Gold Standard for the Global Goals

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT – **TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

KEY PROJECT INFORMATION

Key Project Information

GS ID (s) of Project (s)	GS 1078
Title of the project (s) covered by monitoring report	Aqua Clara Water Filtration Program in Kenya
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	Version 24
Version number of the monitoring report	Version 05
Completion date of the monitoring report	27/10/2021
Date of project design certification	26/12/2013
Date of Last Annual Report	25/02/2021
Monitoring period number	7th monitoring period
Duration of this monitoring period	19/02/2020 to 18/02/2021
Project Representative	Aqua Clara International
Host Country	The Republic of Kenya
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1.0[1]
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

[1] https://www.goldstandard.org/resources/energy-requirements

Table 1 - Sustainable Development Contributions Achieved

BSF

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13: climate action	Emission reductions	15,297	VERs
	Number of workshops, seminars organized, and trainings	5 trainings (85 people trained)	People
SDG 3: Ensure healthy lives and promote well-being for all at all ages	Perceived change in air quality	90% reduction in smoke levels, 93% reduced coughing and 77% reduction in itchy eyes.	Percentage
	Reduction in water borne diseases.	77% reduction	Percentage
	Number of filters sold	3,215	Filters
SDG 6: Ensure availability and sustainable management of water and sanitation for all	Volume of water consumed.	7/l/p/d	Liters
	Number of workshops, seminars organized, and trainings	5 trainings (85 people trained)	People
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Income generation	confidential, employment records submitted	Ksh.
	Number of people employed	52	People
	Change in number of jobs and positions for women or change in income and asset	18 women, and 26 youths	People

	distributions by region, ethnicity, religion, and socio-economic groups		
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	number of people trained on water filtration	85	People

HHFF

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13: climate action	Emission reductions	12,077	VERs
	Number of workshops, seminars organized, and trainings	5 trainings (85 people trained)	People
SDG 3: Ensure healthy lives and promote well-being for all at all ages	Perceived change in air quality	92% reduction in smoke levels, 88% reduction in coughing and 87% reduction in itchy eyes.	Percentage
	Reduction in water borne diseases.	87% reduction	Percentage
	Number of filters sold	2,212	Filters
SDG 6: Ensure availability and sustainable management of	Volume of water consumed. Number of workshops, seminars organized, and trainings	7/l/p/d	Liters

water and sanitation for all		5 trainings (85 people trained)	People
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Income generation Number of people employed Change in number of jobs and positions for women or change in income and asset distributions by region, ethnicity, religion, and socio-economic groups	confidential, employment records submitted 52 18 women, and 26 youths	Ksh. People People
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	number of people trained on water filtration	85 People	

IHFF

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13: climate action	Emission reductions Number of workshops, seminars organized, and trainings	1,056 5 trainings (85 people trained)	VERs People
SDG 3: Ensure healthy lives and promote well-being for all at all ages	Perceived change in air quality Reduction in water borne diseases.	76% reduction in smoke levels and coughing, and 79% itchy eyes. 100% reduction	Percentage Percentage

	Number of filters sold	192	Filters
SDG 6: Ensure availability and sustainable management of water and sanitation for all	Volume of water consumed. Number of workshops, seminars organized, and trainings	2.33/l/p/d 5 trainings (85 people trained)	Liters People
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Income generation Number of people employed Change in number of jobs and positions for women or change in income and asset distributions by region, ethnicity, religion, and socio-economic groups	confidential, employment records submitted 52 18 women, and 26 youths	Ksh. People People
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	number of people trained on water filtration	85	

Table 2 – Product Vintages

BSF

		Amount Achieved		
Start Dates	**End Dates**	**VERs**	**…**	**…**
19/02/2020	31/12/2020	13,385		
01/01/2021	18/02/2021	1,912		

HHFF

		Amount Achieved		
Start Dates	**End Dates**	**VERs**	**...**	**...**
19/02/2020	31/12/2020	10,567		
01/01/2021	18/02/2021	1,510		

IHFF

		Amount Achieved		
Start Dates	**End Dates**	**VERs**	**...**	**...**
19/02/2020	31/12/2020	924		
01/01/2021	18/02/2021	132		

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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The Aqua Clara Water Filtration Program in Kenya (the 'Project Activity') seeks to introduce Aqua Clara International's (ACI) flagship products to the market in Kenya: the ACI BioSand Filter (BSF) and the Point-of-use Hollow Fiber Filters (HFF). These ACI water purifiers (the project technologies) displace the use of firewood fuel traditionally used to boil water for consumption and in the project scenario, offer an affordable, long-term solution for end users who typically consume raw water from turbid sources. The Project Activity seeks to introduce approximately 7,424 BSF purifiers with a capacity to purify an average of up to 60 litres per day, 1,842 household Hollow Fiber Filters with a capacity of up to 15-100 litres per day (which can also be used in institutions) and 425 institutional/commercial-use HFF units with a production capacity of 100–400 litres of water per day throughout the 10-year

crediting period in rural and peri-urban Kenya. However, these capacities can be scaled up, with proper maintenance and use of the filter. Proper maintenance of the filters in this Project Activity is ensured through the PP's visit to the households as a follow-up initiative to check on the household utilisation of the water filters.

The project technologies offer an affordable, clean, efficient and easy-to-use alternative for water purification within the rural area that the Project Activity seeks to operate in. In addition, the Project Activity will actively reduce CO2 emissions and diminish the associated risks of Indoor Air Pollution.

As of 18/02/2021, the PP had installed a total of 3,215 Bio Sand filters (BSF)2,212; Household Hollow Fibre Filters (HHFF)and 192 Institutional Hollow (IHFF) in the project boundary.

a) Relevant Dates of Project Activity

- Start date of Project Activity i.e., it is the date on which distribution of water filter under the proposed Project Activity began – 26/06/2009

-Annual BSF Filter sales since start date of the project:

03/09/2009 -02/09/2010: 199 filters
03/09/2010-02/09/2011: 538 filters
03/09/2011-02/09/2012: 918 filters
03/09/2012-02/09/2013: 629 filters
03/09/2013-02/09/2014: 454 filters
03/09/2014-02/09/2015: 187 filters
03/09/2015-02/09/2016: 149 filters
03/09/2016-02/09/2017:86 filters
03/09/2017-02/09/2018: 40 filters
03/09/2018-18/02/2019: 15 filters
Total: 3,215 filters

Annual HHFF sales since start date of the project:
01/11/2013-31/10/2014: 95 filters
01/11/2014-31/10/2015: 194 filters

01/11/2015-31/10/2016: 366 filters
01/11/2016-31/10/2017: 287 filters
01/11/2017-31/10/2018: 510 filters
01/11/2018-31/10/2019:555 filters
01/11/2019-18/02/2020: 205 filters
Total:2,212

Annual IHFF sales since start date of the project:
19/06/2014-18/06/2015: 19 filters
19/06/2015-18/06/2016: 5 filters
19/06/2016-18/06/2017: 16 filters
19/06/2017-18/06/2018: 22 filters
19/06/2018-18/06/2019: 69 filters
19/06/2019-18/02/2020: 61 filters
Total: 192

The PD undertook a major exercise during 2019/2020 verification period to clean up the TSR and reconcile with the information in the sales receipts. Following this, some filters which were found to be totally abandoned were removed from the TSR. End-users who were found to have been skipped from the TSR during data entry were added as summarised below:

Technology	**End-users removed from TSR**	**Added to TSR**	**New sales**
BSF	761	751	33
HHFF	44	65	599
IHFF	26	2	102

Project registration date: 26/12/2013
Project Design Change date: 16/06/2016
Project transitioning to Gold Standard for Global Goals: 09/07/2018
Start Date of Monitoring Survey 12/04/2021
VVB remote verification 08/07/2021 – 09/07/2021

b) **Total GHG emission Reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period**

The total GHG emission reductions achieved in this monitoring period (between 19/02/2020 and 18/02/2021) is 28,429tCO2e for all the project technologies.

A.2. Location of project

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Host country: The Republic of Kenya

The Project Activity targets to operate within 23 counties within the terrestrial limits of the Republic of Kenya listed below.

Table 1: 23 counties within the Republic of Kenya which represent the Project boundary.

County	Coordinates	County	Coordinates	County	Coordinates	County	Coordinates
Nandi	-00.1666670,35.1500000	**Bomet**	-00.8000000,35.2333000	**Kericho**	-000.3666667 35.3000000,	**Busia**	-000.4333333 34.1500000,
Uasin Gishu	-00.5166670,35.2833000	**Homa Bay**	-00.6833330, 34.4500000	**Elgeyo Marakwet**	-000.9483333, 35.5086111	**Bungoma**	-000.5833333 34.5833333
Kisii	-00.6666670,034.7500000	**Migori**	-000.6666667 ,34.8333333	**Kakamega**	-000.2833333 34.7500000,	**Trans Nzoia**	-00.5833333, 34.5833330
Nyamira	-00.7500000,35.0000000	**Kisumu**	-000.2500000, 34.9167000	**Siaya**	-000.2833333,	**Machakos**	-001.5000000,

					34.7500000		37.2500000,
Nakuru	-00.5000000,36.0000000	**Kiriyaga**	-000.500000, 37.2833333	**Nyeri**	-000.4166667 36.9500000,	**Nairobi**	-001.2833333, 36.8166667
Murang'a	-00.7500000, 37.1166667	**Embu**	- -000.533333, 37.4500000	**Makueni**	-001.8000000 37.6166667		

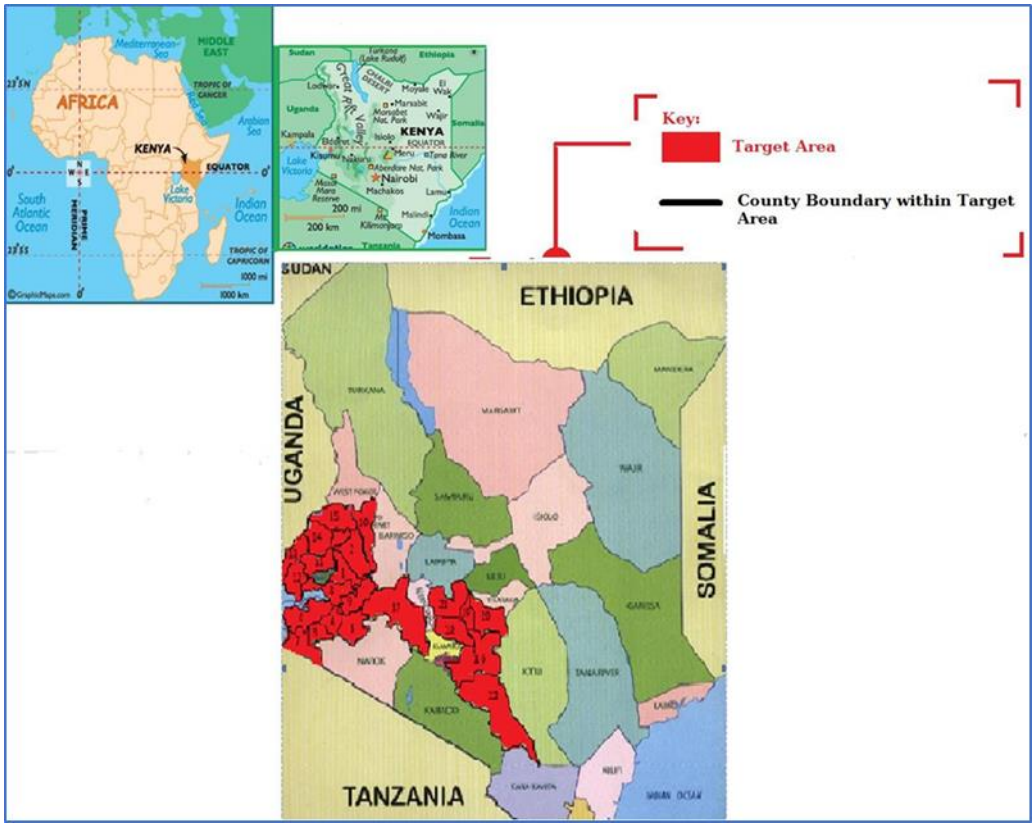

Figure 1: Kenya and the project boundary

A.3. Reference of applied methodology

>> The project is registered under the GS methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption 11/04/2011, version 1.0[2]

Other Gold Standard tools and annexes included in the project development include:

1. Gold Standard for the Global Goals[3]
2. Guidelines for carrying out usage surveys for projects implementing household water filtration technologies [4]

A.4. Crediting period of project

>> The fixed 10-year crediting period started on 28/12/2011. This marks the seventh round of annual monitoring for this project which began on 19/02/2020 to 18/02/2021.

[2]https://www.goldstandard.org/articles/gold-standard-global-goals

[3]https://www.goldstandard.org/project-developers/standard-documents

[4] https://www.goldstandard.org/wp-content/uploads/2011/09/Rule-Update-Guidelines-for-carrying-out-water-usage-surveys.pdf

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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During this monitoring period, the project continued with filter maintenance and trainings following Covid-19 protocols where 4 trainings were done. 85 people were trained. Additionally, during the survey exercise, trainings were conducted for the end users who had been selected on the sample frame and there was emphasis laid on the importance of maintaining hygiene and observing Covid-19 rules to minimise the spread.

Additionally, there were various maintenance and repairs done. Just to mention a few, they included broken tap, broken bottom container, replacing syringe, clogged membrane, leakage from the tap, among others. Some of the repairs done led to some of the filters not being operational for a few days. A total of 21 BSF filters were repaired, 14 of them had a total of 93 days where they were not operational. The other 7 BSF repairs done were minor and hence no operation days were lost. For HHFF,66 repairs were done, however only 35 filters had repairs which led to loss of operation days. A total of 54 operation days were lost. Additionally, 3 IHFF were repaired which led to a total of 5 days when they were not in operation. Emission reductions for the total number of days the filters were not operational have been calculated and deducted from the total Ers claimed.

To date, a total of 3,215 BioSand filters have been installed of which 2,952 are for domestic use whereas 263 are for institutional use. 2,212HHFF units have been installed for domestic use and 192 institutional hollow fiber filters used in the institutions. Filters have been distributed in 17counties namely Kisii, Nyamira, Uasin Gishu, Nandi, Bomet, Kericho, Nairobi, Nakuru, Kisumu, Siaya, Migori, Homa Bay, Trans Nzoia, Machakos, Murang'a, Kakamega and Elgeyo Marakwet. At the time of installation of these project technologies, households are issued with receipts and each filter is assigned a unique identification number to avoid double counting. The PP then keeps record of all sales which are then accumulated as the Total Sales Record for each technology type.

Description of the Hydraid BioSand Water Filter

The Project Technology

1. Bio Sand Filter (BSF)

Several point-of-use water purification technologies are available in Kenya including boiling, chlorination, solar disinfection (using sunlight), flocculent-disinfectants and filtration. The average efficiency of a BSF is 95- 99% elimination of microbial contaminants. However, this figure varies based on the design and operating properties. Maintenance of the ACI BSF is relatively simple, as it only requires that the consumer cleans the filter once or twice a year depending on the turbidity of the water. Highly turbid sources of water tend to clog the filter hence reducing the flow rate. However, the user can increase the flow rate by simply adding 10 litres of water to the BSF unit, swirling the top 4-6 cm of sand up into the water with a stick, taking all sediments into suspension, pausing to allow sand grains to settle out and then scooping and dumping the dirty water out. This simple procedure will guarantee the consumer continued filtration throughout the lifespan of the BSF unit of 10 years. The first maintenance check is done by the installer of the BSF unit, who has received training from ACI, followed by a demonstration of the maintenance.

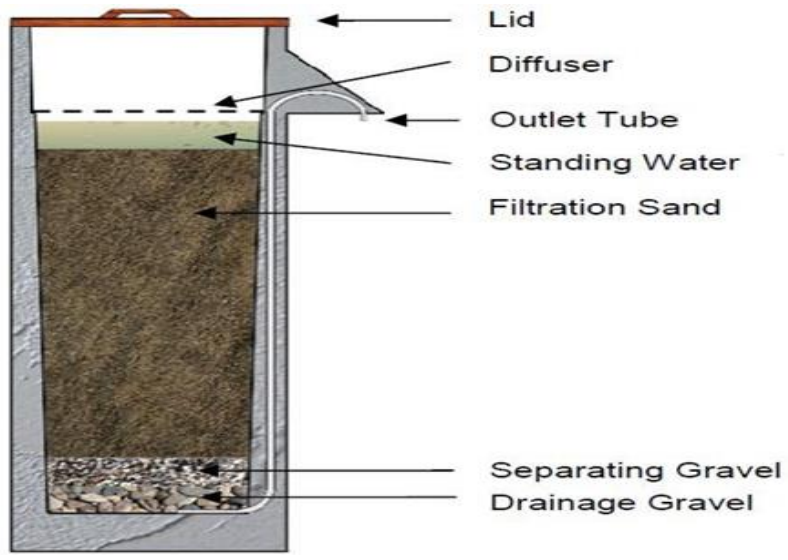

Figure 1 Cross section of a BSF

2. The ACI Hollow Fiber membrane

The ACI Hollow Fiber membrane filter is based upon hollow-fiber membrane technology, which, for decades, has been used in medical, water, food, and industrial applications for high-precision ultra-filtration. Improved manufacturing processes now make the technology economic for humanitarian projects. Hollow micro-tubes are created of polysulphone plastic. The walls of the tubes are permeated with tiny holes not greater than 0.1 microns in diameter. Water enters the filter elements on the outside of the tubes. Since bacteria are larger than 0.1 micron, they cannot flow through the holes in the tubes. Only water can get through the holes. Bacteria and debris are left on the outside of the tubes. Pure water is collected as it flows on through the filter elements. The filters are easily and quickly back flushed using a syringe to wash away the impurities that collect in the filter elements. The filtration process is completely mechanical.

No biological or chemical processes are involved. These filters are designed to be used in both in domestic set ups (households, apartments, etc.) and institutions such as schools and restaurants. The filters were designed and engineered by Aqua Clara in their laboratories at the Bioeconomic Institute of Michigan State University, in Holland, Michigan, USA.

Specifications and performance

- Nominal flow rate of standard model: first litre out of a full 5-gallon filter in 60seconds.
- Scalability: Half-litre-per-minute for small households
- Installation: 1-hour training in hygiene and maintenance; then pick up and carry home.
- Weight: <2.2 kilograms
- Start-up: no start-up process required; filter can be used immediately.
- Pause time: no pause time is required between fill-ups.
- Portability: full portability without disrupting filter processes

Figure 2: Cross Section of Hollow Fiber Membrane Filter

B.1.1. Forward Action Requests

>> c) FARs raised from the last verification.

FAR # 1: The PP shall monitor the times of water filtration and amount of filled water per day to cross-check with the total water demand from households.

Water consumption field test (WCFT) was done which showed that households filter water between 2-3 times per day depending on their needs. For BSF users, the average volume of water required is 7.78l/p/d, which has been capped at 7l/p/d as per WHO guidelines. On the other had the average number of persons per day is 5.5, hence total volume of water required per day is (7.7*5.5=42.35). The capacity of BSF is about 20 litres with households having storage containers to store filtered water, which enables them to filter more than 20 litres per day. BSF fact sheet has been provided which shows that the filter can filter up to 60 litres per day.

HHFF users filter between once to thrice per day. Its capacity ranges from 10l-15 litres. The average number of persons per household using HHFF is 4.5, and average water consumption is 8.6l/p/d. Therefore, the average quantity of water needed is 38.7l/p/d. Households also have storage containers to store the filtered water to meet their needs. HHFF fact sheet has been provided which shows the filter can produce between 100-400 litres of water per day.

FAR # 2: The PP shall submit the phone questionnaires and shall not ask about the operation status of the filter prior to usage survey site visit to avoid the bias of not visiting the non-users. The pre-survey result shall also be submitted.

Pre-visit surveys were conducted in advance to prepare for the main monitoring survey exercise. Phone calls were made to households and institutions by the project implementer. Additionally, physical visits were done to supplement the phone call exercise where the project implementer felt they would be more effective. The results submitted are for the pre-visit survey done via phone and the sample questionnaire used to conduct the surveys.

