.” The scale of the implementation was equally daunting. “Our goal was to distribute enough LifeStraw Family filters to serve approximately 4.5 million residents in Kenya’s Western Province over a 10-year period,” she added.

Central to making the model work was the concept of suppressed demand. Various studies revealed that only about 20-30 percent of families in Western Kenya routinely boiled their water,<sup>13</sup> primarily due to the prohibitive cost of firewood and/or time spent gathering wood for boiling. Suppressed demand guidelines, as set forth in the Gold Standard

methodology, allowed VF to accrue carbon credits for abating the emissions of families who did boil their water, as well as for those families who would boil their water if they could afford the resources to do so, as long as they used their water filter regularly. Suppressed demand was conceived by the United Nations Clean Development Mechanism's Executive Board to allow areas of significant economic underdevelopment to participate in carbon markets.<sup>14</sup> "In order for African communities to access carbon subsidies, or leapfrog to clean development pathways, we need to recognize that there is a demand for energy in these communities that is suppressed by a lack of resources," said Hill. For the Carbon for Water project, the Gold Standard methodology capped the total amount of credits for water filtration that VF could accrue at the threshold for daily water consumption based on established recommendations by the World Health Organization (6.0 liters per person per day).<sup>15</sup>

Another key factor to moving the project forward was the commitment and support of government agencies and other local stakeholders. "The Ministry of Health was on board, the Ministry of Public Health and Sanitation was hugely supportive, and several other entities, including the Ministry of Environment, Ministry of Gender, and Ministry of Education all signed on to a memorandum of understanding that we have with the government of Kenya. It really had a sense of local ownership," Hill commented

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*Because the district public health officers, provincial public health officers, and district administration officers were all closely involved in the planning, they let their communities know that it was coming and that it was okay.*

The final challenge was to convince the VF board to invest \$30 million for the distribution of the water filters, as well as related preparation, training, and support over the 10-year project timeline. "LifeStraw Carbon for Water is one hundred percent equity financed," Hill said. "Mikkel [Vestergaard Frandsen, CEO] and the board took a risk to implement the program, believing it would pay back over time as we demonstrated success."

Before launching the program, VF spent over a year "micro-planning" and implementing a social mobilization campaign built on the CarePack model. The campaign introduced the idea of the LifeStraw filter through "community forums, radio shows, community dramas, and other forms of outreach across the province," described Hill. "Also, because the district public health officers, provincial public health officers, and district administration officers were all closely involved in the planning, they let their communities know that it was coming and that it was okay. As a result, by the time we actually started distribution, people were positive and excited," she enthused.

Over a six-week period in spring 2011, approximately 877,500 LifeStraw Family units were distributed to roughly 90 percent of all households in Kenya's Western Province. To manage the rollout, VF hired and trained 4,000 community health workers and 4,000 drivers to go door-to-door, spending time in each household to set up the filter and train families on its use. VF also committed itself to a comprehensive follow-up program that employed 2,000 community health workers and 2,000 drivers twice a year to provide ongoing health education and training, and the company established free water filter repair and replacement/service centers throughout the province.

On an ongoing basis, approximately every six months, an accredited, independent auditor monitors the program to verify use of the filters and emissions reductions before carbon credits are issued. “Carbon credit financing is set up as a pay-for-performance business model whereby revenue is only obtained if the technology works and the project achieves carbon emission reductions,” explained Hill. “Accordingly, we are incentivized to reinvest heavily in training and education because the more we’re able to get the community involved, the higher the technology adoption and usage rates are, and the more carbon credits come in.”



Photo: Georgina Goodwin/Vestergaard Frandsen

*A family interacts with its LifeStraw educator*

At the program’s first audit, the Gold Standard Foundation and international auditors verified a 91 percent usage rate (defined as filtering at least once every two weeks). Even more importantly from a public health perspective, they found that 83 percent of families were filtering their water at least twice a week, which VF defined as “regular usage.”<sup>16</sup> At this adoption rate, LifeStraw Carbon for Water generated 1.3 million credits in its first six months, nearly twice the amount originally anticipated. According to published reports when VF’s first tranche of credits was issued in March 2012, Gold Standard credits were selling at more than \$11.48 per ton,<sup>17</sup> although a VF representative indicated that the majority of the initial credits were sold in advance in an Emissions Reductions Purchase Agreement at a discounted price.

While LifeStraw Carbon for Water was lauded by many for bringing safe water to African families at no direct cost, it was also censured. In particular, critics argued that distributing water filters did little to reduce carbon emissions and questioned the validity of suppressed demand. They also pointed to limited evidence proving the positive impact of LifeStraw Family filters in real-world settings. In response to the latter issue, VF engaged an external advisory board to help guide the company in generating useful and credible data for the household water treatment and safe storage (HWTS) community, and it continues to invest in impact studies and operational research. Regarding the other concerns, VF ascribed some of the criticism to its role as a pioneer in the space. The company said it would continue to carefully follow the Gold Standard methodology and ensure that its measurement and reporting mechanisms remained objective and robust.

Reflecting on this new approach to financing a point-of-use water intervention, Hill emphasized the importance of staying focused on two key goals: “As we design new programs, new financing mechanisms, and new implementation approaches, what we really need to evaluate is are we meeting the needs of the community and can we sustainably take it to scale.” With Carbon for Water still in its early stages, critics and supporters alike would be watching to see how effectively the program met both objectives over time. ♦

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## NOTES

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