Innovations and Technology for WASH

Presentation at the

35th Mole Conference,

Volta Serene Hotel, Ho

by

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Context

Water:

- The National Water Policy identifies hard to serve communities as a special category of communities that require special focus.
- These may be in remote isolated locales or in normal locations, with difficult hydro-geological terrains,
- or in coastal areas with saline ground water conditions at the fringes of major cities.
- All standard improved water technologies prove unsuccessful - with sucess rates as low as 20% in some cases
- Surface water sources remain their only source of drinking water.

Innovations in Drinking Water Technologies Reaching Last Mile commiunities

1. CWSA's 6 Districts Water System

- The CWSA 6 Districts Water System, serving close to 300 communities in 6 Districts.
- Water treated at a source located on the Volta River, and piped to communities located over 80km away, or more
- Comprises a vast network of primary and secondary transmission lines, overhead reservoirs, boster stations and public stand posts with household connections
- Best approach to reaching last mile communities in rural areas at scale.

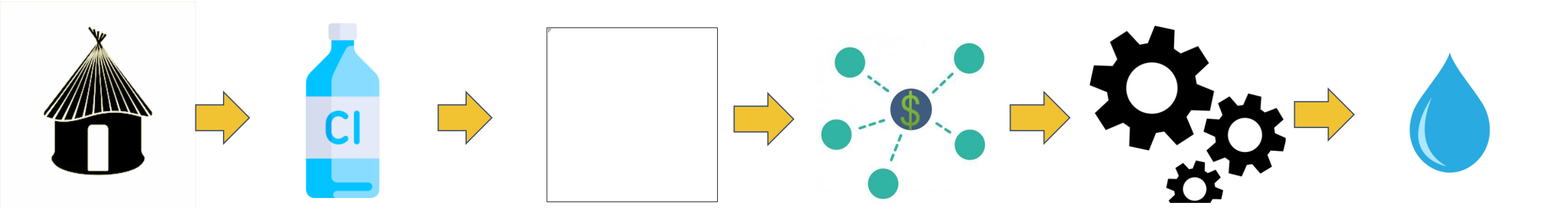
2. Simplified Surface Water Treatment System

- eg, Saha Global in the Northern and Oti Regions
- Targeting communities that lack safe water access due to their:
  - Remoteness, and difficulty to physically access: The road network restrains access by drilling rigs or other heavy machinery and equipment.
  - Size is too small: Populations below the national threshold of 70 people, hence overlooked by service authorities
  - There is no ground water: Often several drilling efforts have yielded no water; yet no other standard improved technology is feasible.
  - Water Scarcity: Available surface water may dry up in the dry season, or no surface water at all
- Currently reaching over 410 communities in 5 districts, serving 138,816 people.

Saha Global

- Raw water from dam/dugout manually hauled into blue drums for coagulation and clarification
- Standardised number of chlorine tablets to be applied depending on number of blue drums of water poured into the black storage.
- Women buy treated water with green buckets
- A water transport innovation deploy tri-cycles to supply raw water to treatment centers placed at community centers

Understanding Saha's Execution Model



Communities served

- Hard-to-reach communities
- Village with populations less than 700 people
- Communities depend on surface water

Treatment Method

- Coagulation & Chlorination
  - Alum & Chlorine
  - Purified centrally at Water centre by 2 to 4 female

Paid local women Operators

- Train, equip and pay local women (Operators) to run treatment centres
- Pay is tied to performance

Sales & Distribution

- Sold by water operators in the community
- Sold at an affordable price

Professional Support

- Regular check in and water testing
- Insurance package
- Repair and replacement of parts
- SOPs

Sustained access to safe water

3. Home grown conventional Surface Water Treatment System

- eg Blue Gray Aqua's Conventional Treatment System,
- Built and operated at Afuaman in the Ga West Municipality
- Design capacity can serve over 10,000 households, but now at initial stages of roll out - About 5000 households currently reached through a combination of Water Kiosks and Household Connections

Problem: Deplorable quality of water sources

1. No potable water system
2. Unusable underground water aquifer due to high salinity
3. The community depended mainly on untreated Densu River (picture) for their domestic use.

Our Solution

Blue Grey Aqua - Ghana's first home-grown Drinking Water Treatment System

- ✔ developed and assembled in Ghana
- ✔ patented
- ✔ adjusted and tested for local conditions
- ✔ plant can serve up to 33'000 people

Safe piped drinking water made available to 33,000 people in Afuaman, (Accra) using our innovative WTP

The product...