FAR # 3: The PP shall monitor the average number of filters in the households and discount in the ER calculation if the households use more than one unit. The ER of MP6 must be recalculated based on the result of average number of filters and the over-issued amount must be deducted in MP7 issuance if any.

The average number of filters per household were determined during this monitoring survey where households being interviewed were asked how many filters they had. No households interviewed with HHFF reported to having more than one filter. For BSF users, only 2 households responded that they had more than 1 filter, which translates to 0.64% of the households in the entire population with more than 1 filter. To know the actual number of filters that percentage translates to, 0.64% was multiplied by the total number of BSF sales, 3125 which translates to 20.61 filters. To know the emission reductions overissued, 20.61 filters were multiplied by Ers per filter (3.32) which converted to a total or 68.38 credits. The figures for 2019/2020 were adjusted to account for over issued credits ie. 10665-68.38 = 10,596.62tCO2e, however since that period already issued, the same amount of overissued credits have been deducted on 2020/2021 credits. 2019/ 2020 period were recalculated to reduce the over issued credits as follows;

Ers for BSF 19/02/2019- 18/02/2020

Calculation to account for households with more than 1 filter	
Total filter distributed	3215
Total ERs claimed for 2019/2020	10,665
% of households with more than 1	20.61
Annual Emission Reduction (Per filter)	**3.32**
Total Ers to be discounted	68.38

Adjusted Ers for 2019/2020	10,596.62

Additionally, the same FAR was applicable for 2020/2021 overclaimed credits for household with more than 1 filter. Calculations were done as follows; 0.64% of households had more than 1 filter. To know the actual number of filters that percentage translates to, 0.64% was multiplied by the total number of BSF sales, 3125 which translates to 20.61 filters. To know the emission reductions overclaimed, 20.61 filters were multiplied by Ers per filter (5.22) which converted to a total or 107.76 credits. This figure was further deducted from total Ers for BSF as follows;

BSF Total = 16,753
Less deductions of households with more than 1 filter = 16,881 –(107.76+68.38) = 16,685.
Emission reductions sheet with a detailed method of how this has been done has been submitted to the GS as evidence.

FAR # 4: Project Developer shall carry out a WCFT per the approved monitoring plan within six months of end of the interim measure validity date or earlier, where possible.

WCFT was done and results recorded and submitted to the GS as a support document (GS 1078 Combined MSS and ERs calculations sheet). BSF had a Qp.y of 7l/p/d (after capping as per WHO guidelines), HHFF had a Qp,y of 7l/p/d (after caping as per WHO guidelines) and IHFF had a Qp,y of 2.33l/p/d.

FAR # 5: Project Developer shall carry out a Water Quality Test as per the approved monitoring plan within three months of end of the interim measure validity date or earlier, where possible.

During this monitoring period, water quality tests were conducted for all the filter technologies and the results obtained are as below:

BSF

Water Quality Summary (Water samples were only collected at 221 households with functional filters)

	Parameter	Results	**Percentage of samples**		**Explanation of results**	Analysis
Incidence of water borne diseases	Yes	0	0%		No household reported water borne diseases	Non-Users
	No	223	100%			Users
	Total	223	100%			
Level of satisfaction	Highly satisfied	219	99%		219 out of 221 households were highly satisfied with the use of the filter	100% Usage
	Moderately satisfied	2	1%		There are 2 out of 221 households were moderately satisfied with the use of the filter	
	Not satisfied	0	0%			Non-Users
	Total	221	100%			
Hygiene practices	Yes	221	100%		All 221 households were practicing hygiene practices	Users
	No	0	0%			Non-Users

	Total	221	100%			
Presence or absence of E.Coli	Present	0	0%		0 households had 0. E. coli in their water	Non-User
	Absent	221	100%		0 households had 0. E. coli in their water	Users
	Total	221	100%			
Users/ non-users	Users	100.00 %	This includes households who have not experienced any water borne diseases related to consumption of contaminated water. All households are highly satisfied and moderately satisfied thus considered as users. All households were practicing hygiene practices.			
	Non-Users	0.0%	This includes households have experienced water borne diseases, households who reported not satisfied with the filter and households who do not practice hygiene practices			

HHFF

Water Quality Summary (Water samples were only collected at 214 households with functional filters)						
	Parameter	Results	Percentage of samples		Explanation of results	Analysis
Incidence of water borne diseases	Yes	0	0%		There were no water borne diseases reported	Non-Users

	No	214	100%		All the 214 households had 0 E. coli in filtered water	Users
	Total	214	100%			
Level of satisfaction	Highly satisfied	212	99%		There are 212 out of 214 households who are highly satisfied with the use of the filter	100% Usage
	Moderately satisfied	2	1%		There are 2 out of 214 households who are moderately satisfied with the use of the filter	
	Not satisfied	0	0%		No household reported as to Not being satisfied	Non-Users
	Total	214	100%			
Hygiene practices	Yes	214	100%		All 214 households were practicing proper hygiene	Users

	No	0	0%			Non-Users
	Total	214	100%			
Presence or absence of E.Coli	Present	3	1%		3 out of 214 households had presence of E. coli	Non-User
	Absent	211	99%		211 out of 214 households had 0 E. coli in their water	User
	Total	214	100%			
Users/ non-users	Users	98.60 %	This includes households who have not experienced any water borne diseases related to consumption of contaminated water. All households are highly satisfied and moderately satisfied thus considered as users. All households were practicing hygiene practices.			
	Non-Users	1.4%	This includes households have experienced water borne diseases, households who reported not satisfied with the filter and households who do not practice hygiene practices			

IHFF

Water Quality Summary (Water samples were only collected at 115 institutions with functional filters)						
	Parameter	Results	**Percentage of samples**		**Explanation of results**	Analysis

Incidence of water borne diseases	Yes	0	0%		No incidences of water borne diseases reported	Non-Users
	No	115	100%		No incidences of water borne diseases reported	Users
	Total	115	100%			
Level of satisfaction	Highly satisfied	115	100%		All institutions were highly satisfied	100% Usage
	Moderately satisfied	0	0%			
	Not satisfied	0	0%			Non-Users
	Total	115	100%			
Hygiene practices	Yes	115	100%		All institutions were practicing hygiene practices	Users
	No	0	0%			Non-Users
	Total	115	100%			

Presence or absence of E. coli	Present	0	0%		All institutions had 0 E. coli in filtered water	Users
	Absent	115	100%		All institutions had 0 E. coli in filtered water	Non-User
	Total	115	100%			
Users/ non-users	Users	100.00 %	This includes households who have not experienced any water borne diseases related to consumption of contaminated water. All households who are highly satisfied and moderately satisfied thus considered as users. All households were practicing hygiene practices.			
	Non-Users	0.0%	This includes households have experienced water borne diseases, households who reported not satisfied with the filter and households who do not practice hygiene practices			

B.2. Post-Design Certification changes

>>

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

>>

No deviations

B.2.2. Corrections

>> There were no corrections made. Changes to start date of crediting period

>> No changes have been applied on the crediting period

B.2.3. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

>>

The PP has made 2 permanent changes to the registered monitoring plan:

1. Cj Factor fixed ex-ante.

The Cj factor that was previously a monitored parameter and is now fixed ex-ante. This is in compliance with the registration review FAR that stated:

"The PP shall conduct a post registration baseline survey/water boiling tests prior to 2nd issuance considering in a representative way the target population in the project boundary and considering households prior to adopting the project technology".

The PP conducted the baseline testing were conducted between 13th to 28th July 2015 and approved in December 2016 in accordance with the Gold Standard methodology. The Household Cj factor is 18%, fixed ex-ante. This CJ was first used during the 2016 monitoring period.

2. Biennial Monitoring of the Water Consumption per filter end user per day:

The registered PDD refers to the frequency of conducting the WCFT as annually. The PP would like to amend this frequency to every other year (biennially). The methodology employed for this project, i.e., 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption - 11/04/2011' states:

'For each or of the baseline scenario and project scenario the BFT and PFT is updated every two years, respectively',

At registration, the PP had chosen a conservative approach of annually monitoring this parameter. However, the PP got approval from the Gold Standard to conduct this as per the methodological threshold of once in every 2 years. The permanent deviation was approved by the GS on 16/09/2016.

Project transitioning to Gold Standard for Global Goals on 09/07/ 2018. As a result, there were some changes in the monitored parameters. This includes, inclusion of SDGs, Monitoring the number of people employed by the project and follow up and reporting on grievances raised and recorded on the logbook during the monitoring period.

B.2.4. Changes to project design of approved project

>> The Project Design now includes the inclusion of institutions to the project boundary. This design change was validated and approved by the Gold Standard Foundation- TAC on 16/06/2016.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

1. >> **Monitoring Procedure**

A total sales record and a project database was maintained continuously and stored on an electronic database maintained by both ClimateCare and Aqua Clara International for the BSF, HHFF and IHFF.

a) Total Sales Record

An accurate and complete sales record has been maintained by the project proponent and backed up electronically by the ClimateCare, the carbon asset development consultant. A Total Sales Record provided as a support document, records the following data:

1) Date of sale
2) Geographic area of sale
3) Model/type of project technology sold
4) Quantity of project technologies sold
5) Name and telephone number and address:
6) Mode of use: domestic, commercial or other:
7) Unique Filter serial number

b) Project Database

This has been developed from the total sales record.

1. **On-going Monitoring Studies**

The monitoring exercise was a combination of the Usage Survey, Monitoring Survey, and the Water quality testing.

a) Monitoring Survey- Completed annually, beginning 1 year after project registration. The project participant has conducted the annual monitoring surveys which were used to investigate annual changes in the project scenario. Physical surveys were conducted while observing covid-19 protocols. The monitoring period covers the duration from 19/02/2020 to 18/02/2021.The monitoring surveys were conducted between 07/04/2021 to 04/06/2021. Below is a summary of sample size selection;

BSF

Table 2: Sampling and Interview Summary for BSF

Age	**09/10**	**10/11**	**11/12**	**12/13**	**13/14**	**14/15**	**15/16**	**16/17**	**17/18**	**18/19**	**Total**
Total Population	199	538	918	629	454	187	149	86	40	15	3215
Samples selected	33	33	33	33	33	33	33	33	33	15	312
Samples required under the meth	30	30	30	30	30	30	30	30	30	30	300
Households interviewed	33	33	33	33	33	33	33	33	33	15	312

For the last vintage, there were only 15 households, and these were all included in the sample frame.

HHFF

Table 3: Sampling and Interview Summary for HHFF

Age	**13/14**	**14/15**	**15/16**	**16/17**	**17/18**	**18/19**	**19/20**	**Total**

Total Population	95	194	366	287	510	555	205	2,212
Sample size	33	33	33	33	33	33	33	231
Samples required under the meth	30	30	30	30	30	30	30	210
Households interviewed	33	33	33	33	33	33	33	231

IHFF

Table 4: Sampling and Interview Summary for IHFF

Age	14/15	15/16	16/17	17/18	18/19	19/20	Total
Total Population	19	5	16	22	69	61	192
Sample size	19	5	16	22	33	33	128
Samples required under the meth	30	30	30	30	30	30	180
Households interviewed	19	5	15	22	33	33	127

All the vintages apart from 18/19 and 19/20 had less than 30 households and these were all interviewed during the surveys. This is because there were low filter sales for all the other years. Also, for vintage 2016/2017, one institution was not available at the time of monitoring hence it could not be interviewed.

For water consumption field test, the PP applied the 90/30 precision in calculating the sample size required. As demonstrated in section D4 of this report, only 8 surveys were needed. However, PP applied a bigger sample to ensure that all vintages were represented on the WCFT exercise. To do so, PP selected the first few households selected on the sample frame per vintage. The selected ones are highlighted in each sample frame Below is a summary.

BSF

Table 3: Sampling Summary for BSF

Age	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	Total
Total Population	199	538	918	629	454	187	149	86	40	15	3215
Total Samples selected	33	33	33	33	33	33	33	33	33	15	312
Samples selected for WCFT	4	3	3	3	3	3	4	3	4	3	33

HHFF

Table 4: Sampling Summary for HHFF

Age	13/14	14/15	15/16	16/17	17/18	18/19	19/20	Total
Total Population	95	194	366	287	509	555	205	2212
Sample size	33	33	33	33	33	33	33	231
Samples selected for WCFT	5	5	4	4	5	5	5	33

IHFF

Table 5: Sampling Summary for IHFF

Age	14/15	15/16	16/17	17/18	18/19	19/20	Total
Total Population	19	5	16	22	69	61	192
Sample size	19	5	16	22	33	33	128
Sample selected for WCFT	4	4	2	4	4	4	22

The parameters assessed in these surveys include:

i. Usage rate in project scenario
ii. Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day.
iii. Quality of the treated water
iv. The raw or unsafe water that is still boiled after installation of the water treatment technology
v. Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology.

b) Usage Survey- Completed annually, or more frequently, and in all cases on time for any request of issuance. The usage survey in this monitoring exercise provides a single usage parameter that is weighted based on drop off rates that are representative of the age distribution for project technologies in the total sales record. The usage parameter in the usage survey shall be based on users who completely abandon use of the filter and those that do not properly use or maintain the filter which could affect the quality of water treated. This survey was carried out using closed questionnaires and spot checks. The usage survey in this monitoring period was held between 12/04/2021- 04/06/2021. Results are as follows;

	Users (%)	Non-Users (%)
BSF	70.83%	29.17%

HHFF	92.64%	7.36%
IHFF	90.55%	9.45%

c) Project Field Test Update- This is completed every other year. The project technology has not had any material changes so far and given the fact that it is a zero-energy technology, the PFT has focused primarily on usage test, water quality test and details of increased sales within the crediting period.

d) Water Quality Test - The PP collected samples from each household which had been selected as a sample unit from technology specific sampling frame. Each sample of filtered water was tested for presence or absence of E. coli using the 3M Petrifilm plate. At a central field laboratory, all the samples were tested, and results recorded for each individual sample. This ensured that the PP's water quality testing was representative and robust. Field laboratory testing was selected because it allows for near immediate testing without contamination or any other distortion from the transportation to laboratories. The use of field laboratory tests is approved in the methodology and is a commonly accepted international approach. 90/30 confidence level/precision required for this parameter was achieved on the surveys conducted. Detailed analysis on the sampling criteria and results from the qualitative criteria used to determine the quality of treated water is provided in Section D.3 of this Monitoring report. PP also included qualitative questions on the survey questionnaire to further investigate water quality. Results were as follows;

BSF

Water Quality Summary (Water samples were only collected at 221 households with functional filters)						
	Parameter	Results	**Percentage of samples**		**Explanation of results**	Analysis
Incidence of water borne diseases	Yes	0	0%		No household reported water borne diseases	Non-Users
	No	223	100%			Users

	Total	223	100%			
Level of satisfaction	Highly satisfied	219	99%		219 out of 221 households were highly satisfied with the use of the filter	100% Usage
	Moderately satisfied	2	1%		There are 2 out of 221 households were moderately satisfied with the use of the filter	
	Not satisfied	0	0%			Non-Users
	Total	221	100%			
Hygiene practices	Yes	221	100%		All 221 households were practicing hygiene practices	Users
	No	0	0%			Non-Users
	Total	221	100%			
Presence or absence of E.Coli	Present	0	0%		0 households had 0.Ecoli in their water	Non-User
	Absent	221	100%		0 households had 0.Ecoli in their water	Users

	Total	221	100%			
Users/ non-users	Users	100.00 %	This includes households who have not experienced any water borne diseases related to consumption of contaminated water. All households are highly satisfied and moderately satisfied thus considered as users. All households were practicing hygiene practices.			
	Non-Users	0.0%	This includes households have experienced water borne diseases, households who reported not satisfied with the filter and households who do not practice hygiene practices			

HHFF

Water Quality Summary (Water samples were only collected at 214 households with functional filters)						
	Parameter	Results	**Percentage of samples**		**Explanation of results**	Analysis
Incidence of water borne diseases	Yes	0	0%		There was no water borne diseases reported	Non-Users
	No	214	100%		All the 214 households had 0 E. coli in filtered water	Users
	Total	214	100%			
	Highly satisfied	212	99%		There are 212 out of	100% Usage

Level of satisfaction					214 households who are highly satisfied with the use of the filter	
	Moderately satisfied	2	1%		There are 2 out of 214 households who are moderately satisfied with the use of the filter	
	Not satisfied	0	0%		No household reported as to Not being satisfied	Non-Users
	Total	214	98.60%			
Hygiene practices	Yes	214	100%		All 214 households were practicing proper hygiene	Users
	No	0	0%			Non-Users
	Total	214	100%			
Presence or absence of E.Coli	Present	3	1%		3 out of 214 households had presence of E. coli	Non-User

	Absent	211	99%		211 out of 214 households had 0 E. coli in their water	User
	Total	214	100%			
Users/ non-users	Users	98.60 %	This includes households who have not experienced any water borne diseases related to consumption of contaminated water. All households are highly satisfied and moderately satisfied thus considered as users. All households were practicing hygiene practices.			
	Non-Users	1.4%	This includes households have experienced water borne diseases, households who reported not satisfied with the filter and households who do not practice hygiene practices			

IHFF

Water Quality Summary (Water samples were only collected at 115 institutions with functional filters)						
	Parameter	Results	**Percentage of samples**		**Explanation of results**	Analysis
Incidence of water borne diseases	Yes	0	0%		No incidences of water borne diseases reported	Non-Users

	No	115	100%		No incidences of water borne diseases reported	Users
	Total	115	100%			
Level of satisfaction	Highly satisfied	115	100%		All institutions were highly satisfied	100% Usage
	Moderately satisfied	0	0%			
	Not satisfied	0	0%			Non-Users
	Total	115	100%			
Hygiene practices	Yes	115	100%		All institutions were practicing hygiene practices	Users
	No	0	0%			Non-Users
	Total	115	100%			
Presence or absence of E.Coli	Present	0	0%		All institutions had 0 E. coli in filtered water	Users

	Absent	115	100%		All institutions had 0 E. coli in filtered water	Non-User
	Total	115	100%			
Users/ non-users	Users	100.00 %	This includes households who have not experienced any water borne diseases related to consumption of contaminated water. All households who are highly satisfied and moderately satisfied thus considered as users. All households were practicing hygiene practices.			
	Non-Users	0.0%	This includes households have experienced water borne diseases, households who reported not satisfied with the filter and households who do not practice hygiene practices			

e) Leakage Assessment - As demonstrated in section B.3 of the PDD, there are no perceived leakage risks for this parameter.

The core of the methodology prescribes possible parameters that should be evaluated for leakage emissions.

i) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.

Fuel wood is gathered and consumed locally. Therefore, an increase in supply of wood in one locality (due to filtration) will not increase supply in another location. Total

Kenyan demand for fuel wood remains well above supply[5], therefore the gradual increase of fuel wood supplies due to diminished consumption in the target area will not warrant a reduction in prices so as to increase supply. Kenya has a wood supply potential of 31.4 million m^3 against a national demand of 41.7 million m^3 hence a current deficit of 10.3 million m^3. The supply for firewood and charcoal stands at 13,654,022m^3 and 7,358,717m^3 while demand stands at 18,702,748$m^3$and 16,325,810m^3 respectively [6]. Forecasts for a 20-year period indicate a 20.0% increase in supply and 21.6% increase in demand by the year 2032 which signifies a gradually increasing deficit. The Project Activity will not displace the baseline technology but rather, it seeks to displace the baseline practice of boiling water. Therefore, there is minimal risk of the baseline technologies being reused outside the project boundary.

ii) The non-renewable biomass or fossil fuels saved under the Project Activity are used by non-project users who previously used lower emitting energy sources.

Fuel wood is gathered and consumed locally. As per the baseline survey, most of the households/ institutions use firewood and charcoal to boil water. Since the demand for firewood and charcoal is very high in Kenya as explained in question (I) it is very unlikely that the firewood/ charcoal saved after introduction of the project will cause the non-project users to switch from lower emitting energy to using fossil fuels.

iii) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.

