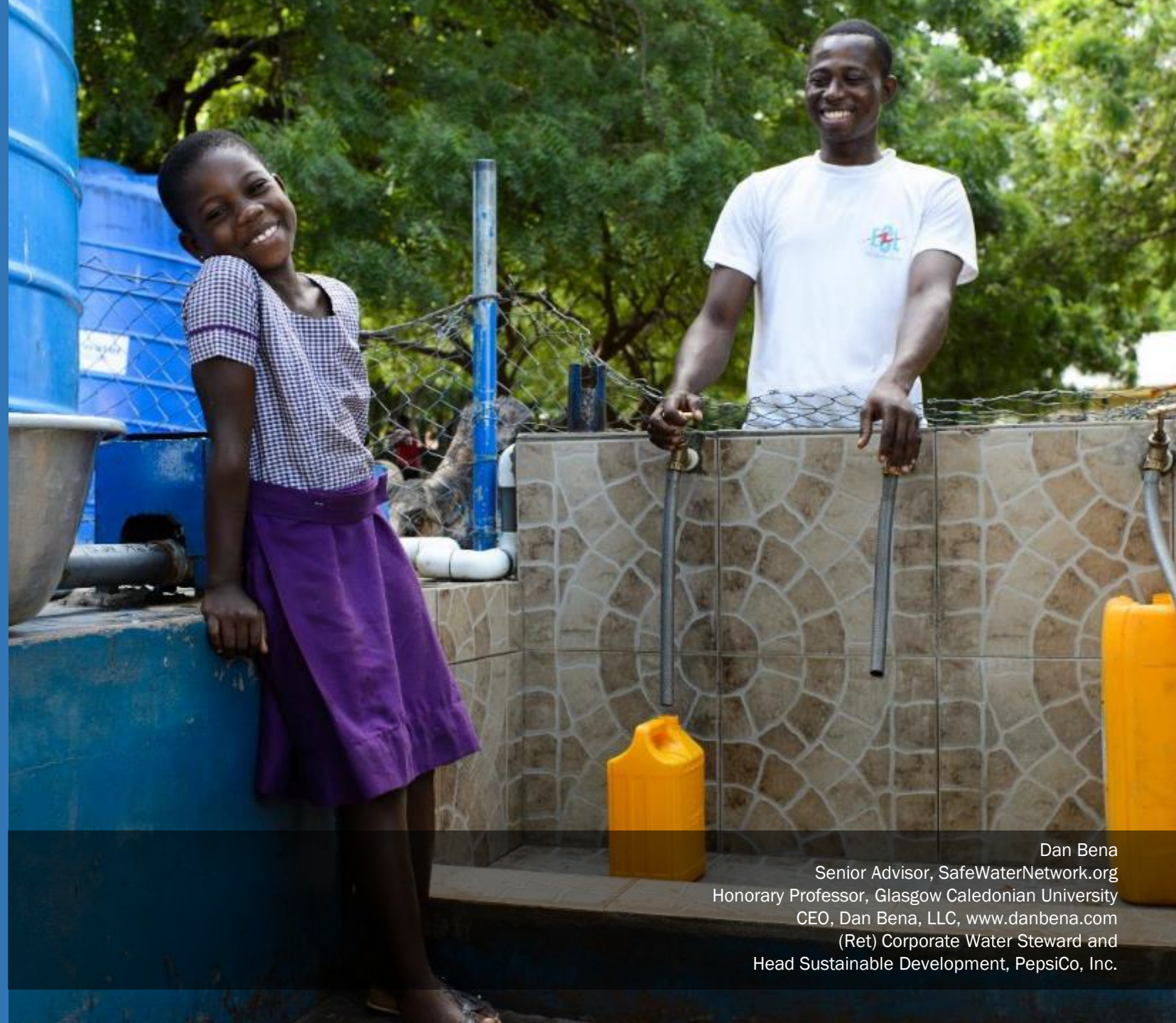



Tackling The Challenges  
Of Consistently Providing  
*Safe Water*  
To Those In Need





Four young girls are standing in a line in front of a blue metal fence. They are holding signs that emphasize the importance of water. The girl on the far left holds a pink sign that says 'WATER IS LIFE'. The second girl from the left holds a pink sign that says 'WATER IS WEALTH'. The third girl from the left holds a yellow sign that says 'WATER IS EDUCATION'. The girl on the far right holds a light blue sign that says 'WATER IS PEACE' with a small drawing of a water tap. All the girls are smiling and wearing school uniforms consisting of a light-colored top and a grey skirt. The ground is dirt and gravel.

