Gold Standard®

Gold Standard for the Global Goals Monitoring Report

June 2017, version 1

Gold Standard®

Title of the project	Aqua Clara Water Filtration Program in Kenya
Gold Standard project id	GS 1078
Version number of the monitoring report	Version ~~04~~05
Completion date of the monitoring report	~~28th~~ 25th ~~February~~ March 2019
Date of project design certification	26th December 2013
Start date of crediting period	28th December 2011
Duration of this monitoring period	(19/02/2017) to (18/02/2018)
Duration of previous monitoring period	19/02/2016 to 18/02/2017
Project representative(s)	Aqua Clara International
Host Country	The Republic of Kenya
Certification pathway (activity certification/impact certification)	Impact certification
SDG Contributions targeted (as per approved PDD)	1) SDG 3 Good health and well-being 2) SDG 6 Clean water and sanitation 3) SDG 8 Decent work and Economic growth 4) SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation 5) SDG 13 Climate Action
Gold Standard statement/product certification sought (GSVER/ADALYs/RECs)	GSVER
Selected methodology(ies)	Technologies and Practices to Displace Decentralized Thermal Energy Consumption 11/04/2011 [1]
Estimated amount of annual average certified SDG impact (as per approved PDD)	The ex-ante estimated amount of GHG is 32,818tCO2 from the project technologies. This amount is estimated in accordance to the registered PDD. The total reductions estimations have been determined for the period between 19th February 2017 and 18th February 2018 for the Biosand Filter (BSF), Household Hollow Fiber filters (HHFF) and Institutional Hollow Fiber Filters (IHFF) combined. Individually, the BSF total estimated emission reduction was 26,164.87tCO2, the HHFF was 4,4,257.5 tCO2 and IHFF was 2,395.96tCO2. This has been proven in the 'Ex-ante estimated ERs' tab in the Emission reduction spread sheets for the BSF, HHFF and the IHFF. These documents have been submitted as supporting documents.
Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period	33,059 tCO2

[1] https://www.goldstandard.org/sites/default/files/documents/gs_tpddtec_meth_110411.pdf

SECTION A. Description of project

A.1. Purpose and general description of project

>> The Aqua Clara Water Filtration Program in Kenya (the 'Project Activity'), seeks to introduce Aqua Clara International's[2] (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 36 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.

To date the PP has installed a total of 3,542 Biosand filters, 933 domestic HHFF and 62 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 – 26th June 2009
- Annual BSF Filter sales since start date of the project:
  - July 2009 to June 2010: 400 filters
  - July 2010 to June 2011: 617 filters
  - July 2011 to June 2012: 1010 filters
  - July 2012 to June 2013: 787 filters
  - July 2013 to June 2014: 345 filters
  - July 2014 to June 2015: 115 filters
  - July 2015 to June 2016: 143 filters
  - July 2016 to June 2017: 91 filters
  - July 2017 to Feb 2018: 34 filters

Annual HHFF sales start date of the project:
- 1st Nov 2013 to 31st Oct 2014: 110 filters
- 1st Nov 2014 to 31st Oct 2015: 179 filters
- 1st Nov 2015 to 31st Oct 2016: 330 filters
- 1st Nov 2016 to 31st Oct 2017: 253 filters
- 1st Nov 2017 to 31st Feb 2018: 61

Annual IHFF sales start date of the project:
- 1st June 2014 to 31st May 2015: 21 filters
- 1st June 2015 to 31st May 2016: 11 filters
- 1st June 2016 to 31st May 2017: 17 filters
- 1st June 2017 to 31st May 2018: 13 filters

Project registration date:	26th December 2013
Project Design Change date:	16th June 2016
Start Date of this Monitoring Survey	15th May 2018
Project transitioning to Gold Standard for Global Goals:	9th July 2018

[2] The Project developer changed name from Aqua Clara Foundation to Aqua Clara International (ACI) on 7th October 2017 and a certificate of amendment of the name issued. ACI shall be used in all related documentation for consistency with this change.

Addressing FARs

Forward Action Request # 1
The PP shall conduct water quality tests prior to next verification of baseline water sources representative of the overall project boundary and carry it out in the season which is representative. PP shall ensure that Kisii country (77% of BSF filters) is directly sampled in these water quality tests of baseline water sources.

Response
In addressing FAR 1 raised by the Gold Standard during the previous verification, PD carried out water Quality Test for baseline water sources between 15/05/2018 to 06/11/2018. The PD employed a random sample approach to select the filters for testing where, a total of 297 samples for BSF and 165 samples for HHFF were selected randomly from the Total Sales Records.

For institutional clusters, the project has distributed 62 filters and all of them were tested as part of the survey. The samples were spread across 12 counties. However, during the actual Water Quality Samples collection, some of the filters were found to be non-functional hence no water sample was collected from them. The PD, managed to collect 180 samples for BSF, 117 for HHFF and 62 for IHFF as shown in the table below. In Kisii, 173 samples for BSF technology were tested. These samples are an additional of water samples survey study done during the baseline survey exercise.

BSF

County	Samples Selected	Non-working	Samples Tested	Percentage Tested
Bomet	3	3	0	0%
Homabay	1	1	0	0%
Kisii	173	53	120	67%
Kisumu	3	3	0	0%
Migori	1	1	0	0%
Nakuru	6	6	0	0%
Nandi	11	11	0	0%
Narok	1	0	1	1%
Nyamira	77	28	49	27%
Uasin Gishu	21	11	10	6%
Total	297	117	180	0%

HHFF

County	Samples Selected	Non-functional	Samples Tested	Percentage Tested
Bomet	10	2	8	7%
Homabay	2	2	0	0%
Kericho	15	6	9	8%
Kisii	68	21	47	40%
Elgeyo Marakwet	1	0	1	1%
Migori	1	1	0	0%
Nairobi	1	1	0	0%
Nakuru	3	3	0	0%
Nandi	2	0	2	2%
Nyamira	54	10	44	38%
Uasin Gishu	7	2	5	4%
Siaya	1	0	1	1%
Total	165	48	117	100%

IHFF

County	Samples Selected	Non-functional	Samples Tested	Percentage Tested
Bomet	20	0	20	32%
Kericho	2	0	2	3%
Kisii	22	0	22	35%
Kisumu	2	0	2	3%
Nairobi	3	0	3	5%
Nyamira	8	0	8	13%
Uasin Gishu	3	0	3	5%
Siaya	2	0	2	3%
Total	62	0	62	100%

During the Monitoring Survey training, the enumerators were instructed to collect water from baseline sources where households/ institutions get their water from. The samples were collected from different filters randomly distributed across various counties which had been randomly selected on the sample frame used for this monitoring period. The testing results has been included in the Monitoring Survey Summary (MSS) tab ''Water Quality'' excel sheet. The testing results showed that in 85 samples tested, there was presence of E. coli in the baseline water sources. However, there was no E. coli found on the filtered water.

Forward Action Request # 2
Cluster 4 will need to be represented in baseline surveys should the project move into this cluster at a later date.

Response

The PP had gotten approval from the Gold Standard on this since no filters have been distributed in this cluster. In this monitoring period, there were still no filters sold in cluster 4 as per the sales record, and therefore no baseline surveys were conducted.

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 19th February 2017 and 18th February 2018) is 33,059 for all project technologies.

A.2. Location of project

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

County	Coordinates	County	Coordinates	County	Coordinates	County	Coordinates
Nandi,	00.1666670,	Bomet	-00.8000000,	Kericho,	000.3666667 35.3000000,	Busia,	000.4333333 34.1500000,
	035.1500000		035.2333000				
Uasin	00.5166670,	Homa	-00.6833330,	Elgeyo,	000.9483333 35.5086111,	Bungo	000.5833333 34.5833333,
Gishu,	035.2833000	Bay,	034.4500000			ma,	
Kisii,	-00.6666670,	Migori,	34.8333333,	Kakamega,	000.2833333 34.7500000,	Trans	00.5833333 34.58333330
	034.7500000		-			Nzoia,	
			000.6666667				
Nyamira	-00.7500000,	Kisumu	34.9167000, -	Siaya,	000.2833333 34.7500000,	Machak	001.5000000 7.2500000,
	035.0000000		000.2500000			os,	
Nakuru,	-00.5000000,	Kirinya	37.2833333, -	Nyeri,	000.4166667 36.9500000, -	Nairobi	001.2833333 36.8166667,
	036.0000000	ga,	000.500000				
Muranga,	-00.7500000, 037.1166667	Embu,	: 37.4500000, - 000.533333	Makueni.	001.8000000 37.6166667, -		

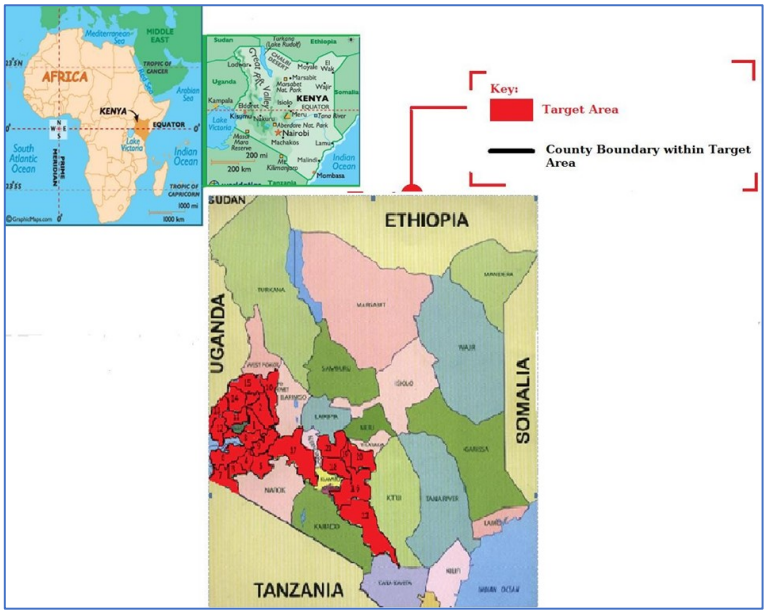


Figure 1: Kenya and the project boundary

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[3]

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

1. Gold Standard for the Global Goals [4]
2. Guidelines for carrying out usage surveys for projects implementing household water filtration technologies [5]

A.4. Crediting period of project

>> The fixed 10-year crediting period started on 28/12/2011. This marks the fourth round of annual monitoring for this project which began on 19th February 2017 to 18th February 2018.