Sales of our innovative modular water treatment systems

The Business MODEL

Sales of safe piped drinking water

4. Micro grids Approach

- eg JBest Co Ltd
- Has provided over 500 Boreholes to households and Individuals who pay full cost, with the purpose of selling water to other households
- An emerging trend where a few nearby households (10-15) get a household connection from the source, thereby forming a Micro grid
- JBest now offers credit up to 20% of the cost of the borehole
- Such boreholes equipped with digital control devices that allow the company to remotely shut down the system if repayment is defaulted over an agreed period.

J BEST WATER
& ENVIRONMENT
CONSULTANT

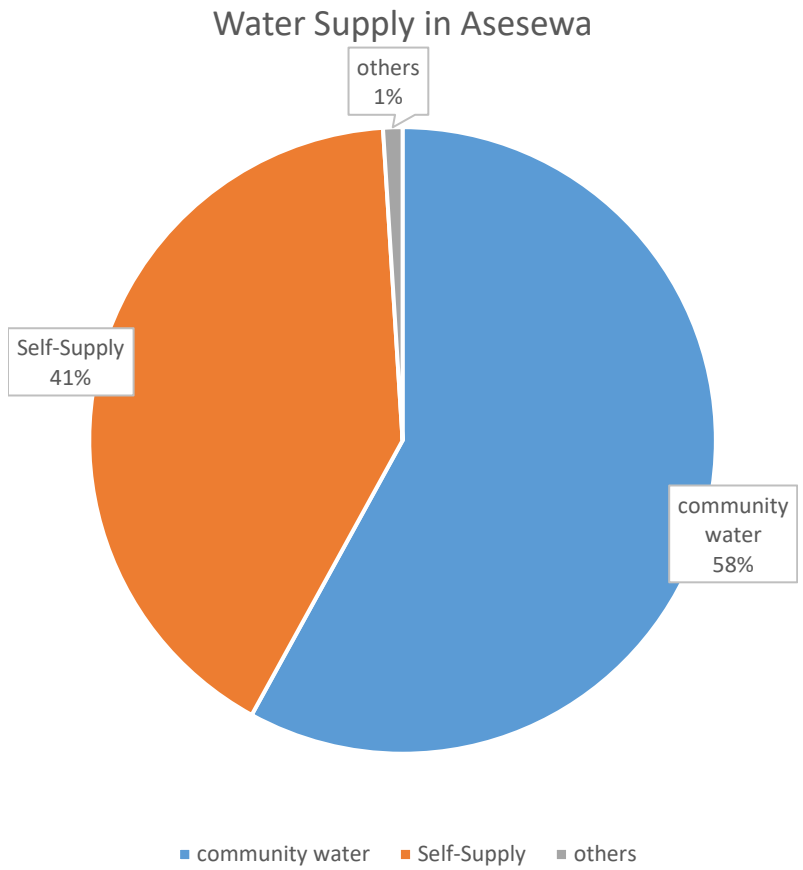
THE J BEST BASIC SYSTEM

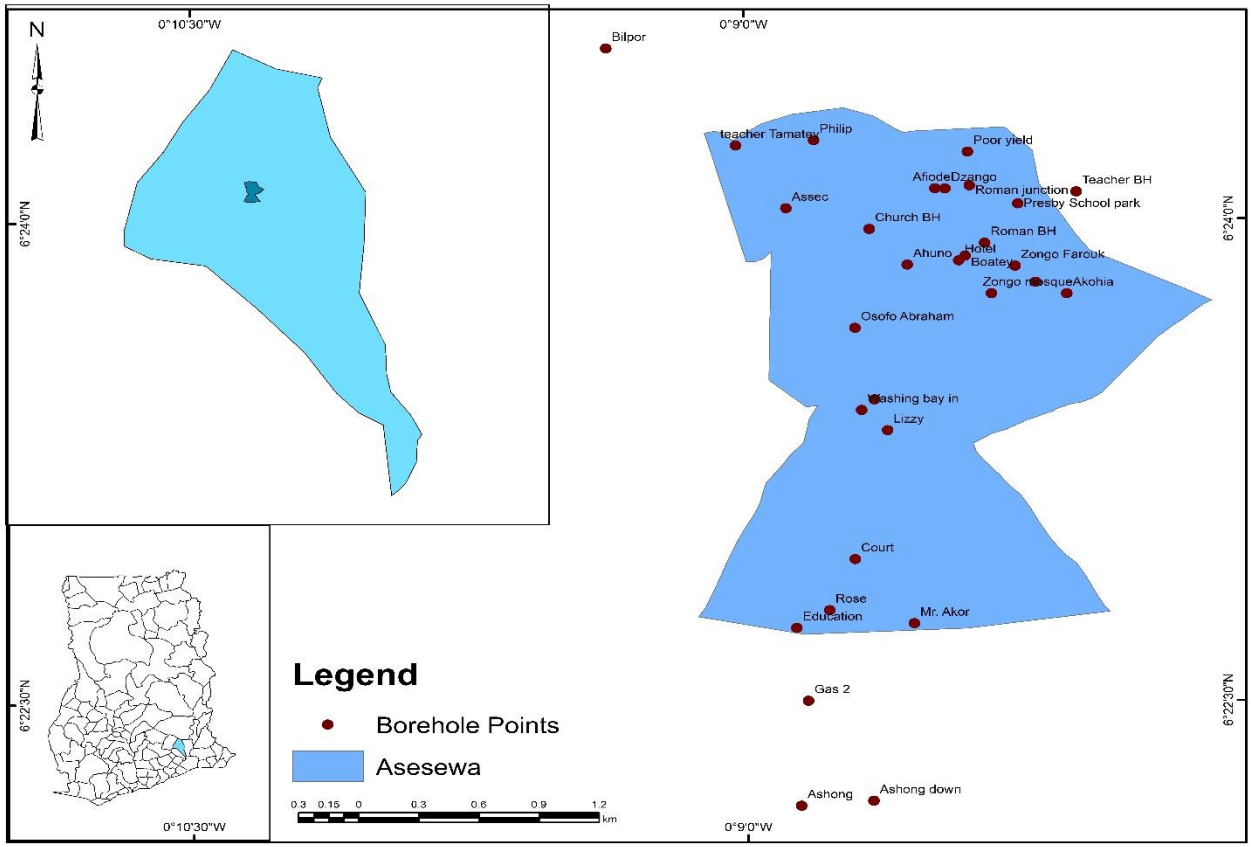
THE S5 SERIES

- Safe
- Sustainable
- Self
- Supply
- System

If it must be done ,
it must be done sustainably

IMPACT ANALYSIS (Asesewa Case Study)





J BEST WATER & ENVIRONMENT CONSULTANT

SCALLING APPRAOCH

20%

- Upfront payment for J BEST Basic Unit

80%

- Financing payable within 2 years

- using prepaid meters to regulate payment of pre financed amount

If it must be done ,
it must be done sustainably

SAFEGUARDS

1. SMART Technology, allowing the company to remotely open and shut down the system as and when required
2. Removable pumps, tanks and structure for overhead tank (Financial)
3. Seasonal analysis of water quality (Health)
4. Setting of pumping limits for environmental protection (Environmental)

5. The emmerging ROT Model

- eg Dani Hydro in the Western North Region
- They Repair, Operate and Transfer (ROT), as opposed to Build Operate and Transfer (BOT)
- The company identifies boreholes abandoned for about 5 or more years,
- Redevelops them with its own equipment and resources