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5 Gender and equity in bio energy Access and Delivery in Kenya: http://practicalaction.org/page/docs/consulting/pisces/gender-and-equity-in-bioenergy-kenya.pdf

[6]http://www.kenyaforestservice.org/documents/redd/Analysis%20of%20Demand%20and%20Supply%20of%20Wood%20Products%20in%20Kenya.pdf

An estimation of 7,424 BSF filters,1,842 Household ACI Hollow Fiber membrane filters and 425 Institutional/commercial-use HFF units respectively are projected to be sold/ installed within the crediting period and a baseline fuel consumption of 4.11 tonnes of fuel wood per household (in the BSF and Household HFF units project scenario) and 0.00013056 tonnes of fuel wood in institutions. The population of the country is increasing hence the demand of NRB in households and institutions will continue to increase. Additionally, people are becoming aware on the importance of consuming safe water hence there is a possibility of increased boiling practices hence the project will not alter the countries NRB significantly.

iv) The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.

In the project area, evening temperatures are 18^{o}c and people do not use any space heating. Therefore, there is no loss of space heating for not filtering water, so there is no leakage as people do not light fires anyway.

v) By virtue of promotion and marketing of a new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

The technology involves distribution of zero energy water treatment units hence even if households who in the baseline were using treatment chemicals opt to use the filter, there is no risk of emissions.

f) Non-Renewable Biomass Assessment Update - The NRB assessment update will not occur for the project given its fixed baseline and the fact that the project scale is not large enough to affect the national NRB fraction.

g) Registration with other Carbon standards - The project is not registered with any other carbon standard and hence there is no likelihood that double counting would occur. Additionally, each filter is provided with a unique serial number which gives a distinction on the end users to ensures there is no double counting.

h) Project survey – This refers to the scenario before the households bought the water filter, i.e the baseline scenario. PP asked the relevant questions to assess the

source of water, water treatment options that the households used and the type of fuel that they used before purchasing the filter. Below are the results:

BSF

	Project Survey Analysis		
Fuel used in the baseline	wood	281	90.1%
	Charcoal	23	7.4%
	Gas	8	2.6%
	Total	312	100.0%
Water Purification in the baseline	Boiling	263	84.3%
	Treatment Chemicals	28	9.0%
	None/ Raw Water	21	6.7%
	Total	312	100.0%
Suppressed Demand	Would Have Boiled	19	90.5%
	Would Have Used Treatment Chemicals	2	9.5%
	Total	21	100%
water sources	Piped water	13	4.2%
	Local Spring, River or Lake	188	60.3%
	Private or Community Well	87	27.9%
	Artificial Lagoon or Catchment Basin	21	6.7%
	Purchase	2	0.6%
	Rain water harvested in tanks	1	0.3%
	Total	312	100.0%
Barriers to Water Purification	Too Expensive	6	28.6%
	Lack of awareness	13	61.9%
	Distance to cover to purify water was too great	1	4.8%

	Not satisfied with available purification methods	1	4.8%
	Total	21	100.0%
CJ Factor	43		16.3%

HHFF

	Project Survey Analysis		
Fuel used in the baseline	wood	202	87.4%
	Charcoal	13	5.6%
	Gas	16	6.9%
	Total	231	100.0%
Water Purification in the baseline	Boiling	179	77.5%
	Treatment Chemicals	21	9.1%
	None/ Raw Water	31	13.4%
	Total	231	100.0%
Suppressed Demand	Would Have Boiled	27	87.1%
	Would Have Used Treatment Chemicals	4	12.9%
	Total	31	100%
water sources	Piped water	6	2.6%
	Local Spring, River or Lake	142	61.5%
	Private or Community Well	79	34.2%
	Artificial Lagoon or Catchment Basin	4	1.7%
	Purchase	0	0.0%
	Rain water harvested in tanks	0	0.0%
	Total	231	100.0%
	Too Expensive	5	16.1%
	Lack of awareness	23	74.2%

Barriers to Water Purification	Distance to cover to purify water was too great	0	0.0%
	Not satisfied with available purification methods	3	9.7%
	Total	31	100.0%
CJ Factor	31		11.7%

IHFF

	Project Survey Analysis		
Fuel used in the baseline	wood	108	85.0%
	Charcoal	9	7.1%
	Gas	8	6.3%
	Electricity	2	1.6%
	Total	127	100.0%
Water Purification in the baseline	Boiling	45	35.4%
	Treatment Chemicals	50	39.4%
	None/ Raw Water	26	20.5%
	Bottled water	2	1.6%
	Tenwek filter	3	2.4%
	BSF	1	0.8%
	Total	127	100.0%
Suppressed Demand	Would Have Boiled	3	11.5%
	Would Have Used Treatment Chemicals	23	88.5%
	Total	26	100.0%
water sources	Piped water	37	29.1%
	Local Spring, River or Lake	50	39.4%
	Private or Community Well	27	21.3%
	Artificial Lagoon or Catchment Basin	5	3.9%
	Purchase	8	6.3%

	Rain water harvested in tanks	0	0.0%
	Total	127	100.0%
Barriers to Water Purification	Too Expensive	3	11.5%
	Lack of awareness	22	84.6%
	Distance to cover to purify water was too great	0	0.0%
	Not satisfied with available purification methods	1	3.8%
	Total	26	100.0%
CJ Factor	118		44.7%

Water Consumption Field Test Protocol Report:

The WCFT took place over a 3-day period for each household with functional water filters. The WCFT exercise is conducted biennially but it was not conducted last verification due to Covid-19 pandemic. The PP limited the water measured to the water used for cooking, personal hygiene (washing hands) and drinking only as per the Gold Standard requirements. The households were instructed to keep this water measured separate from water used for other uses to maintain the integrity of the exercise.
PP used a calibrated 8 litre bucket to measure the volume of water. The water is measured before pouring into the buckets that the households use on their daily routine. Water from the bucket is the poured into the filter.

Day 1: Surveys and Introduction
The PP executed the Usage surveys, SD assessments assessment and other non-field exercise surveys for the same sampling frame as the WCFT per technology. The PP then informed households of the three-day WCFT exercise informing them to purify water as they normally do year-round. Households told the PP on the time which they would be purifying water every day, and specifically for the coming 3 days. The time reported was recorded to allow enumerators to go to households the following day before raw water is treated.

Day 2 – 4: WCFT exercise
Based on the schedule of respective households' water treatment, enumerators conducted a volumetric assessment for raw water before it is added to the Hydraid water filter. The enumerator recorded the value of raw water to be filtered prior to filtration. This assessment was conducted using standardized volumetric container of a known volume. Raw water was measured prior to it either being filtered or boiled. The mean value of the total raw water (the total water filtered per day aggregated over a three-day period) was used to determine parameter Qp,y per household. This parameter was then aggregated (after elimination of outliers) to determine the value used to calculate Emission Reductions for the whole project per technology. The PP has demonstrated the determination of safe water consumed per person per day that is provided from the filtration of water using the project technology. The parameter Qp,y has been determined to be 7l/p/d for BSF, 7l/p/d for HHFF and 2.33l/p/d for IHFF.

Households and institutions that boil water to buffer their safe water supply were also considered. The raw water to be boiled was to be measured just as explained above, only in this case, the water would be measured prior to it being poured into the boiling pot. None of the households or institutions surveyed indicated that they boil additional raw water. Parameter Qp,raw,boil was therefore found to be 0 litres per person per day.

The PP also sought to find out households and institutions that boil water that has been filtered via the Hydraid water filter. From the findings, there were no households or institutions that reported to have this approach to water purification. Therefore, parameter Qp, clean, boil has been found to be 0 litres per person per day.

The WCFT recorded on a day-to-day basis - the number of people living in the household and institutions. This helped in the determination of Np, y. The PP found that there was an average of 5.59 p/d for BSF, 4.55p/d HHFF and 65 IHFF. The WCFT used questionnaires incorporated into the monitoring surveys to quantify the parameters listed above.

No tests were conducted over the weekends or on public holidays. This is a conservative approach chosen to eliminate the likelihood of recording abnormally

high-water consumption behavior common to weekends (children out of school, no work for some, etc.) and/or public holidays.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

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Relevant SDG Indicator	**SDG 13: Climate Action** **Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries**
Data/parameter:	**EFb,fuel,CO2**
Unit	tCO2/TJ
Description	CO2 emission factor of the wood fuel
Source of data	2006 IPCC Default emission factors
Value(s) applied)	112
Choice of data or measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	CO2 emission factor of the wood fuel
Additional comments	N/A

Relevant SDG Indicator	**SDG 13: Climate Action** **Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries**
Data/parameter	**EFb, fuel, CH4**
Unit	tCH4/TJ
Description	CH4 emission factor of the wood fuel
Source of data	2006 IPCC Default emission factors
Value(s) applied	0.03
Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	Calculation of CH4 emission factor of the wood fuel
Additional comment	N/A

Relevant SDG Indicator	**SDG 13: Climate Action** **Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries**
Data/parameter	**EFb, fuel,N2O**
Unit	t N_2O /TJ
Description	N_2O emission factor of the wood fuel
Source of data	2006 IPCC Default emission factors
Value(s) applied	0.004
Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	Determining N_2O emission factor of the wood fuel
Additional comment	N/A

Relevant SDG Indicator	**SDG 6: Clean Water and Sanitation** **Target 6.1 : By 2030, achieve universal and equitable access to safe and affordable drinking water for all**
Data/parameter:	**Cj**
Unit	**Percentage**
Description	Expressed as a percentage, this is the portion of users of the project technology j or who in the baseline were already consuming safe water without boiling it
Source of data	Baseline Survey
Value(s) applied)	18% - Households 76% - Institutions and commercial facilities
Choice of data or measurement methods and procedures	Baseline surveys carried out in project boundary showed that out of 144 households interviewed, 26 households had access to safe drinking water without boiling. That is, 12 households used treatment chemicals, 5 households would have used treatment chemicals if it wasn't for suppressed demand, while the other 9 households used either rain or piped water. The Cj factor was determined based on the methodological requirements by dividing the 26 households by the total in the sample frame. The same process was applied to the institutions/commercial facilities Cj value except that the number of sample units with access to safe water was 47 out of the total (62 sample units).
Purpose of data	To determine the portion of users of the project technology who in the baseline were already consuming safe water without boiling it.
Additional comments	N/A

Relevant SDG Indicator	SDG 13: Climate Action Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Data/parameter	Wb,y
Unit	Tonnes/litre
Description	Quantity of fuel in tonnes required to treat 1 litre of water using technologies representative of baseline scenario b
Source of data	GS default
Value(s) applied	Households – 0.0004 Institutions/commercial facilities – 0.0004
Choice of data or Measurement methods and procedures	Gold Standard default values for the amount of wood used.
Purpose of data	To estimate the quantity of fuel in tonnes required to treat 1 litre of water using technologies representative of baseline scenario b
Additional comment	During baseline surveys, values obtained were 0.00054960 for households and 0.00054458 for institutions. These values have now been capped to 0.0004tons as per GS guidelines.

Relevant SDG Indicator	SDG 13: Climate Action Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Data/parameter	NCVb
Unit	TJ/tonne
Description	Net calorific value of wood fuel used in the baseline
Source of data	IPCC default value
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	To determine the calorific value of wood fuel used in the baseline
Additional comment	N/A

Relevant SDG Indicator	SDG 13: Climate Action Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Data/parameter	GWP
Unit	Fraction
Description	Global Warming Potential of CH4

Source of data	Literature Review:
Value(s) applied	25 (value used before 01/01/2021) 28[7] (Value used after 01/01/2021)
Choice of data or Measurement methods and procedures	IPCC Third Assessment Report: Climate Change 2001. IPCC fifth Assessment Report (AR5)
Purpose of data	To determine the Global Warming Potential of CH4
Additional comment	Value for 2021 updated as per GS Rule Update dated 03/06/2021

Relevant SDG Indicator	SDG 13: Climate Action Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Data/parameter	GWP
Unit	Fraction
Description	Global Warming Potential of N_2O
Source of data	Literature Review:
Value(s) applied	298 (Value used before 01/01/2021) 265[8](Value used after 01/01/2021)
Choice of data or Measurement methods and procedures	IPCC Third Assessment Report: Climate Change 2001. IPCC Fifth Assessment Report: (AR5)
Purpose of data	To determine the Global Warming Potential of N2O

[7],[8] Applicability of Global warming potential for Gold Standard for the Global Goals Projects – Gold Standard for the Global Goals

Additional comment	Value for 2021 updated as per GS Rule Update dated 03/06/2021

D.2. Data and parameters monitored

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Relevant SDG Indicator	SDG 3: Good health and wellbeing. Target 3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.
Data / Parameter:	Up,y
Unit:	Percentage
Description:	Usage rate in project scenario p during year y. This data will be used to account for end users which discontinue use of the filters from the monitored sample frame and thereafter be extrapolated across the total sales record.
Measured/Calculated / Default:	Calculated
Source of data:	GS1078 Combined Monitoring survey summary, tabs BSF, HHFF and IHFF Usage Survey
Value(s) of monitored parameter:	BSF 2020– 70.83% 2021– 70.83% HHFF 2020–92.64% 2021– 92.64% IHFF 2020– 90.55% 2021–90.55%
Monitoring equipment:	Monitoring Survey
Measuring/Reading/ Recording frequency:	Annually
Calculation method (if applicable):	The PP has provided excel based calculations that demonstrate the calculation of the usage parameter.
QA/QC procedures:	The guidance questions in the usage survey section in the monitoring survey template clearly determined the operational and non-operational filters in the project scenario.
Purpose of data:	Calculations of total Emission reductions
Additional comment:	A minimum of 30 surveys has been used to determine minimum required sample size as required by the methodology.

Relevant SDG Indicator	SDG 3: Good health and wellbeing. Target 3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.
Data / Parameter:	Np,y
Unit:	Person.days
Description:	Number of persons consuming water supplied by project scenario p through year y
Measured/ Calculated/Default:	Calculated
Source of data:	GS1078 Combined Monitoring survey summary, tabs BSF, HHFF and IHFF Inputs
Value(s) of monitored parameter:	BSF – 2,043 HHFF – 1,662 IHFF –Calculated individually for each institution. Calculations have been provided on the ERs sheet tab ER- calculation-IHFF.
Monitoring equipment:	Open ended question from the Monitoring surveys
Measuring/Reading/ Recording frequency:	Biennially
Calculation method (if applicable):	Households and institutions were asked the number of people living in their household and institutions for that day in the three consecutive days during the water consumption field test. An average of this number was then calculated, and an average of the total obtained. The figure was multiplied by 365 days in a year to obtain the figure for BSF and HHFF and by specific number of days a filter in in operation for IHFF.
QA/QC procedures:	The number of people living in a household and institution for the three consecutive days during the water consumption field test was obtained to capture the differences in the household and institution number of people throughout the year.
Purpose of data:	To calculate the number of persons consuming water supplied by project scenario p through year y.
Additional comment:	None

Relevant SDG Indicator/Safeguarding Principle	SDG 3: Good health and well being. Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter	Number of filters sold.
Unit	Number of filters
Description	Number of filters sold as per the Total Sales Records (TSR)
Source of data	Total Sales Records for BSF, HHFF and IHFF
Value(s) applied	BSF:3,215 HHFF:2,212 IHFF: 192
Measurement methods and procedures	Records kept electronically by the PP.
Monitoring frequency	Annual
QA/QC procedures	Continuous updates of the TSR to ensure that filter sales are updated.
Purpose of data	Calculating emission reductions.
Additional comment	None

Relevant SDG Indicator	SDG 6: Clean water and Sanitation Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data / Parameter:	Quality of Treated Water
Unit:	Percentage
Description:	Quality of filtered water
Measured/Calculated /Default:	N/A
Source of data:	GS1078 Combined Monitoring survey summary, tabs BSF, HHFF and IHFF Water Quality
Value(s) of monitored parameter:	BSF: 100% HHFF:98.6% IHFF: 100%
Monitoring equipment:	Field Laboratory Tests
Measuring/ Reading/Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	The water test results are compared against values provided from the product specifications
Purpose of data:	Sustainable development Monitoring; Methodological Requirement.

Additional comment:	The water quality assessment was done and included a qualitative and quantitative criterion for Water Quality which covered the following aspects: • Reported incidence of water borne disease in child/members in last 30 days • User satisfaction • Level of hygiene including but limited to Hand washing & Safe storage practices being followed. • Level of E. coli in filtered water. The water quality testing values obtained were 100%for BSF, and IHFF while HHFF was 98.6. The methodological requirement is that the 90/30 confidence/precision should be used to determine the minimum required sample size. This has been achieved as the water quality assessment was undertaken for all the end-users with functional water filters.

Relevant SDG Indicator	SDG 6: Clean water and sanitation Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data / Parameter:	Qp,y
Unit:	Litres per person per day
Description:	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Measured/Calculated/Default:	Calculated
Source of data:	GS1078 Combined Monitoring survey summary, tabs Qp,yBSF, Qp,y HHFF and Qp,y IHFF Inputs
Value(s) of monitored parameter:	BSF – 7l/p/d HHFF – 7l/p/d IHFF – 2.33l/p/d
Monitoring equipment:	Calibrated Buckets for measuring water
Measuring/ Reading/Recording frequency:	Biennially, 3 consecutive days of the monitoring exercise with exception of holidays and weekends
Calculation method (if applicable):	The Water Consumption Field Test results were collected for three consecutive days in each household included in the sample frame. An average of this was then obtained. The figure was then divided by the average number of people in the household.
QA/QC procedures:	The enumerators were provided with calibrated buckets to ensure they took accurate measurements during the WCFT protocol. To ensure accuracy, the enumerators were advised to read calibrated units less of topmost numbers which could be easily read.
Purpose of data:	Calculation of emissions reductions
Additional comment:	The sampling requirement is that the 90/30 confidence/precision shall be used to determine the minimum required sample size. As demonstrated, PP only needed a minimum sample of 8 households but chose a bigger sample of 33 households for BSF and HHFF and a sample of 12 for IHFF to ensure representativeness for all vintage years.

Relevant SDG Indicator	SDG 6: Clean water and sanitation Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data / Parameter:	Qp,cleanboil,y
Unit:	Litres per person per day
Description:	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology
Measured/Calculated / Default:	Calculated
Source of data:	GS1078 Combined Monitoring survey summary, tabs Qp,y BSF, Qp,y HHFF and Qp,y IHFF Inputs
Value(s) of monitored parameter:	BSF - 0 HHFF – 0 IHFF – 0
Monitoring equipment:	Monitoring surveys
Measuring/Reading/Recording frequency:	Biennially
Calculation method (if applicable):	The amount of filtered water boiled was obtained for the three consecutive days during the water consumption field test before the water was poured into the boiling pot. An average of this amount was then obtained and divided by the average number of people in the household.
QA/QC procedures:	The enumerators were trained how to accurately measure this parameter using calibrated buckets. The households were advised not to boil the water before the enumerators measured it.
Purpose of data:	Calculation of project emissions.
Additional comment:	The sampling requirement is that the 90/30 confidence/precision shall be used to determine the minimum required sample size. No household or institution was boiling filtered water.

Relevant SDG Indicator	SDG 6: Clean water and sanitation Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data / Parameter:	Qp,rawboil,y
Unit:	Litres per person per day
Description:	Quantity of raw water boiled in the project scenario p per person per day
Measured/Calculated / Default:	Calculated
Source of data:	GS1078 Combined Monitoring survey summary, tabs Qp,y BSF, Qp,y HHFF and Qp,y IHFF Inputs
Value(s) of monitored parameter:	BSF- 0 HHFF – 0 IHFF - 0
Monitoring equipment:	3-day measurement using calibrated measuring buckets
Measuring/ Reading/Recording frequency:	Biennially
Calculation method (if applicable):	The amount of raw water boiled was obtained for the three consecutive days during the water consumption field test before the water was poured into the boiling pot. An average of this amount was then obtained and divided by the average number of people in the household. (There were no households/ institutions boiling water in the project scenario)
QA/QC procedures:	The enumerators were trained how to accurately measure this parameter using calibrated buckets. The households were advised not to boil the water before the enumerators measured it.
Purpose of data:	Calculation of baseline and project emissions.
Additional comment:	The sampling requirement is that the 90/30 confidence/precision shall be used to determine the minimum required sample size. No household or institution was boiling raw water to supplement the already filtered water.