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

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

[5] 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

>> (*Provide information on the implementation status of the project during this monitoring period. Specify any deviations / delays compared to information in approved project.)*

During this monitoring period, the project continued to sell water filters. There were deviations from the monitoring plan as there were delays in the start date of the monitoring survey exercise so as to satisfy an FAR raised during the last monitoring period.

To date, a total of 3,542 Biosand filters have been installed for domestic use and 933 HHFF units for domestic use and 62 institutional hollow fiber filters used in the institutions. Filters have been distributed in 15 counties namely Kisii, Nyamira Uasin Gichu, Nandi, Bomet, Kericho, Nairobi, Nakuru, Kisumu, Siaya, Migori, Homa Bay, Transzoia 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.

The Project Technology

1. 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.

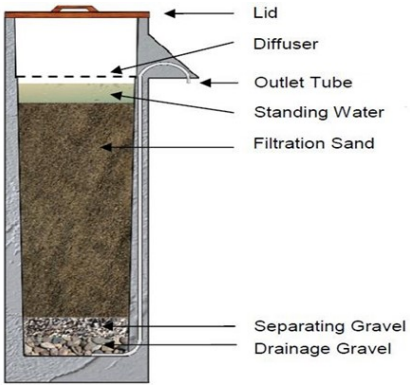


Figure 2 Cross section of a BSF

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.

Figure 3 Hollow fiber filter membrane

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 60 seconds.
- 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 4: Cross Section of Hollow Fiber Membrane Filter

B.2. Post-registration changes

B.2.1. Temporary deviations from Certified Key Project Information, Project Design Document, Monitoring & Reporting Plan, applied methodology or applied standardized baseline

>> None applied

B.2.2. Corrections

>> None applied.

B.2.3. Changes to start date of crediting period

>> None applied

B.2.4. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

The PP proposes 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 in accordance to the Gold Standard methodology. The Household Cj factor is 18%, fixed ex-ante.

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 now wishes to conduct this as per the methodological threshold of once every 2 years. Seeing as the PP has conducted this exercise the past 2 monitoring periods back to back, the parameters related to this exercise should remain fixed this verification as the Gold Standard International has approved this permanent deviation.

B.2.5. Changes to project design of approved project

>> *(Indicate whether any changes to the design of the project have been approved by GS-TAC that is relevant for this monitoring period.)*

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 on 16th June 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.

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

Project Database

This has been developed from the total sales record.

2. On-going Monitoring Studies

The monitoring exercise was a combination of the Usage Survey, Monitoring Survey and the Water Consumption Tests.

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. The monitoring surveys cover the duration from 19th February 2017 to 18th February 2018.
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 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 ACI filter and those that do not properly use or maintain the filter to affect the quality of water treated. This survey was carried out using closed questionnaires and spot checks. The usage survey was carried out from 15th May to 6th November 2018.
c) **Project Field Test Update-** Completed biennially, this is an extension of the project PFT and provides a water consumption assessment representative of project technologies currently every year. Hence the PFT update accounts for changes in the project scenario over time as project technologies age and new customers are added, also as new models and designs are introduced.

Water Consumption Field Test (WCFT) Protocol Report:

The PP employed the following usage survey protocol for the BSF, HHFF and IHFF:

The protocol employed field exercises based on the Kitchen Project Test (KPT) guidelines in Annex 4 of the approved methodology 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption'. The protocol was executed over a one-day period as this monitoring was targeting usage and sustainable development survey for the BSF, HHFF and IHFF. The entire process began on the 15th May and ended on the 10th of November 2018.

The three-day WCFT per household was not carried out over either a National Holiday or over the weekends (Saturday/Sunday) to ensure conservative quantification of water consumption.

Day 0: Training of field enumerators

The PP carried out training exercise with the enumerators who would then proceeded to carry out the Usage Survey, Sustainable Development survey and WCFT. A total of 21 people were trained and responsible for carrying out the monitoring exercise.

Enumerator training for the WCFT protocol and annual monitoring exercise

The PP explained the survey questions to be asked during WCFT exercise as well as showing mock examples of WCFT with the enumerators to ensure they understood what would take place in a real-world situation in the field. Calibrated 8-litre water buckets were issued to each of the enumerators which they would use in the field in measuring the water volume consumed in a day per household and institution. Enumerators were expressly told to ensure maximum accuracy in measuring water using the buckets.

The PP explained the parameters Q,p,y, Q,p cleanboil and Q,p,raw boil. The enumerators were to enquire of the households/institutions on the day of the surveys what the households/ institutions water treatment method was – boiling raw water, filtering raw water only, or filtering raw water then boiling the clean filtered water. This was to account for parameters Q,p,rawboil, Q,p,y, Q,p,cleanboil respectively. The PP also enquired from the households/ institutions how many times a day they purified their water to know when to go for the measuring of water.

For households/ institutions that boil raw water, the PP explained that the enumerator was to measure the water the household/ institution would consume that day before the water was put in the boiling pot and record that volume. (Q,p,rawboil)

For households/ institutions who consume raw water, no testing was to be done.

For households / institutions who filter raw water only, the enumerator was instructed to measure the water that would be used in a day before this water was poured into the filter. (Q,p,y)

For water that was filtered and thereafter boiled, the enumerator was instructed to measure the volume of filtered water before it was poured into the boiling pot (Q, p,cleanboil)

All feedback that was obtained from the households was carefully recorded in the WCFT surveys and analysed.

Day 1 - Surveys and Introduction

The PP executed Usage Surveys (US), Sustainable Development (SD) Survey and other non-field exercise surveys for the selected sampling units for BSF, IHFF and HHFF. The PP then informed the households and the institutions of the three-day WCFT exercise informing them that they were to treat water as they normally do year-round.

Day 2 - 4. WCFT exercise

Based on the respective household/ institution water treatment habits, enumerators conducted a volumetric assessment for safe water used in the household/ institution as explained above. This assessment was conducted using calibrated 8 litre water buckets.

Parameters Qpy, Qp,rawboil and Q,p, clean boil are aggregated from the mean of safe water consumed per day, over a 3 day period. Safe water in this case implies water filtered from the project technologies (Qpy), raw water boiled (Qp,rawboil) and/or filtered water boiled.

The outcome of the WCFT have been summarized in the monitoring survey summary.

B) Water Quality Tests
The PP collected samples of water from water sources that households/ institutions selected by the sample frame get their water from. Each water sample was labelled to show which sample was from the filtered water and which was from the raw water. The samples were stored in cool packs. At a central field laboratory, all the samples were tested suing the 3m petri-film plates, 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 drinking standard doesn't specifically approve or endorse either method of water testing but rather specifies quantified limits that determine the quality of the water. The use of field laboratory tests is approved in the methodology and is a commonly accepted international approach[6].

C) Leakage Assessment
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[7], 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 fire wood and charcoal stands at 13,654,022m^3 and 7,358,717m^3 while demand stands at 18,702,748m^3 and 16,325,810m^3 respectively [8]. 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.

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,

[6] http://www.who.int/water_sanitation_health/resourcesquality/wqmchap6.pdf

[7] 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

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

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°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.

c) 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.

SECTION D. Data and parameters

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

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	%
Description	Expressed as a percentage, this is the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it
Source of data	Baseline Surveys
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 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,CO2
Unit	tCO2/TJ
Description	CO2 emission factor of the wood fuel
Source of data	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	tCO2/TJ
Description	CH4 emission factor of the wood fuel
Source of data	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	tCO2/TJ
Description	CO2 emission factor of the wood fuel
Source of data	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 CO2 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	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	Baseline water Boiling test
Value(s) applied	Households – 0.00054960 Institutions/commercial facilities – 0.00054458
Choice of data or Measurement methods and procedures	The value provided above was derived from water boiling tests as recommended by the methodology. The value selected is the mean value derived from 144 households and 62 institutions/commercial facilities respectively.
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	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	NCV_b
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	IPCC default value
Value(s) applied	25
Choice of data or Measurement methods and procedures	IPCC Third Assessment Report: Climate Change 2001.
Purpose of data	To determine the Global Warming Potential of CH4
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 N_2O
Source of data	Literature Review:
Value(s) applied	298
Choice of data or Measurement methods and procedures	IPCC Third Assessment Report: Climate Change 2001.
Purpose of data	To determine the Global Warming Potential of N2O
Additional comment	N/A

D.2. **Data and parameters monitored**

Relevant SDG Indicator	SDG 3: Good health and well being ***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:	Annual Usage Surveys
Value(s) of monitored parameter:	BSF 2017 – 60% 2018 – 60% HHFF 2017 – 68% 2018 – 68% IHFF 2017 – 100% 2018 – 100%
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:	N/A

Relevant SDG Indicator	SDG 3: Good health and well being 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:	Water consumption field test (WCFT)
Value(s) of monitored parameter:	BSF – 2843 HHFF – 2059 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.
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:	Calculation of project emissions.
Additional comment:	N/A

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
Value(s) applied	BSF- 3,542 HHFF – 933 IHFF - 62
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	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:	Quality of Treated Water
Unit:	N/A
Description:	Quality of filtered water
Measured/Calculated / Default:	N/A
Source of data:	Monitoring Survey – Water Quality Tests
Value(s) of monitored parameter:	BSF Safe – 100% Unsafe – 0% HHFF Safe – 99 % Unsafe -0% IHFF Safe – 100% Unsafe –0%
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 tests were conducted using 3M Petrifilm Plate instructions. Water samples were collected from raw water and water filtered using the project technologies to determine coliform levels in both water samples. A description of the water testing method is described in the section below.

