

# Scaling up Household Water Treatment and Safe Storage in Ghana

## Report



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## LIST OF ABBREVIATIONS

BoP	Bottom of the Pyramid
BWN	Basic Water Needs
FDA	Food and Drugs Authority
GSA	Ghana Standards Authority
HCD	Human Centred Design
HWTS	Household water treatment and storage
iDE	International Development Enterprise
WHO	World Health Organization

## Introduction: What have we done around scaling up HWTS in Ghana?

A consortium of partners, including Antenna, IRC, WHO, and the Swiss Development Cooperation have been exploring ways to scale up household water treatment and safe storage (HWTS) in Ghana as part of the Safe Water Phase II Programme (2015-2018).

Key activities in Ghana to explore how to scale up HWTS include an assessment of the HWTS landscape in Ghana by Marion Kyomuhendo in 2010. A market assessment of HWTS options in Ghana by Roshini George in 2015 and a study by iDE in 2016 to understand the situation around household water treatment in northern Ghana. In 2016, iDE presented the report 'Understanding household water treatment in northern Ghana' to stakeholders in Accra.

The main purpose of this report is to reflect with key stakeholders (see Annex 1 for list of respondents) involved in trying to scale up HWTS in Ghana (as part of the Safe Water Phase II Programme) on what has happened since the presentation of the report by iDE in 2016. Both on the setting up of HWTS businesses in Ghana or other countries (see box 3) and the methodology used in the 2016 study of iDE (i.e. human centred design and technologies – see Annex 2).

The World Health Organisation (WHO) also visited Ghana twice in 2016. First to share the results of the first round of the International Scheme to Evaluate Household Water Treatment Technologies<sup>1</sup>. Secondly, to convene a national workshop to discuss the scope for setting up a regulatory framework in Ghana for HWTS, with amongst others the Ghana Standards Authority (GSA), the University of Cape Coast, the Water Resources Commission and the Ministry of Local Government and Rural Development (water and sanitation division). Additionally, in 2016 the Ministry of Water Resources, Works and Housing, the Ghana Standards Authority, the Ministry of Health and the Ministry of Local Government and Rural Development participated in an inter-regional workshop on strengthening evaluation, regulation and implementation of HWTS by the WHO/UNICEF International Network on Household Water Treatment and Safe Storage in Ethiopia<sup>2</sup>. WHO is planning to visit Ghana on HWTS in 2018.

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<sup>1</sup> The WHO International Scheme to Evaluate Household Water Treatment Technologies was established in 2014 to evaluate the microbiological performance of household water treatment (HWT) technologies against WHO health-based criteria. For more information see [http://www.who.int/water\\_sanitation\\_health/publications/household-water-treatment-report-round-1/en/](http://www.who.int/water_sanitation_health/publications/household-water-treatment-report-round-1/en/)

<sup>2</sup> For more information see [http://www.who.int/water\\_sanitation\\_health/water-quality/household/hwts-regional-workshop-ethiopia-2016.pdf](http://www.who.int/water_sanitation_health/water-quality/household/hwts-regional-workshop-ethiopia-2016.pdf)

## Scaling up HWTS in Ghana: progress since 2016

Although the potential for HWTS in Ghana seems apparent (see box 1 below), the demand for HWTS by both the users and the government (i.e. enabling environment) and the context (i.e. the wider WASH sector) need to be better understood in order to determine how to (or not) best scale up HWTS in Ghana. Below you find a summary of the main findings from the key stakeholders involved in scaling up HWTS in Ghana: the water users, the government and the WASH sector.

### **Box 1 THE CONTEXT: SAFE WATER IN GHANA**

Due to drinking contaminated water, diarrhoeal disease is the third most commonly reported illness by health centres across Ghana<sup>1</sup>. Without safe water, communities in Ghana suffer from high incidence of diarrhoeal diseases leading to persistent illness and death, particularly among children and infants. Around 6,600 Ghanaians die each year from diarrhoea, more than 50% of whom are children under five. 1 in 10 children will die before their fifth birthday due to water related illnesses<sup>2</sup>. Poor water quality is also a major cause of stunting in children, as is chronic malnutrition, a condition that affects 1 in 5 children in Ghana. Although there is an apparent need for HWTS, it is used only sporadically in Ghana, mostly in the north in emergency settings such as cholera outbreaks.