- Upgrades the source through Limited mechanisation and extend fetching points to other parts of the community
- Manages the system and keeps greater portion of sales for an agreed period with the community to recover cost
- Continues to manage the system after the agreed period, but keeps a reduced % of the sales,
- Has identified over 100 of such abandoned boreholes in Western North and Ashanti regions alone for ROT in the next 5 years

6. The ROT Model

Borehole Redevelopment & Mechanization

Maintenance and Rehabilitation of water system

Operating water systems

Operation of water system

The Rural Sub-Sector

- Water facilities in the rural sub sector comprise:
  - Over 50,000 boreholes fitted with hand pums
  - About 616 reticulated pipe schemes, with estimated market value of between $1m - $1.5m per system, or $616m - $925m in total
  - About 1,300 Limited Mechanized systems, with estimated market value of $35,000 - $50,000 per system, or $45m-$65m in total
  - Sustainability of these systems severely threatened by the Community Ownership and Management (COM) to some degree

Professionalizing the Management of a Publicly funded Water Water System

- CWSA has shown early signs of reversing the decline of these systems through professionalization of their Management
- Non-state actors AFRADO co. Ltd in Oti Region, NETCOWAS in Ashanti Region and World Vision in Ahafo Region have followed suit, with promising results
- Main differentiation point is the focus on professionalism, and use of Internally Generated funds to:
  - Finance the cost of expansion of the system to cover all areas in the community
  - Increase the number of stand posts to bringing water closer to all households, and to the extent possible,
  - targeting households with metered connections

Innovations in Sanitation Technologies

What constitutes last mile in the context of Sanitation?