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:	Q,p,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:	Water consumption field test (WCFT)
Value(s) of monitored parameter:	BSF – 6.56 HHFF – 5.53 IHFF – 0.87
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 ~~divide~~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 top most numbers which could be easily read.
Purpose of data:	Calculation of emissions reductions
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:	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:	Water consumption field test (WCFT)
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:	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:	Q p,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:	Water consumption field test (WCFT)
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:	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:	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:	Water consumption field test (WCFT)
Value(s) of monitored parameter:	BSF – Qp,y 6.56 HHFF – Qp,y 5.53 IHFF – Qp.y 0.87
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 ~~divide~~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 top most numbers which could be easily read.
Purpose of data:	Calculation of emissions reductions
Additional comment:	The PP applied a value of 6.56, 5.53 and 0.87 for BSF, HHFF and IHFF respectively which is water consumption rate per person per day.

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:	B,by
Unit:	Tonnes
Description:	Quantity of wood fuel consumed in baseline scenario b during the year y in tons
Measured/ Calculated / Default:	Calculated
Source of data:	Monitoring Survey
Value(s) of monitored parameter:	BSF: 8.39 HHFF: 5.124 IHFF: 6.714
Monitoring equipment:	N/A
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	The parameter is a function of the Cj factor, Npy, Wib,y , Qpy an Qp raw boil as shown in the equation below: Bby= (1-Cj)*Wib,y*Np,y*(Qpy+Qpraw,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"
Purpose of data:	Calculation of Baseline emissions.
Additional comment:	N/A

Gold Standard Sustainable Development Indicators

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:	Reduction in water borne diseases such as skin rush, 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:	Monitoring Survey
Value(s) of monitored parameter:	BSF: 56% HHFF: 47% IHFF: 77% For BSF users, no one has experienced any waterborne disease since they started using their filter. With HHFF, only 1 person reported getting a water borne disease. With IHFF, only one person reported have a water borne disease as well.
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:	Though Andrew Ochura, the HHFF user reported as having a stomach problem, his water was tested and there was 0 E.Coli. Additionally, Cheptuyet Ngenda who reported as having water borne diseases after using water from the filter, 0 E.coli was found in his water sample collected.

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:	Monitoring Surveys
value(s) of monitored parameter:	BSF Reduced Smoke levels in the House: Yes = 55% No = 1% No Change = 3% N/A=40% Reduced Incidents of Coughing: Yes = 56% No = 0% No Change = 3% N/A=40% Reduced incidences of Itchy Eyes: Yes = 55% No = 0% No Change = 5% N/A=40%
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:	N/A

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:	Monitoring Surveys
value(s) of monitored parameter:	HHFF Reduced Smoke levels in the House Yes = 65% No = 3% No Change = 3% N/A=28% Reduced Incidents of Coughing: Yes = 65% No = 0% No Change = 5% N/A=30% Reduced incidences of Itchy Eyes: Yes = 55% No = 0% No Change = 15% N/A=30%
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:	N/A

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:	Monitoring Surveys
value(s) of monitored parameter:	IHFF Reduced Smoke levels in the House: Yes = 58% No = 37% No Change = 0% N/A=5% Reduced Incidents of Coughing: Yes = 65% No Change = 34% N/A=2% Reduced incidences of Itchy Eyes: Yes = 65 No Change = 34% N/A=2%
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:	N/A

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 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:	Training records
Value(s) of monitored parameter:	6 trainings were held as summarised below: • WASH Training at Borabu on 15th-18th October 2018: 12 participants (9 female and 3male) • Community wash promotion workshop on 10-12 September: 17 participants (6 female and 11male) • Household water treatment and safe storage workshop on 24-15th October: 15 participants (4 female and 11male) • WASH Training at COHESU, Kisumu on 25th April 2018: 9 participants (4 female and 5male) • CDE training on 29th June 2017, 15 participants (13 women, 2 men) • Training of Aqua Clara by Viability Africa on 24th April 2018, 21 participants (12 women, 9men)
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:	One training session was held in preparation for the monitoring survey exercise. The training was conducted by Sally Gakii and Lilian Kagume of ClimateCare, and the list of 21 attendees has been provided as a support document. Additionally, there were 5 WASH trainings done and training records have been provided as well.

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:	Number of men and women employed by the project
Measured/ Calculated / Default:	N/A
Source of data:	Employment and wages Records
Value(s) of monitored parameter:	14 employees (staff at Aquaclara offices) and 16 Filter installers Total number= 30 employees
Monitoring equipment:	Employment 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 have been submitted as support documents. ~~Specific~~ The wages ~~have not been indicated since they are confidential however,~~for the staff is included and it is evident that ~~,~~both men and women get equal pay for equal value of work done. Also, all employees are paid above the minimum wage for the country. ~~and the company CEO has signed the employment records to attest to that.~~

<table>
<tr><td>Relevant SDG Indicator</td><td>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.</td></tr>
<tr><td>Data / Parameter:</td><td>Records of income generated by entrepreneurs enrolled in the project activity distribution programme</td></tr>
<tr><td>Unit:</td><td>Wages of the entrepreneurs employed by the project</td></tr>
<tr><td>Description:</td><td>Number of men and women employed by the project</td></tr>
<tr><td>Measured/ Calculated / Default:</td><td>N/A</td></tr>
<tr><td>Source of data:</td><td>Employment and wages Records</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>16 people were employed in the filter distribution program. Each person was paid 300 for each filter sold.
The highest record is 29 filters where the employee was paid Kshs. 8,700. While the lowest had sold receiving Kshs. 300.

<table>
<tr><td>Filters sold</td><td>No of employees</td><td>Salary range (Kshs.)</td></tr>
<tr><td>0-5</td><td>8</td><td>0-1500</td></tr>
<tr><td>6-10</td><td>1</td><td>1800-3000</td></tr>
<tr><td>11-15</td><td>4</td><td>3300-4500</td></tr>
<tr><td>16 -20</td><td>2</td><td>4800-6000</td></tr>
<tr><td>Above 20 (29)</td><td>1</td><td>8700</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment:</td><td>Employment and wages Records</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>Annually</td></tr>
<tr><td>Calculation method (if applicable):</td><td>N/A</td></tr>
<tr><td>QA/QC procedures:</td><td>Employment Records are kept electronically and updated frequently to ensure they are up to date.</td></tr>
<tr><td>Purpose of data:</td><td>Gold Standard's sustainable development monitoring</td></tr>
<tr><td>Additional comment:</td><td>Employment records have been submitted as support documents. Equal pay was made to both men and women depending on the number of filters sold where a payment of Ksh. 300 was made for every filter.</td></tr>
</table>

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:	Employment Records
Value(s) of monitored parameter:	A total of 30 people ~~were~~was employed by the project including 14 employees at Aqua Clara and 16 people who were employed in the filter distribution program. 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 12 women. 10 people in total are under the age of 35 years. For the ACI staff, out of the 14, there were 4 women and 10 men.
Monitoring equipment:	N/A
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	The employment records shall be up to date and backed up electronically
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 CDE where a pay of 300 is made for each filter sold. Additionally, all payments are above the official Kenya's minimum wage [9]

[9] http://kenyalaw.org/kl/fileadmin/pdfdownloads/LegalNotices/2015/LN117_2015.pdf

Relevant SDG Indicator	SDG9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Target 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 water filters.
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:	Training records
Value(s) of monitored parameter:	15 people trained
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:	During this monitoring period, there is a total of 15 filter installers who are trained on filter assembly, installation and maintenance. These included 5 women and 10 men. At installation, the households/ institutions are also trained on proper usage and maintenance of the filter. 1 refresher training was conducted, and training participants list has been provided. Training manual has been provided as a support document.

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. Certificates/ training manuals
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:	6 trainings
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 6 trainings were conducted. The trainings were on filter installation and maintenance, WASH and Community Development Entrepreneurs (CDE) meeting. During this training, the people were also trained about the filters.

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	LEp,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 every two years.
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

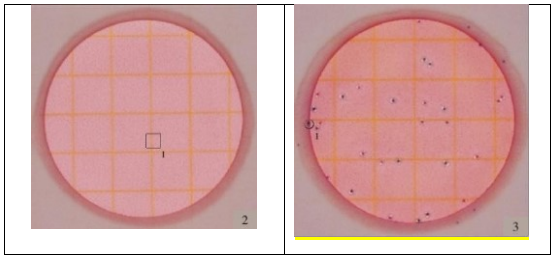
D.3 Implementation of sampling plan

>> (If data and parameters monitored described in section D.2 above are determined by a sampling approach, provide a description on how project participants implemented the sampling plan and surveys for those data and parameters according to the approved PDD.)

1. WATER QUALITY TESTING

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 5: 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 6: 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 fecal contamination. Its presence in water indicates recent fecal 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 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

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:

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

- 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
- 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

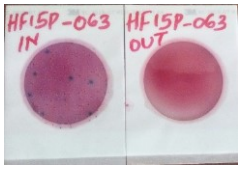
The U.S FDA Bacteriological Analytical Manual (BAM)
APHA Standard methods for the examination of Water and waste water.

