

Household Water Treatment and Safe Storage (HWTS) Implementation Case Study: Solar Water Disinfection (SODIS) in Uganda



Program Details



Lead Organization: Water School Uganda (WSU)

Product/Technology: Solar Water Disinfection (SODIS)

Dates: WSU started studies on SODIS in 2004 and registered as a charity in 2007







Implementation Reach: 138,252 households and 125 schools directly trained, as of September 2016

Program Overview:

The Directors of Water School Uganda (WSU) were colleagues at a child development charity for many years. They witnessed the devastating effects of unsafe drinking water in many rural communities, and wanted to make a difference. They developed a pilot Water, Sanitation, and Hygiene (WASH) intervention in Kisoro District, Uganda. Their vision was to empower communities to gain sustainable access to safe water, sanitation, and good hygiene. The pilot intervention was very successful, receiving recognition by the Ministry of Health and winning the first-ever WASH Impact Award from Stars Foundation in 2013.

WSU's strategy involves training trainers about WASH issues, generating community participation in program design and implementation, and monitoring beneficiaries' increased knowledge and improved WASH practices. In 2014, WSU expanded their program using two approaches: (1) a satellite village approach, through which neighbors train neighbors about WASH practices, and (2) a child-to-community approach, through which children learn WASH techniques at school and transfer them to their homes and neighborhoods. Over 20,000 new households have registered in these programs every year.

Who's Engaged?

Group / Organization 	Creating Demand 	Supplying Products & Services 	Monitoring for Improvement 	Building Capacity 	Financing 
<i>Water School Uganda (WSU)</i>	✓	✓	✓	✓	✓
<i>Community Households</i>	✓	✓		✓	✓
<i>School Children and Teachers</i>	✓	✓	✓	✓	
<i>Opinion Leaders, Village Health Teams</i>	✓			✓	
<i>Government (Water, Education, Health)</i>	✓		✓	✓	
<i>Other Partnering Donor Agencies</i>			✓	✓	✓
<i>Other Implementing Partners</i>	✓	✓	✓	✓	✓

Case Study Details



Creating Demand

WSU believes that building knowledge and skills is more cost-effective than simply providing water and toilet facilities. Knowledge, skills and attitudes pass from generation to generation, eventually becoming community norms. As people learn to improve their WASH practices, and see the benefits of these improvements for their families, their neighbours will begin to want the same improvements for their own households.

WSU works to raise demand for, and skills in, three key areas of water, sanitation, and hygiene:

1. **Safe Water:** With WSU support, communities make water safe to drink through the sustained use of SODIS (a solar water disinfection method). SODIS promotion and education is the topic of this case study.
2. **Community Sanitation:** With WSU support, communities understand the importance of, and consistently use, sanitation practices that lead to improved public health.
3. **Personal Hygiene:** With WSU support, communities develop and habitually practice good personal hygiene.

WSU has two approaches that create demand for WASH. These are the satellite village approach (for households in communities) and the child-to-community approach (for schools).

Satellite Village Approach

WSU staff begin by reaching out to local authorities to find out where the greatest needs for WASH interventions are. They then visit the villages recommended by the local authorities. After meeting with key opinion leaders in the community, WSU staff members host training events about the causes and prevention of WASH-related diseases. These events generate interest in the WASH solutions WSU promotes.

Next, WSU enlists volunteers to pioneer WASH improvements in their homes. WSU strategically works with selected village health team (VHT) workers, and with opinion leaders, such as the chief, religious leaders, and other community groups. These leaders learn the skills required to set up WASH facilities in their homes. With support from WSU, they begin creating pit latrines, handwashing stations, SODIS racks, clotheslines, animal shelters, compost pits, bathing shelters, and clean kitchens. WSU provides two free one-litre PET (polyethylene terephthalate plastic) bottles per household member for treating drinking water.

At the beginning, WSU staff come back very regularly (sometimes weekly) to continue building relationships with, monitoring progress of, and encouraging



A couple uses SODIS in their compound.

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community volunteers. Over the first year, volunteers improve the quality of their homes through WASH improvements. Many volunteers begin experiencing benefits such as fewer pests and reduced incidences of WASH-related diseases. Excited by these benefits, volunteers begin training other community members to do the same things in their homes. They monitor and support the progress of their neighbours who adopt WASH improvements.

Child-to-Community Approach

WSU introduces teachers and children to SODIS in separate sessions at their school. Sessions are interactive, using music, drama, and dance. WSU provides each classroom with a SODIS table and shelves for storage of processed drinking water. Every child receives two free one-litre PET bottles. For health reasons, students learn to drink water only from their own bottle.