- Limited space
- Water Logging
- High capital cost
- High O&M costs
- ???

1. The Biodigester Revolution

- The most significant technology revolution in the sanitation space, since the advent of the KVIP
- Requires less than half of the space required for manholes, and costs less as well
- Partially overcomes waterlogging to a certain degree using drain fields or enginerred soak pits
- Over 100,000 units installed by different actors in the last 5 years alone
- MSWR, through the GAMA Project successfullly standerdised the technology, and trained hundreds of technicians, paving the way for scaling

Beyond GAMA

- Sanitation Enterprises currently testing commercial pathways of selling the Bio-digester to households, eg
- Clean Team Ghana in Obuasi, Kedat 47 in Sunyani, Samalex in Ga West Municipalities
- All bulit around some revolving fund mechanism
- Based on initial success, Pan African Savings and Loans Company is at final stages of allocating $300,000 to finance the revolving aspects
- An attractive rate (approx 2% per month) offerred.

2. Container Based Sanitation

- Cleam Team Ghana, probably the Market Leader in Container Based Sanitation in the Last Mile Segment in West Africa, or even Africa
- Initially intened as “last resort” household sanitation, taking advantage of a large number of “abandoned” spaces previousely used for pan latrines in Kumasi
- Continuous improvement in the technology over the years is gradually shifting CBS from “last resort” to the “first choice” for poor households in the interim
- No upfront investment required. Only services charges paid monthly for regular emptying of the containers