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:



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

Figure 7: Sample showing presence and absence of E. coli for a HHFF user

Household Name – Margret Kerubo Momanyi
Filter Number - HF15P-063
Raw water quality (IN) – 7
Filtered water quality (OUT)– 0 cfu

BSF Filter:

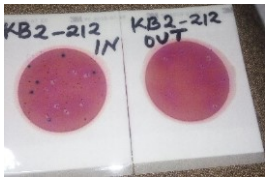


Figure 8: Diagram showing presence and absence of E. coli for a BSF user

Household Name: Betty Kerubo
Filter Number – KB2-212
Raw water quality (IN) – 6cfu
Filtered water quality (OUT)– 0 cfu

IHFF Filter:

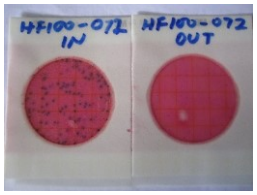


Figure 9: Diagram showing presence and absence of E.coli for IHFF user

Household Name: Mugango Girls Day School
Filter Number – HF100-72
Raw water quality (IN) – 72
Filtered water quality (OUT)– 0 cfu

2. Sampling method

A Simple Random sampling method was used to determine the random test subjects from the total sales record.

Determination of the Sample size

A total of 297 households for the BSF, 165 HHFF and 62 IHFF were initially selected for this monitoring period. PP ensured that at least 30 samples for BSF and HHFF were selected for each age being interviewed.

All the 62 IHFF sold were included on the sample frame.

The following method was used to determine the 297 sampling units for BSF and 165 HHFF 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 and Household HHFF filters sold was 3,542 BSF Filters and 933 HHFF.
3. A sample size of 297 BSF and 165 HHFF was determined as illustrated above.

4. 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.
5. A random number was determined between 1 and the Sample Interval was which gave the Random Start.
6. Sample units were then determined as
a) SU1=RS
b) SU2=RS+S1
c) SUN=RS+ (n-1) SI
7. 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.

The sample size utilized for analysis of this monitoring period for BSF has increased from 297 to 352 and that of HFF has increased from 165 to 180. This is because additional 55 households were substituted in the BSF sample frame and 15 households in the HHFF sample frame (based on random selection) due to unavailability of the intended households during the monitoring exercise. Instead of discounting the 55 and 15 households replaced as non-users, from the BSF and HHFF sample frames respectively. The PP made replacements due to several reasons namely: some of the users had relocated to other locations, some could not be traced, and some phone numbers were no longer in service. The PP has opted to discount these households as not applicable due to their availability. Counting them as non-users automatically would be as inaccurate as automatically counting them as users. Therefore, these households that cannot be traced have not been included in the final sample frame. The sample size and calculations have been provided as supporting documentation. There were no replacements made for the IHFF, since all the IHFF sold were found and interviewed.

For BSF, the sample used for Usage Survey is 297, for water quality test analysis, a sample of 180 was used since for households no longer using their filters, no water samples were taken. For HFF the sample used for usage survey was 165 whereas the sample for water quality tests was 116. For IHFF all the 62 filters participated in the Usage Survey as well as the Water Quality Analysis. No Water Quality Tests were conducted in Households/ institutions no longer using the filter.

BSF

Table 1: Sampling Summary for BSF

Age	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	Total
Total Population	400	617	1010	787	345	115	143	91	34	3542
Sample size	33	33	33	33	33	33	33	33	33	297

HHFF

Table 2: Sampling Summary for HHFF

Age	13/14	14/15	15/16	16/17	17/18	Total
Total Population	110	179	330	253	61	933
Sample size	33	33	33	33	33	165

IHFF

Table 3: Sampling Summary fro IHFF

Age	14/15	15/16	16/17	17/18	Total
Total Population	21	11	17	13	62
Sample size	21	11	17	13	62

The Total Sales Record provided as a supporting document gives the total sample size per vintage year with the additional households.

Procedures for Administering Data Collection and Minimizing Non-Sampling Errors

1. **Procedures for Data Collection**

ClimateCare trained the enumerators on the monitoring questionnaire administration and the water filed testing protocol. A key emphasis was given on the Usage Survey where enumerators were to interview the households/ institutional members and conduct spot checks on the project technologies. The enumerators were also informed, where household members present were children under the age of 12 years with no adult present, a revisit was to be done to interview older respondent and if none was available at all, the survey was treated as nonapplicable.

2. **Data Collected**

- The data collected from the field exercise included the following information:
- Basic Information of the Household/ institution
- Usage survey information
- Sustainable Development Indicators
- Water Consumption Field Test
- Water Quality Results

The enumerators submitted the questionnaires from the field in hard copies to the Project Proponent. They also collected water samples from the water source for the households/ institutions. They stored them in unique transportation bags where they were collected at the field lab within a period of 6 hours to ensure qualitative results.

The Project Proponent, ACI, conducted the water quality testing using the water samples collected by the enumerators. They then filled in the results in the appropriate section in the Monitoring Survey.

The monitoring surveys were then submitted to Viability Africa in hard copies and then stored electronically. A summary of the data collected has been submitted in excel format as a support document.

3. Quality Control/Quality Assurance

To ensure quality control and quality assurance, the following was implemented:

1. ClimateCare[12] conducted random in-house checks on the survey team to ensure adherence to the set protocol in interviewing the project technologies end users and conducting the water quality tests.
2. Data entry and evaluation was conducted by ClimateCare.
3. Data was controlled and Managed solely by ClimateCare to avoid erroneous entries.
4. The water quality tests were conducted at controlled lab tests to avoid contamination and ensure consistency of results. Every survey team member collected the sample water sachets in every household/ institution, stored them in unique transportation bags and delivered them at the lab test within a period of 6 hours to ensure qualitative results.

4. Data Analysis

Data was analysed solely by ClimateCare and is presented in excel format as a support document.

[12] The Carbon Asset Developer changed from Viability Africa to ClimateCare Limited as per the cover letter submitted to the Gold standard.

SECTION E. Calculation of SDG outcomes

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

SDG 3

BSF technology

The figures given are derived from the baseline estimations as calculated during the baseline surveys. Please refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab BSF

Usage: 80%

Np,y :1,825

Quality of treated water: 100%

Number of filters sold: 7424 (refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab operational BSF)

The sustainable development parameters including water borne diseases, smoke levels, incidences of coughing and incidences of itchy eyes were not estimated in the baseline survey since they relate to the implementation of the project and hence have been indicated as "not applicable".

HHFF

The figures given are derived from the baseline estimations as calculated during the baseline surveys. Please refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tabs Household inputs and HFF

Usage: 100%

Np,y :1,825

Quality of treated water: 100%

Number of filters sold: 1842 (refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab HFF)

The sustainable development parameters including water borne diseases, smoke levels, incidences of coughing and incidences of itchy eyes were not estimated in the baseline survey since they relate to the implementation of the project and hence have been indicated as "not applicable".

IHFF

The figures given are derived from the baseline estimations as calculated during the baseline surveys. Please refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab institutional inputs.

Usage: 80%

Np,y :N/A (estimated per each institution)

Quality of treated water: 100%

Number of filters sold: 425 (refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab HFF)

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The sustainable development parameters including water borne diseases, smoke levels, incidences of coughing and incidences of itchy eyes were not estimated in the baseline survey since they relate to the implementation of the project and hence have been indicated as "not applicable".

SDG 6

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BSF

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The figures given are derived from the baseline estimations as calculated during the baseline surveys. Please refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab BSF

$Q_{P,y}$: 5

$Q_{P,raw\ boil}$: 0

$Q_{P,clean\ boil}$: 0

Quality of treated water: 100%

Volume of safe water consumed: 5litres per person per day

Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): N/A (This parameter was not estimated in the baseline scenario since it was included during the project transition to Gold Standard for the Global Goals).

HHFF

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The figures given are derived from the baseline estimations as calculated during the baseline surveys. Please refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab HFF

$Q_{P,y}$: 5

$Q_{P,raw\ boil}$ 0

$Q_{P,clean\ boil}$ 0

Quality of treated water: 100%

Volume of safe water consumed: 5litres per person per day

Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 0 (This parameter was not estimated in the baseline scenario since it was included during the project transition to Gold Standard for the Global Goals).

IHFF

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The figures given are derived from the baseline estimations as calculated during the baseline surveys. Please refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab institutional inputs.

$Q_{P,y}$: 1

$Q_{P,raw\ boil}$ 0

$Q_{P,clean\ boil}$ 0

Quality of treated water: 100%

Volume of safe water treated per filter: 250litres (GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab institutional inputs)

Number of workshops, seminars organized, and trainings on installation, water and sanitation management and maintenance of the water filters: 0 (This parameter was not estimated in the baseline scenario since it was included during the project transition to Gold Standard for the Global Goals).

SDG 8

BSF

The values of the parameters were not estimated in the baseline scenario since they were to be monitored during project implementation. A value of 0 have been applied.

Number of persons employed by the project: 0

Number of women and youths employed by the project: 0

Income generation from filter distribution: 0

HHFF

The values of the parameters were not estimated in the baseline scenario since they were to be monitored during project implementation. A value of 0 have been applied.

Number of persons employed by the project: 0

Number of women and youths employed by the project: 0

Income generation from filter distribution: 0

JHFF

The values of the parameters were not estimated in the baseline scenario since they were to be monitored during project implementation. A value of 0 have been applied.

Number of persons employed by the project: 0

Number of women and youths employed by the project: 0

Income generation from filter distribution: 0

SDG 13

BSF

Number of people trained on filters installation and maintenance: 0 (The values of the parameters were not estimated in the baseline scenario since they were to be monitored during project implementation. A value of 0 have been applied).