Relevant SDG Indicator	SDG 6: Clean water and sanitation Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data / Parameter:	Volume of safe water consumed in the project scenario
Unit:	Litres consumed per person per day
Description:	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Measured/Calculated/Default:	Calculated
Source of data:	GS1078 Combined Monitoring survey summary, tabs Qp,y BSF, Qp,y HHFF and Qp,y IHFF Inputs
Value(s) of monitored parameter:	BSF –7 l/p/d HHFF –7 l/p/d IHFF –2.33 l/p/d
Monitoring equipment:	Calibrated Buckets for measuring water
Measuring/ Reading/Recording frequency:	Biennially, 3 consecutive days of the monitoring exercise with exception of holidays and weekends
Calculation method (if applicable):	The Water Consumption Field Test results were collected for three consecutive days in each household included in the sample frame. An average of this was then obtained. The figure was then divided by the average number of people in the household.
QA/QC procedures:	The enumerators were provided with calibrated buckets to ensure they took accurate measurements during the WCFT protocol. To ensure accuracy, the enumerators were advised to read calibrated units less of topmost numbers which could be easily read.
Purpose of data:	Calculation of emissions reductions
Additional comment:	The sampling requirement is that the 90/30 confidence/precision shall be used to determine the minimum required sample size.

Gold Standard Sustainable Development Indicators

Relevant SDG Indicator	SDG 3: Good health and wellbeing. Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter:	Reduction in water borne diseases such as skin rash, diarrhoea, foot sores, parasites, eye problems and other water borne diseases.
Unit:	Percentage
Description:	Number of persons who have experienced a decrease of water borne diseases such as skin rash, diarrhoea, foot sores, parasites, eye problems and other water borne diseases since using the filter
Measured/Calculated / Default:	N/A
Source of data:	GS1078 Combined Monitoring survey summary, tabs BSF, HHFF and IHFF Sustainable Development
Value(s) of monitored parameter:	BSF: 77% HHFF: 87% IHFF: 100%
Monitoring equipment:	Open ended questionnaires to ascertain real and perceived improvements in household health and reduction of water borne diseases.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	The questionnaire is asked in an unbiased manner to ensure the respondents are not coerced into any answer by the interviewer
Purpose of data:	Gold Standard's Sustainable Development Monitoring
Additional comment:	Surveys were conducted for all households and institutions with functional water filters. A minimum of 30 surveys per vintage year has been used to determine minimum required sample size. This has been achieved as the sustainable development assessment was undertaken for all the end-users with functional water filters. The samples were as follows: BSF-221, HHFF-214 and IHFF-115.

Relevant SDG Indicator	SDG 3: Good health and wellbeing. Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter:	Air Quality
Unit:	Percentage
Description:	Measurement of user perceptions between the baseline and project scenario: smoke levels, incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes.
Measured/Calculated /Default:	Measured
Source of data:	GS1078 Combined Monitoring survey summary, tabs BSF, HHFF and IHFF Sustainable Development
value(s) of monitored parameter:	BSF Reduced Smoke levels in the House: Yes = 90 No = 2% No Change = 8% Reduced Incidents of Coughing: Yes = 93% No Change = 7% Reduced incidences of Itchy Eyes: Yes = 77% No Change = 23%
Monitoring equipment:	Monitoring Survey questionnaire
Measuring/ Reading/Recording frequency:	Annually
Calculation method (if applicable):	The number of end users with the perceived outcome e.g., reduced levels of smoke was divided by the total units in the sample frame and multiplied by 100 to get the percentage.
QA/QC procedures:	The monitoring survey questions related to air quality were fashioned in an unbiased manner so as not to influence the feedback from the respondents in any way.
Purpose of data:	Gold Standard's sustainable development monitoring
Additional comment:	A minimum of 30 surveys per vintage year has been used to determine minimum required sample size. This has been achieved as the sustainable development assessment was undertaken for all the end-users with functional water filters. The samples were as follows: BSF-221, HHFF-214 and IHFF-115.

Relevant SDG Indicator	SDG 3: Good health and well-being. Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter:	Air Quality
Unit:	Percentage
Description:	Measurement of user perceptions between the baseline and project scenario: smoke levels, incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes.
Measured/Calculated /Default:	Measured
Source of data:	GS1078 Combined Monitoring survey summary, tabs BSF, HHFF and IHFF Sustainable Development
value(s) of monitored parameter:	HHFF Reduced Smoke levels in the House Yes = 92% No = 1% No Change = 7% Reduced Incidents of Coughing: Yes = 88% No = 1% No Change = 11% Reduced incidences of Itchy Eyes: Yes = 87% No = 1% No Change = 12%
Monitoring equipment:	Monitoring Survey questionnaire
Measuring/ Reading/Recording frequency:	Annually
Calculation method (if applicable):	The number of end users with the perceived outcome e.g., reduced levels of smoke was divided by the total units in the sample frame and multiplied by 100 to get the percentage.
QA/QC procedures:	The monitoring survey questions related to air quality were fashioned in an unbiased manner so as not to influence the feedback from the respondents in any way.
Purpose of data:	Gold Standard's sustainable development monitoring
Additional comment:	Surveys were conducted for all households with functional water filters. A minimum of 30 surveys per vintage year has been used to determine minimum required sample size. This has been achieved as the sustainable development assessment was undertaken for all the end-users with functional water filters. The samples were as follows: BSF-221, HHFF-214 and IHFF-115.

Relevant SDG Indicator	SDG 3: Good health and well-being. Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter:	Air Quality
Unit:	Percentage
Description:	Measurement of user perceptions between the baseline and project scenario: smoke levels, incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes.
Measured/Calculated /Default:	Measured
Source of data:	GS1078 Combined Monitoring survey summary, tabs BSF, HHFF and IHFF Sustainable Development
value(s) of monitored parameter:	IHFF Reduced Smoke levels in the House: Yes = 76% No Change = 24% Reduced Incidents of Coughing: Yes = 76% No Change = 24% Reduced incidences of Itchy Eyes: Yes = 79% No Change = 21%
Monitoring equipment:	Monitoring Survey questionnaire
Measuring/ Reading/Recording frequency:	Annually
Calculation method (if applicable):	The number of end users with the perceived outcome e.g., reduced levels of smoke was divided by the total units in the sample frame and multiplied by 100 to get the percentage.
QA/QC procedures:	The monitoring survey questions related to air quality were fashioned in an unbiased manner so as not to influence the feedback from the respondents in any way.
Purpose of data:	Gold Standard's sustainable development monitoring
Additional comment:	Surveys were conducted for all households with functional water filters. A minimum of 30 surveys per vintage year has been used to determine minimum required sample size. This has been achieved as the sustainable development assessment was undertaken for all the end-users with functional water filters. The samples were as follows: BSF-221, HHFF-214 and IHFF-115.

Relevant SDG Indicator	SDG 6: Clean water and Sanitation Target 6b: Support and strengthen the participation of local communities in improving water and sanitation management
Data / Parameter:	Number of people attending training/ workshops on maintenance of the water filters, water hygiene and sanitation management.
Unit:	Number people
Description:	This parameter will be collected to demonstrate that the project provides training and workshops on filter assembly, installation, use and maintenance
Measured/Calculated /Default:	N/A
Source of data:	GS 1078 Training records
Value(s) of monitored parameter:	• Washiriki Training, 25-27/02/2020, 30 attendees (20 women, 10 men) • Community WASH promoters, 09/10/2020, 25 attendees (13 women, 12 men) • Community WASH Promoters Meeting, 03/12/2020, 15 attendees (12 women, 3 men) • Community WASH Promoters Meeting, 14/01/2021, 15 attendees (12 women, 3 men)
Monitoring equipment:	Training records
Measuring/ Reading/Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/Procedures:	Accurate and up to date records on trainings held by the project are kept by the project participant.
Purpose of data:	Gold Standard's Sustainable Development Monitoring
Additional comment:	One Skype training session was held in preparation for the monitoring survey exercise. The training was conducted by Sally Gakii ClimateCare, with the Aqua Clara team leader for the monitoring exercise, Josephine Orare. The training was held on 1st April 2021.

Relevant SDG Indicator	SDG 8: Decent Work and Economic Growth Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.
Data / Parameter:	Number of people employed by the project
Unit:	Number of people
Description:	Number of people employed by the project
Measured/ Calculated / Default:	Measured
Source of data:	GS 1078 Employment Records
Value(s) of monitored parameter:	52 people were employed by the project. These included 14 permanent employees at Aqua Clara, 22 people who were employed in the filter distribution program and 16 as enumerators for the monitoring survey exercise. Both women and youth have been employed in this project as evidenced in the employment record and monitoring survey summary. For the filter installers, 4 were men and 18 women. Out of the 14 permanent ACI employees, 8 were men while 6 were women, 9 people in total are youths, defined in Kenya as persons under the age of 35 years.
Monitoring equipment:	Employment and wages Records
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	Employment Records are kept electronically and updated frequently to ensure they are up to date.
Purpose of data:	Gold Standard's sustainable development monitoring
Additional comment:	The project has employed both men and women. From the employment records it is evident that all the employees are paid equally depending on equal value of work done as in the case of the where the sales agents get a pay of 500 depending on sales channel for each filter sold. Additionally, enumerators who were parttime employees were paid ksh. 700 daily which is above the official Kenya's minimum wage while those employed as permanent employees are paid above Ksh. 13,572[9].

[9] http://kenyalaw.org/kl/fileadmin/pdfdownloads/LegalNotices/2019/LN2_2019.pdf

Relevant SDG Indicator	SDG 8: Decent Work and Economic Growth Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.
Data / Parameter:	Employment wages of people employed by the project
Unit:	Wages of the people employed by the project
Description:	This parameter will be collected to indicate the project provides decent work for all men and women.
Measured/ Calculated / Default:	Calculated
Source of data:	GS 1078 Employment Records Sales per sales agent Enumerator's employment record
Value(s) of monitored parameter:	22 people were employed in the filter distribution program. Each person was paid Ksh. 500 for each filter sold. The highest record of filters sold by the employees is 39 filters where the employee was paid Ksh. 19,500. While the lowest had sold receiving 3 filter and got Ksh. 1,500. There are also 14 permanent employees working with the project. The employment records have been submitted separately. Total income generated by the employees from filter distribution is Ksh. 222,500 while that from the monitoring exercise is Kshs.88,900.
Monitoring equipment:	Employment and wages Records
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	Employment Records are kept electronically and updated frequently to ensure they are up to date.
Purpose of data:	Gold Standard's sustainable development monitoring
Additional comment:	Employment records for both permanent and part time staff have been submitted as support documents.

Relevant SDG Indicator	SDG9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Target: 9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities
Data / Parameter:	Number of people attending training/ workshops on filter installation and maintenance
Unit:	Number of people
Description:	This parameter will be collected to demonstrate that the project provides training and workshops on filter assembly, installation, and use
Measured/Calculated /Default:	N/A
Source of data:	GS 1078 Training records
Value(s) of monitored parameter:	85
Monitoring equipment:	Training records
Measuring/ Reading/Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	Accurate and up to date records on trainings held by the project are kept by the project participant.
Purpose of data:	Gold Standard's Sustainable Development Monitoring
Additional comment:	none

Relevant SDG Indicator	SDG 13: Take urgent action to combat climate change and its impacts. Target 13.1: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data / Parameter:	Number of workshops, seminars organized, and training-related opportunities held.
Unit:	Number of workshops, seminars and trainings
Description:	This parameter will be collected to demonstrate that the project provides training and workshops on filter assembly, installation, and use
Measured/ Calculated / Default:	N/A
Source of data:	Training records
Value(s) of monitored parameter:	4 trainings and workshops
Monitoring equipment:	Training records
Measuring/ Reading/Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	Accurate and up to date records on trainings held by the project are kept by the project participant.
Purpose of data:	Gold Standard's Sustainable Development Monitoring
Additional comment:	A total of 4 trainings were conducted. The trainings were on filter installation and maintenance and WASH promotion. Additionally, there were two trainings done for monitoring survey, 1 was a refresher course between ClimateCare and Aqua Clara, the other training was between Aqua Clara and the enumerators.

Relevant SDG Indicator/Safeguarding Principle	SDG 13: Climate Action Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data / Parameter	LE,p,y
Unit	tCO2e per year
Description	Leakage in project scenario p during year y
Source of data	Literature review
Value(s) applied	0
Measurement methods and procedures	In accordance with the methodology an assessment of all project scenarios which might result in leakage emissions has been conducted. This demonstrated, there are no potential leakage emission sources arising.
Monitoring frequency	Parameter to be monitored biennially.
QA/QC procedures	There are no perceived leakage risks for this project as explained in section E.2 of this Monitoring report.
Purpose of data	Calculation of Emissions Reductions.
Additional comment	N/A

Relevant SDG Indicator	SDG 13: Climate Action Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Data / Parameter:	Bb,y
Unit:	Tons
Description:	Quantity of wood fuel consumed in baseline scenario b during the year y in tons
Measured/ Calculated / Default:	Calculated
Source of data:	GS1078 Combined Monitoring survey summary, tabs BSF, HHFF and IHFF Inputs
Value(s) of monitored parameter:	BSF: 4.6896 HHFF: 3.8150 IHFF: 0.00022
Monitoring equipment:	N/A
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	The parameter is a function of the Cj factor, Np,y, Wb,y , Qpy an Qp,raw boil as shown in the equation below: Bby= (1-Cj)*Wb,y*Np,y*(Qpy+Qp,raw,boil)
QA/QC procedures:	The variables were based on accurate monitored data as well as data fixed ex-ante. Additionally, the formula used is derived from the GS approved methodology "Technologies and practices to Displace Decentralized Thermal Energy Consumption, version 1.0"
Purpose of data:	Calculation of Baseline emissions.
Additional comment:	N/A

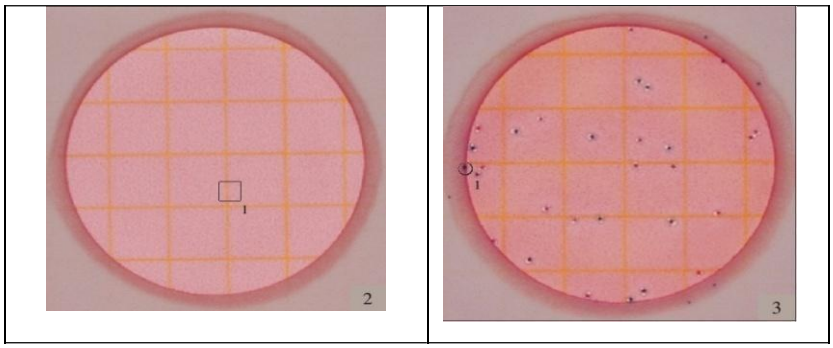
Water quality testing procedure

Water quality tests were done together with the monitoring surveys for the monitoring period between 19th February 2020 to 18th February 2021.

I. Water Quality Testing Approach

Water quality testing was conducted through the 3M Petrifilm instructions manual. The 3M Petrifilm plate contains Violet Red Bile (VRB) nutrients, a cold-water-soluble gelling agent, an indicator of glucuronidase activity, and an indicator that facilitates colony enumeration. Most E. coli (about 97%) produce beta- glucuronidase which produces a blue precipitate associated with the colony. The top film traps gas produced by the lactose fermenting coliforms and E. coli. About 95% of E. coli produce gas, indicated by blue to red-blue colonies associated with entrapped gas on

the Petrifilm EC plate (within approximately one colony diameter). It is therefore relatively easy to detect presence or absence of any population of the E. coli during water quality testing.



No growth = 0 **E. coli count = 13**

Figure 6: Presence and absence of E. coli in a sample of water using the 3M Petrifilm Plates.

3rd Party Endorsements

1. **CAWST9**

CAWST – Centre for Affordable Water and Sanitation Technology - a Canadian humanitarian not-for-profit organization that provides education, training and technical consulting in water and sanitation to organizations working with the poor in developing countries.

"The WHO Guidelines cover microbiological, chemical and physical qualities. However, it is stressed that microbiological quality is the most important since this is biggest cause of illness and death around the world. The water quality tests endorsed by CAWST are primarily simplistic in nature. Historically, conventional laboratories were mainly used to carry out water quality testing. Now there is a wide variety of good testing kits and products available in the commercial market that allows you to conduct water quality testing on your own without relying on a laboratory. A significant advantage of field analysis is that tests are carried out on fresh samples whose characteristics have not been contaminated or otherwise changed as a result of being stored and transported over long distances. In rural and remote communities, it is more convenient to carry out water testing on site. However, in practice, it is difficult to transport samples in a way that does not affect their bacteriological quality.

Setting up a small laboratory to provide a clean and controlled environment is highly recommended.
Laboratory testing is preferred when carrying out technology verification and preparing water quality guidelines. UNICEF recommends that some complex chemicals such as antimony, barium, cadmium, mercury, molybdenum, selenium and uranium should be tested by a laboratory to achieve a reliable result. However, testing specifically for these chemicals is not usually a concern for the majority of HWTS projects".

3M Petri film is one of the kits recommended by CAWST.

Figure 7: 3M Petrifilm

There are two procedures for water testing using Petrifilm, but neither are approved international methods. The first procedure recommends the water be filtered through a cellulose acetate filter and the filter be placed on the Petrifilm. This would allow a 100 ml sample to be tested. The filter paper is not included. For this procedure, the gel needs to be prepared ahead of time adding a few extra hours on to the procedure time. If the water sample was really contaminated it could be a challenge to count all the bacteria colonies and the sample may have to be diluted. The second procedure (used by Robert Metcalf) tests a 1 ml sample by placing the sample directly on the Petrifilm. This procedure does not require that the gel be prepared ahead of time. The challenge with this procedure is that sample size is very small, and discrepancy is very likely. With any sample larger than 1 ml the water leaks off the film.

2. A practical method for rapid assessment of the bacterial quality of water[10]

In this statement, the UN recognises the need for safe drinking water in communities to avoid drinking disease-causing microbes, such as bacteria and viruses. It recognizes that a new generation of testing E. Coli has been introduced that can be performed in any setting with minimal training. The tests are being used in the most advanced water and food testing labs in developed countries, but they can also be used in remote villages.

The endorsed tests, which include the 3M plates are effective in detecting the presence of E. Coli which is a bacterium that indicates faecal contamination. Its presence in water indicates recent faecal contamination, and the possibility that microbes may also be in the water.

The endorsement explains how to use the Petrifilm test and the expected results.

The Petrifilm tests correlate with the relative risk of disease from drinking-water (WHO Guidelines for Drinking Water, 2nd Edition). The table below shows how this risk assessment is done.

Table 2: Risk assessment of water sources

Table 1: Risk assessment of water sources

Risk level	*E. coli*/sample	Colilert fluorescence	Petrifilm # Blue&gas
Low	< 1/10 ml	-	0
Moderate	1-10/10 ml	+	0
High	1-10/ml	+	1-10
Very High	>10/ml	+	>10

[10] http://mirror.unhabitat.org/pmss/getElectronicVersion.aspx?nr=3056&alt=1

If there are no blue colonies with gas bubbles on the Petrifilm, the risk of disease is low, if the Petrifilm remains clear, the risk is moderate and if between 1 and 10 blue colonies with gas appear on the Petrifilm, the risk is high. The E. Coli count Petrifilm is a reliable, sample ready medium system for enumerating E. Coli and Coliforms.

EColi Count Petrifilm contains:

- Violet, red bile nutrients, which include lactose. The bile salts and crystal violet in the medium inhibit gram positive bacteria.
- A cold water-soluble gelling agent.
- A glucuronidase indicator (BCIG, 5-bromo-4 chloro-3 indolyl-beta D Glucuronide) to identify E. Coli (the same enzyme which hydrolyzes MUG in the Coli rent test.
- A tetrazolium indicator which Gram negative bacteria reduce to a red color to enhance colony visualization.