WATER  
IS  
LIFE

WATER  
IS  
WEALTH

WATER  
IS  
EDUCATION

WATER  
IS  
PEACE

**Who is Safe Water Network?**



---

# OUR HISTORY

Safe Water Network was co-founded in 2006 by the late actor and philanthropist Paul Newman, along with prominent civic and business leaders. In 2008 Safe Water Network established field offices in Accra, Ghana and New Delhi in India.

Our team of local water experts began laying the groundwork for an approach to developing the community capability to own and manage Safe Water Stations. Today our country teams oversee field initiatives, host forums and workshops, as well as produce publications and research about our work. An esteemed international board comprised of leading water authorities and business leaders contributes to an increasingly influential organization focused on empowering communities around the world to overcome the challenges to local sustainability.



Watch Paul Newman's daughter, Clea, reflect on her father's legacy and the impact of Safe Water Network (two-minutes):

<https://vimeo.com/305866799>

We started out with a black box, literally

# We started out with a black box, literally

It was a unique treatment device, using enhanced distillation, housed in a black box!

It was capable of treating a broad range of water contaminants...

...but technology, alone isn't enough!

# Many other pieces of the puzzle are needed to ensure lasting impact

## Local Operations

Training to run the water enterprise like a business



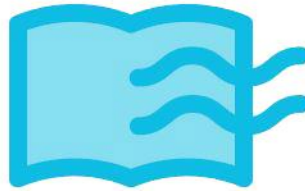
## Monitoring

Real-time data collection and analysis



## Outreach

Programs to build consumer demand



## Treatment



## Delivery

Clean water reaches community members

## Source Water

Assessed and managed for sustainability



## Water Revenue

Pays for operations, technical services, maintenance, and capital recovery



~1.5 MILLION PEOPLE

(our impact, so far)

It's a great achievement, but still incremental considering that

**2.1 BILLION**

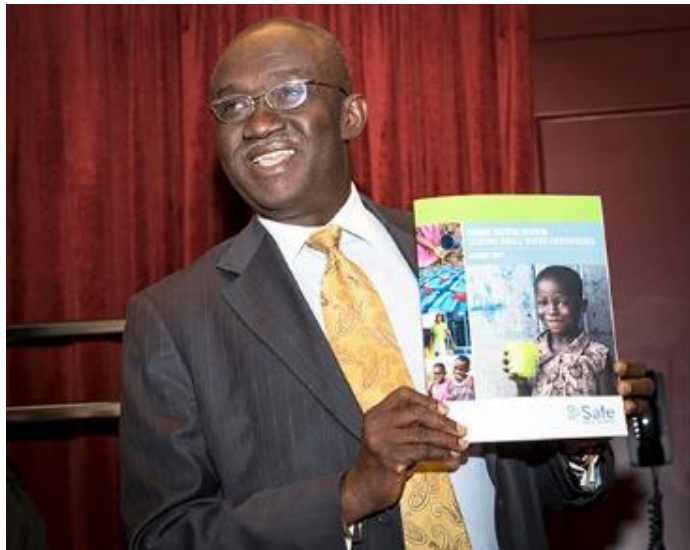
people currently lack access to

reliable, safe water services



We are taking our impact to scale, through replication of proven model,  
documenting and sharing successes to advance the sector,  
engaging the right stakeholders, and  
building capability through technical advisory services