Each class is responsible for treating its water under the leadership of the class teacher and a student monitor. Students also learn about other WASH topics such as sanitation practices and menstrual hygiene management. WSU staff challenge the students to set up handwashing facilities, compost pits, and other WASH facilities. As children learn these practices, they are encouraged to take them to their homes. This increases demand for WASH in the broader community.



Students pose next to a shelf holding the water bottles for their classroom.

Challenges Faced: Creating Demand

- The SODIS method requires leaving water on a table in the sunlight for many hours. Some community members feared that someone might put poison in their water while it was being treated on the SODIS tables. To address this, staff worked with community members to improve interpersonal relationships and help families recognize the importance of working together.
- Some community members believed that other PET bottles would not be as effective as the ones provided by WSU. WSU staff and volunteers addressed this by deliberately distributing a mix of bottle types, and by drinking from different bottles while they were in the communities. This helped people realize that if the role models and staff in the program were using different types of PET bottles, it must not be a concern.
- SODIS is a very simple method for water treatment. It involves leaving bottles of water in the sun and allowing ultraviolet light to inactivate pathogens. Some people expressed scepticism about the effectiveness of SODIS, requesting a more complex solution. Staff explained how SODIS works and how effective it can be. They used posters, demonstrations, and school events to communicate their messages.
- Over time, WSU transitioned away from providing SODIS tables to households, but people had already started believing that iron tables were essential for SODIS to work. Staff needed to convince families that corrugated iron was not necessary for successful SODIS treatment. Staff explained that they could reach more homes and grow the program faster by reducing

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this cost. They also showed materials from Eawag-Sandec, the Swiss Federal Institute for Aquatic Science and Technology, to explain why corrugated iron tables are no longer considered necessary for SODIS.

- Committed head teachers (school principals) transferred to other schools just as the child-to-community approach was gaining momentum. This sometimes meant staff had to start over by educating and working with new teachers.

Lessons Learned: Creating Demand

- Public approval made a big difference in changing community norms. Staff and opinion leaders publically applauded households who succeeded in making WASH improvements. These households were asked to share their new knowledge and skills with others, which made them feel valued and empowered. These steps accelerated the spread of the program.
- The use of music, dance and drama in schools enhanced children's communication skills and their confidence, helping them to create demand for WASH in their community.



Supplying Products and Services

From 2007 to 2016, WSU had a steadily growing population of direct program beneficiaries, from 204 households and three schools in one district, to 138,252 households and 125 schools in 10 districts. Generating and sustaining this level of growth requires a good program delivery support system.

The key services for WSU's approaches are outlined above, in the section on Creating Demand. These services can be thought of as the "software" that supports sustained use of the "hardware" products that WSU supplies, such as PET bottles, SODIS tables, and safe water storage facilities. Along with providing these materials, WSU ensures that volunteers have contact information for VHTs, local authorities, and WSU staff, in case any issues or questions arise.

PET Bottles

WSU purchases an average of 210,000 PET bottles per month from a local packaging factory. Each bottle costs US\$0.12. Mineral water bottles donated by hotels and events supplement this supply. WSU staff and program beneficiaries do the bottle collection together. This helps to increase ownership and sustainability of the program.

Households receive two free PET bottles per member on entry into the program. They are encouraged to find their own bottles to replace or supplement the ones they initially receive. To encourage plastic reuse and recycling, WSU gives households one new PET bottle for every two old unusable bottles they return.

SODIS Tables

For the child-to-community approach, WSU provides SODIS tables with a corrugated iron surface. Each class receives one table, and the teachers and other staff receive their own table. Students and staff fill PET bottles with clear water and place them on these tables for processing.

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For the satellite village approach, WSU trains households to construct multi-level racks. The top level of the rack serves as a SODIS table for treating drinking water, and lower racks carry plates, cups and saucepans. Households are encouraged to take ownership for building their own tables.

Safe Water Storage Facilities

In schools, WSU provides child-friendly cupboards for safe and easy access to drinking water in each classroom. These special shelves emphasize the need to protect safe drinking water from recontamination.



Students use SODIS bottles and a SODIS table at school.

In households, WSU encourages beneficiaries to store the treated water in places of their choice that are safe and accessible. This fosters safe habits and minimizes the risk of drinking untreated water. Most families use cupboards or woven baskets to store their treated water.