Compared to the rest of the country, the three northern regions of Ghana are particularly deprived of clean drinking water, and in the main northern region of Ghana alone, 32% of the 2.5 million residents lack access to improved water resources<sup>3</sup>.

## The user perspective

The research by iDE Ghana in 2016 aimed to ‘better understand the knowledge, attitude and practices of water users in northern Ghana’. One of the outcomes was that HWTS is hampered in Ghana by the perception that clear water equals clean water and people are therefore not treating their water. Many assume that clear water especially sachets, groundwater and piped water are safe even if this is not the case (iDE, 2016). To be able to scale up HWTS in Ghana, people need to be aware that clear water is not necessarily clean. **Behaviour change will need to be a large part of any strategy to scale up HWTS in Ghana.**

Sachet water is serious competition for safe household water treatment solutions (iDE, 2016). Users buy more sachets during the dry season due to scarcity of water (September-March)<sup>3</sup>. Sachets are convenient for users on the go or at school/work, even those who filter water use sachets. Users believe that sachet water is clean even when it is not.

Market research by Basic Water Needs in Ghana in 2017<sup>4</sup> has also shown that the supply chain of and awareness for HWTS is still in its infancy. Available options are chlorine tablets, but people do not seem to use them very much, and locally made ceramic pot filters. Awareness for safe water has increased due to the increase in use of sachet water. Sachet water is perceived as being safe ‘pure’ water but this is only the case for some brands.

<sup>3</sup> The study by iDE in north Ghana (2016) showed that sachet water costs around 3 Ghana Cedis per pack. Each pack contains 30 sachets. Each sachet costs 20 Pesewa.

<sup>4</sup> See <https://rsr.akvo.org/en/project/6216/>

Typical water sachet said to contain "pure water"



Photo credit: Justin Stoler/University of Miami, <https://phys.org/news/2013-06-sachet-consumption-ghana.html>.

Market research by the Ghanaian partners, through a Basic Water Needs funded project in 2017, showed that people were positive towards using a water filter instead of sachets, for reasons of savings in the longer term, reliability (they can be sure that the water is safe) and decrease of plastic waste. The study of iDE Ghana in 2016 also indicated that families are interested in and willing to pay for a water filter.

Based on the study of iDE in Ghana (2016), users of HWTS products stop using them when piped water is installed in their proximity. Even though boreholes and pipes were not always properly excavated and maintained, and groundwater in certain areas can contain elements such as arsenic and fluoride due to the nature of the geological rock formation. They can cause serious health issues and HWTS products should therefore still be used in areas with piped water.

Some challenges to successfully introduce household water filters in Ghana are the relatively high initial investment costs, the absence of a supply chain, the unfamiliarity of filters and the 'convenience' of sachets.

The research by iDE in 2016 in Ghana also showed that a user's decision to use one source over another is driven by price, availability, labour intensity, distance and taste preference. Taste preference is related to a user's current and past water access and experience. This is in line with other studies on HWTS products uptake by Ojomo (2015, see Box 2).

## **Box 2 ENABLING ENVIRONMENT FOR HWTS PRODUCTS**

Ojomo (2015) identified 22 enablers and 25 barriers for the enabling environment of HWTS products uptake in 'Sustainability and scale-up of household water treatment and safe storage practices'. Many factors identified by Ojomo are relevant for safe water businesses. The barrier to HWTS uptake that was most frequently mentioned was the 'product cost'. The only ways for safe water businesses to become sustainable is through household demand and affordability of the product. All factors were summarised and grouped as follows:

- User preferences (i.e. user demand for HWTS and user technologies preferences)
- Integration and collaboration (e.g. partnerships)
- Standards, certification and regulations (i.e. formal rules and voluntary standards)
- Resource availability (e.g. affordability of products)
- Market strategies – product supply (e.g. supply chain, competition)
- User guidance on HWTS products

## The enabling environment in Ghana

Many barriers for going to scale are outside the direct control of HWTS businesses as they are related to broader market, industry or government constraints. This is what we call the business environment or enabling environment. Governments therefore play a key role in scaling up HWTS in creating an enabling environment conducive to HWTS by for instance creating a well-functioning (financial) infrastructure, setting a benefiting regulatory framework and providing information about the benefits of drinking safe water.