# Taking Impact to Scale



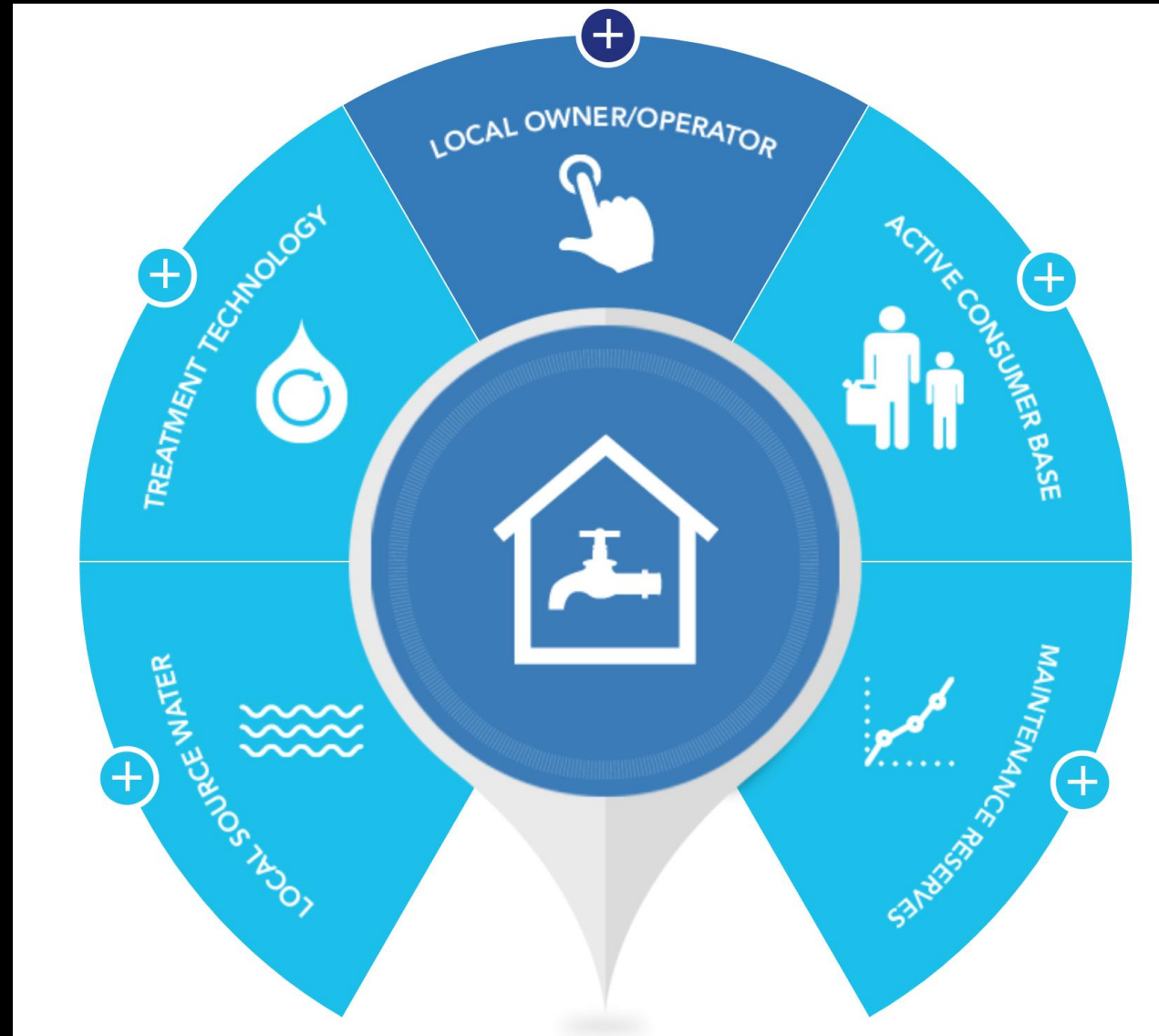
THE WORLD BANK





A photograph of a water tower with a blue metal frame. The tower has two blue water tanks on top, each with the 'HOME!' logo. A white banner across the tower features the 'HOME!' logo in large blue letters, the text 'water for life', and logos for 'Safe' and 'Newman's Own Foundation'. The tower is set against a sky with a palm tree and a building in the background. A blue metal fence is in the foreground, and a concrete base with gravel is visible. In the bottom left corner, a few people are sitting on the ground.