All coliform indicator ferment lactose to produce gas bubbles. The bubbles are trapped around the coliform colony. This will distinguish coliform bacteria from other gram-negative bacteria which do not produce gas bubbles from lactose.

In addition, glucuronidase produced by most E. Coli, will hydrolyze the Glucuronide from BCIG. The BCI produces a blue colony allowing visual identification of E. Coli coliform colonies which are red with gas bubbles.

3. Testing Approach Appropriateness

The 3M Petrifilm water testing approach has an informative technology which produces productivity, consistency, easy to use and producing best results.

Benefits of 3M Petrifilm[11]

- 80 % productivity.
- Greater consistency
- Longer Shelf life

[11] http://vimeo.com/28951486

- 85% confirmed coliform result in 24 hours.
- Effective in coliform count

The 3m Plates perform similar to standard water testing requirements as found in

1) ISO 6222
2) ISO 9308

The U.S FDA Bacteriological Analytical Manual (BAM)
APHA Standard methods for the examination of Water and wastewater.

II. Water quality testing results

The PP has used the Kenya water regulations (2006) to determine the acceptable efficiency of the E. coli removal capacity of the filter technologies. The percentage removal of E. coli is given as 100%. From the water quality testing conducted,100% of the samples showed 100% E. coli removal, 100% of the HFF samples have water quality E. coli removal of 100%. All the filters that failed to meet the 100% E. coli removal standard have been deemed as non-users and stricken from the Emission reduction calculations. The PP has provided the water quality testing results in the monitoring survey data summary attached as an appendix to this monitoring report.

Below are examples of water quality test results from some households' water samples tested:

HFF Filter:

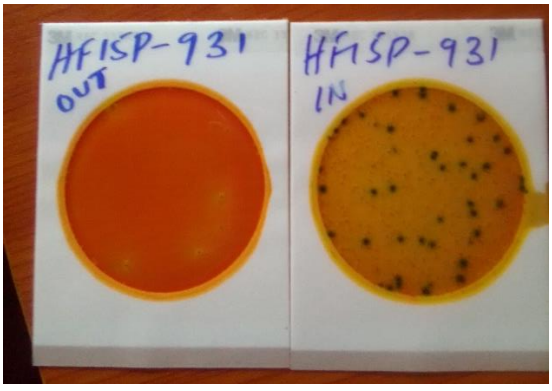


Figure 8: Sample showing presence and absence of E. coli for a HHFF user.

Household Name – Jerusa Ototo
Filter Number - HF15P-931
Raw water quality (IN) – 42
Filtered water quality (OUT)– 0 cfu

BSF Filter:

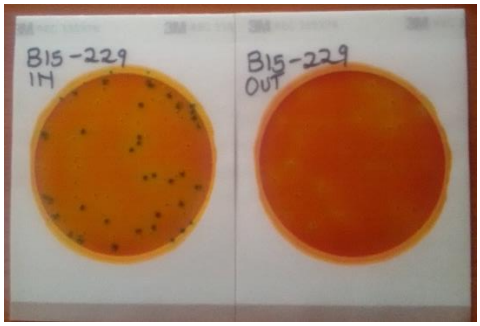


Figure 9: Diagram showing presence and absence of E. coli for a BSF user.

Household Name: James Onsongo

Filter Number – B15 - 229

Raw water quality (IN) – 37cfu

Filtered water quality (OUT)– 0 cfu

IHFF Filter:

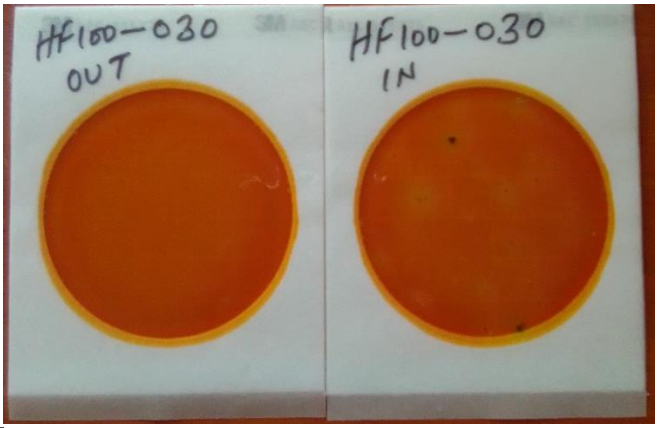


Figure 10: Diagram showing presence and absence of E. coli for IHFF user.

Household Name: Etono SDA Primary School

Filter Number – HF100-030

Raw water quality (IN) – 2

Filtered water quality (OUT)– 0 cfu

D.3. Comparison of monitored parameters with last monitoring period.

BSF

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
Up,y	70.83%	60%
Qp,y (biennially monitored capped as per WHO guidelines)	7	4
Quality of filtered water	100%	94.87%
Qp,rawboil,y	0	0
Qp,cleanboil,y	0	0
Np,y	2,043	2,821
Bb,y	4.6896	3.7014
Number of People trained on water, hygiene and sanitation management	85	156
Number of filters sold	3,215	3,215
Income generation	Total income ksh. confidential, employment records provided	Total income confidential
Number of people employed	52	54
Air quality parameters	Reduction in occurrences of water borne diseases;77% Reduced Smoke levels in the House: • Yes: 90% • N/A: 0% • No change: 8% • No: 2% Reduced Incidents of Coughing: • Yes = 93%	Reduction in occurrences of water borne diseases; 96.8% Reduced Smoke levels in the House: • Yes: 96.8% • N/A: 0% • No change: 3.2% • No: 0% Reduced Incidents of Coughing: • Yes = 94.8%

	• No = 0% • No Change = 7% • N/A=0% Reduced incidences of Itchy Eyes: • Yes = 77% • No = 0% • No Change = 23% • N/A=0%	• No = 0% • No Change = 5.2% • N/A=% Reduced incidences of Itchy Eyes: • Yes = 93.5% • No = 0% • No Change = 6.5% • N/A=0%

HHFF

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
Up,y	92.64%	68%
Qp,y (biennially monitored capped as per WHO guidelines)	7	4
Quality of filtered water	98.6%	99%
Qp,rawboil,y	0	0
Qp,cleanboil,y	0	0
Np,y	1,662	2,059
Bb,y	3.8150	2.7008
Number of People trained on water, hygiene and sanitation management	85	156
Number of filters sold	2,212	2,070
Income generation	Total income confidential, employment records provided	Total income confidential, employment records provided
Number of people employed	52	54
Air quality parameters	Reduction in occurrences of water borne diseases; 87%	Reduction in occurrences of water borne diseases; 100%

	Reduced Smoke levels in the House: • Yes: 92% • N/A: 0% • No change: 7% • No: 1% Reduced Incidents of Coughing: • Yes = 88% • No = 1% • No Change = 11% • N/A=0% Reduced incidences of Itchy Eyes: • Yes = 87% • No = 1% • No Change = 12% • N/A=0%	Reduced Smoke levels in the House: • Yes: 98.5% • N/A: 0% • No change: 1.5% • No: 0% Reduced Incidents of Coughing: • Yes = 98.5% • No = 0% • No Change = 1.5% • N/A=0% Reduced incidences of Itchy Eyes: • Yes = 97.7% • No = 0% • No Change = 2.3% • N/A=0%

IHFF

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
Up,y	90.55%	53%
Qp,y (biennially monitored capped as per WHO guidelines)	2.33	0.87
Quality of filtered water	100%	100%
Qp,rawboil,y	0	0
Qp,cleanboil,y	0	0
Np,y	65.05	Calculated for each institution
Bb,y	0.00022	0.000084

Number of People trained on water, hygiene and sanitation management	85	156
Number of filters sold	192	164
Income generation	Total income Confidential, employment records provided	Total income Confidential, employment records provided
Number of people employed	52 (34 men and 18 women)	54 (34 men 18 women)
Air quality parameters	Reduction in occurrences of water borne diseases; 100% Reduced Smoke levels in the House: • Yes: 76% • N/A: 0% • No change: 24% • No: 0% Reduced Incidents of Coughing: • Yes = 76% • No = 0% • No Change = 24% • N/A=0% Reduced incidences of Itchy Eyes: • Yes = 79% • No = 0% • No Change = 21% • N/A=0%	Reduction in occurrences of water borne diseases;97.6% Reduced Smoke levels in the House: • Yes: 83.2% • N/A: 0% • No change: 16.8% • No: 0% Reduced Incidents of Coughing: • Yes = 78.4% • No = 0% • No Change = 21.6% • N/A=0% Reduced incidences of Itchy Eyes: • Yes = 82.4% • No = 0% • No Change = 17.6% • N/A=0%

D.4. Implementation of sampling plan

>> Systematic sampling method was used to determine the random test subjects from the total sales record.

Determination of the Sample size

A total of 312 households for the BSF, 231 HHFF and 128 IHFF were initially randomly selected for this monitoring period.

The following method was used to determine the sampling units.

1. A list of the geographical regions in the total sales record and the total number of filters sold in these regions was determined.
2. Cumulative sum of all the BSF filters HHFF filters, and IHFF filters sold was 3,215 BSF Filters and 2,212 HHFF and 192 IHFF.
3. The total number of filters sold in the respective age groups was then divided by the sample size chosen for that particular age group for BSF and HHFF. This result determined the Sample Interval.
4. A random number was determined between 1 and the Sample Interval was which gave the Random Start.
5. Sample units were then determined as

a) SU1=RS

b) SU2=RS+SI

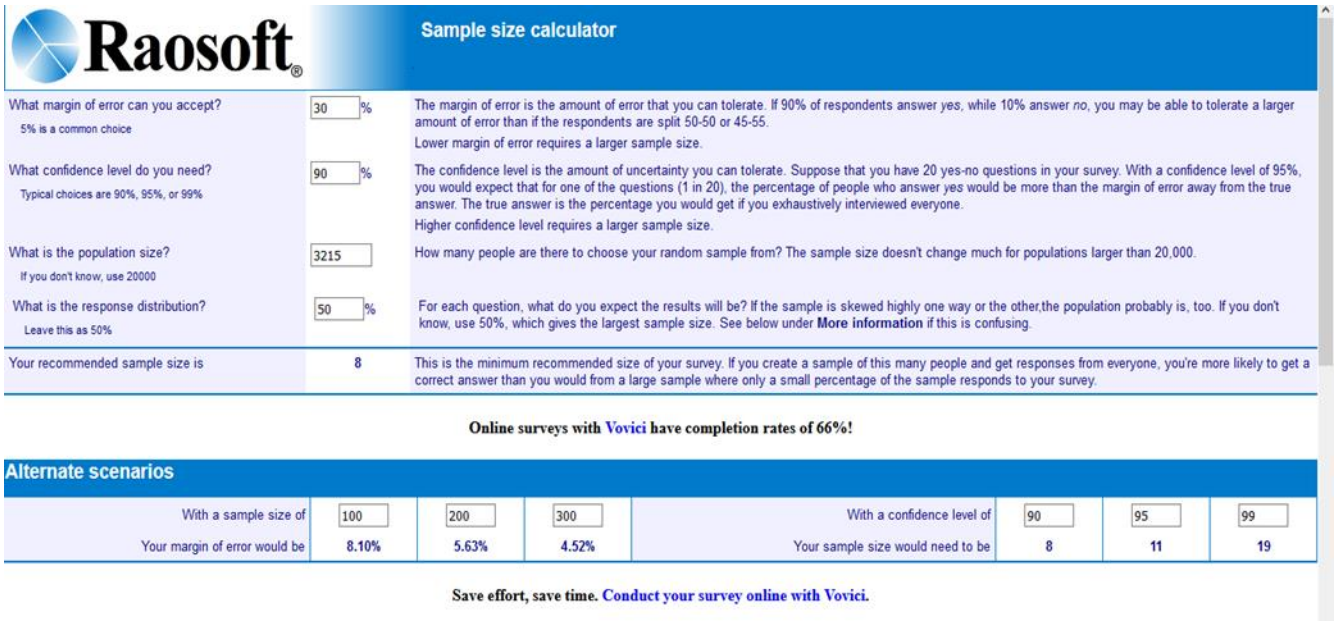
c) SUN=RS+(n-1) SI

6. The identified sample units were then identified with corresponding household in the Total Sales Record which provided the name of the household and the details of the location of the household.

7. For WCFT exercise, PP followed 90/30 precision as per the methodology for sample selection. Only 8 surveys were needed however PP did a larger sample where for BSF and HHFF, WCFT was done in 33 households, and for IHFF, 12 surveys were done. Below is calculation of sample size selection for WCFT. To ensure that all vintage years were represented on the sample frame for the WCFT exercise, PP selected the first few households on the sample frame for each vintage year to attain the sample of 3 for BSF and HHFF, and 12 for IHFF. The households selected have been highlighted on the sample frame and included on the WCFT tab.

BSF Technology

The sample required to meet the 90/30 confidence level was 8. However, PP undertook water quality testing survey for all the 221 households sampled with functional BSF filters and 33 surveys for WCFT.



Raosoft®

Sample size calculator

What margin of error can you accept? 5% is a common choice	30 %	The margin of error is the amount of error that you can tolerate. If 90% of respondents answer *yes*, while 10% answer *no*, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. Lower margin of error requires a larger sample size.
What confidence level do you need? Typical choices are 90%, 95%, or 99%	90 %	The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer *yes* would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. Higher confidence level requires a larger sample size.
What is the population size? If you don't know, use 20000	3215	How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000.
What is the response distribution? Leave this as 50%	50 %	For each question, what do you expect the results will be? If the sample is skewed highly one way or the other,the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing.
Your recommended sample size is	8	This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.

Online surveys with Vovici have completion rates of 66%!

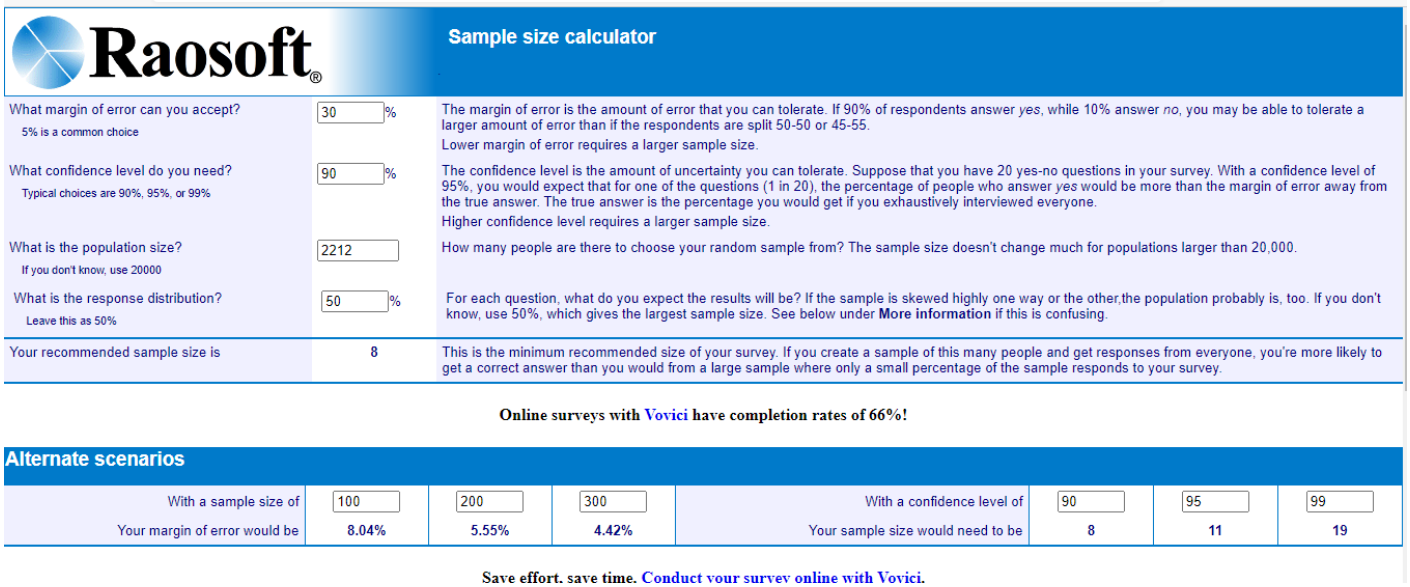
Alternate scenarios

With a sample size of	100	200	300	With a confidence level of	90	95	99
Your margin of error would be	8.10%	5.63%	4.52%	Your sample size would need to be	8	11	19

Save effort, save time. Conduct your survey online with Vovici.

HHFF technology

The sample required to meet the 90/30 confidence level was 8. However, PP undertook water quality testing survey for all the 214 households sampled with functional HHFF filters and 33 surveys for WCFT.



Raosoft®

Sample size calculator

What margin of error can you accept? 5% is a common choice	30 %	The margin of error is the amount of error that you can tolerate. If 90% of respondents answer *yes*, while 10% answer *no*, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. Lower margin of error requires a larger sample size.
What confidence level do you need? Typical choices are 90%, 95%, or 99%	90 %	The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer *yes* would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. Higher confidence level requires a larger sample size.
What is the population size? If you don't know, use 20000	2212	How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000.
What is the response distribution? Leave this as 50%	50 %	For each question, what do you expect the results will be? If the sample is skewed highly one way or the other,the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing.
Your recommended sample size is	8	This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.

Online surveys with Vovici have completion rates of 66%!

Alternate scenarios

With a sample size of	100	200	300	With a confidence level of	90	95	99
Your margin of error would be	8.04%	5.55%	4.42%	Your sample size would need to be	8	11	19

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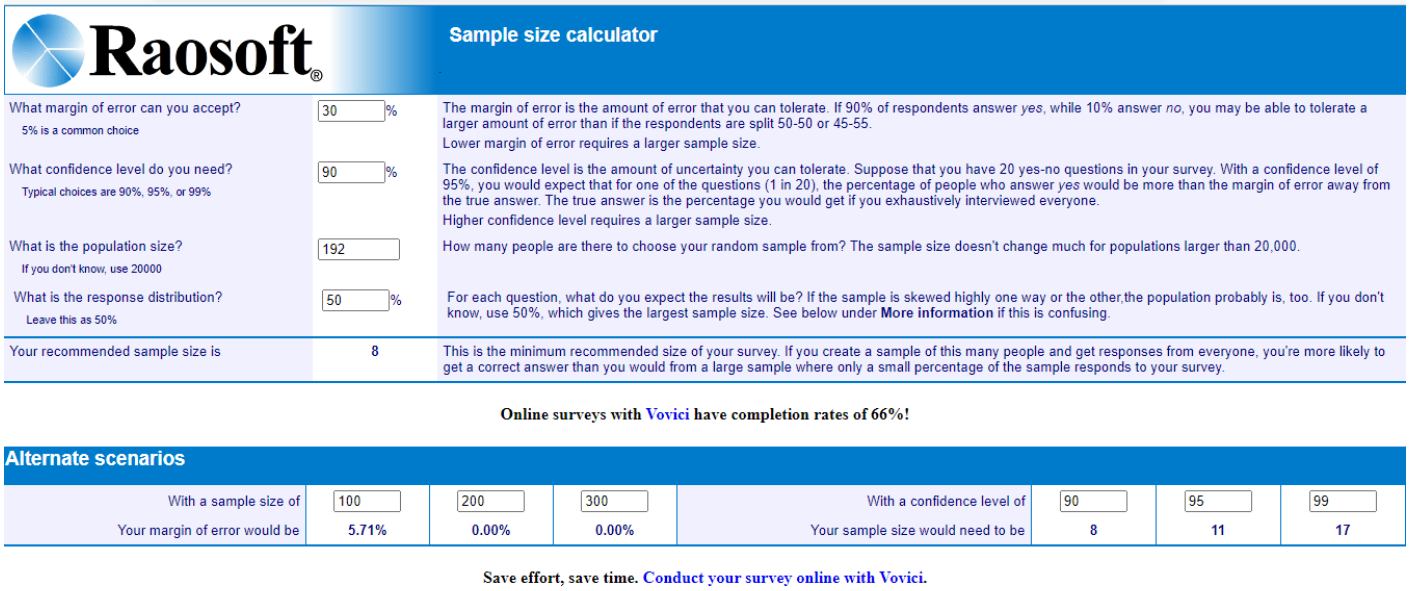
IHFF technology

The sample required to meet the 90/30 confidence level was 8. However, PP undertook water quality testing survey for all the 115 institutions sampled with functional IHFF filters.