B,by: 4.11*(refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" BSF).*

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HHFF

Number of people trained on filters installation and maintenance: 0 (The values of the parameters were not estimated in the baseline scenario since they were to be monitored during project implementation. A value of 0 have been applied).

B,by: 4.11(*refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab HHFF .*

JHFF

Number of people trained on filters installation and maintenance: 0 (The values of the parameters were not estimated in the baseline scenario since they were to be monitored during project implementation. A value of 0 have been applied).

B,by: 0.00013056 (*refer to the "GS 1078 Design Change Emission Reduction Spreadsheet 2016 05" tab institutional inputs).*

BASELINE EMISSIONS

>> 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 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 (form 1stJanuary 2013) will be calculated using the revised GWPs. Projects emission reductions accrued before 1st January 2013 will use the former GWP values[13].

Fuel used to Treat water (Parameter Bby)

BSF Filters:

Bb,y = (1 - Cj) * Nj,y * Wb,y * (Qj,y + Q j,rawboil,y)

Where:

Nj,y Number of person.days consuming water supplied by project scenario p through year y
Cj Expressed as a percentage, this is the portion of users of the project 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
Qp,y Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Qp, raw,boil,y Quantity of raw water boiled in the project scenario p 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.

Therefore:

Nj,y= 7.79*365=2843
Cj= 18%
Wby= 0.000550
Qp,y= 6.56

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

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Qp, rawboil,y=0

Bb, y is therefore calculated as:

= (1-0.18)*2843*0.00055*(6.56+0)
=8.396 tonnes

HHFF Filters:
Bb,y = (1 - Cj) * Nj,y * Wb,y * (Qj,y + Q j,rawboil,y) Where:
Nj,y Number of person.days consuming water supplied by project scenario p through year y
Cj Expressed as a percentage, this is the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it
Bb,y Quantity of fuel consumed in baseline scenario b during the year y in tons
Qp,y Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Qp, raw,boil,y Quantity of raw water boiled in the project scenario p 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.

Therefore:

Nj,y= 5.64*365=2059
Cj= 18%
Wby= 0.0005496
Qp,y= 5.53
Qp, rawboil,y=0

Bb, y is therefore calculated as:

= (1-0.0.18) *0.0005496*2059(5.53+0)

=5.124 tonnes

IHFF Filters:
Bb,y = (1 - Cj) * Nj,y * Wb,y * (Qj,y + Q j,rawboil,y) Where:
Nj,y Number of person.days consuming water supplied by project scenario p through year y
Cj Expressed as a percentage, this is the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it
Bb,y Quantity of fuel consumed in baseline scenario b during the year y in tons
Qp,y Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Qp, raw,boil,y Quantity of raw water boiled in the project scenario p 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.

Therefore:
Kindly note, parameter Nj and Nj,y will be presented using variable x and y respectively for IHFF filters. Number of tons 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.

Nj,y= x*365=y(this parameter was calculated individually for each filter in the institutions, see ER excel sheet)
Cj= 76%
Wby= 0.0005496
Qp,y= 0.87
Qp, rawboil,y=0

Bb, y is therefore calculated as:

= (1-0.0.76) *0.0005496*y(0.87+0)

= This parameter was calculated separately for each individual institution since it was not possible to combine the values for the institutions. Please see the GS 1078-IHFF MSS and ERs excel sheet tab ER calculation- IHFF)

Baseline Emissions BSF filters:

Vintage Year 2017:
BEy= Bby*(fNRB,b,y* EFb,fuel,CO2)+(EFb,fuel,CH4+ Efb,fuel,N2O)* NCV bfuel

fNRB, b, y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.03*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVb, fuel=0.015

=13.2229 tCO2e (per filter, per year)

Vintage Year 2018:
BEy= Bby*(fNRB,b,y* EFb,fuel,CO2)+(EFb,fuel,CH4+ Efb,fuel,N2O)* NCV bfuel

fNRB, b, y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.03*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVb, fuel=0.015

=13.2229 tCO2e (per filter, per year

Baseline Emissions HHFF filters

Vintage Year 2017:
BEy= Bby*(fNRB,b,y* EFb,fuel,CO2)+(EFb,fuel,CH4+ Efb,fuel,N2O)* NCV bfuel

fNRB, b, y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.03*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVb, fuel=0.015

=8.07 tCO2e (per filter, per year)

Vintage Year 2018:
BEy= Bby*(fNRB,b,y* EFb,fuel,CO2)+(EFb,fuel,CH4+ Efb,fuel,N2O)* NCV bfuel

fNRB, b, y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.03*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVb, fuel=0.015

=8.07 tCO2e (per filter, per year

Baseline Emissions IHFF filters:
Vintage Year 2017:
BEy= Bby*(fNRB,b,y* EFb,fuel,CO2)+(EFb,fuel,CH4+ Efb,fuel,N2O)* NCV bfuel

fNRB, b, y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.03*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVb, fuel=0.015

=316 tCO2e (for the total institutional filters, per year) (see Individual calculation for each filter at GS 1078- Combined ER and MSS tab ER calculation- IHFF)

Vintage Year 2018:
BEy= Bby*(fNRB,b,y* EFb,fuel,CO2)+(EFb,fuel,CH4+ Efb,fuel,N2O)* NCV bfuel

fNRB, b, y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.03*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVb, fuel=0.015

=45 tCO2e (for the total institutional filters, per year) (see Individual calculation for each filter at GS 1078- Combined ER and MSS excel sheet tab ER calculation- IHFF)

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

Period	BSF Total Baseline Emissions (tCO2e)	HHFF Baseline Emissions per filter /year (tCO2e)	IHFF total Baseline Emission Reduction (tCO2e)	Combined Totals
19/02/2017-31/12/2017	24,268	3959	316	28,543
01/01/2018-18/02/2018	3787	684	45	4,516
Total	28,055	4,643	361	33,059

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

>>

SDG 3

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BSF technology

The figures given are derived from the monitoring survey calculations.

Usage: 60% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Usage Survey-BSF)

Np,y: 2843 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab BSF inputs

Quality of treated water: Quality of treated water: 100% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Water quality analysis- BSF)

Number of filters sold: 3,542 (please refer to the BSF TSR and Sample Frame spreadsheet, tab TSR)

Water borne diseases: 56% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-BSF)

Reduced smoke levels: 55% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-BSF)

Reduced incidences of coughing: 56% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-BSF)

Reduced incidences of itchy eyes:55% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-BSF)

HHFF technology

Usage:68 % (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Usage Survey-HHFF)

Np,y: 2059 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab HHFF inputs

Quality of treated water: Quality of treated water: 99% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Water quality analysis- IHFF)

Number of filters sold: 933 (please refer to the HHFF TSR and Sample Frame spreadsheet, tab TSR)

Water borne diseases: 47% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-HHFF)

Reduced smoke levels: 65% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-HHFF)

Reduced incidences of coughing: 65% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-HHFF)

Reduced incidences of itchy eyes:55% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-HHFF)

IHFF technology

Usage100% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Usage Survey-IHFF)

Np,y: 58239 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab ER calculation-IHFF

Quality of treated water: Quality of treated water: 100% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Water quality analysis-IHFF)

Number of filters sold: 62 (please refer to the IHFF TSR and Sample Frame spreadsheet, tab TSR)

Water borne diseases: 77% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-IHFF)

Reduced smoke levels: 58% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-IHFF)

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Reduced incidences of coughing: 65% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-IHFF)

Reduced incidences of itchy eyes:65% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Sustainable development-IHFF)

SDG 6

BSF technology

Qp,y: 6.565 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-BSF)

QP,raw boil: 0 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-BSF)

QP,clean boil: 0 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-BSF)

Volume of safe water consumed: 6.56 litres/person/day (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-BSF)

Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 7 (please refer to the training records).

HHFF technology

Qp,y: 5.53 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-HHFF)

QP,raw boil: 0 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-HHFF)

QP,clean boil: 0 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-HHFF)

Quality of treated water: 99% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Water quality analysis-HHFF)

Volume of safe water consumed: 5.53 litres/person/day (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-HHFF)

Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 7 (please refer to the training records).

IHFF technology

Qp,y: 0.87 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-IHFF)

QP,raw boil: 0 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-IHFF)

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QP,clean boil: 0 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-IHFF)

Quality of treated water: 62% (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Water quality analysis-IHFF)

Volume of safe water consumed: 0.87 litres/person/day (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab Qp,y-IHFF)

Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters): 7 (please refer to the training records).