# At the core is the Small Water Enterprise (SWE)

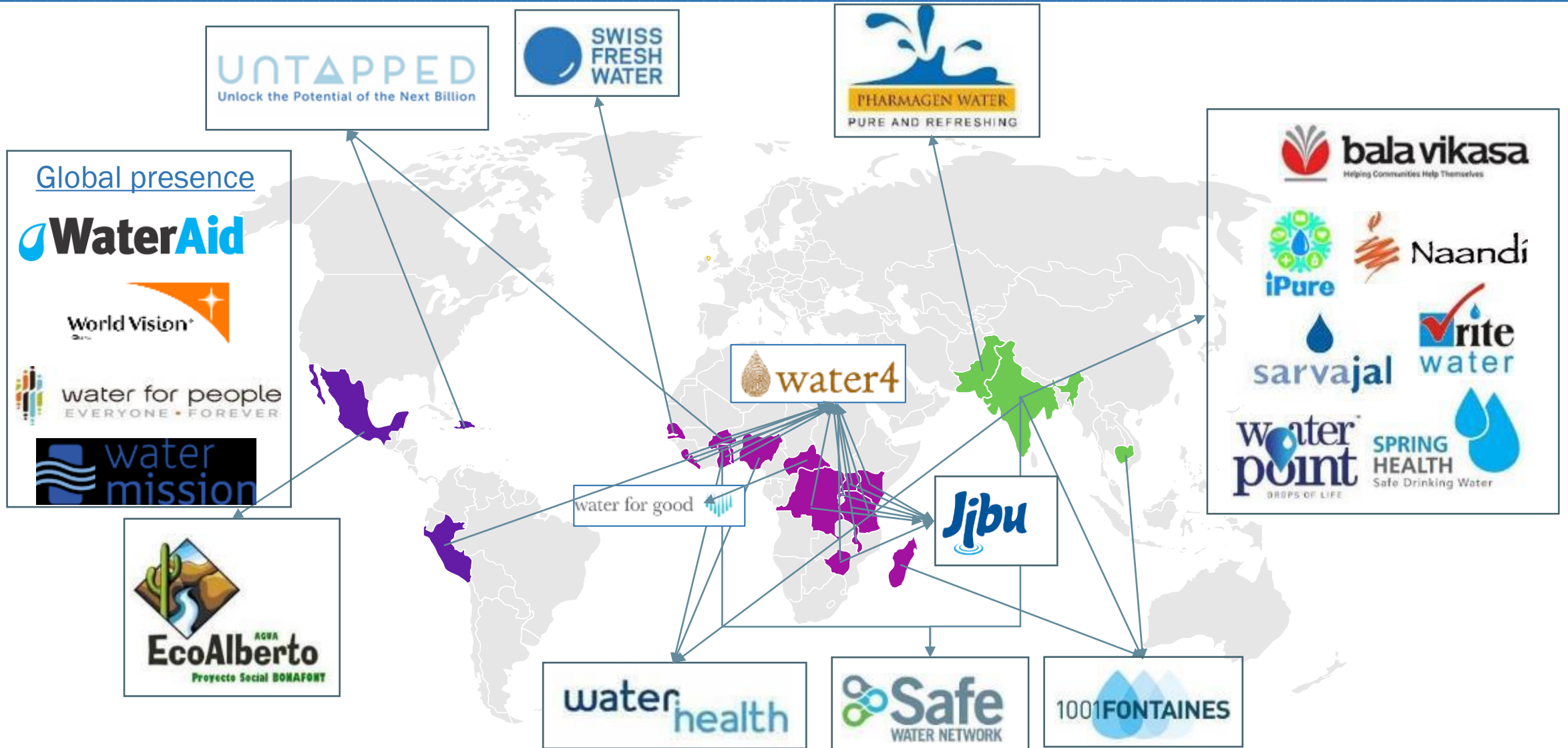


Watch this short animation which describes a Small Water Enterprise:

<https://vimeo.com/347818171/cd4e5c5f74>



# Where Do SWEs Operate?





“What is exciting about Safe Water Network’s approach is that it is truly sustainable.”

--His Excellency Kofi Annan  
Seventh Secretary General, United Nations  
Nobel Peace Prize Laureate





# Ghana Household Water Quality







## 2018 STATISTICS

86

ENTERPRISES IN  
GHANA

>380k People  
WITH ACCESS TO SAFE  
WATER

AFFORDABLE

\$0.02

PER 20L

<5%

DOWNTIME

100%

OF ENTERPRISES STILL  
IN OPERATION

Meets

RELEVANT QUALITY  
GUIDELINES



# Span of the study

## SAFE WATER NETWORK HOUSEHOLD WATER QUALITY ASSESSMENT PROGRAM

### Field Report

Submitted to:

Program Manager  
Safe Water Network  
Accra, Ghana

Submitted by:

Dr. Lydia Mosi  
Senior Lecturer/ Head of Department  
Department of Biochemistry, Cell & Molecular Biology  
West African Center for Cell Biology of Infectious Pathogens  
University of Ghana  
Accra, Ghana

7<sup>th</sup> March 2019



The study was undertaken in six (6) villages in five (5) Districts in three (3) regions in Ghana as presented in **Table 1.1** below.

Table 1.1: Distribution of Study Communities


Region	District	Community
Ashanti	Ejura-Sekyeredumasi	Anyinasu
		Ofoase
	Asante Akim South	Yawkwei
Western	Bodi	Kwesikrom
Volta	Biakoye	Apesokubi
	North Tongu	Fodzoku