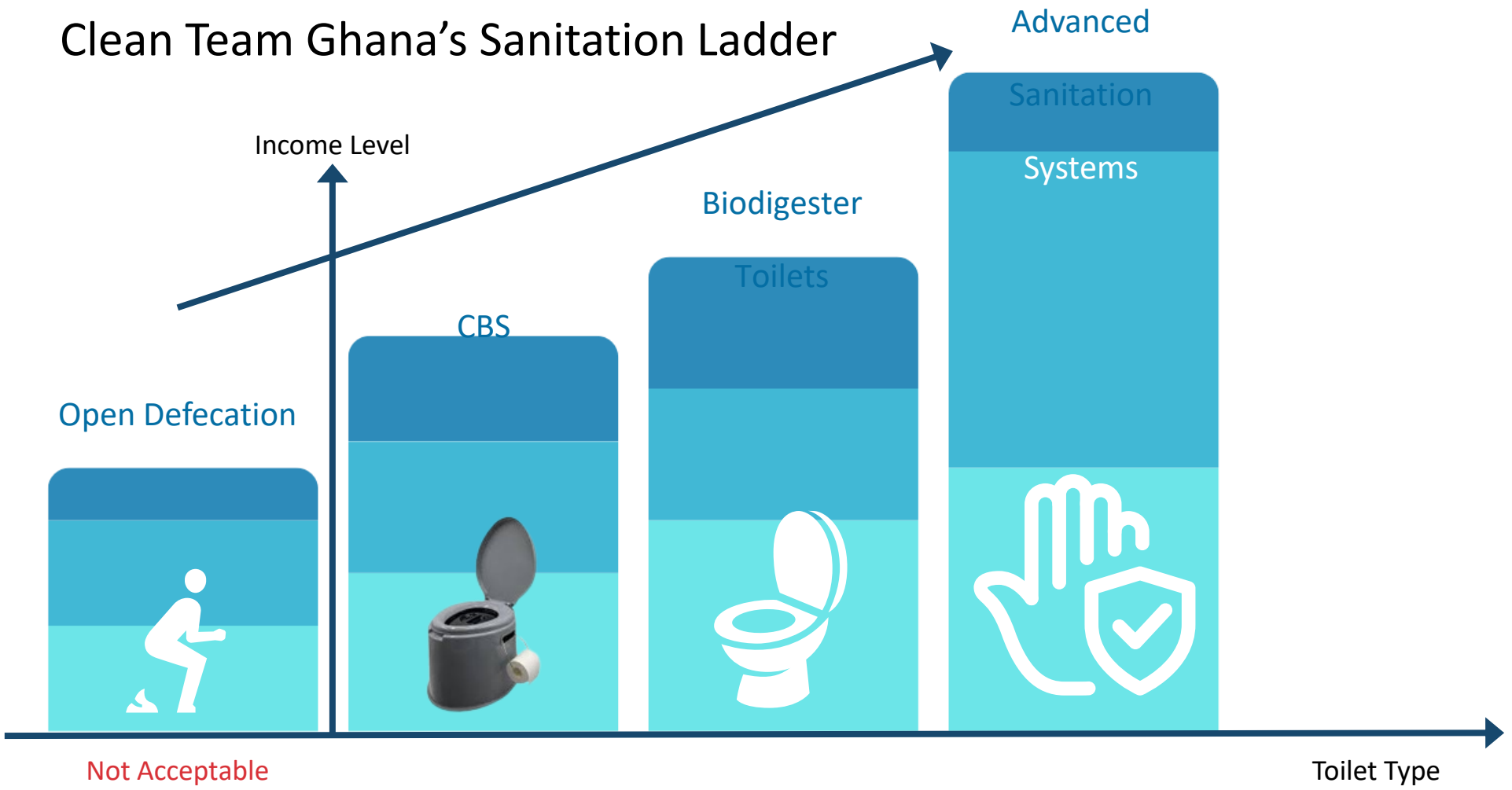
PRODUCT AND SERVICE MIX

Container-Based Toilet

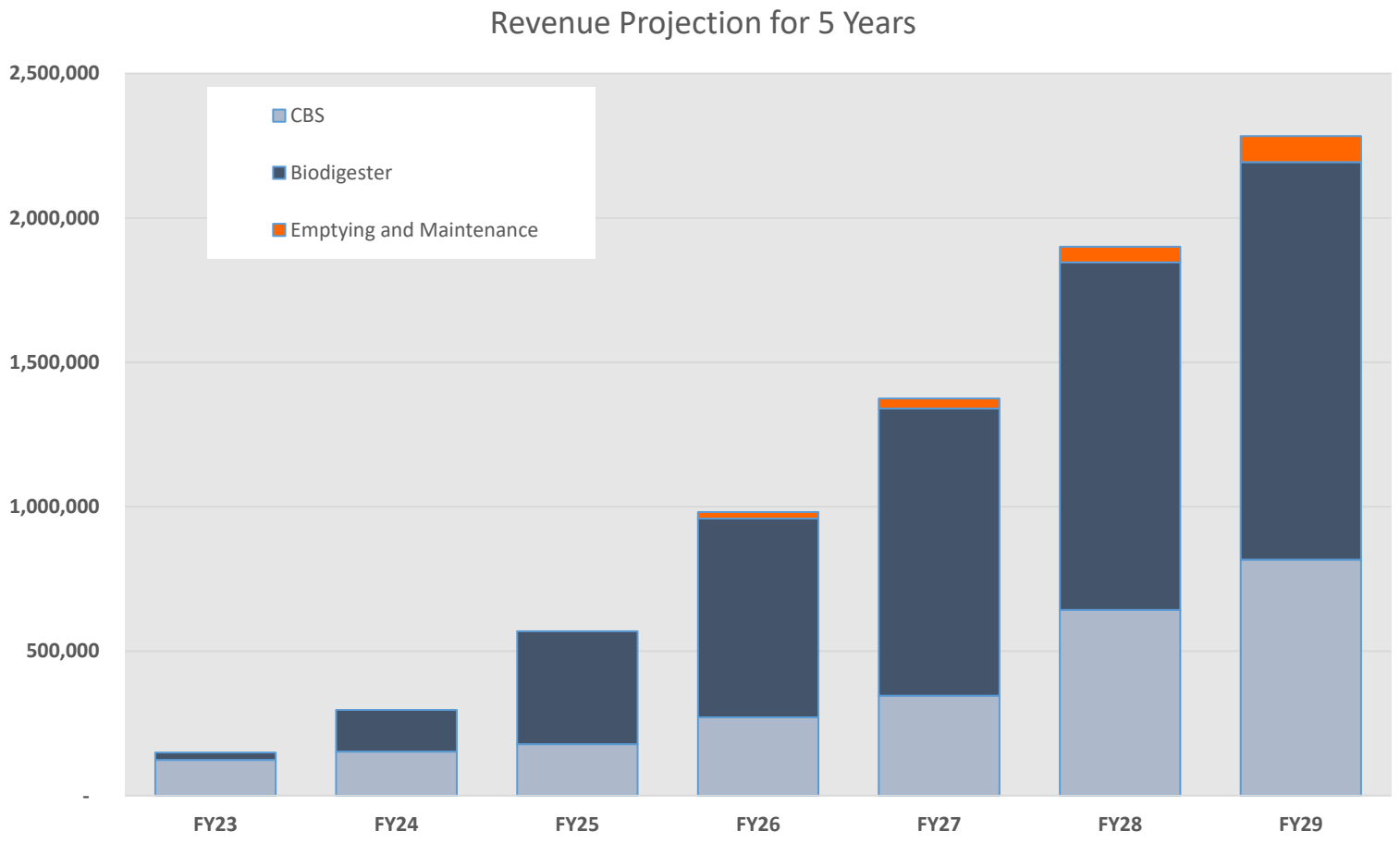
Bio digester Toilet

Emptying Services

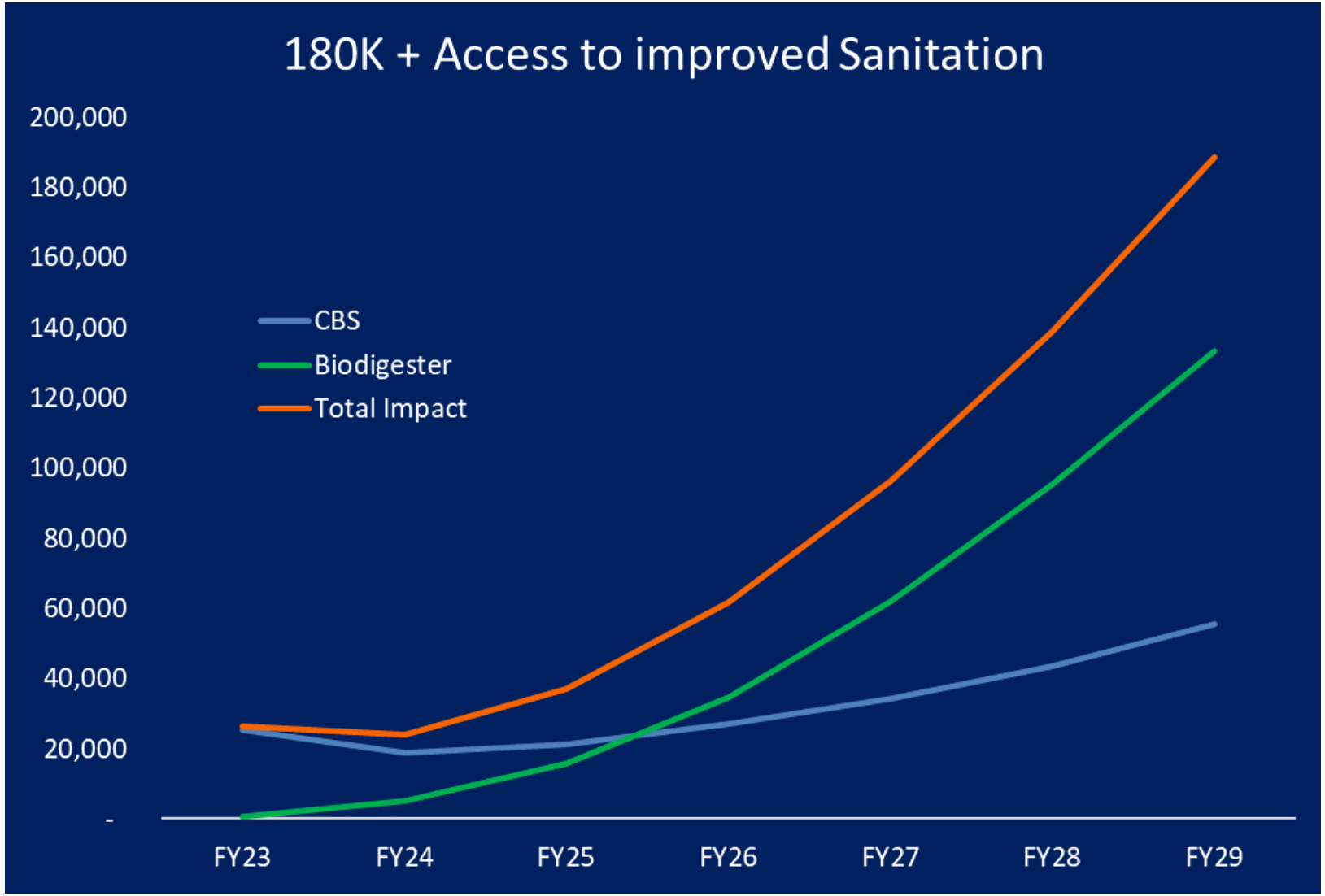
NEW BUSINESS MODEL



PROJECTED REVENUE GROWTH



IMPACT


180K + Access to improved Sanitation
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
CBS
Biodigester
Total Impact
FY23
FY24
FY25
FY26
FY27
FY28
FY29

KEY LEARNING AND RESULTS FROM BTP

Key Learning

- Despite arranging credit scheme offers, people st
  low income communities
- The market is not mature yet for biodigesters in t
  communities.
- We need to target middle-income communities f
- It is likely to convert customers from the CBS serv
  biodigester toilet in the future