SDG 8

BSF technology

Number of persons employed by the project: 30 (please refer to the GS 1078 employment records)

Number of women and youths employed by the project: 16 women and 10 youths (please refer to the GS 1078 employment records)

Income generation from filter distribution: ,16 people were employed in the filter distribution program. Total income paid to the employees is 45,300 (please refer to the CDE employment and income records)

HHFF technology

Number of persons employed by the project: 30 (please refer to the GS 1078 employment records)

Number of women and youths employed by the project: 16 women and 10 youths (please refer to the GS 1078 employment records)

Income generation from filter distribution: ,16 people were employed in the filter distribution program. Total income paid to the employees is 45,300 (please refer to the CDE employment and income records)

IHFF technology

Number of persons employed by the project: 30 (please refer to the GS 1078 employment records)

Number of women and youths employed by the project: 16 women and 10 youths (please refer to the GS 1078 employment records)

Income generation from filter distribution: ,16 people were employed in the filter distribution program. Total income paid to the employees is 45,300 (please refer to the CDE employment and income records)

SDG 13

BSF technology

Number of people trained on filters installation and maintenance: 15 (please refer to the SACCO training participants list)

Bb,y: 8.397(Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab BSF inputs)

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HHFF technology

Number of people trained on filters installation and maintenance: 15 (please refer to the SACCO training participants list)

B,by: 5.12 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab HHFF inputs)

IHFF technology

Number of people trained on filters installation and maintenance: 15 (please refer to the SACCO training participants list)

B,by: 0.000114234 (Please refer to calculations on the "GS 1078 Combined ER and MSS Spreadsheet tab BE-person-day IHFF)

PROJECT EMISSIONS

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)

Where:

Np, y Number of person. days consuming water supplied by project scenario p through year y

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

Bp, y Quantity of fuel consumed in project scenario p during the year y in tons

Qp, rawboil, y Quantity of raw water boiled in the project scenario p per person per day

Qp, cleanboil,y Quantity of safe water boiled in the project scenario p per person per day

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

Project Scenario Fuel Consumption BSF Filters:

N_j, y= 7.79*365=2843
Cj= 18%
Wpy= 0.00055
Qp, clean boil, y= 0
Qp, rawboil, y=0

Bp,y is therefore calculated as:

= (1-0.18)*2843*0.000549*(0+0)
=0 tonnes

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Project Scenario Fuel Consumption HHFF Filters:
Nj, y= 5.64*365=2059
Cj= 18%
Wpy= 0.00055
Qp, clean boil, y= 0
Qp, rawboil, y=0
Bp, y is therefore calculated as:

= (1-0.18) *2059*0.000549*(0+0)
= 0 tonnes

Project Scenario Fuel Consumption IHFF Filters:
Nj, y= x*365=y
Cj= 76%
Wpy= 0.000549
Qp, clean boil, y= 0
Qp, rawboil, y=0
Bp, y is therefore calculated as:

= (1-0.18) * *0.000549*(0+0)
= The parameter has been calculated individually for each filter, see GS 1078-IHFF MSS and ERs excel sheet tab ER calculation- IHFF))

Project emissions 2017 per filter (19th Feb to 31st December)

BSF
PE,y= Bp,y*(fNRB,b,y*EFb,fuel,CO2)+(EFb,fuel,CH4+Efb,fuel,N2O)*NCVbfuel

fNRB, b,y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.3*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVb, fuel=0.015

=0 tCO2e (per filter, per year)

Project emissions 2018 per filter (1st January to 18th Feb)

PE,y= Bp,y*(fNRB,b,y*EFb,fuel,CO2)+(EFb,fuel,CH4+Efb,fuel,N2O)*NCVbfuel

fNRB, b,y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.3*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVbfuel=0.015

=0 tCO2e (per filter, per year)

Project Emissions HHFF:

Vintage Year 2017 (19th Feb to 31st December)
PE,y= Bp,y*(fNRB,b,y*EFb,fuel,CO2)+(EFb,fuel,CH4+Efb,fuel,N2O)*NCVbfuel fNRB, b,y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.3*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVbfuel=0.015

= 0 tCO2e (per filter, per year)

Vintage Year 2018 (1st January to 18th Feb)

PE,y= Bp,y*(fNRB,b,y*EFb,fuel,CO2)+(EFb,fuel,CH4+Efb,fuel,N2O)*NCVbfuel
fNRB, b,y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.3*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVbfuel=0.015

= 0 tCO2e (per filter, per year)

Project Emissions IHFF:

Vintage Year 2017

PE,y= Bp,y*(fNRB,b,y*EFb,fuel,CO2)+(EFb,fuel,CH4+Efb,fuel,N2O)*NCVbfuel fNRB, b,y=0.92
EFb, fuel, CO2=112
EFb, fuel, CH4=7.5(0.3*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVbfuel=0.015

= 0 tCO2e (per filter, per year) (calculated individually for each filter, see GS 1078- Combined ER and MSS excel sheet tab ER calculation- IHFF)

Vintage Year 2018 (1st January to 18th Feb)

PE,y= Bp,y*(fNRB,b,y*EFb,fuel,CO2)+(EFb,fuel,CH4+Efb,fuel,N2O)*NCVbfuel
fNRB, b,y=0.92
EFb, fuel,CO2=112
EFb, fuel, CH4=7.5(0.3*25)
Efb, fuel, N2O=1.192 (0.004*298)
NCVbfuel=0.015

= 0 tCO2e (per filter, per year) (calculated individually for each filter, see GS 1078- Combined ER and MSS excel sheet tab ER calculation- IHFF)

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

Period	BSF Total Project Emissions (tCO2e)	HHFF project Emissions per filter /year (tCO2e)	IHFF total project Emission Reduction (tCO2e)	Combined Totals
19/02/2017-31/12/2017	0	0	0	0
01/01/2018-18/02/2018	0	0	0	0
Total	0	0	0	0

Calculation of leakage

>> Leakage = 0
As demonstrated in section B.6.3 of the PDD as well as this monitoring report, there are no perceived leakage risks for this parameter

GHG Emission Reductions

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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:

Emission Reductions 2017 per filter
(13.229 - 0) * 60.27 %) *100% - 0= 7.97 tCO_2e (This figure was then divided by 365 days in a year to get the emission reductions per day).

Emission Reductions 2018 per filter

(13.229 - 0) *60.27%) *100% - 0= 7.97tCO_2e (This figure was then divided by 365 days in a year to get the emission reductions per day).

HHFF
Emission Reductions 2017 per filter
(8.07 - 0) * 68%) *100% - 0= 5.479tCO_2e (This figure was then divided by 365 days in a year to get the emission reductions per day).

Emission Reductions 2018 per filter

(8.07 - 0) * 68%) *100% - 0= 5.479tCO2e (This figure was then divided by 365 days in a year to get the emission reductions per day).

IHFF
Emission Reductions 2017 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

Emission Reductions 2018 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 Filters:

Period	Emission Reduction (tCO2e)
19/2/2017-31/12/2017	24,268
1/1/2018-18/2/2018	3,787
Total	28,055

HHFF:

Period	Emission Reduction (tCO2e)
19/2/2017-31/12/2017	3,959
1/1/2018-18/2/2018	684
Total	4,643

IHFF

Period	Emission Reduction (tCO2e)
19/2/2017-31/12/2017	316
1/1/2018-18/2/2018	45
Total	361

Combined Summary of Emission Reductions accrued in the monitoring period by both BSF, HHFF and IHFF

Period	**BSF total Emission Reduction (tCO2e)**	**HHFF total Emission Reduction (tCO2e)**	**IHFF total Emission Reduction (tCO2e)**	**Combined Totals**
19/02/2017-31/12/2017	24,268	3,959	316	28,543
01/01/2018-18/02/2018	3,787	684	45	4,516
Total	28,055	4,643	361	33,059

E.3. Calculation of net benefits as difference of baseline and project values or direct calculation for each SDG outcome

The difference between Baseline emissions per filter per year and project emissions per filter per year.

BSF
7.97-0= 7.97tCO2

HHFF
5.479- 0= 5.479 tCO2

IHFF
361.16-0= 361.16tCO2 (for all the filters, each filter's Ers were calculated individually)

Total net benefit
>> The difference between baseline emissions and project emissions:

BSF
Σ BEb,y=28,055

Σ PEp,y=0

Net benefit: 28,055-0= 28,055

HHFF
Σ BEb,y: 4643
Σ PEp,y=0
Net benefit: 4,643-0= 4643

IHFF
Σ BEb,y: 361
Σ PEp,y=0
Net benefit: 361-0= ~~361~~361

Total for all the project technologies

Σ BEb,y: 33,059- 0=~~0~~33,059
Σ PEp,y=0

Total net benefit: 33,059- 0=33,059

The total net benefit for the project is 100%.

SDG 3 Good health and well being

BSF, HHFF and IHFF

During the calculation of the baseline values, usage was estimated at 80% for BSF, HHFF and IHFF. This was a conservative estimate since it was expected that usage rate would change over the years. However, during the project survey, BSF achieved 60.27 % usage, HHFF achieved 68.48 due to some of the filters being no longer in use and IHFF achieved 100% since all the filters are currently in use.
The number of people per household (for both BSF and HHFF) was estimated a household would have an average of 5 people which resulted to an NP,y of 1,825. During this monitoring period, the number of persons per household was 7.79 for BSF, 5.64 for HHFF and the number of people in institutions was calculated individually as stated on the GS 1078-IHFF MSS and ERs excel sheet as this approach seemed more conservative.
Quality of treated water was estimated at 100% because the filter was anticipated to remove all the E. coli during filtration for BSF, HHFF and IHFF. During this monitoring period, BSF achieved 100%, HHFF achieved 99.15% and IHFF achieved 100%.

Water borne diseases, reduced smoke levels, reduced coughing and itchy eyes were not estimated during the baseline level. However, during the monitoring survey, the households were asked to compare if they had experienced a reduction in this parameter since they purchased the water filters. Their responses were recorded and reported as follows: BSF; 56% of the households experienced a reduction in water borne diseases, 55 % of the households reported experiencing reduced smoke levels, 55% of the households reported reduced incidences of coughing and 55% reported reduced incidences of itchy eyes. HHFF; 47% reported a reduction in water diseases, 65 % of the households reported experiencing reduced smoke levels, 65% of the households reported reduced incidences of coughing and 55% reported reduced incidences of itchy eyes. IHFF; 77% of institutions reported a reduction in water borne diseases, 58 % of the institutions reported experiencing reduced smoke levels, 65% of the institutions reported reduced incidences of coughing and 65% reported reduced incidences of itchy eyes

During the baseline estimates, it was projected that by this time 5,049 BSF filters, 892 HHFF and 127 IHFF would have been sold. However, the project has so far distributed 3,542 BSF, 933 HHFF and 62 IHFF as per the total sales records.