Challenges Faced: Supplying Products and Services

- During the first four years, it was very challenging for WSU to get bottles, due to the small number of people in their program. Without making large bulk orders (which were not required at the time), it was difficult to get PET bottles cost-effectively. As well, there were few factories with modern production equipment in the country. As the number of people in the program increased, and as bottle manufacturers upgraded their equipment, WSU slowly overcame this challenge.
- In the early days of the program, SODIS tables were sometimes stolen from the school. Some people near fishing villages also stole PET bottles to use them as floaters on fishing nets. Theft has been minimised through the use of community policing systems. WSU also provided many materials and training sessions to help communities understand the importance of SODIS and the harm caused by stealing SODIS materials.

Lessons Learned: Supplying Products and Services

- WSU learned the benefits of continually looking for better sources of bottles at an affordable price. WSU explained to bottle manufacturers that they could build a market for PET bottles and were targeting a distinct market segment. Eventually, mineral water bottle manufacturers were willing to work with WSU and appreciated the fact that WSU was generating customers for them.



Monitoring for Improvement

WSU's annual plans and budgets are set at a local level. Local volunteers are given freedom to adapt WSU's approaches to their unique context. This leads to variation in how the satellite village approach is implemented. The national office sets and monitors minimum standards to ensure quality assurance, and creates monthly and annual targets to guide monitoring efforts in each region.

Regional and National Office Monitoring

WSU's national and regional offices regularly monitor deliverables against plans and budgets. Each quarter, one of the four regional offices has an opportunity to host other regions and share its practices. This allows staff to provide feedback, and to share challenges and lessons learned in different regions.

Household Monitoring

Each community has a group of volunteers that works with the VHT to monitor households. The VHTs ensure that WASH facilities in people's homes meet agreed standards. If a VHT representative visits a household and identifies necessary improvements, the household commits to how and when they will improve their WASH practices. This forms the agenda for the next monitoring visit.



Members of WSU's management team visit a household to see its SODIS table and drying racks.

School Monitoring

The District Education Inspectorate, together with WSU regional staff, monitor how teachers and children implement the child-to-community approach at schools. Students also supervise each other on the processing, storing and use of water. This creates a learning opportunity for them in interpersonal skills and management.

Challenges Faced: Monitoring for Improvement

- Many volunteers and school staff are not comfortable with, or used to, keeping written records. As well, school staff sometimes view monitoring this program as an extra burden on their already stretched resources. Volunteers and school staff need extra encouragement and support to do their part in keeping accurate records.
- WSU generates large amounts of data from its monitoring efforts. Taking the time to absorb this information and use it effectively for improvement is sometimes a challenge.

Lessons Learned: Monitoring for Improvement

- WSU has learned a lot from engaging program beneficiaries in monitoring. Community members are the experts in their own problems and often have the best ways to solve them. Monitoring by teams of volunteer beneficiaries has increased the program's cost-effectiveness and community ownership.



Building Human Capacity

Building Capacity of Staff

WSU employs 10 people: the Management Team, a Finance and Administrative Officer, Program Officers, and Project Facilitators. A host of passionate volunteers supports these staff.

WSU provides internet and cell phone access to all staff and volunteers so that accessing and sharing information is easy. On-the-job mentorship and team building are also strongly encouraged at all levels in the organization, including volunteer teams.

Training Village Health Teams and Community Volunteers

WSU trains the VHTs appointed by the Ministry of Health to be more effective in their roles related to WASH. The government mandates the VHTs to be the first to intervene on health issues in communities. To build the VHTs' capacity, WSU staff teach them appreciative inquiry approaches (focusing on what does/could work well), and participatory methods for community development (engaging participants at all stages so that they determine the project's direction, priorities, and progress indicators). WSU frequently monitors VHT homes to ensure that they are good examples for their communities.

WSU also trains other opinion leaders and active community members as volunteers, so they can demonstrate good WASH practices and train their neighbours.

Building Capacity of Household Members

WSU creates easy-to-understand graphic material for rural families with low levels of formal education. These materials provide reminders about how to use SODIS and other WASH facilities correctly. WSU gives beneficiaries and volunteers the freedom to adapt WASH solutions to their own needs and experiences, as long as they meet minimum standards. This helps households take more ownership for the changes they make in their communities.



A Community Trainer conducts grassroots training for village WASH volunteers



WSU provides this simple instructional SODIS poster to communities and schools.

Building Capacity of Other WASH Implementers

In 2014, WSU decided to begin training other organizations to reach more Ugandans with safe water and improved WASH. WSU piloted a training program for Revelation Life, who are now running SODIS programs peri-urban areas outside WSU's region of influence.

“If we can equip others in our sector to excel, then we contribute towards increasing the whole WASH profile in the country.”