Raosoft®

Sample size calculator

What margin of error can you accept? 5% is a common choice	30 %	The margin of error is the amount of error that you can tolerate. If 90% of respondents answer *yes*, while 10% answer *no*, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. Lower margin of error requires a larger sample size.
What confidence level do you need? Typical choices are 90%, 95%, or 99%	90 %	The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer *yes* would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. Higher confidence level requires a larger sample size.
What is the population size? If you don't know, use 20000	192	How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000.
What is the response distribution? Leave this as 50%	50 %	For each question, what do you expect the results will be? If the sample is skewed highly one way or the other,the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing.
Your recommended sample size is	8	This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.

Online surveys with Vovici have completion rates of 66%!

Alternate scenarios

With a sample size of	100	200	300	With a confidence level of	90	95	99
Your margin of error would be	5.71%	0.00%	0.00%	Your sample size would need to be	8	11	17

Save effort, save time. Conduct your survey online with Vovici.

8.There were replacements done after the initial calls to the households. The reasons for replacements was that some households were not willing to be visited during the pandemic, some phone numbers were switched off hence could not reach the households, some households were not answering the phone and in some incidences, the households said that they do not want to be called about the exercise.

For replacements, the PP called households below the one which had been selected and include the households available. This was done to continue with the random trend. For BSF, 47 replacements were made, HHFF 62 replacements were made while for IHFF no replacements were made.

For BSF, the sample used for Usage Survey is 312, for water quality test analysis, a sample of 221 was used since for households no longer using their filters and the water quality assessment was not undertaken. For HHFF the sample used for usage survey was 231 whereas the sample for water quality tests was 214. For IHFF samples used for usage survey was 127 whereas those used for water quality analysis was 115 samples.

BSF

Table 3: Sampling Summary for BSF

Age	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	Total
Total Population	199	538	918	629	454	187	149	86	40	15	3215
Total Samples selected	33	33	33	33	33	33	33	33	33	15	312
Samples selected for WCFT	4	3	3	3	3	3	4	3	4	3	33
Replacements	9	7	6	7	7	7	2	1	1		47

HHFF

Table 4: Sampling Summary for HHFF

Age	13/14	14/15	15/16	16/17	17/18	18/19	19/20	Total
Total Population	95	194	366	287	510	555	205	2,212
Sample size	33	33	33	33	33	33	33	231
Samples selected for WCFT	5	5	4	4	5	5	5	33
Replacements	9	13	11	9	12	5	3	62

IHFF

Table 5: Sampling Summary for IHFF

Age	14/15	15/16	16/17	17/18	18/19	19/20	Total
Total Population	19	5	16	22	69	61	192
Sample size	19	5	16	22	33	33	128

Sample selected for WCFT	4	4	2	4	4	4	22

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

>> Baseline Emissions are calculated as follows:

In accordance to Gold Standard requirements on Global warming potentials for project activities, all monitoring, verifications and requests for issuance from Gold Standard Certified Emission Reductions (GS CERs) and GS VERs that fall within the second commitment period (from 01/01/2013) will be calculated using the revised GWPs. Project's emission reductions accrued before 01/01/2013 will use the former GWP values.

During this monitoring period, the PP has used the latest version of the GWP values as provided in the Gold standard rules.

SDG 3: BSF technology

Parameter	Value applied	Remarks
Usage rate (Up,y)	0%	No persons were using the project technology in the baseline scenario
Number of people. days consuming water supplied by project scenario p through year y(Nj,y)	0	No persons were using the project technology in the baseline scenario
Reduced incidence in water borne diseases	High incidence of water borne diseases: 0% reduction	No persons were using the project technology in the baseline scenario
Reduced smoke levels	High smoke level in the households: 0% reduction	No persons were using the project technology in the baseline scenario

Reduced incidences of coughing.	High Incidences of coughing: 0% reduction	No persons were using the project technology in the baseline scenario
Reduced incidences of itchy eyes	High incidence of itchy eyes: 0% reduction	No persons were using the project technology in the baseline scenario

SDG 3: HHFF technology

Parameter	Value applied	Remarks
Usage rate (Up,y)	0%	No persons were using the project technology in the baseline scenario
Number of people. days consuming water supplied by project scenario p through year y(Nj,y)	0	No persons were using the project technology in the baseline scenario
Reduced incidence in water borne diseases	High incidence of water borne diseases: 0% reduction	No persons were using the project technology in the baseline scenario
Reduced smoke levels	High smoke level in the households: 0% reduction	No persons were using the project technology in the baseline scenario
Reduced incidences of coughing.	High Incidences of coughing: 0% reduction	No persons were using the project technology in the baseline scenario
Reduced incidences of itchy eyes	High incidence of itchy eyes: 0% reduction	No persons were using the project technology in the baseline scenario

SDG 3: IHFF technology

Parameter	Value applied	Remark
Usage rate (Up,y)	0%	No persons were using the project technology in the baseline scenario

Number of people. days consuming water supplied by project scenario p through year y(Nj,y)	0	No persons were using the project technology in the baseline scenario
Reduced incidence in water borne diseases	High incidence of water borne diseases: 0% reduction	No persons were using the project technology in the baseline scenario
Reduced smoke levels	High smoke level in the households: 0% reduction	No persons were using the project technology in the baseline scenario
Reduced incidences of coughing.	High Incidences of coughing: 0% reduction	No persons were using the project technology in the baseline scenario
Reduced incidences of itchy eyes	High incidence of itchy eyes: 0% reduction	No persons were using the project technology in the baseline scenario

SDG 6: BSF technology

Parameter	Value applied	Remarks
QP,y	0 l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
$QP_{,raw\ boil}$	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
$QP_{,clean\ boil}$	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
Volume of clean water consumed.	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.

Quality of treated water	0%	No clean and safe water was being supplied by the project in the baseline scenario.
Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management	0	No trainings or workshops were being organised by the project in the baseline scenario.

SDG 6: HHFF technology

Parameter	**Value applied**	**Remark**
QP,y	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
$QP_{,raw\ boil}$	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
$QP_{,clean\ boil}$	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
Volume of clean water consumed.	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
Quality of treated water	0%	No clean and safe water was being supplied by the project in the baseline scenario.
Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management	0	No trainings or workshops were being organised by the project in the baseline scenario.

SDG 3: IHFF technology

Parameter	Value applied	Remark
QP,y	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
$QP_{,raw\ boil}$	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
$QP_{,clean\ boil}$	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
Volume of clean water consumed	0l/p/d	No clean and safe water was being supplied by the project in the baseline scenario.
Quality of treated water	0%	No clean and safe water was being supplied by the project in the baseline scenario.
Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management	0	No trainings or workshops were being organised by the project in the baseline scenario.

SDG 8: BSF, HHFF and IHFF technologies

Parameter	Value applied	Remark
Number of persons employed by the project.	0	No persons were employed by the project in the baseline scenario
Change in number of jobs and positions for women or change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups	0	No persons were employed by the project in the baseline scenario

Employment wages of people employed by the project	0	No persons were employed by the project in the baseline scenario

SDG 9: BSF, HHFF and IHFF technologies

Parameter	**Value applied**	**Remark**
Number of people trained on filters installation and maintenance	0	No persons were being trained by the project in the baseline scenario

SDG 13: BSF technology

Parameter	**Value applied**	**Remark**
Number of filters sold	0	No filters had been distributed by the project in the baseline
Number of workshops, seminars organized, and training-related opportunities held.	0	No persons were being trained by the project in the baseline scenario
Bb,y	4.1153	
Total baseline emissions	**35,959 tCO2e**	

SDG 13: HHFF technology

Parameter	Value applied	Remark
Number of filters sold	0	No filters had been distributed by the project in the baseline
Number of workshops, seminars organized, and training-related opportunities held	0	No persons were being trained by the project in the baseline scenario
Bb,y	4.1153	
Total baseline emissions	**8,241tCO2e**	

SDG 13: IHFF technology

Parameter	Value applied	Remark
Number of filters sold.	0	No filters had been distributed by the project in the baseline
Number of workshops, seminars organized, and training-related opportunities held	0	No persons were being trained by the project in the baseline scenario
Bb,y	0.0001306	
Total baseline emissions	**5,135 tCO2e**	

BASELINE EMISSIONS CALCULATIONS

>> Baseline Emissions are calculated as follows:

$$BE_{b,y} = B_{b,y} * ((f_{NRB,b,y} * EF_{b,fuel,CO2}) + EF_{b,fuel,nonCO2}) * NCV_{b\ fuel}$$

In accordance with Gold Standard requirements on Global warming potentials for project activities, all monitoring, verifications and requests for issuance from Gold Standard Certified Emission Reductions (GS CERs) and GS VERs that fall within the second commitment period (from 1st January 2013) will be calculated using the revised

GWPs. Projects emission reductions accrued before 1st January 2013 will use the former GWP values[12].

Quantity of fuel consumed in baseline scenario b during year y, in tons (Bb,y)

BSF, HHFF and IHFF Filters:

$Bb,y = (1 - Cj) * Nj,y * Wb,y * (Qp,y + Qp,_{rawboi},y)$

Where:

Parameter	Description	Value applied BSF	Value applied HHFF	Value applied IHFF
Np,y	Number of people consuming water supplied by project scenario p through year y	2,043	1,662	x*365=y (this parameter was calculated individually for each filter in the institutions, see ER excel
Cj	Expressed as a percentage, this is the portion of users of the project	18%	18%	76%

[12] http://www.goldstandard.org/wp-content/uploads/2011/09/Global-Warming-Potentials-for-Gold-Standard- Project-Activities-2013.pdf

	technology j who in the baseline are already consuming safe water without boiling it			
Bb,y	Quantity of fuel consumed in baseline scenario b during the year y in tons.	4.6896	3.8150	0.00022
Qp,y	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day.	7 l/p/d	7 l/p/d	2.33 l/p/d
Qp, $_{raw,boil,y}$	Quantity of raw water boiled in the project scenario p	0 l/p/d	0 l/p/d	0 l/p/d

	per person per day.			
Wb,y	Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b during project year y, as per Baseline Water Boiling Test.	0.0004	0.0004	0.0004
$f_{NRB,b.y}$	Fraction of non-renewable biomass	0.92	0.92	0.92
$EF_{b,\ fuel,\ co2}$	CO2 emission factor of the wood fuel	112	112	112
$EF_{b,\ fuel,\ CH4}$	CH4 emission factor of the wood fuel	GWP before 01/01/2021 =0.75(0.03*25) GWP after 01/01/2021 = 0.84(0.03*28)	GWP before 01/01/2021 =0.75(0.03*25) GWP after 01/01/2021 = 0.84(0.03*28)	GWP before 01/01/2021 =0.75(0.03*25) GWP after 01/01/2021 = 0.84(0.03*28)
EFb, fuel, N2O	N2O emission	GWP before 01/01/2021	GWP before 01/01/2021	GWP before 01/01/2021

	factor of the wood fuel	1.192(0.004*298) GWP after 01/01/2021 = 1.06 (0.004*265	1.192(0.004*298) GWP after 01/01/2021 = 1.06 (0.004*265	1.192(0.004*298) GWP after 01/01/2021 = 1.06 (0.004*265
$NCV_{b,\ fuel}$	Net calorific value of the fuel that is substituted or reduced	0.015	0.015	0.015
BE,by	Baseline emissions	2020:18,985tCO2e 2021: 2,333 tCO2e Total: 21,229tCO2e	2020:11,471 tCO2e 2021:1,676 tCO2e Total: 13,147 tCO2e	2020:1,288 tCO2e 2021:181 tCO2e Total: 1,469 tCO2e

NB: For IHFF technology, the parameters average number of persons living in the institution(N) and Number of people. days consuming water supplied by project scenario p through year y (Np,y) will be presented using variable x and y respectively. The ER calculations are provided in the GS 1078-IHFF MSS and ERs excel sheet tab ER calculation- IHFF). This is because this parameter has been calculated individually for each filter due to difference in days of operation in the institutions.

Combined Summary of Baseline emissions in the monitoring period by both BSF, HHFF and IHFF

Table 6: summary of baseline emissions in the monitoring period

Period	BSF Total Baseline Emissions (tCO2e)	HHFF Total Baseline Emissions (tCO2e)	IHFF total Baseline Emissions (tCO2e)	Combined Totals (tCO2e)
19/02/2020-31/12/2020	18,985	11,471	998	31,454
01/01/2021-18/02/2021	2,333	1,676	169	4,178
Total	**21,299**	**13,147**	**1,167**	**35,613**

E.2. Calculation of project value or estimation of project situation of each SDG Impact

>> **SDG 3: BSF technology**

Parameter	Value applied	Source of data
Usage rate (Up,y)	70.83%	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Usage survey
Number of people. days consuming water supplied by project scenario p through year y(Np,y)	2,043	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Inputs
Reduced incidence in water borne diseases	77%	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Sustainable development
Reduced smoke levels	90%	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Sustainable development
Reduced incidences of coughing.	93%	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Sustainable development
Reduced incidences of itchy eyes	77%	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Sustainable development

SDG 3: HHFF technology

Parameter	Value applied	Source of data
Usage rate (Up,y)	92.64%	GS 1078 Combined MSS and ERs calculations sheet, tab HHFF Usage survey

Number of people. days consuming water supplied by project scenario p through year y(Np,y)	1,662	GS 1078 Combined MSS and ERs calculations sheet, tab HHFF Inputs
Reduced incidence in water borne diseases	87%	GS 1078 Combined MSS and ERs calculations sheet, tab HHFF sustainable development
Reduced smoke levels	92%	GS 1078 Combined MSS and ERs calculations sheet, tab HHFF sustainable development
Reduced incidences of coughing.	88%	GS 1078 Combined MSS and ERs calculations sheet, tab HHFF sustainable development
Reduced incidences of itchy eyes	87%	GS 1078 Combined MSS and ERs calculations sheet, tab HHFF sustainable development

SDG 3: IHFF technology

Parameter	Value applied	Source of data
Usage rate (Up,y)	90.55%	GS 1078 Combined MSS and ERs calculations sheet , tab IHFF Usage survey
Number of people. days consuming water supplied by project scenario p through year y(Np,y)	Calculated separately for each institution	GS 1078 Combined MSS and ERs calculations sheet, tab IHFF ER calculations IHFF
Reduced incidence in water borne diseases	100%	GS 1078 Combined MSS and ERs calculations sheet, tab IHFF Sustainable development
Reduced smoke levels	76%	GS 1078 Combined MSS and ERs calculations sheet, tab IHFF Sustainable development
Reduced incidences of coughing.	76%	GS 1078 Combined MSS and ERs calculations sheet, tab IHFF Sustainable development
Reduced incidences of itchy eyes	79%	GS 1078 Combined MSS and ERs calculations sheet, tab IHFF Sustainable development

SDG 6: BSF technology

Parameter	Value applied	Source of data
QP,y	7 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Q,py
$QP_{,raw\ boil}$	0 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Qp,y
$QP_{,clean\ boil}$	0 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Qp,y inputs

Volume of clean water consumed.	7 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab BSF Q,py
Quality of treated water	100%	GS 1078 Combined MSS and ERs calculations sheet, tab Water Quality Analysis
Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management	85	GS 1078 Training records

SDG 6: HHFF technology

Parameter	**Value applied**	**Source of data**
QP,y	7 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab Qp,y HHFF
$QP_{,raw\ boil}$	0 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab Qp,y HHFF
$QP_{,clean\ boil}$	0 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab Qp,y HHFF
Volume of clean water consumed.	7 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab Qp,y HHFF
Quality of treated water	98.6%	GS 1078 Combined MSS and ERs calculations sheet, tab water quality HHFF
Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management	85	GS 1078 Training records

SDG 6: IHFF technology

Parameter	Value applied	Source of data
QP,y	2.33 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab Qp,y IHFF
$QP_{,raw\ boil}$	0 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab Qp,y IHFF
$QP_{,clean\ boil}$	0 l/p/d	GS 1078 Combined MSS and ERs calculations sheet, tab Qp,y IHFF
Quality of treated water	100%	GS 1078 Combined MSS and ERs calculations sheet, tab water quality analysis IHFF
Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management	85	GS 1078 Training records

SDG 8: BSF, HHFF and IHFF technologies

Parameter	Value applied	Source of data
Number of persons employed by the project.	52	GS 1078 Employment records
Change in number of jobs and positions for women or change in income and asset. distributions by region, ethnicity, religion, and socioeconomic groups	34 women and 26 youths	GS 1078 Employment records
Employment wages of people employed by the project.	Confidential, employment records provided	GS 1078 Employment records

SDG 9: BSF, HHFF and IHFF technologies

Parameter	Value applied	Source of data
Number of people trained on filters installation and maintenance	85	GS 1078 Training summary

SDG 13: BSF technology

Parameter	Value applied	Source of data
Number of filters sold.	3,215	BSF TSR and Sample frame 2020-2021, tab TSR
Number of workshops, seminars organized, and training related. opportunities held.	4	GS 1078 Training records
Bp,y	0 tonnes	GS 1078 Combined MSS and ERs calculations sheet, tab BSF 2020/2021
Total project emissions	0 tCO2e	GS 1078 Combined MSS and ERs calculations sheet 2020/2021

SDG 13: HHFF technology

Parameter	Value applied	Source of data
Number of filters sold	**2,212**	HHFF TSR and Sample frame 2020-2021, tab TSR
Number of workshops, seminars organized, and training-related opportunities held	**4**	GS 1078 Training records

Bp,y	0 tonnes	GS 1078 Combined MSS and ERs calculations sheet 2020/2021
Total project emissions	0 tCO2e	GS 1078 Combined MSS and ERs calculations sheet, tab HHFF 2020/2021

SDG 13: IHFF technology

Parameter	**Value applied**	**Source of data**
Number of filters sold.	**192**	IHFF TSR and Sample frame 2020-2021, tab TSR
Number of workshops, seminars organized, and training-related opportunities held.	**4**	GS 1078 Training records
Bp,y	0 tonnes	GS 1078 Combined MSS and ERs calculations sheet, tab IHFF 2020/2021
Total project emissions	**0**	GS 1078 Combined MSS and ERs calculations sheet 2020/2021

PROJECT EMISSIONS CALCULATIONS

Project Emissions are calculated as follows:

$$PE_{p,y} = B_{p,y} * ((f_{NRB,p,y} * EF_{p,fuel,CO2}) + EF_{p,fuel,nonCO2}) * NCV_{p.\ fuel}$$

$$B_{p,y} = (1 - C_j) * N_{p,y} * W_{b,y} * (Q_{p,rawboil,y} + Q_{p,cleanboil,y})$$

$B_{p,y}$ = Number of person.days x Project Fuel used to boil water (T/L) x Total volume of water boiled in project scenario (L/p/d)

BSF technology

Parameter	Description	Value applied
Np, y	Number of person. days consuming water supplied by project scenario p through year y	2,043
Cj	Expressed as a percentage, this is the portion of users of the project technology j or who in the baseline were already consuming safe water without boiling it	18%
$Qp_{, rawboil, y}$	Quantity of raw water boiled in the project scenario p per person per day	0 l/p/d
$Qp_{, cleanboil,y}$	Quantity of safe water boiled in the project scenario p per person per day	0l/p/d
Wp,y	Quantity of wood fuel or fossil fuel in tons required to treat 1 litre of water using technologies representative of the project scenario p during project year y	0.0004tonnes
Bp, y	Quantity of fuel consumed in project scenario p during the year y in tons	= (1-0.18) *2043* 0.0004*(0+0) =**0 tonnes**