SDG 6: Clean Water and Sanitation
During the baseline survey, it was estimated that the volume of water would be 5 litres per person per day for BSF and HHFF, and 1 litre per person per day for IHFF. During this monitoring survey exercise, the water supplied by the project per person per day is as follows; BSF 6.56 litres, 5.64 for HHFF and 0.87 litres for IHFF.

During the baseline survey, the number of trainings were not estimated though the project was expected to conduct them. During this monitoring period, 1 training on filter installation and maintenance was conducted where 15 people attended. Additionally, there were six trainings for Water Sanitation and Hygiene (WASH) management. Participant's lists for each training have been provided as a support document.

SDG 8: Decent work and Economic growth
On employment, during the baseline estimates, the exact number of employees to be involved in the project had not been established. As a result, we indicated 0 employees, and this was to be monitored upon project implementation, where by the time of monitoring a total of 14 employees had been employed and 16 additional Community Development Entrepreneurs (CDEs) have been employed by the project. Employment records for Aqua Clara staff responsible for project implementation and CDE staff records have been submitted as support documents.
Income generation: The project is a source of income for the employees where they are paid above the minimum wage. Income ~~is confidential and hence the CEO~~information for the Aqua Clara staff has been provided and its is evident that both men and women get equal pay for equal value of work done, and they are also paid ~~signed on the employee records to confirm the number of employees and that they are paid~~ above the minimum wage for the country. The CDEs also get income from the project. They are paid on commission basis where they get Ksh. 300 for each filter sold.

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Number of people trained in water filtration: A number of people have been trained on filter installation and maintenance. This include employees at Aqua Clara as well as the CDEs who sell the filters. During this monitoring period, there was 1 training conducted for filter installation and maintenance where 15 people attended.

SDG 13: Climate Action

Number of workshops, seminars organized, and training-related opportunities held: 7 trainings were held both for filter installation and maintenance as well as WASH. Participants' lists have been provided for all the trainings held. Using the filters instead of boiling water leads to reduction of GHG emissions to the atmosphere. Additionally, a stepwise calculation of the emission reductions calculations achieved have been shown above as well as on the Ers sheet.

E.4. Summary of ex-post values of each SDG outcome for the current monitoring period

BSF

• Item	Baseline estimate	Project estimate	Net benefit
• **SDG 3 Good Health and well being**	• Usage: 100% • Np,y :1,825 • Quality of treated water: 100% • • Number of filters sold: 0 • Water borne diseases: N/-A • Reduced smoke levels: N/A • Reduced	• Usage: 60% • Np,y: 2059 • Quality of treated water: 100% • Number of filters sold: 3,542 • Water borne diseases: 56% • Reduced smoke levels: 55% Reduced incidences of coughing: 56% • Reduced incidences of	• Usage: 60% • Np,y: 2,059 • Quality of treated water: 100% • Number of filters sold: 3,542 • Water borne diseases: 56% • Reduced smoke levels: 55% • Reduced incidences of coughing: 56% • Reduced incidences

	incidences of coughing: N/A • Reduced incidences of itchy eyes: N/A	itchy eyes:55%	of itchy eyes:55%
• **SDG 6 Clean water and sanitation**	• QP,y: 5 • QP,raw boil 0 • QP,clean boil 0 • Quality of treated water: 100% • Volume of safe water consumed: N/A • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 0	• Qp,y: 6.56 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 100% • Volume of safe water consumed: 6.56 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7	• Qp,y: 6.56 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 100 • Volume of safe water consumed: 6.56 litres/person/day Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
• **SDG 8 Decent work and economic growth**	• Number of persons employed by the project: 0 • Number of women and youths employed by the project: 0 • Income generation from filter distribution, 0	• Number of persons employed by the project: 30 • Number of women and youths employed by the project: 16 women and 10 youths. • Income generation from filter distribution, 16 people were employed in the filter distribution program. Total income paid to the employees is 45,300 Records of income they generated from filter distribution is summarised below: Filters sold / No of employees / Salary range (Kshs.) 0-5 / 8 / 0-1500 6-10 / 1 / 1800-3000 11-15 / 4 / 3300-4500 16 -20 / 2 / 4800-6000	• Number of persons employed by the project, 30 Number of women and youths • employed by the project: 16women and 10 youths. • Total Income generation from filter distribution, 45,300

		Above 20 (29) | 1 | 8700	
• **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, 15	• Number of people trained on filters installation and maintenance,15 people including 5 women and 10 men
• **SDG 13 Take urgent action to combat climate change and its impacts**	• B,by: ~~8.73~~4.11 • 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: 8.397 • Number of filters sold 3,542 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7	• Bb,y: 8.397 • Number of filters sold 3,542 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
Total	• 19th Feb – 31st December 2017= 7.97tCO2e per filter per year • 1st January to 18th Feb2018 = 7.97 tCO2e per filter per year	• 19th Feb – 31st December 2017= 0 tCO2e per filter per year. • 1st January to 18th Feb 2018= 0 tCO2e per filter per year	• 19th Feb – 31st December 2017= 7.97 tCO2e per filter per year • 1st January to 18th Feb 2018 = 7.97 tCO2e per filter per year

HHFF

• Item	Baseline estimate	Project estimate	Net benefit
• **SDG 3 Good Health and well being**	• Usage: 100% • Np,y :1,825 • Quality of treated water: 100% • • Number of filters sold: 0 • Water borne diseases: N.A • Reduced smoke levels: N/A • Reduced incidences of coughing: N/A • Reduced	• Usage: 68% • Np,y: 2,059 • Quality of treated water: 99% • Number of filters sold: 933 • Water borne diseases: 47% • • Reduced smoke levels: 65% • Reduced incidences of coughing: 65% Reduced incidences of itchy eyes:55%	• Usage: 68% • Np,y: 2,059 • Quality of treated water: 99% • Number of filters sold: 933 • Water borne diseases: 47% • Reduced smoke levels: 65% • Reduced incidences of coughing: 65% • Reduced incidences of itchy eyes:55%

	incidences of itchy eyes: N/A		
• **SDG 6** **Clean water and sanitation**	• QP,y: 5 • QP,raw boil 0 • QP,clean boil 0 • Quality of treated water: N/A • Volume of safe water consumed: N/A • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 0	• Qp,y: 5.53 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 99% • Volume of safe water consumed: 5.53 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7	• Qp,y: 5.53 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 99% • Volume of safe water consumed: 5.53 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
• **SDG 8** **Decent work and economic growth**	• Number of persons employed by the project: 0 • Number of women and youths employed by the project: 0 • Income generation from filter distribution, 0	• Number of persons employed by the project: 30 • Number of women and youths employed by the project: 16 women 10 youths • Income generation from filter distribution, 16 people were employed in the filter distribution program. Total income paid to the employees is 45,300 Records of income they generated from filter distribution is summarised below:	• Number of persons employed by the project: 30 • Number of women and youths employed by the project: 16 women 10 youths • Total Income generation from filter distribution, 45,300

		<table><tr><th>Filters sold</th><th>No of employees</th><th>Salary range (Kshs.)</th></tr><tr><td>0-5</td><td>8</td><td>0-1500</td></tr><tr><td>6-10</td><td>1</td><td>1800-3000</td></tr><tr><td>11-15</td><td>4</td><td>3300-4500</td></tr><tr><td>16 - 20</td><td>2</td><td>4800-6000</td></tr><tr><td>Above 20 (29)</td><td>1</td><td>8700</td></tr></table>	
• **SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Target**	• Number of people trained on filters installation and maintenance, 0	• 15	• 15 people were trained on filter installation including 5 women and 10 men
SDG 13 Take urgent action to combat climate change and its impacts	• B,by: 4.11 • 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: 5.125 • Number of filters sold 933 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7	• Bb,y: 5.125 • Number of filters sold 933 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
Total	• 5th May – 31st December 2017= 5.47tCO2e per filter per year • 1st January to 16th April 2018 = 5.47 tCO2e per filter per year	• 5th May – 31st December 2017= 0 tCO2e per filter per year. • 1st January to 16th April 2018= 0 tCO2e per filter per year	• 5th May – 31st December 2017= 5.47 tCO2e per filter per year • 1st January to 16th April 2018 = 5.47 tCO2e per filter per year

IHFF

• **Item**	**Baseline estimate**	**Project estimate**	**Net benefit**
• **SDG 3 Good Health and well being**	• Usage: 100% • Np,y :N/A • Quality of	• Usage: 100% • Np,y: 58239 • Quality of treated	• Usage: 100% • **Np,y:** 58239 • Quality of treated

	treated water: 100% • • Access to filters: 0 • Water borne diseases: N/A • Reduced smoke levels: N/A • Reduced incidences of coughing: N/A • Reduced incidences of itchy eyes: N/A	water: 100% • • Access to filters: 62 • Reduced Water borne diseases: 77% • • Reduced smoke levels: 58% • • Reduced incidences of coughing: 65% Reduced incidences of itchy eyes:65%	water: 100% • Access to filters: 62 • Reduced Water borne diseases: 77% • Reduced smoke levels: 58% • Reduced incidences of coughing: 65% • Reduced incidences of itchy eyes:65%
• **SDG 6 Clean water and sanitation**	• QP,y: 1 • QP,raw boil 0 • QP,clean boil 0 • Quality of treated water: N/A • Volume of safe water consumed: N/A • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 0	• Qp,y: 0.87 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 100% • Volume of safe water consumed: 0.87 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7	• Qp,y: 0.87 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 100% • Volume of safe water consumed: 0.87 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
• **SDG 8 Decent work and economic growth**	• Number of persons employed by the project: 0 • Number of women and youths employed by the project: 0 • Income generation from filter distribution, 0	• Number of persons employed by the project: 30 • Number of women and youths employed by the project: 4 women 10 youths. • Income generation from filter distribution, 16 people were employed in the filter distribution program. Total income paid to the employees is 45,300 Records of income they generated from filter distribution is	• Number of persons employed by the project: 30 • Number of women and youths employed by the project: 16 women 10 youths • Income generation from filter distribution, 45,300