Concerning the enabling environment, Ghana has a national strategy for HWTS. However, after the last elections in Ghana (December 2016 red.) and the consequent re-structuring of the ministries, there is a need to scope the interest and level of priority within the ministry responsible for HWTS. It is unclear, for WHO amongst others, who in the ministry is now responsible for HWTS and the priority given to HWTS. Scaling up HWTS in Ghana can only be successful if it is also a priority for the ministry responsible.

The mandate for regulation of HWTS (and sachet water) in Ghana is also unclear. In order to be able to scale up HWTS in Ghana there is a need to clarify who has the mandate for regulation and establishing a regulatory framework for HWTS, including product safety and performance standards, certification and product labelling system.

There are currently no national standards for HWTS systems in Ghana. Products have to be certified by the Ghana Standards Authority<sup>5</sup>, and need to be registered with the Food & Drugs Authority (FDA)<sup>6</sup>. Current certification requirements are inspection of facility and premises, dossier review, laboratory test results, and appropriate labelling. The timeline for product registration is three months. As part of the capacity building activities of the International Network on Household Water Treatment and Safe Storage Scheme, WHO was working with FDA and GSA to expand the scope of the evaluation and registration to include microbiological performance against bacteria, viruses and protozoa, and develop national standards for HWTS systems.

<sup>5</sup> The Ghana Standards Authority (GSA) formerly Ghana Standards Board (GSB) is a Government of Ghana agency responsible for the maintenance of acceptable standards for products and services and sound management practices in industries and public institutions in Ghana.

<sup>6</sup> The Food and Drugs Authority (FDA) is a Ghanaian government agency responsible for the inspection, certification and proper distribution of foods and food products as well as drugs in Ghana.

Women fetching water from a hand dug well in Agravi, Ghana



Photo credit: IRC Ghana

## The wider context: WASH sector

Since the beginning of the Safe Water Phase I Programme in 2010, the context for HWTS has changed. With the SDGs attention for safe water and water quality will grow.

Within WHO (and increasingly within the WASH sector), HWTS is now part of water safety planning and is seen as a component of realising basic access to safely managed drinking water for all by 2030 (i.e. SDG 6). In 2015, when the Safe Water Phase II Programme started, HWTS was viewed in isolation as a standalone intervention, mostly implemented in emergency settings. It was not part of a wider framework on safe drinking water or water safety planning. This shift in thinking provides new opportunities for scaling up HWTS and the sustainability of HWTS businesses as it moves away from HWTS as just an effective emergency response intervention. HWTS is part of water safety planning and sustainable safe water service delivery.

The space for HWTS is evolving from products at household level to the design of point of use treatment for small-scale distribution systems, storage tanks and boreholes<sup>7</sup>. Particularly applying point of use treatment (for example through chlorination) is an area of work that seems to be expanding with organisations such as UNICEF, WaterAid and USAID. For example, HWTS as part of WASH in health care facilities programmes can be an entry point to scale it up. HWTS is part of these programmes but in a different format.

<sup>7</sup> For example in Bangladesh see the work of Amy Pickering <https://engineering.stanford.edu/magazine/article/stanford-engineers-debug-dhaka-s-water>

## Concrete outcomes

Concrete outcomes in trying to scale up HWTS in Ghana (as part of the Safe Water Phase II Programme) since the presentation of the report on household water in northern Ghana by iDE in 2016:

***iDE Ghana aligned their country strategy in Ghana and made access to water their entry point.***

The research by iDE in 2016 in northern Ghana made iDE Ghana realise that one of the major constraints in northern Ghana is access to (safe) water. The research funded by Safe Water Phase II helped iDE Ghana to align their country strategy and make access to water their entry point. In the new country strategy, HWTS falls under access to safe water, the same as for iDE's agricultural and nutritional programmes.