HHFF technology

Parameter	Description	Value applied
Np, y	Number of people. days consuming water supplied by project scenario p through year y	1,662
Cj	Expressed as a percentage, this is the portion of users of the project technology j or who in the baseline were already consuming safe water without boiling it	18%
$Qp_{, rawboil, y}$	Quantity of raw water boiled in the project scenario p per person per day	0 l/p/d
$Qp_{, cleanboil,y}$	Quantity of safe water boiled in the project scenario p per person per day.	0 l/p/d

Wp,y	Quantity of wood fuel or fossil fuel in tons required to treat 1 litre of water using technologies representative of the project scenario p during project year y	0.0004 tonnes
Bp, y	Quantity of fuel consumed in project scenario p during the year y in tons	= (1-0.18) *1,662* 0.0004*(0+0) **=0 tonnes**

IHFF technology

Parameter	Description	Value applied
Np, y	Number of people. days consuming water supplied by project scenario p through year y	Calculated separately for each (GS 1078 Combined MSS and ERs calculations sheet tab ER calculation- IHFF).
Cj	Expressed as a percentage, this is the portion of users of the project technology j or who in the baseline were already consuming safe water without boiling it	76%
$Qp_{, rawboil, y}$	Quantity of raw water boiled in the project scenario p per person per day	0 l/p/d
$Qp_{, cleanboil,y}$	Quantity of safe water boiled in the project scenario p per person per day	0 l/p/d
Wp,y	Quantity of wood fuel or fossil fuel in tons required to treat 1 litre of water using technologies representative of the project scenario p during project year y	0.0004tonnes
Bp, y	Quantity of fuel consumed in project scenario p during the year y in tons	= (1-0.76) *y*0.0004*(0+0) **=0 tonnes**

Calculation of Project Emissions

$PE_{,y} = B_{p,y}* ((f_{NRB,b,y}*EF_{b,fuel,CO2}) + (EF_{b,fuel,CH4} + EF_{b,fuel,N2O}) * NCV_{b,fuel}$

BSF technology

Parameter	Description	Value applied
$f_{NRB, b,y}$	Fraction of biomass used in year y for project scenario b that can be established as non-renewable biomass.	0.92
$EF_{b, fuel, CO2}$	CO2 emission factor of the wood fuel	112
$EF_{b, fuel, CH4}$	CH4 emission factor of the wood fuel	GWP before 01/01/2021 =0.75(0.03*25) GWP after 01/01/2021 = 0.84(0.03*28)
$EF_{b, fuel, N2O}$	N_2O emission factor of the wood fuel	GWP before 01/01/2021 1.192(0.004*298) GWP after 01/01/2021 = 1.06 (0.004*265)
$NCV_{b, fuel}$	Net calorific value of the fuel that is substituted or reduced	0.015
$B_{p,y}$	Quantity of fuel consumed in project scenario p during the year y in tons	0
PEy	Project emissions	**0 tCO2e**

HHFF technology

Parameter	Description	Value applied
$f_{NRB, b,y}$	Fraction of biomass used in year y for project scenario b that can be established as non-renewable biomass.	0.92
$EF_{b, fuel, CO2}$	CO2 emission factor of the wood fuel	112
$EF_{b, fuel, CH4}$	CH4 emission factor of the wood fuel	GWP before 01/01/2021 =0.75(0.03*25) GWP after 01/01/2021 = 0.84(0.03*28)
$EF_{b, fuel, N2O}$	N_2O emission factor of the wood fuel	GWP before 01/01/2021 1.192(0.004*298) GWP after 01/01/2021 = 1.06 (0.004*265
$NCV_{b, fuel}$	Net calorific value of the fuel that is substituted or reduced	0.015
$B_{p,y}$	Quantity of fuel consumed in project scenario p during the year y in tons	0
PEy	Project emissions	**0 tCO2e**

IHFF technology

Parameter	Description	Value applied
$f_{NRB, b,y}$	Fraction of biomass used in year y for project scenario b that can be established as non-renewable biomass.	0.92
$EF_{b, fuel, CO2}$	CO2 emission factor of the wood fuel	112
$EF_{b, fuel, CH4}$	CH4 emission factor of the wood fuel	GWP before 01/01/2021

		=0.75(0.03*25) GWP after 01/01/2021 = 0.84(0.03*28)
$EF_{b, fuel, N2O}$	N_2O emission factor of the wood fuel	GWP before 01/01/2021 1.192(0.004*298) GWP after 01/01/2021 = 1.06 (0.004*265
$NCV_{b, fuel}$	Net calorific value of the fuel that is substituted or reduced	0.015
$B_{p,y}$	Quantity of fuel consumed in project scenario p during the year y in tons	0
PEy	Project emissions	**0 tCO2e**

Combined Summary of Project emissions in the monitoring period by both BSF, HHFF and IHFF

Period	BSF Total Project Emissions (tCO2e)	HHFF total project Emissions (tCO2e)	IHFF total project Emission (tCO2e)	Combined Totals
19/02/2020-31/12/2020	0	0	0	0
01/01/2021-18/02/2021	0	0	0	0
Total	**0**	**0**	**0**	**0**

Calculation of leakage

As demonstrated in section E.3 of this monitoring report, there is no leakage identified during this monitoring period for all the 3 filter technologies.

GHG Emission Reductions calculations

Overall GHG were calculated as follows:

The overall GHG reductions are calculated as follows:

$$ER_y = (\sum BE_{b,y} - \sum PE_{p,y}) * U_{p,y} - \sum LE_{p,y} \quad (13)$$

Where:

$U_{p,y}$	Cumulative usage rate for technologies in project scenario p during year y, based on cumulative installation rate and drop off rate.

BSF technology

Emission Reductions 2020 per filter
(7.405- 0) * 70.83%) *100% - 0=5.2453tCO_2e (This figure was then divided by 365 days in a year to get the emission reductions per day i.e., 0.01433tCO2e)

Emission Reductions 2021 per filter

(7.3820- 0) * 70.83%) *100% - 0=5.22880tCO2e (This figure was then divided by 365 days in a year to get the emission reductions per day i.e., 0.01433tCO2e)

HHFF technology

Emission Reductions 2020 per filter
(6.024– 0) * 92.64%) *98.60% - 0= 5.5026tCO_2e (This figure was then divided by 365 days in a year to get the emission reductions per day i.e. 0.01503).

Emission Reductions 2021 per filter

(6.005– 0) * 92.64%) *98.60% - 0= 5.4853tCO_2e (This figure was then divided by 365 days in a year to get the emission reductions per day i.e. 0.01502).

IHFF technology

Emission Reductions 2020 per filter

Emissions Reductions have been calculated individually for operation days of each filter installed. Stepwise calculations have been done on GS 1078 Combined MSS and ERs calculations sheet excel sheet.
Emission Reductions 2021 per filter

Emissions Reductions have been calculated individually for operation days of each filter installed. Stepwise calculations have been done on GS 1078- IHFF MSS and ERs excel sheet.

Summary of ERs accrued in this monitoring period:

BSF technology

Table 8: Summary of BSF ERs

Period	Emission Reduction (tCO2e)
19/02/2020-31/12/2020	13,385
01/01/2021-18/02/2021	1,912
Total	**15,297**

HHFF technology

Table 9: Summary of HHFF ERs

Period	Emission Reduction (tCO2e)
19/02/2020-31/12/2020	10,567
01/01/2021-18/02/2021	1,510
Total	**12,077**

IHFF technology

Table 10: Summary of IHFF ERs

Period	Emission Reduction (tCO2e)
19/02/2020 - 31/12/2020	924
01/01/2021 - 18/02/2021	132
Total	**1,056**

Table 11: Summary of ER for BSF, HHFF and IHFF

Period	BSF total Emission Reduction (tCO2e)	HHFF total Emission Reduction (tCO2e)	IHFF total Emission Reduction (tCO2e)	Combined Totals
19/02/2020-31/12/2020	13,385	10,567	924	24,876
01/01/2021-18/02/2021	1,912	1,510	132	3,693
Total	**15,297**	**12,077**	**1,056**	**28,429**

E.3. Calculation of leakage

The core of the methodology prescribes possible parameters that should be evaluated for leakage emissions.

a) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.

Traditional fuel wood consumption was mainly restricted to the domestic setting it is highly unlikely that fuel wood consumption in regions outside the target area will increase.

b) The non-renewable biomass or fossil fuels saved under the project activity are used by non- project users who previously used lower emitting energy sources.

Fuel wood previously used was sourced or obtained individually and domestic fuel wood consumption is a function of market forces of demand and supply. There is no indication that the fuel wood consumption would increase amongst non-project users who previously relied on lower-emitting sources.

c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.
This is a micro-scale VPA and will hence have minimal aggregate effect on the total NRB fraction in respective countries in which the VPAs are to be implemented with regards to other CDM or VER project activities baseline scenario.

d) The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.
Not applicable to the project activity.

e) By virtue of promotion and marketing of a new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

The Hydraid BioSand Water Filter are zero energy technologies that will provide an alternative to boiling water using fuel wood. Most of the households targeted boiled water using fuel wood. There is no envisioned scenario where these consumers will substitute fuel wood to a technology with lower emissions because of promotion of the BioSand filter.

Leakage = 0

As demonstrated in the registered VPA DD as well as this monitoring report, there are no perceived leakage risks for this parameter.

E.4. Calculation of net benefits or direct calculation for each SDG Impact

BSF technology

Table 12: Summary for ex-post values each SDG for BSF filter

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
SDG 3	**Good Health and well being**	• Usage: 0% • Np,y :0 • Reduced incidence in water borne diseases: high incidence: 0% reduction. • Reduced smoke levels: High smoke levels, 0% reduction. • Reduced incidences of coughing: high incidences of coughing, 0% reduction. • Reduced incidences of itchy eyes:0%	• Usage: 70.83% • Np,y: 2,043 • Reduced incidence in water borne diseases: 77% • Reduced smoke levels: 90% • Reduced incidences of coughing: 93% • Reduced incidences of itchy eyes:77%	• Usage:70.83% • Np,y: 2,043 • Reduced incidence in water borne diseases: 77% • Reduced smoke levels: 90% • Reduced incidences of coughing: 93% • Reduced incidences of itchy eyes:77%
SDG 6	**Clean water and sanitation**	• QP,y: 0 • $QP_{,raw\ boil}$: 0 • $QP_{,clean\ boil}$: 0 • Quality of treated water: 0%	• Qp,y: 7l/p/d • $QP_{,raw\ boil}$ 0 • $QP_{,clean\ boil}$ 0 • Quality of treated water: 100%	• Qp,y: 7l/p/d • $QP_{,raw\ boil}$ 0 • $QP_{,clean\ boil}$: 0 • Quality of treated water: 100%

		• Volume of safe water consumed: 0l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management: 0	• Volume of safe water consumed: 7l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management: 85	• Volume of safe water consumed: 7l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management) :85
SDG 8	**Decent work and economic growth**	• Number of persons employed by the project: 0 • Change in number of jobs and positions for women or change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups : 0	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 18 women and 26 youths • Employment wages of people employed by	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 18

		• Employment wages of people employed by the project: 0	the project: 22 people were employed in the filter distribution program. Total income paid to the employees is Ksh. 222,500	women and 26 youths • Employment wages of people employed by the project: 22 people were employed in the filter distribution program. Total income paid to the employees is Ksh. 222,500
SDG 9	**Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Target**	• Number of people trained on filters installation and maintenance : 0	• Number of people trained on filters installation and maintenance: 85	• Number of people trained on filters installation and maintenance: 85

SDG 13	**Take urgent action to combat climate change and its impacts**	• Number of filters sold: 0. • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 0 • Bb,y: 0	• Number of filters sold: 3,215. • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • Bb,y: 4.6896	• Number of filters sold: 3,215. • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • Bb,y: 4.6896
Total emission reductions	**Total emission reductions**	• 19/02/2020 – 31/12/2020 = 13,385 tCO2e • 01/01/2021-18/02/2021 = 1,912 tCO2e • **Total: 15,297 tCO2e**	• 19/02/2020 – 31/12/2020 = 0 tCO2e • 01/01/2021-18/02/2021 = 0 tCO2e • **Total: 0 tCO2e**	• 19/02/2020 – 31/12/2020 = 13,385 tCO2e • 01/01/2021-18/02/2021 = 1,912 tCO2e • **Total: 15,297 tCO2e**

HHFF technology

Table 13: Summary for ex-post values each SDG for HHFF filter

SDG	SDG Impact	Baseline Estimate	Project Estimate	Net Benefit
SDG 3	**Good Health and well being**	• Usage: 0% • Np,y :0 • Reduced incidence in water borne diseases: high incidence,0 % reduction. • Reduced smoke levels: High smoke levels, 0% reduction. • Reduced incidences of coughing: high incidences of coughing, 0% reduction. • Reduced incidences of itchy eyes: 0%	• Usage: 92.64% • Np,y: 1,662 • Reduced incidence of water borne diseases: 87% • Reduced smoke levels: 92% • Reduced incidences of coughing: 88% • Reduced incidences of itchy eyes:87 %	• Usage: 92.64% • Np,y: 1,662 • Reduced incidence of water borne diseases: 87% • Reduced smoke levels: 92% • Reduced incidences of coughing: 88% • Reduced incidences of itchy eyes:87%
SDG 6	**Clean water and sanitation**	• QP,y: 0 • $QP_{,raw\ boil}$:0l/p/d	• Qp,y: 7l/p/d	• Qp,y: 7l/p/d • $QP_{,\ raw\ boil}$:0l/p/d

		• $QP_{,clean\ boil}$: 0l/p/d • Quality of treated water: 0% • Volume of safe water consumed: 0l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management :0	• $QP_{,\ raw\ boil}$:0l/p/d • $QP_{,clean\ boil}$: 0l/pd • Quality of treated water: 98.60% • Volume of safe water consumed: 7l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation manageme nt: 85	• $QP_{,clean\ boil}$: 0l/p/d • Quality of treated water: 98.60% • Volume of safe water consumed: 7l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene, and sanitation management: 85
SDG 8	**Decent work and economic growth**	• Number of persons employed by the project: 0 • Change in number of jobs and positions for women or	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or change in	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or change in income and

		change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 0 • Employment wages of people employed by the project: 0	income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 18 women and 26 youths employed. • Employment wages of people employed by the project:22 people were employed in the filter distribution program. Total income paid to the employees is Ksh. 222,500	asset distributions by region, ethnicity, religion, and socioeconomic groups: 18women and 6 youths employed. • Employment wages of people employed by the project: 22 people were employed in the filter distribution program. Total income paid to the employees is Ksh. 222,500
SDG 9	**Build resilient infrastructure, promote inclusive and sustainable industrialization and foster**	• Number of people trained on filters installation and maintenance : 0	• 85 people were trained on filter installation including 57 women and 28men	• 85 people were trained on filter installation including 57 women and 28 men

	innovation Target			
SDG 13	**Take urgent action to combat climate change and its impacts**	• Number of filters sold: 0 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 0 • Bb,y: 0	• Number of filters sold: 2,212 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • Bb,y: 3.8150	• Number of filters sold: 2,212 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • Bb,y: 3.8150
Total emission reductions	**Total emission reductions**	• 19/02/2020 – 31/12/2020 = 10,567 tCO2e • 01/01/2021-18/02/2021 = 1,510 tCO2e • **Total: 12,077tCO2e**	• 19/02/2020 – 31/12/2020 = 0 tCO2e • 01/01/2021-18/02/2021 = 0 tCO2e • **Total: 0 tCO2e**	• 19/02/2020 – 31/12/2020 = 10,567tCO2e • 01/01/2021-18/02/2021 = 1,510 tCO2e • **Total: 12,077 tCO2e**

IHFF technology

Table 14: Summary for ex-post values each SDG for IHFF filter

SDG	SDG Impact	Baseline Estimate	Project Estimate	Net Benefit
SDG 3	Good Health and well being	• Usage: 0% • Np,y :0 • Reduced incidence in water borne diseases: high incidence,0 % reduction • Reduced smoke levels: High smoke levels, 0% reduction. • Reduced incidences of coughing: high incidences of coughing, 0% reduction. • Reduced incidences of itchy eyes: 0%	• Usage: 90.55% • Np,y: determined for each institution • Reduced incidence of water borne diseases: 100% • Reduced smoke levels: 76% • Reduced incidences of coughing: 76% • Reduced incidences of itchy eyes:79 %	• Usage: 90.55% • Np,y: determined for each institution • Reduced incidence of water borne diseases: 100% • Reduced smoke levels: 76% • Reduced incidences of coughing: 76% • Reduced incidences of itchy eyes:79%
SDG 6	Clean water and sanitation	• QP,y: 0 • QP,raw boil:0l/p/d	• Qp,y: 2.33l/p/d	• Qp,y: 2.33l/p/d

		• QP,clean boil: 0l/p/d • Quality of treated water: 0% • Volume of safe water consumed: 0l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management :0	• QP, raw boil:0l/p/d • QP,clean boil: 0l/pd • Quality of treated water: 100% • Volume of safe water consumed: 2.33l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation manageme nt: 85	• QP, raw boil:0l/p/d • QP,clean boil: 0l/p/d • Quality of treated water: 100% • Volume of safe water consumed: 2.33l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management: 85
SDG 8	Decent work and economic growth	• Number of persons employed by the project: 0 • Change in number of jobs and positions for women or	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or change in	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or change in income and

		change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 0 • Employment wages of people employed by the project: 0	income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 18 women and 26 youths employed. • Employment wages of people employed by the project:22 people were employed in the filter distribution program. Total income paid to the employees is KShs. 222,500	asset distributions by region, ethnicity, religion, and socioeconomic groups: 18 women and 26 youths employed. • Employment wages of people employed by the project: 22 people were employed in the filter distribution program. Total income paid to the employees is Kshs. 222,500
SDG 9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Target	• Number of people trained on filters installation and maintenance : 0	• 85 people were trained on filter installation including 57 women and 28 men	• 85 people were trained on filter installation including 57 women and 28 men

SDG 13	Take urgent action to combat climate change and its impacts	• Number of filters sold: 0 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 0 • Bb,y: 0	• Number of filters sold: 2,212 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • Bb,y: 0.00022	• Number of filters sold: 2,212 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • Bb,y: 0.00022
Total emission reductions	Total emission reductions	• 19/02/2020 – 31/12/2020 = 924 tCO2e • 01/01/2021-18/02/2021 = 132 tCO2e • Total: 1,056 tCO2e	• 19/02/2020 – 31/12/2020 = 0 tCO2e • 01/01/2021-18/02/2021 = 0 tCO2e • Total: 0 tCO2e	• 19/02/2020 – 31/12/2020 = 924 tCO2e • 01/01/2021-18/02/2021 =132 tCO2e • Total: 1,056 tCO2e

E.5. Comparison of actual SDG Impacts with estimates in approved PDD BSF

Table 15: Comparison of actual value of outcomes with estimates in approved PDD for BSF

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values13 achieved during this monitoring period
SDG 3	• Usage: 80% • Np,y :1,825 • Reduced incidence in water borne diseases: N/A • Reduced smoke levels: N/A • Reduced incidences of coughing: N/A • Reduced incidences of itchy eyes: N/A	• Usage: 70.83% • Np,y: 2,043 • Reduced incidence of water borne diseases: 77% • Reduced smoke levels: 90% • Reduced incidences of coughing: 93% • Reduced incidences of itchy eyes:77%
SDG 6	• QP,y: 5l/p/d • QP,raw boil :0l/p/d • QP,clean boil :0 l/p/d • Quality of treated water: 100% • Volume of safe water consumed: 5 l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management: N/A	• Qp,y: 7l/p/d • QP, raw boil 0 l/p/d • QP,clean boil 0 l/p/d • Quality of treated water: 100% • Volume of safe water consumed: 7l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management:85
SDG 8	• Number of persons employed by the project: N/A • Change in number of jobs and positions for women or Change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: N/A • Employment wages of people employed by the project: N/A	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or Change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 18 women and 26 youths employed • Employment wages of people employed by the project: 22 people were employed in the filter distribution program. Total income paid to the employees is KShs. 222,500
SDG 9	• Number of people trained on filters installation and maintenance: 0	• 85 people were trained on filter installation including 57 women and 28men