<table>
<tr>
<td></td>
<td></td>
<td>summarised below:
<table>
<tr><th>Filters sold</th><th>No of employees</th><th>Salary range (Kshs.)</th></tr>
<tr><td>0-5</td><td>8</td><td>0-1500</td></tr>
<tr><td>6-10</td><td>1</td><td>1800-3000</td></tr>
<tr><td>11-15</td><td>4</td><td>3300-4500</td></tr>
<tr><td>16 - 20</td><td>2</td><td>4800-6000</td></tr>
<tr><td>Above 20 (29)</td><td>1</td><td>8700</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>• SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Target</td>
<td>• Number of people trained on filters installation and maintenance, 0</td>
<td>• Number of people trained on filters installation and maintenance, 15</td>
<td>• 15 people were trained on filter installation including 5 women and 10 men</td>
</tr>
<tr>
<td>• SDG 13: Take urgent action to combat climate change and its impacts</td>
<td>• B,by: 0.00013056
• 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</td>
<td>• Bb,y: 6.714
• Number of filters sold 62
• Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7</td>
<td>• Bb,y: 6.714
• Number of filters sold 62
• Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7</td>
</tr>
<tr>
<td>Total</td>
<td>• 5th May – 31st December 2017= 361 tCO2e per filter per year
• 1st January to 16th April 2018 = 361 tCO2e</td>
<td>• 5th May – 31st December 2017= 0 tCO2e per filter per year.
• 1st January to 16th April 2018= 0 tCO2e per filter per year</td>
<td>• 5th May – 31st December 2017= 361 tCO2e
• 1st January to 16th April 2018 = 361 tCO2e</td>
</tr>
</table>

E.5. Comparison of actual value of outcomes with estimates in approved PDD

BSF

Item	Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
• SDG 3 Good Health and well being	• Usage: 100% • Np,y :2190 • Quality of treated water: 100% • Access to filters: 0 • Water borne diseases: N.A • Reduced smoke levels: N/A • Reduced incidences of coughing: N/A • Reduced incidences of itchy eyes: N/A	• Usage: 60% • Np,y: 2059 • Quality of treated water: 100% • • Access to filters: 3,542 • Water borne diseases: 56% • Reduced smoke levels: 55% • Reduced incidences of coughing: 55% Reduced incidences of itchy eyes:99%
• SDG 6 Clean water and sanitation	• QP,y: 5 • QP,raw boil 0 • QP,clean boil 0 • Quality of treated water: 100% • Volume of safe water consumed: 5 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 0	• Qp,y: 6.56 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 100% • Volume of safe water consumed: 6.56 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
• SDG 8 Decent work and economic growth	• Number of persons employed by the project: 0 • Number of women and youths employed by the project: 0 • Income generation from filter distribution, 0	• Number of persons employed by the project: 30 • Number of women and youths employed by the project: 16 women and 10 youths. • Income generation from filter distribution, 45,300 •
• 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, 15
SDG 13 : Take urgent action to combat climate change and its impacts	• B,by: ~~8.73~~4.11 • 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: 8.396 • Number of filters sold 3,542 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7

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Total Ers Achieved	• 27,004	• 28,055

HHFF

Item	Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
• **SDG 3** **Good Health and well being**	• Usage: 100% • Np,y :1,825 • Quality of treated water: 100% • Access to filters: 0 • Water borne diseases: N.A • Reduced smoke levels: N/A • Reduced incidences of coughing: N/A • Reduced incidences of itchy eyes:	• Usage: 68% • Np,y: 2,059 • Quality of treated water: 99% • Access to filters: 933 • Water borne diseases: 47% • Reduced smoke levels: 65% • Reduced incidences of coughing: 55% Reduced incidences of itchy eyes:99%
• **SDG 6** **Clean water and sanitation**	• QP,y: 5 • QP,raw boil 0 • QP,clean boil 0 • Quality of treated water: 100 • Volume of safe water consumed: 5 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 0	• Qp,y: 5.53 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 99% • Volume of safe water consumed: 5.53 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
• **SDG 8** **Decent work and economic growth**	• Number of persons employed by the project: 0 • Number of women and youths employed by the project: 0 • Income generation from filter distribution, 0	• Number of persons employed by the project: 30 • Number of women and youths employed by the project: 16 women 10 youths • Total Income generation from filter distribution, 45,300
• **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, 15
• **SDG 13 :** **Take urgent action to**	• B,by: 4.11 • Number of filters sold – 0	• Bb,y: 5.124 • Number of filters sold 933

combat climate change and its impacts	• Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 0	• Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
Total Ers Achieved	• 4,392.5	• 4,643

IHFF

Item	**Values estimated in ex ante calculation of approved PDD**	**Actual values achieved during this monitoring period**
• **SDG 3 Good Health and well being**	• Usage: 100% • Np,y :N/A • Quality of treated water: 100% • Access to filters: 0 • Water borne diseases: N.A • Reduced smoke levels: N/A • Reduced incidences of coughing: N/A • Reduced incidences of itchy eyes: N/A	• Usage: 100% • Np,y: 58239 • Quality of treated water: 100% • Access to filters: 62 • Reduced Water borne diseases: 77% • Reduced smoke levels: 58% • Reduced incidences of coughing: 65% • Reduced incidences of itchy eyes:65%
• **SDG 6 Clean water and sanitation**	• Qp,y: 1 • Q,p,raw boil 0 • QP, clean boil 0 • Quality of treated water: 100 • Volume of safe water consumed: N/A • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 0	• Qp,y: 0.87 • QP, row boil 0 • QP,raw boil 0 • Quality of treated water: 100% • Volume of safe water consumed: 0.87 litres/person/day • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
• **SDG 8 Decent work and economic growth**	• Number of persons employed by the project: 0 • Number of women and youths employed by the project: 0 • Income generation from filter distribution, 0	• Number of persons employed by the project: 30 • Number of women and youths employed by the project: 16 women 10 youths. • total Income generation from filter distribution, 45,300
• **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, 15

• **SDG 13: Take urgent action to combat climate change and its impacts**	• B,by: 0.00013056 • 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: 6.65 • Number of filters sold 62 • Number of workshops, seminars organized, and trainings (on installation, water and sanitation management and maintenance of the water filters), 7
• **Total Ers Achieved**	• **1,618**	• **361**

E.6. Remarks on difference from estimated value in approved PDD

>> The values estimated in the ex-ante calculations were lower for than the actual values achieved during this monitoring period. The reason for this difference in numbers is:

1. BSF in the ex-ante , PP had estimated Qp,y of 5 but upon monitoring, Qp,y achieved is 6.7
2. HHFF in the ex-ante, PP had estimated Qp,y of 5 but upon monitoring, Qp,y achieved is 5.53.
3. IHFF, during exante, PD had not included parameter Nj (number of persons per institution per day) in the emission reductions calculations. PP has calculated the parameter Nj in response to an FAR raised during the last verification period 'Forward Action Request # 1: The PP shall prior to next issuance provide evidence about the usage patterns in institutions and water consumption in litres per person per day. PP shall ensure that the cap of 7.5l/p/d is not exceeded. Parameter Nj, y has been established as 58,239 and used to calculate the water consumption in institutions per person per day. QP,y had been estimated as 1 litre however during the Monitoring Survey, 0.87 litres were achieved. As a result, the ERs achieved were lower than the estimated ERs.

SECTION F. Stakeholder inputs and legal disputes

F.1. List all inputs/grievances which have been received for the project during the monitoring period together with their respective answers/actions

During this monitoring, a log book 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 14 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 – Log Book 2018-2019

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

Date of comment	Comment	Action required from the project implementer	Response from the project implementer	Name of the person who will handle the issue	Was the issue resolved?	Date the issue was resolved
22/09/2017	Transfer f BSF to new house	Assistance to transfer the BSF to new house	Transferred the BSF with the required skills.	Peter	Yes	29/09/2017
27/09/2017	Filter body leakage	Replace the filter body with a new one	Replaced the filter body	Peter	Yes	29/09/2017
28/07/2018	Standing water depth 7 cm	Topping up of sand	Filter maintenance	Peter	Yes	1/08/2017
3/7/2017	Spout broken	Replacing the spout	Replaced the spout	Peter	Yes	1/08/2017
28/07/2017	Slow flow rate	Unclogging the filter	Scooped the upper sand layer and washed it and refilled it	Peter	yes	1/08/2017
28/07/2018	Spout broken	Replacing the spout	Replaced the spout	Peter	Yes	31/07/2017
20/07/2017	Spout broken	Replacing the spout	Replaced the spout	Peter	Yes	31/07/2017
05/06/2017	Leakage of the filter	Sealing the filter	leakage sealed	Peter	Yes	5/07/2017
19/06/2017	Spout leakage	sealing the spout	Spout sealed with silicon	Peter	Yes	26/06/2017
27/06/2017	Spout leakage	Replaced the spout	Spout sealed with silicon	Peter	Yes	29/06/2017
31/01/2018	Spout disturbed	Repairing the spout	Spout repaired	Peter	Yes	1/02/2018
05/02/2018	Spout broken	Repairing the spout	Spout repaired	Peter	Yes	1/02/2018
21/08/2017	3 BSF Spouts broken 3 filters leakages	Replacing the spouts Repairing the leakage	Spout repaired Leakage repaired	Peter	Yes	22/08/2017
23/08/2017	Spout broken	Replacing the spout	Replaced the spout	Peter	Yes	24/08/2017

>> **F.2. List all inputs/grievances from previous monitoring period where follow up action is to be verified in this monitoring period**

>> None

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

>> None