***Several concept notes developed by IRC Ghana and iDE Ghana on HWTS in Ghana are in the pipeline of which one (up to date) has been successful.*** iDE Ghana receives funding from the Hilton Foundation for a period of two years, to assess and explore the feasibility of HWTS products and the business model for delivering the product (i.e. candle filter) in Ghana and the customer base. In this project, iDE Ghana partners with private sector company KOHLER.

The project of iDE Ghana together with KOHLER started in December 2017 with a 'deep dive' (as part of the Human Centred Design methodology) for 6-8 weeks to explore the feasibility of HWTS products and the business model for delivering the product in Ghana and the customer base. Trying to answer design principles and potential business delivery principles (e.g. door-to-door for BoP customers on less than 2 USD a day or a greater supply chain working with a market-based approach). In the project, iDE Ghana is working with suppliers and research value chains. The project aims to pilot the business model for a filter system (i.e. candle filter also known as KOHLER clarity). No specific area in Ghana has been identified to pilot the business model. This will be chosen based on the outcomes of the ongoing feasibility study.

As part of the Hilton funded project, iDE Ghana is trying to learn more about the perception on and demand for HWTS in other cities in Ghana such as Tamale where the 2016 research took place. iDE Ghana is now trying to understand the market for sachet water (i.e. costs, affordability) and trying to generate awareness and demand for HWTS.

***Two new projects on HWTS in Ghana have been started by Basic Water Needs (BWN).*** BWN used the 2016 study by iDE Ghana as a confirmation to start working there. One of the filters (i.e. Tulip filter) developed by BWN was studied by iDE Ghana in their 2016 study. The VIA Water project funded by Aqua for All (A4A) is trying to scale up mobile IT tools for safe water enterprises in Ghana and Rwanda<sup>8</sup>.

BWN is also trying to scale HWTS in Ghana with a 'Try and Buy approach'<sup>9</sup>. The innovation to be tested in this project is the business model, not the product (i.e. Tulip filter). The project wants to prove that with a new and innovative business model (i.e. try and buy) a sustainable supply chain for household water filters can be developed in Ghana. Women leaders and women entrepreneurs are trained and subsequently demonstrate the filters to their network (existing women groups). Families can try the filter for three months for free and in that period save costs by not having to buy sachet water or to boil water. After the trial period, each family can decide to buy the filter or to give it back. It is hoped that this will lead to demand creation and income generation.

In 2014, a small six months action research project tested a newly developed ProCleanse water filter in Savelugu-Nanton municipality in the northern region of Ghana<sup>10</sup>. A public-private partnership looked into use, acceptance and performance of the filters by 265 households. The research results have not been published yet.

<sup>8</sup> See <https://www.viawater.nl/projects/scaling-mobile-it-for-safe-water-enterprises>

<sup>9</sup> For more information see <https://rsr.akvo.org/en/project/6216/>

<sup>10</sup> See <https://www.ircwash.org/news/irc-leads-partnership-test-procleanse-water-filter-rural-ghana>

### **Box 3 Scaling up HWTS in other countries: Examples from Ethiopia**

**Ethiopia:** As part of a larger Self Supply Acceleration programme in Ethiopia led by the Millennium Water Alliance (MWA), Aqua for All initiated in 2016 a so-called Try and Buy pilot to draw attention to a market-led approach to increase the availability and sales of HWTS products like water filters in two woredas. The aim was to trigger all stakeholders active in the HWTS supply chain, all the way from private sector suppliers to the household level, supported by government and NGOs. The goal was to stimulate increased household investments in safe water solutions, by getting acquainted with different HWTS products, and increasing knowledge about and access to products and services.

Since October 2017, iDE Ethiopia has also started a project in Ethiopia with a budget of 1.1 million Euro funded by RVO (the Dutch enterprise agency) on household water filters.