-Zephaniah Mukalere, WSU Country Director

Challenges Faced

- WSU benefits greatly from the work of high-quality volunteers. They cannot pay the volunteers for their services, which sometimes leads to challenges with volunteer retention and engagement.
- In some communities, it is a challenge to find VHTs that are passionate about WASH improvements. In other areas, communities are overly eager to adopt and expand WASH solutions, and there is sometimes a compromise on program quality if it expands too quickly.

Lessons Learned: Building Capacity

- Finding enthusiastic head teachers (principals) is key for effective implementation of the child-to-community program. If these influential teachers are motivated, they help build capacity of other teachers and students. They also act as positive role models.
- It is easier to achieve program expansion and sustainability when community leaders are well equipped and buy into the program. It is also essential and strategic to build the capacity of VHTs. Given their influence and reputations, these volunteers are critical for program acceptance, quality assurance, and sustainability.



Financing

From inception in 2007 until 2013, more than 90% of funding for WSU was coming from Water School Canada (WSC). In 2013, WSU went through restructuring and diversified its funding sources. By the end of 2015, WSU raised 30% of its income outside WSC. By 2016, their funding from outside WSC was 50%.

Currently, WSU's primary funding comes from a mix of:

- Water School Canada
- Philanthropists
- Research agencies
- Other WASH implementing organizations
- In-kind contributions from program beneficiaries

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Water School Canada

WSC is a sister organization that was founded at the same time as WSU, in 2007. They raised the bulk of the funding that allowed WSU to launch and grow.

Philanthropists

In 2013, WSU won a WASH Impact Award from the UK-based Stars Foundation, recognizing its excellent governance, management, and program impact. In addition to the funding associated with it, the award attracted other philanthropists to partner with WSU. This increased credibility and visibility has improved WSU's financial growth and security.

Research Agencies

Eawag-Sandec funded WSU as it began working in SODIS, and created the peer-promotion strategy. Eawag-Sandec also funds a gravity-driven membrane filtration project that WSU has been piloting in some schools. Through this project, Eawag-Sandec finances some of WSU's "WASH in Schools" training.

Other WASH Implementing Organizations

Since 2014, WSU has earned some revenue from training other WASH organizations and building their capacity to implement programs in Uganda. Recently, SNV Netherlands Development Organisation contracted WSU to deliver some of their WASH programs in the country. WSU hopes to build collaborations with additional WASH-implementing organizations.

In-Kind Contributions from Beneficiaries

While WSU invests in WASH training and provides free PET bottles in households and schools, beneficiary households invest in supplies for tippy taps (foot-lever operated handwashing devices), pit latrines, bathing shelters, animal shelters, clotheslines, and compost pits in their homes. This means they typically contribute about 50% of the cost for the WASH hardware in their homes.

Challenges Faced: Financing

- Unlike hardware (such as boreholes, water tanks and pit latrines, which donors often want to fund because they are very visible evidence of programs), a software/knowledge-based program is harder to market for fundraising. A high degree of discipline was necessary to keep focused on building an education and training program, especially during the early stages of implementation when funding for such a program was difficult to access.

Lessons Learned: Financing

- To ensure donor retention, WSU needs to demonstrate commitment to transparency and integrity in financial management. WSU does this by clearly measuring and communicating outputs and outcomes for each donor.
- Having strong memorandums of understanding in place with program partners is important for communication and transparency.
- Small contributions made by beneficiaries add value, visibility, and sustainability to the program. As people's neighbours see the changes in their homes, they adopt similar changes for themselves, and this increases program impact.

Water School Uganda: Summary of Lessons Learned

- Actively listen to beneficiaries and use their suggestions to improve the program. Concerns and challenges may be specific to certain regions. For example, WSU learned that certain communities were losing PET bottles due to theft for fishing. Other individuals were worried about poison in their water. Addressing these concerns was critical for program credibility.
- Persist in looking for better options for product supply. Network in public and private sectors to maximise opportunities. Sometimes a larger program lends itself to sourcing materials more affordably in bulk.
- Engage with opinion leaders to increase the program's acceptance and sustainability.
- Demonstrate commitment to transparency and integrity with program resources; this increases the likelihood of not only retaining donors, but also attracting new ones.

Further Information

This case study is based on personal communication (November 2016 and February 2017) with Zephaniah Mukalere, Country Director of WSU. For more information, refer to:

- Water School Uganda: www.waterschooluganda.com
- Water School Canada: www.waterschool.com/

CAWST (Centre for Affordable Water and Sanitation Technology)
Calgary, Canada
Website: www.cawst.org Email: resources@cawst.org
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