Figure 1.1: Selected districts for the study

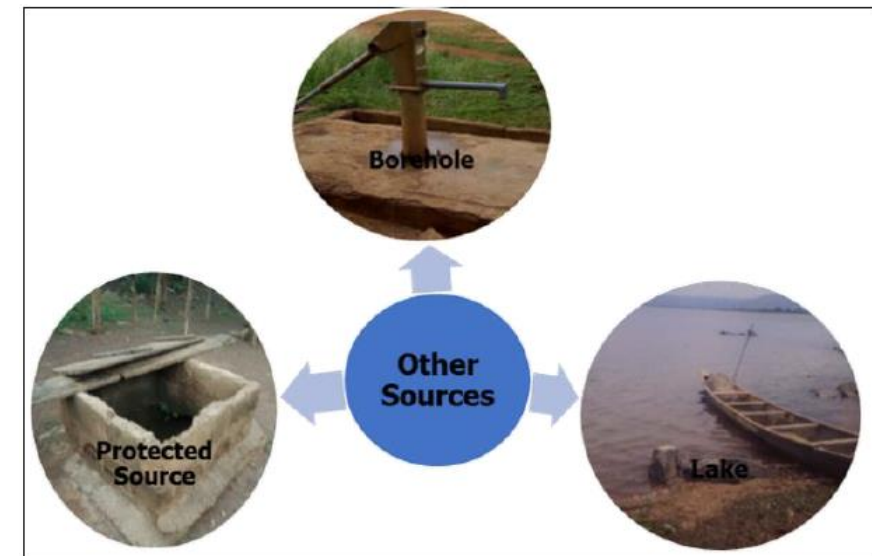
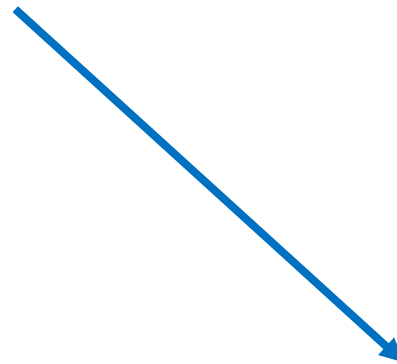
# Goals and Objectives

The overall goal of the water quality assessment program is to improve drinking-water transportation, storage and handling practices and consequently water quality at the household through on-going water quality monitoring and interventions. Specific objectives and activities include:

- 
- A large, solid blue arrow pointing to the right, positioned on the left side of the slide, pointing towards the list of objectives.
1. Conduct on-going water quality monitoring and evaluation by comparing household level water quality among consumers collecting at the ***SWN Station, consumers with SWN household connections, and consumers of alternative water sources***
  2. Understand ***household behavior*** with respect to transportation, storage and handling of water that affects water quality through observation, surveys and water quality testing
  3. Make recommendations to SWN to ***inform their operational and consumer-focused interventions*** and to share with the sector to ensure provision of safe water at the household.

# Methodology

- 180 Households surveyed for behaviors
- SWN users include at station, standpipe, household connections
- Non-SWN users include protected storage, lakes, boreholes
- 265 samples total:
  - Total coliform
  - *E. Coli*
  - Turbidity (nephelometric)
  - Residual chlorine (total)
  - pH
  - Total Dissolved Solids (TDS)



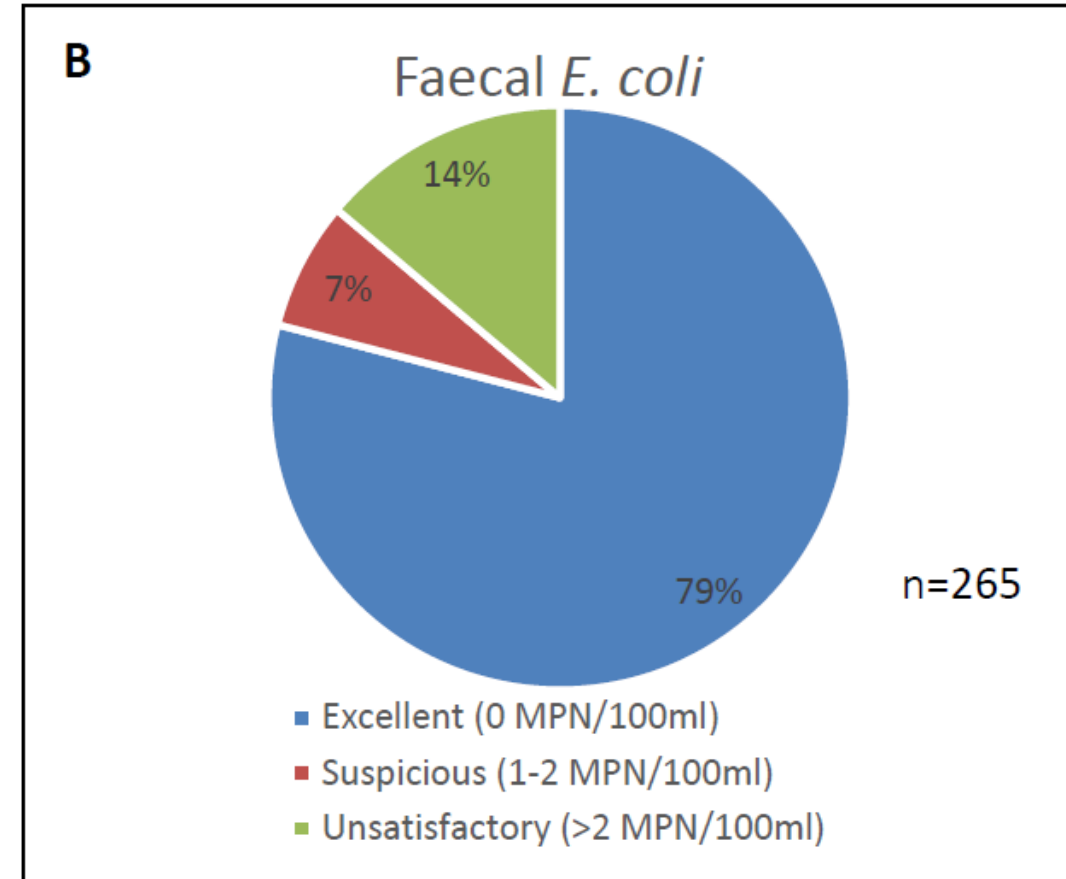
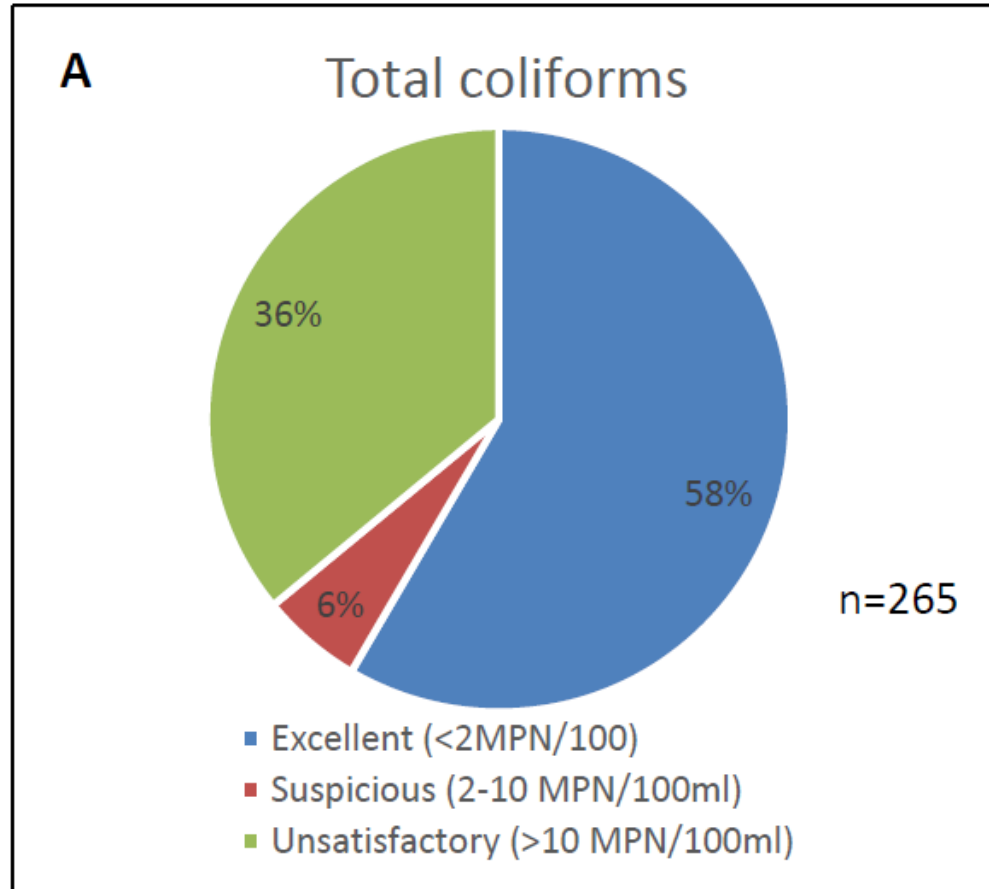


Figure 3.14: Overview of microbial purity of all the water sample collected. The total coliform (A) and faecal *E. coli* (B) contaminants were determined as most probable number (MPN) and classified as excellent, suspicious or unsatisfactory.



# Water Quality Degrades from Station to Home

Sample taken at source



Sample taken before transport



Sample taken at the end of transport before delivery



Sample taken from storage after new delivery



<i>E. coli</i>	<u>Source</u>	<u>Before transport</u>	<u>End of transport</u>	<u>Storage</u>
Excellent	17 (100%)	22 (100%)	21 (91%)	16 (80%)
Suspicious	0 (0%)	0 (0%)	0 (0%)	2(10%)
Unsatisfactory	0 (0%)	0 (0%)	2 (9%)	2(10%)
<b>Total</b>	<b>17</b>	<b>22</b>	<b>23</b>	<b>20</b>
<b>Total coliforms</b>				
Excellent	15 (88%)	20 (91%)	18 (78%)	12 (60%)
Suspicious	2 (12%)	1(5%)	3 (13%)	1 (5%)
Unsatisfactory	0(0%)	1(5%)	2 (9%)	7 (35%)
<b>Total</b>	<b>17</b>	<b>22</b>	<b>23</b>	<b>20</b>
Average Cl <sub>2</sub> level (mg/l)	0.5	0.3	0.2	0.0

# Reality check...

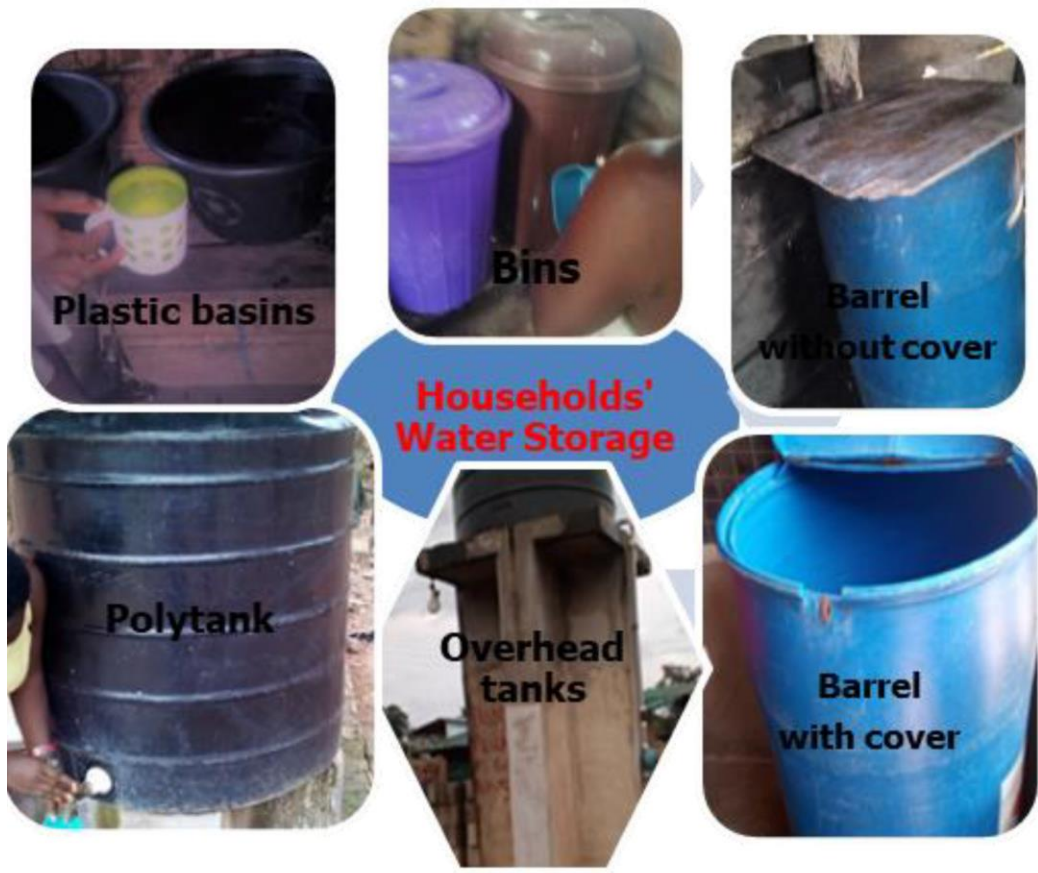
Photos “on-the-ground” to anchor us in some of the local challenges, not unique to Ghana



**Ways of  
Collecting  
Water  
from  
sources**







The human side--  
behaviors and beliefs...

(extracted from the report)

# Report Observations

“In spite of the unprotective manner in which vessels used for fetching water are handled, 70% of 40 respondents from household connections think that retrieving water from storage with such unprotected cups, bowls, cans, etc.

**does not affect the water quality.**

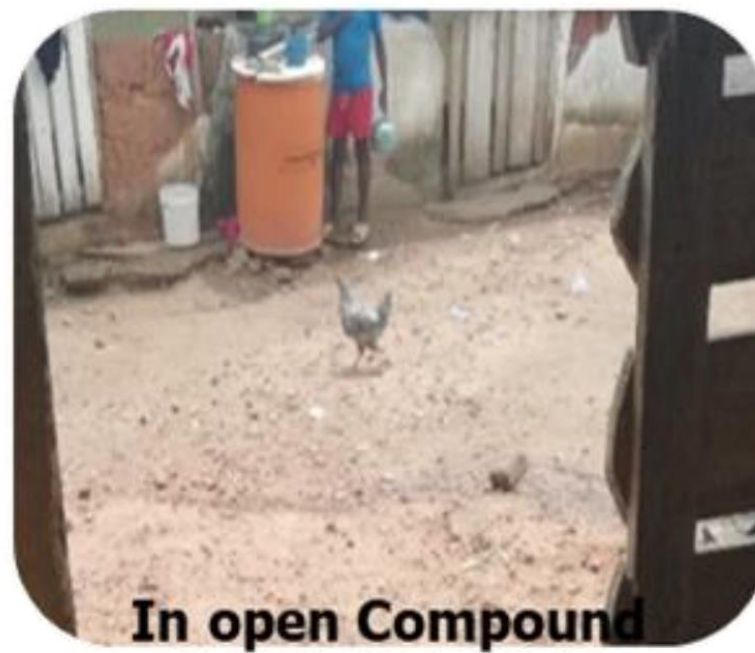
This group believes that their storage containers are clean and covered to protect their water.”





# Report Observations

“Even though a significant number of respondents (81%) state the benefits of household water treatment and safe storage, only 11% use any form of household water treatment and safe storage units. Bleaching and the use of camphor are the most common methods of treatment.”



# Report Observations

“Only 40 out of 155 (26%) respondents indicate that *water quality has an effect on the health of their households*. The 74% who think otherwise *believe that their water is clean and safe* and that they do not have any reported cases of water-related illnesses.”



# Report Observations

“For the community members in this study, water from source and in storage is generally considered safe by virtue of its visual clarity. Majority of respondents think that because the water remains as clear as they secured it from source, the quality remains the same, regardless of their improper handling, transport, and storage.”





We have just read about various challenges that are common when  
“on the ground” providing safe water services.

Another significant challenge is the variable  
and sometimes inexact definition of “safe water.”

# WHO/UNICEF Definition of Safe Water

Safely managed  
drinking water



“To be considered safe, drinking water must be free from pathogens and elevated levels of harmful substances at all times. Assessment of drinking water quality provides an important measure of safety, and most countries have national standards that are in many cases aligned with WHO Guidelines for Drinking Water Quality. The highest priority water quality parameter globally, and in most countries, is contamination of drinking water with faecal matter.”

# Do You See Anything Of Concern Here?

- “Free from” is not scientific, nor is it routinely achievable
- “Elevated levels” varies widely
- “Harmful” is based on many complex assumptions of toxicologic science and health risk assessments
- “At all times” is virtually impossible to achieve, in reality

“To be considered safe, drinking water must be free from pathogens and elevated levels of harmful substances at all times. Assessment of drinking water quality provides an important measure of safety, and most countries have national standards that are in many cases aligned with WHO Guidelines for Drinking Water Quality. The highest priority water quality parameter globally, and in most countries, is contamination of drinking water with faecal matter.”



# Do You See Anything Of Concern Here?

- “Aligned with” is often non-specific and varies in meaning
- WHO Guidelines include many chemical, physical, microbiologic, and radiologic parameters
- Even when WHO Guidelines are adopted into national law, it is common to lack laboratory testing capability to confirm compliance

“To be considered safe, drinking water must be free from pathogens and elevated levels of harmful substances at all times. Assessment of drinking water quality provides an important measure of safety, and **most countries have national standards that are in many cases aligned with WHO Guidelines for Drinking Water Quality.** The highest priority water quality parameter globally, and in most countries, is contamination of drinking water with faecal matter.”

# Do You See Anything Of Concern Here?

- Historically, focus has been on microbial testing, due to acute health risk (vs. exposure over a lifetime)
- Recent genomic testing is advancing our knowledge of waterborne contaminants, but also raising questions of treatment efficacy and health correlations

“To be considered safe, drinking water must be free from pathogens and elevated levels of harmful substances at all times. Assessment of drinking water quality provides an important measure of safety, and most countries have national standards that are in many cases aligned with WHO Guidelines for Drinking Water Quality. The highest priority water quality parameter globally, and in most countries, is contamination of drinking water with faecal matter.”

## A definition of “safe water” for consideration\*:

“Safe water” is water protected from contamination by waterborne pathogens, and which meets health-based limits for microbial, chemical, physical, and radiologic contaminants established by national regulations, as well as any secondary limits established for aesthetics, corrosion control, or other rationale.

\* Recommended by Dan Bena to Safe Water Network, internal communication



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

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