Since 2013, UNICEF and iDE Ethiopia implement a Sanitation Marketing programme in Amhara, Oromia and Tigray Regions of Ethiopia. This was the first type of social enterprise in Ethiopia at the time. iDE used the HCD methodology (i.e. Deep Dive Market Assessment) to assess the socio-economic situation of the woredas before embarking on piloting and implementing the project. Five businesses have been set up and trained to produce and sell slabs with a standard vent pipe. The inclusion of vent pipes was the result of a consumer satisfaction assessment on the use of slabs.

In conclusion, the potential for HWTS in Ghana is unclear. By the middle/end of 2018, through the ongoing projects of BWN and iDE Ghana (which include market assessments and piloting of business models) and engagement with key government stakeholders on HWTS by WHO this should become clearer. A possibility would be to organise a workshop in Ghana or at the Stockholm World Water Week 2018 to share experiences and show the potential of HWTS in Ghana in order to attract investors and NGOs.

The commitment of the private sector is however really lacking in Ghana<sup>11</sup>. This needs more attention in order for the sustainable scaling up of HWTS in Ghana.

Although the potential for HWTS in Ghana remains unclear, finding traction for HWTS in Ghana seems opportune. With (at least) three organisations (iDE Ghana, BWN and WHO) currently working on scaling up HWTS in Ghana, there appears to be momentum.

## References

IDE, 2016, '*Understanding household water in Northern Ghana; from a user's point of view*', report. (This report has not been made publicly available.)

Ojomo, Edema et al, 2015. *Sustainability and scale-up of household water treatment and safe storage practices: Enablers and barriers to effective implementation*, International Journal of Hygiene and Environmental Health 218 (2015) 704-713

<sup>11</sup>Based on the analysis from WHO Ghana see <https://www.washghana.net/sites/default/files/c16740175bca2f5b-4b2721271284a5dd.pdf> and [http://hwts.web.unc.edu/files/2014/08/2013Accra\\_Day1\\_04\\_Demedeme.pdf](http://hwts.web.unc.edu/files/2014/08/2013Accra_Day1_04_Demedeme.pdf)

## Annex 1: List of respondents

Table 1 Respondents

Name	Function	Organisation
Yi Wei	Director	iDE Global WASH
Brian Kiger	Program Director	iDE Ghana
Vida Duti	IRC Ghana director	IRC Ghana
Annemarieke Maltha		Basic Water Needs
Batsi Majuru	Technical Officer	WHO
Abinet Kebede	Research and policy advisor	IRC Ethiopia
Dries de Kater	Business Developer	Basic Water Needs

## Annex 2: Human Centred Design

### Human Centred Design

Human-Centred Design (HCD) is a methodology that maximises the likelihood of adoption, long-term sustainability, and scalability of a market-based solution. It is used to design and deliver holistic offerings – usually a combination of product(s), service(s), marketing, financing, and distribution.

HCD utilises an ethnographic method to really understand latent user and stakeholder needs, and combines this with design methods and expertise from product design, industrial design, business design, service design, and marketing strategy. The result is a market-based solution that is desirable, accessible, usable, maintainable, and affordable to consumers, in addition to being technically feasible and economically viable for stakeholders in the market system.

HCD is a best practice among (market-based) consumer goods and services firms. It has gained recent credence in the development sector as a means to improve the ROI (return on investment) as well as the probability of scale and sustainability of market-based initiatives.

Source: <http://www.designkit.org/human-centered-design> and [https://en.wikipedia.org/wiki/Human-centered\\_design](https://en.wikipedia.org/wiki/Human-centered_design)

**Human-Centred Design (HCD)** is again used as part of the new ongoing projects of iDE Ghana. On the one hand it was an appropriate methodology to use for the 2016 study of iDE Ghana as it is suitable for short projects to understand the users perspective and do a 'gut check' of what is happening on the ground. It helps to get insights that can be actionable. However, the methodology might work better in a setting where people are more familiar with a range of technologies, as it can be difficult to get a user's perception on HWTS technologies if users only know one type of technology.