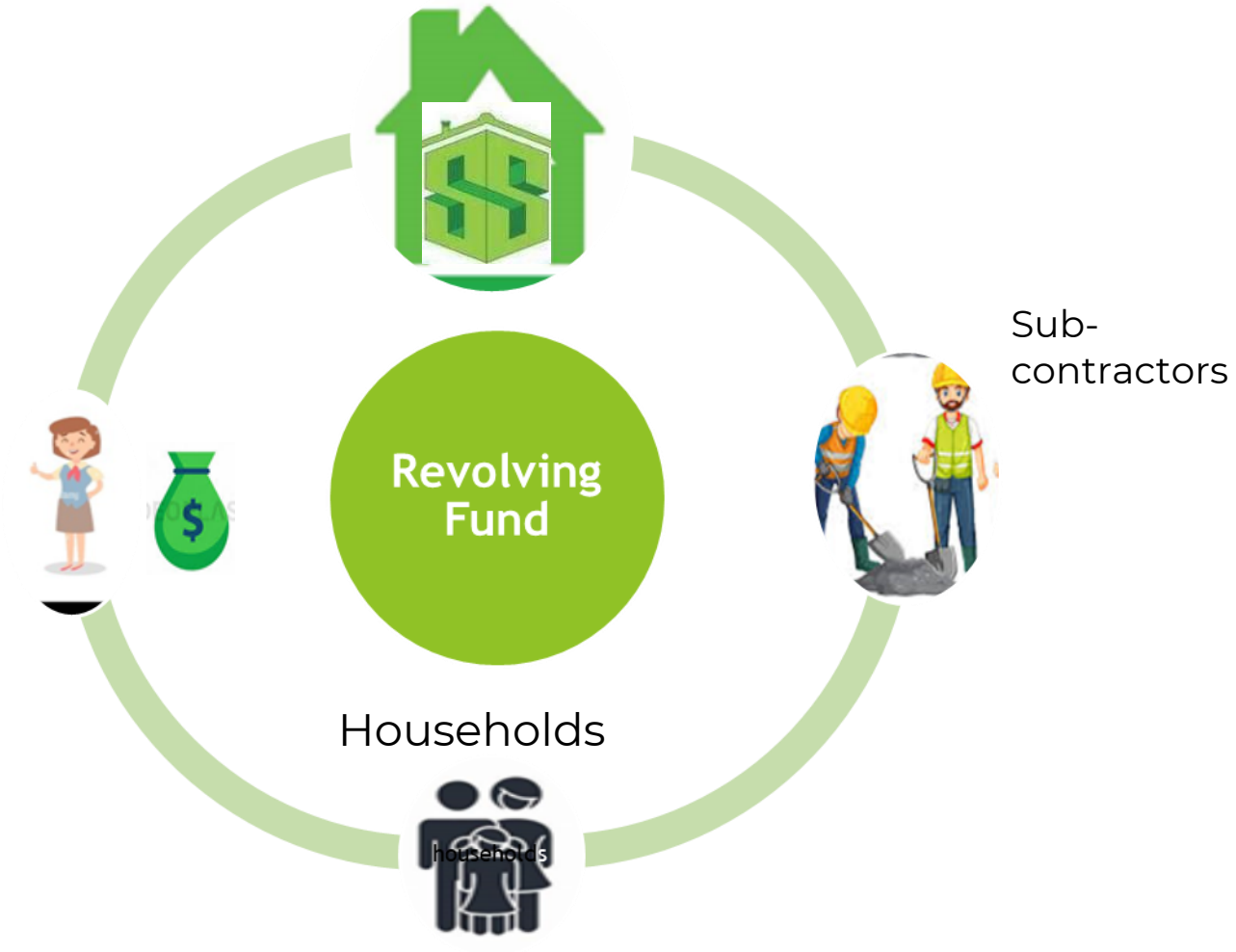
Key Results

- 3 biodigester toilets constructed.
- 2 cash payment, 1 on credit

3. The Affordable Toilet Ownership Model (Atom)

- Pionered by Samalex Solutions, one of the earliest adopters and commercialization of the Bio-digester toilet
- Further customised the standard design to suit smaller households to suite a specific customer need:
- Households with just 2 or 3 people
- The custimiztion has reduced the cost of a standard digester by up to 30%
- Additional financial modalities has made the toilet more affordable

REVOLVING FUND



Sales Agent

Sub-contractors

Using $300 to build 6 more toilets

PILOTING ATOM IN AFIAMAN AND MANCHIE

- **100 Households Registered**
  - 50% practice Open Defecation
- **Over 60 bio-digester toilets built in both communities**
- **500 people have access to improved toilet facilities;**
  - 45% children
  - 35% women
  - 20% men
- **Repayment Rate As At Date 96%**

KEY LEARNING AND TAKE AWAYS

The low income class can own an improved household toilet with right financing mechanism

- Much premium is placed on owning a household toilet
- A robust revolving fund can help solve the problem of sanitation financing
- A tailored measured sanitation service help improve access

Other well known Innovations

- The Original Digniloo
- APDO Award winning toilet
- Water ATMs
- SMART metering
- Water Kiosks
- The outpouring of Hand Hygiene innovations during the COVID-19
- etc

Moving from Pilot to Scale.....

1. “Smoothening the rough edges” of the Bio-digester toilet

- Further scaling of the Bio-digester toilet through subsidies already on auto-pilot - sky no longer the limit
- Waste water treatment and discharge aspects still require further enhancements and refinement
- Further development of the bio-digester to address water logged areas
- Proper user education to reduce failure and backlash

2. Support systemtic Testing of Promising Innovations and Financing

- CEWAS, SkyFox Ltd and Young Water Solutions have identified 10 of such WASH innovators and currently supporting them in a one-year accelerator program
- All Enterprises given EUR 9,000 to systematically test their business models in their target markets through (Business Transformation Projects:
- All enterprises support to distill their lessons from the pilots to package their growth strategies
- Have facilitated them pitch to a group of international donors, targeting a mix of grant and debt financing (ave of $200,000 per enterprise) to scale their innovations
- Pan African Savings and Loans is a low hanging fruit for the sanitation enterprises

3. Systematic Learning - Community of Practice (COP)

- CEWAS, SkyFox and Young Water Solutions will be engaging stakeholders, including the MSWR, on a community of practice around:
  1. Sending the Bio-digester to scale through the commercial pathway
  2. Sending Micro-grids to scale
  3. Professionalizing the Management of publicly funded water systems.

3. Community of Practice ctd

- Tentative date for the initial discussions on the COP is 22nd October
- Please sign up to be part of these discussions and learn more, or contribute your ideas on how to take emmerging innovations forward.

4. Connecting Innovators in Multi-Stakeholders Platforms

- Innovators will benefit from various connections through organized and facilitated Multi-Stakeholder Platforms
- Beficial actors to network with include Financiers, distributors, agents, artisans, aggregators, transportes etc,

5. Providing Bridges

- Partners that are advanced inTechnology adoption can support early innovators to grow, eg Safe Water Network Smart Metring platform, and technical assistance it provides to others who cannot afford their own platforms from the start.

Thank you