SDG 13:	• Number of filters sold: 7,424 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): N/A • B,by: 4.115375	• Number of filters sold: 3,215 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • B,by: 4.6896
Total emission reductions	35,959 tCO2e	19/02/2020 – 31/12/2020 = 13,385 tCO2e 01/01/2021- 18/02/2021 =1,912 tCO2e Total: 15,297 tCO2e

HHFF

Table 16: Comparison of actual value of outcomes with estimates in approved PDD for HHFF

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[14] achieved during this monitoring period
SDG 3	• Usage: 80% • Np,y :1,825 • Reduced incidence in water borne diseases: N/A • Reduced smoke levels: N/A • Reduced incidences of coughing: N/A • Reduced incidences of itchy eyes: N/A	• Usage: 92.64% • Np,y: 1,662 • Reduced incidence of water borne diseases: 87% • Reduced smoke levels: 92% • Reduced incidences of coughing: 88% • Reduced incidences of itchy eyes:87%
SDG 6	• QP,y: 5l/p/d • QP,raw boil :0l/p/d • QP,clean boil :0 l/p/d • Quality of treated water: 100%	• Qp,y: 7 l/p/d • QP, raw boil 0 l/p/d • QP,clean boil 0 l/p/d

[13] Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

[14] Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

	• Volume of safe water consumed: 5 l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management: N/A	• Quality of treated water: 98.6% • Volume of safe water consumed: 7 l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management:85
SDG 8	• Number of persons employed by the project: N/A • Change in number of jobs and positions for women or Change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: N/A • Employment wages of people employed by the project: N/A	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or Change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 18 women and 26 youths employed • Employment wages of people employed by the project: 22 people were employed in the filter distribution program. Total income paid to the employees is KShs. 222,500
SDG 9	• Number of people trained on filters installation and maintenance: 0	• 85 people were trained on filter installation including 57 women and 28 men
SDG 13:	• Number of filters sold: 1,612 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): N/A • B,by: 4.115375	• Number of filters sold: 2,212 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • B,by: 3.8150
Total emission reductions	5,550tCO2e	• 19/02/2020 – 31/12/2020 = 10,567tCO2e • 01/01/2021- 18/02/2021 = 1,510 tCO2e • Total: 12,077tCO2e

IHFF Technology

Table 17: Comparison of actual value of outcomes with estimates in approved PDD for IHFF

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[15] achieved during this monitoring period
SDG 3	• Usage: 80% • Np,y :N/A • Reduced incidences of water borne diseases: N/A • Reduced smoke levels: N/A • Reduced incidences of coughing: N/A • Reduced incidences of itchy eyes: N/A	• Usage: 90.55% • Np,y: calculated individually for each institution • Reduced incidences of water borne diseases: 100% • Reduced smoke levels: 76% • Reduced incidences of coughing: 76% • Reduced incidences of itchy eyes:79%
SDG 6	• Qp,y: 1 l/p/d • Qp,raw boil: 0 l/p/d • QP, clean boil: 0 l/p/d • Quality of treated water: 100% • Volume of safe water consumed: 1 l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management: N/A	• Qp,y: 2.33 l/p/d • QP, raw boil: 0 l/p/d • QP,clean boil: 0 l/p/d • Quality of treated water: 100% • Volume of safe water consumed: 2.33 l/p/d • Number of people attending workshops, seminars or trainings on water, hygiene and sanitation management85

[15] Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

SDG 8	• Number of persons employed by the project: N/A • Change in number of jobs and positions for women or Change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: N/A • Employment wages of people employed by the project: N/A	• Number of persons employed by the project: 52 • Change in number of jobs and positions for women or Change in income and asset distributions by region, ethnicity, religion, and socioeconomic groups: 18 women and 26 youths employed • Employment wages of people employed by the project: 22 people were employed in the filter distribution program. Total income paid to the employees is KShs. 222,500
SDG 9	• Number of people trained on filters installation and maintenance: 0	• 85 people were trained on filter installation
SDG 13:	• Number of filters sold: 367 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): N/A • Bb,y: 0.00013056	• Number of filters sold: 192 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 4 • Bb,y: 0.00022
Total emission reductions	867tCO2e	• 19/02/2020 – 31/12/2020 =924 tCO2e • 01/01/2021- 18/02/2021 = 132 tCO2e • Total: 1,056 tCO2e

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

>> The values estimated in the ex-ante calculations were higher than the actual values achieved during this monitoring period. The reason for this difference in numbers is that during the baseline estimated ex-ante estimates, the project had

done actual baseline water boiling tests following all GS guidelines and GS approval at validation and achieved Wi,y of 0.000549, however due to GS new rule to cap Wi,y, PP has capped Wi,y at 400g, that has made the huge difference in the estimated Ers and the actual Ers achieved during this period. Also, during the baseline estimate, parameter Qp,y was capped at 7.5l/p/d as per WHO guidelines whereas during this monitoring period, the same parameter was capped at 7l/p/d as per the current WHO guidelines. Finally, during the baseline estimates, number of filter sales were estimated as 6,824 for BSF, however, the actual number of filter sales to date is 3,215. These three parameters have contributed to the big difference in the estimated Ers and the actual Ers achieved.

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

>> Summary of SDG impacts which have increased;

BSF

SDG	Baseline	Actual values achieved	Remarks for the increase
SDG 3	Nj,y: 1,825	Nj,y: 2,043	This were conservative estimates during validation, actual values are higher
SDG 6	Qp,y: 5l/p/d	Qp,y: 7l/p/d	This were conservative estimates during validation, actual values are higher

HHFF

SDG	Baseline	Actual values achieved	Remarks for the increase
SDG 3	Up,y: 80%	Up,y: 92.6%	This were conservative estimates during validation, actual values are higher
SDG 6	Qp,y: 5l/p/d	Qp,y: 7l/p/d	This were conservative estimates during validation, actual values are higher
SDG 13	No. of filter sales: 1,612 Ers: 8,241tCO2e	No. of filter sales: 2,212 Ers: 12,077tCO2e	The was a better uptake of the filters than the project developer had predicted. More Ers achieved due to higher usage rate, more water being consumed and more filter sales than predicted

IHFF

SDG	Baseline	Actual values achieved	Remarks for the increase
SDG 3	Up,y: 80%	Up,y: 90.55%	This were conservative estimates during validation, actual values are higher

SECTION F. SAFEGUARDS REPORTING

>> As per safeguarding assessment done in section D of the registered VPADD, below is a summary of all questions answered yes or potentially under section *'Assessment of relevance to the project (Yes/potentially/no)'* of safeguarding principles assessment and the parameter has been captured in section D2 above of the monitoring plan. Parameters indicated as *'no'* in that section have not been included in this section. Though there were no mitigation measures required for all the principles, PP has included parameter *'Gender equality and women rights'* as this parameter is relevant to the project and it will also be monitored throughout the project's crediting period.

Safeguarding Principle	**Relevant to the project**	**Implementation status**
Gender equality and women rights	Yes	Both men and women employed by the project i.e. 34 men and 18 women. Both men and women are involved in trainings i.e. 28 men and 57 women trained.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

>>

During this monitoring, a logbook was placed at the project developers (Aqua Clara) office where filter owners could file their grievances in relation to the project. The filter owners also have the office contacts and those of the installing CDE, in case any information or assistance is needed. Grievances were recorded using the prescribed format. In this period, a total of 90 grievances were recorded, and all of them were adequately resolved. These issues revolved around the operation and maintenance of the filters and the necessary support was given. There were no other grievances raised from other platforms apart from those included in the logbook as outlined below:

Aqua Clara Water Filtration Program in Kenya – Logbook2020-2021
Contact Person: Monitoring and Evaluation Officer
Person's name: Josephine Mokeira Orare
Office/ telephone number: (Rigoma) Kisii Office, +254716406687
Cell phone number: +254724784897
Email address:orarejosephine@yahoo.com

Stakeholders have also been provided with the Gold Standard contact which they can use to reach the standard in case of any issues or comments. The email provided for this purpose is info@goldstandard.org
Below is a summary of the comments received, a detailed logbook has been provided as a support document.

TEMPLATE-

No.	Date of complaint (MM/DD/YY)	Customer Name	Product description	Complaint details	Response from the project implementer	Name of the person who will handle the issue	Was the issue resolved?	Date the issue was resolved (MM/DD/YY)	DAYS FILTER WAS NON-FUNCTIONAL
1	10/15/2020	Kemuga Primary School	Bisosand fi	Broken spout	Repaired	Peter Moindi	Yes	10/18/2020	3
2	11/02/2020	Ronald Mochere	Household	Broken containers and loss of syringe	Comtainers and syringe replaced	Josephine Orare	Yes	11/3/2020	1
3	10/22/2020	Elizabeth Amenya	Household	Broken bottom container	Container replaced	Risper Mose	Yes	10/22/2020	1
4	10/22/2020	Zipporah Nyamweya	Household	Leakage from top container	Filter assembled properly to avoid leakage	Risper Mose	Yes	10/22/2020	0
5	10/26/2020	Simion Michoki Oirere	Household	Broken containers	Containers replaced	Josephine Orare	Yes	10/27/2020	1
6	10/24/2020	Abel Oriki	Household	Clogged membrane,broken tap and loss of syrir	Membrane, tap and syringe replaced	Josephine Orare	Yes	10/26/2020	2
7	10/27/2020	Albert Ombiro	Household	Loss of syringe	Syringe replaced	Risper Mose	Yes	10/17/2020	0
8	10/16/2020	Edinah Chepkemoi	Household	Broken top container	Top container replaced	Irene	Yes	10/17/2020	1
9	10/16/2020	Pollen Adeka	Household	Broken tap	Tap replaced	Irene	Yes	10/17/2020	1
10	10/16/2020	Faustina Kerubo	Household	Loss of syringe	Syringe replaced	Irene	Yes	10/17/2020	0
11	10/16/2020	Everline Kerubo	Household	Broken top lid	Top lid replaced	Irene	Yes	10/17/2020	0
12	10/16/2020	Gladys Orangi	Household	Broken jar	Jar replaced	Irene	Yes	10/17/2020	0
13	10/16/2020	Edinah Kerubo	Household	Broken bottom container	Bottom container replaced	Irene	Yes	10/17/2020	1
14	10/16/2020	Simion Sengenge	Household	Broken jar	Jar replaced	Irene	Yes	10/17/2020	0
15	10/16/2020	Rose Machuchu	Household	Loss of syringe	Syringe replaced	Irene	Yes	10/17/2020	0
16	10/16/2020	Margret Omwenga	Household	Broken lower lid	Lower lid replaced	Irene	Yes	10/17/2020	1
17	10/16/2020	Jeremiah Nyamari	Household	Broken bottom container	Bottom container replaced	Irene	Yes	10/17/2020	1
18	10/16/2020	Salome Nyangweso	Household	Loss of syringe	Syringe replaced	Irene	Yes	10/17/2020	0
19	10/16/2020	Phyllis Omwori	Household	Loss of syringe	Syringe replaced	Irene	Yes	10/17/2020	0
20	10/16/2020	Phyllis Obae	Household	Loss of syringe	Syringe replaced	Irene	Yes	10/17/2020	0
21	10/16/2020	Jared Obiri	Household	Broken lower lid	Lower lid replaced	Irene	Yes	10/17/2020	1
22	10/16/2020	Jeremiah Iteba	Household	Broken bottom container	Bottom container replaced	Irene	Yes	10/17/2020	1
23	09/28/2020	Deborah Gesare	Household	Loss of syringe	Syringe replaced	Irene	Yes	9/28/2020	0
24	09/29/2020	Joshua Ongeta	Household	Broken tap	Tap replaced	Josephine Orare	Yes	9/29/2020	1
25	08/26/2020	Joash Mogaka	Household	Clogged membrane	Membrane backwashed	Josephine Orare	Yes	8/27/2020	1
26	10/04/2020	Elizabeth Moraa	Household	Leakage from top bucket		Rose	Yes	10/08/2020	0
27	10/05/2020	Evans Osoro	Household	Breakage of bottom Bucket	Container replaced	Rose	Yes	10/07/2020	2
28	10/05/2020	Laureen Chepchumba	Household	Non -Fuctional Syringe	Syringe replaced	Rose	Yes	10/12/2020	0
29	10/06/2020	Lydia Ougo	Household	Reduced flow rate	Sent filter maintanance video	Rose	Yes	10/06/2020	1
30	10/21/2020	Celestine Kelong	Household	Breakage of top Bucket	Container replaced	Rose	Yes	10/22/2020	1
31	10/28/2020	Norah Gesare	Household	Breakage of Syringe		Rose	Yes	10/28/2020	0
32	10/29/2020	Ann Morara	Household	Loss of syringe	Syringe Replaced	Irene	Yes	10/29/2020	0
33	10/29/2020	Cecilia Onsare	Household	Loss of syringe	Syringe Replaced	Irene	Yes	10/29/2020	0
34	10/29/2020	George Jane	Household	Loss of syringe	Syringe Replaced	Irene	Yes	10/29/2020	0
35	10/29/2020	Hyline Otwoma	Household	Loss of syringe	Syringe Replaced	Irene	Yes	10/29/2020	0
36	10/29/2020	Phylis Moraa Obae	Household	Non -Fuctional Syringe	Syringe Replaced	Irene	Yes	10/29/2020	0
37	10/29/2020	Alice Makori	Household	Loss of syringe	Syringe Replaced	Irene	Yes	10/29/2020	0
38	10/29/2020	Joseph Teresa Bosibori	Household	Non -Fuctional Syringe	Syringe Replaced	Irene	Yes	10/29/2020	0
39	10/29/2020	Birita Nyangara	Household	Loss of syringe	Syringe Replaced	Irene	Yes	10/29/2020	0
40	09/18/2020	Joseph Sigei	Household	Faulty Membrane	Customer bought new filter	Rose	Yes	09/18/2020	1
41	09/29/2020	Elijah Aboki Obino	Household	Loss of Syringe	Syringe replaced	Rose	Yes	09/29/2020	0
42	7/8/2020	Nancy Aoko	Household	Leakage From tap	Video shared	Rose	Yes	7/8/2020	0
43	7/14/2020	Rachael Moraa	Household	Leakage from top container	Video shared	Rose	Yes	7/14/2020	0
44	7/20/2020	Mary Mogere	Household	Leakage from top container	Video shared	Rose	Yes	7/20/2020	0
45	7/21/2020	Elizabeth kemuka	Household	know how to clean and assemble the filter -old	Video shared	Rose	Yes	7/21/2020	0
46	11/5/2020	Leah Mwita	Household	weak jar and reduced flow rate	Video shared	Risper Mose	Yes	11/5/2020	1
47	11/6/2020	Winnie Malau	Household	Breakage of top bucket and complete blockage	Client bought a new HF15P filter	Rose	Yes	11/6/2020	2
48	11/9/2020	Agnes Kemunto Ragira	Biosand filt	Breakage of filter container			Yes	11/10/2020	23
49	11/2/2020	Emily Omae	Biosand filt	Broken spout	Reinstallation	Peter Moindi	Yes	11/4/2020	23
50	11/13/2020	Amos Samba Mose	Household	Broken male adapter(elbow)	Replaced male adapter	Dominic	Yes	11/13/2020	1
51	11/18/2020	Emily Cheruiyot	Household	Leakage from top container	Advise on how to tighten membrane	Risper	Yes	11/18/2020	0
52	11/12/2020	Mose Nyambane Ogeto	Household	Breakage of tap,blockage of memebrane		Rose	Yes	11/15/2020	3
53	11/9/2020	Alice Mokeira	Biosand filt	Reduced flow rate	Reinstallation	Peter Moindi	Yes	11/12/2020	3
54	11/19/2020	Pr Kiage Paul	Biosand filt	Leaking container			Yes	11/22/2020	0
55	11/23/2020	Tom Mauya	Biosand filt	Filtered water contains particles/spout pulled out			Yes	11/26/2020	24
56	11/24/2020	Wilter Chepng'eno	household	Breakage of top container		Dominic	Yes	11/24/2020	1
57	11/30/2020	Laureen Chepchumba	household	Breakage of bottom container		Rose	Yes	11/30/2020	1
58	12/1/2020	Mary Makori	Biosand filt	severe leakage			Yes	12/3/2020	0
59	12/1/2020	Nellia Nyanchama	Biosand filt	spout broken			Yes	12/3/2020	1
60	12/14/2020	Silas Manyange	Biosand filt	reduced flow rate			Yes	01/08/2021	0
61	12/14/2020	Prisca Obino	Biosand filt	Broken spout			Yes	12/15/2020	2
62	12/11/2020	Mellen Obonyo	Biosand filt	Leakage along the spout			Yes	12/13/2020	0
63	12/11/2020	Zablon Ongoi	Biosand filt	Broken spout			Yes	12/13/2020	2
64	12/14/2020	Esther Nyakundi/Luke Star	Biosand filt	reduced flow rate			Yes	01/08/2021	0
65	12/1/2020	Doreen Kenneth	Household	Loss of syringe			Yes	12/01/2020	0
66	12/1/2020	Lilian Ombiro	Household	Reduced flow rate			Yes	12/01/2020	1
67	12/15/2020	Janet Ngetich	Household	Blockage			Yes	12/15/2020	1
68	01/10/2021	Agnes Atuma	Biosand filt	spout broken			Yes	01/12/2021	2
69	01/04/2021	Ruth Magara	Biosand filt	Leakage along the spout			Yes	01/10/2021	0
70	12/21/2020	Rhoda M Onguti	Biosand filt	Leakage along the spout			Yes	12/23/2020	2
71	01/18/2021	Joshua Onsongo	Household	Broken bottom container			Yes	01/18/2021	1
72	01/14/2021	Hellen Kerubo Onguti	Household	Breakage of top container			Yes	01/16/2021	2
73	01/18/2021	Ogongo High School	Community	Reduced flow rate			Yes	01/20/2021	2
74	01/19/2021	Callen Menge	Biosand filt	Broken spout			Yes	01/20/2021	2
75	01/20/2021	Rigoma PAG church	Biosand filt	Severe spout leakage			Yes	01/21/2021	2
76	01/16/2021	Johnstone Nyaosi	Biosand filt	Leakage along the spout			Yes	01/18/2021	2
77	01/16/2021	Mary Stephen	Biosand filt	Broken spout			Yes	01/18/2021	2
78	01/27/2021	Tebeswet Primary School	Institutiona	Broken top container			Yes	01/28/2021	1
79	01/28/2021	Tabitha Charana	Household	leakage from top container			Yes	01/27/2021	2
80	01/28/2021	Dorcah-Rigoko Secondary S	Institutiona	Blockage			Yes	01/31/2021	2
81	01/29/2021	Wesley Onyiego-Sarah Ker	Household	Breakage of top container			Yes	02/01/2021	4
82	02/03/2021	Mathias Orango Maina	Household	Breakage of top container			Yes	02/03/2021	1
83	02/08/2021	Eunice B. Nyarangi	Biosand filt	Leakage along the spout			Yes	05/03/2021	0
84	02/12/2021	Elizabeth Kemunto	Household	Breakage of the bottom lid and jar			Yes	02/14/2021	3
85	02/12/2021	Robinson Koros	Household	Leakage from top container			Yes	02/12/2021	0
86	02/15/2021	John Otoki	Household	Reduced flow rate			Yes	02/15/2021	0
87	02/17/2021	Sharon Kochir	Household	Blockage			Yes	02/19/2021	3
88	02/19/2021	Job Misati	Household	Damaged tap			Yes	02/21/2021	3
89	02/23/2021	Robert Togom	Household	Bottom lid cracked			Yes	02/25/2021	3
90	02/18/2021	Truphena Mokaya	Household	Breakage of top container			Yes	02/18/2021	2

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

>> None

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

>>None

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption