

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

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

This document contains the following Sections

Key Project Information

0 - Description of project

0 - Implementation of project

0 - Description of monitoring system applied by the project

0 - Data and parameters

0 - Calculation of SDG Impacts

0 - Safeguards Reporting

0 - Stakeholder inputs and legal disputes

KEY PROJECT INFORMATION

This template has been revised to aid a consistent interpretation and to better support project developers submitting documentation for certification. Please read the accompanying guide to understand how to complete this template accurately.

TEMPLATE GUIDE Monitoring Report v. 1.1

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Programme of Activity Information – (delete below table if N/A)

GS ID of Programme	GS5658
Title of Programme	PoA – Climate Finance for Sustainable Development
Version of POA-DD applicable to this monitoring report	Ver 06
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	GS5658 VPA 1: Borehole project “Ease Water Madagascar” (GS ID GS:5230) GS5658 VPA 2: Improved Cookstoves for Rural Families in Gilé Reserve Area, Mozambique (GS ID: GS5812)

Key Project Information

GS ID (s) of Project (s)	GS6752 GS7311 GS7566 GS10657 GS10658 GS10659
Title of the project (s) covered by monitoring report	GS5658 VPA 7: Water is Life, Madagascar GS5658 VPA 9: Water is Life - Phase II, Madagascar GS5658 VPA 14: Water is Life, Madagascar GS5658 VPA 16: Water is Life, Madagascar GS5658 VPA 17: Water is Life, Madagascar GS5658 VPA 18: Water is Life, Madagascar
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	GS6752: Ver 05 GS7311: Ver 04 GS7566: Ver 08

	GS10657: Ver 05 GS10658: Ver 05 GS10659: Ver 05
Version number of the monitoring report	Ver 06
Completion date of the monitoring report	16/09/2021
Date of project design certification	GS6752: 16/04/2019 GS7311: 17/04/2019 GS7566: 24/03/2020 GS10657: 30/07/2020 GS10658: 30/07/2020 GS10659: 30/07/2020
Date of Last Annual Report	GS6752: 24/04/2020 GS7311: 24/04/2020
Monitoring period number	GS6752: 2 GS7311: 2 GS7566: 1 GS10657: 1 GS10658: 1 GS10659: 1
Duration of this monitoring period	GS6752: 18/11/2019-08/10/2020 GS7311: 18/11/2019-08/10/2020 GS7566: 22/09/2019-08/10/2020 GS10657: 22/09/2019-08/10/2020 GS10658: 23/11/2019-08/10/2020 GS10659: 22/09/2019-08/10/2020
Project Representative	Carbonsink Group S.r.l (Carbonsink)
Host Country	Madagascar
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A

Methodology (ies) applied and version number	Technologies and practices to displace decentralized thermal energy consumption (TPDDTEC), version 3.1
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

GS6752

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Emissions Reductions	2,366	VERs
SDG 3: Good Health and Well-being	Additional persons using safe water in the project activity compared to the baseline scenario	1,126	Households
SDG 6: Clean Water and Sanitation	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	1,251	Households
SDG 12: Responsible Consumption and Production	Hygiene campaign on water, sanitation and health related issues made in the project area	1	Hygiene campaign

GS7311

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Emissions Reductions	1,838	VERs
SDG 3: Good Health and Well-being	Additional persons using safe water in the project activity compared to the baseline scenario	901	Households

SDG 6: Clean Water and Sanitation	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	1,001	Households
SDG 12: Responsible Consumption and Production	Hygiene campaign on water, sanitation and health related issues made in the project area	1	Hygiene campaign

GS7566

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Emissions Reductions	10,517	VERs
SDG 3: Good Health and Well-being	Additional persons using safe water in the project activity compared to the baseline scenario	4,502	Households
SDG 6: Clean Water and Sanitation	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	5,002	Households
SDG 12: Responsible Consumption and Production	Hygiene campaign on water, sanitation and health related issues made in the project area	1	Hygiene campaign

GS10657

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Emissions Reductions	10,499	VERs
SDG 3: Good Health and Well-being	Additional persons using safe water in the project activity compared to the baseline scenario	4,425	Households

SDG 6: Clean Water and Sanitation	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	4,917	Households
SDG 12: Responsible Consumption and Production	Hygiene campaign on water, sanitation and health related issues made in the project area	1	Hygiene campaign

GS10658

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Emissions Reductions	7,778	VERs
SDG 3: Good Health and Well-being	Additional persons using safe water in the project activity compared to the baseline scenario	3,738	Households
SDG 6: Clean Water and Sanitation	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	4,153	Households
SDG 12: Responsible Consumption and Production	Hygiene campaign on water, sanitation and health related issues made in the project area	1	Hygiene campaign

GS10659

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Emissions Reductions	10,517	VERs
SDG 3: Good Health and Well-being	Additional persons using safe water in the project activity compared to the baseline scenario	4,507	Households

SDG 6: Clean Water and Sanitation	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	5,008	Households
SDG 12: Responsible Consumption and Production	Hygiene campaign on water, sanitation and health related issues made in the project area	2	Hygiene campaign

Table 2 – Product Vintages

GS6752

		Amount Achieved
Start Dates	End Dates	VERs
18/11/2019	31/12/2019	314
01/01/2020	08/10/2020	2,052

GS7311

		Amount Achieved
Start Dates	End Dates	VERs
18/11/2019	31/12/2019	246
01/01/2020	08/10/2020	1,592

GS7566

		Amount Achieved
Start Dates	End Dates	VERs
22/09/2019	31/12/2019	3,072
01/01/2020	08/10/2020	7,445

GS10657

		Amount Achieved
Start Dates	End Dates	VERs
22/09/2019	31/12/2019	2,098
01/01/2020	08/10/2020	8,401

GS10658

		Amount Achieved
Start Dates	End Dates	VERs
23/11/2019	31/12/2019	682
01/01/2020	08/10/2020	7,096

GS10659

		Amount Achieved
Start Dates	End Dates	VERs
22/09/2019	31/12/2019	3,075
01/01/2020	08/10/2020	7,442

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The micro-scale voluntary Project Activities (VPA) “Water is Life, Madagascar” and “Water is Life – Phase II, Madagascar” are developed by an Italian Associazione Mondobimbi Veneto Onlus in collaboration with Carbonsink.

The project activity includes the construction and securing of a network of wells for increase accessibility to safe and clean drinking water for local families living in the surroundings of the city of Tulear located in the Region of Atsimo-Andreafana, in Toliara Province, Madagascar.

In targeted areas, many families do not have access to safe and clean drinking water and, moreover, long daily journeys are needed to reach the water sources in these semi-desert areas. Many health problems are linked to the use of unsafe drinking water: a high incidence of diseases such as diarrhea, intestinal infections, and parasites. Local people typically use boiling with firewood or charcoal to purify their drinking water. This process results in the release of greenhouse gas emissions from the wood combustion.

The project is addressed to supply safe drinking water for domestic use and consequently to improve the hygiene, social, economic and environmental issues related to the water consume. Moreover, verifiable Carbon Dioxide (CO₂) emission reductions are achieved through the reduced wood/charcoal combustion and the need for water purification through boiling is reduced. The project will also raise awareness among population regarding hygiene and contribute to sustainable development.

The water supply systems of the projects GS6752 and GS 7311 are equipped with manual pumps and all the other projects involve boreholes with solar powered pumps (GS7566, GS10657, GS10658 and GS10659).

A.2. Location of project

Republic of Madagascar, Atsimo-Andreafana Region, in Province of Toliara.

GS6752- Villages of Betsingilo and Ambolofoty

GS7311- Villages of Samontilahy, Andaboly and Ankilofolo

GS7566- Villages of Belembokely Androvakely and Andranomena

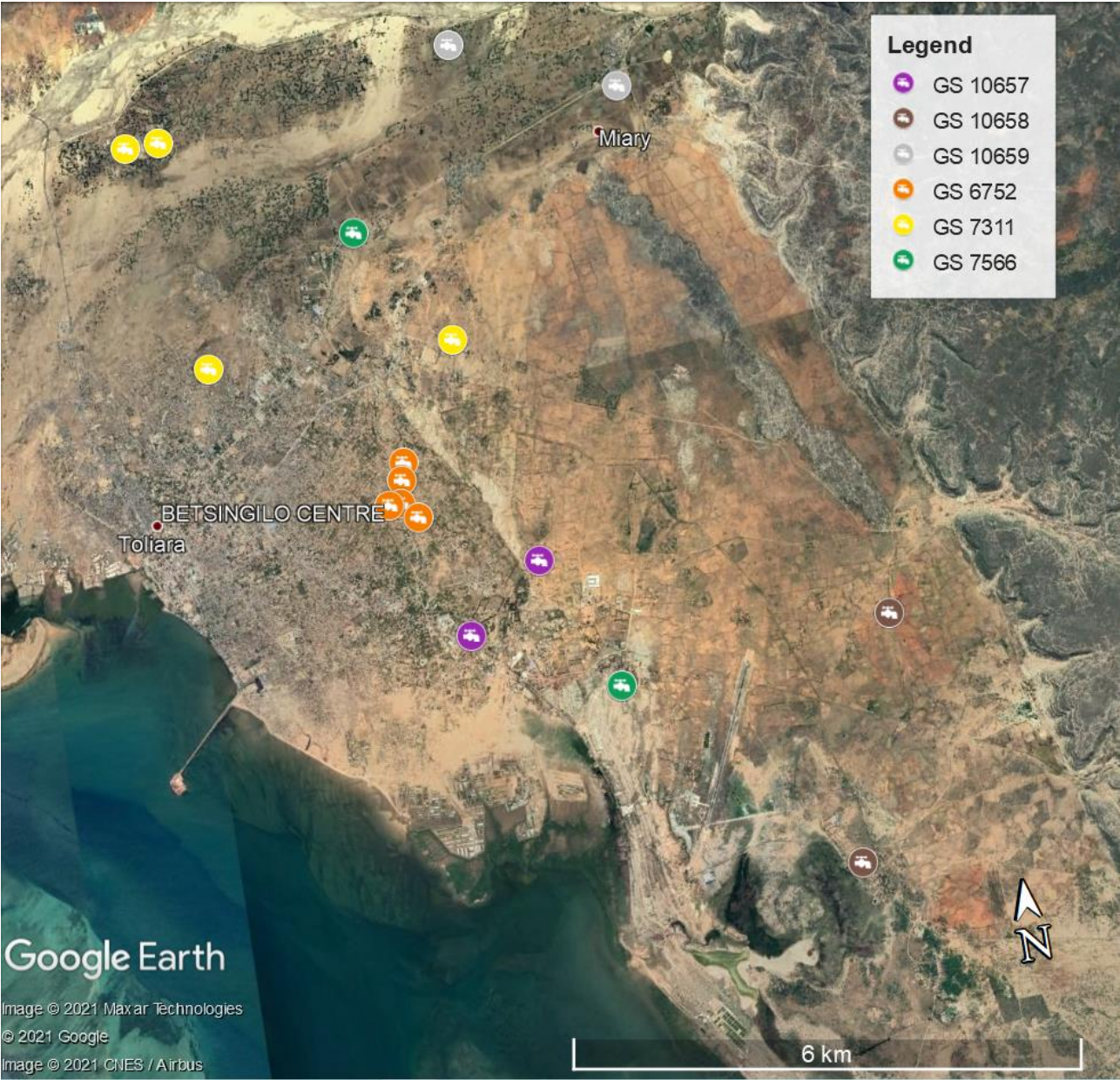
GS10657- Villages of Ankilimarovahatse and Antanamikodoy

GS10658- Villages of Antobe and Ankoronga

GS10659- Miary Ville and Miary Ankoronga

Table A-1. The GPS coordinates of the projects water systems

GS6752		
Betsingilo P1	23°21'13.76"S	43°41'49.21"E
Betsingilo P2	23°21'7.27"S	43°41'37.90"E
Betsingilo P3	23°21'7.28"S	43°41'42.80"E
Ambolofoty P6	23°20'51.70"S	43°41'46.56"E
Ambolofoty P7	23°20'58.45"S	43°41'44.73"E
GS7311		
Samotilahy	23°20'7.47"S	43°42'15"E
Andaboly	23°20'3.04"S	43°40'31.03"E
Ankilofolo P1	23°18'31.74"S	43°40'24.09"E
Ankilofolo P2	23°18'38.40"S	43°40'12.27"E
GS7566		
Belembokely Androvakely	23°19'19.54"S	43°41'40.45"E
Andranomena	23°22'30.93"S	43°43'2.62"E
GS10657		
Ankilimarovahatse	23°22'2.34"S	43°42'3.60"E
Antanamikodoy	23°21'38.00"S	43°42'36.65"E
GS10658		
Antobe	23°22'20.51"S	43°44'58.46"E
Ankoronga Angara	23°23'53.00"S	43°44'30.25"E
GS10659		
Miary Ville	23°18'38.95"S	43°43'40.99"E
Miary Ankoronga	23°18'11.94"S	43°42'32.72"E



Imagine A-1. Location of projects water systems



Imagine A-2. Example of project scenario of GS6752 (Betsingilo P2)



Imagine A-3. Example of project scenario of GS7311 (Andaboly)



Imagines A-4, A-5. Project water systems constructed in Belemboky Androvakely and Andranomena villages (GS7566)



Imagines A-6, A-7. Project water systems constructed in Ankilimarovahatse and Antanimikodoy villages (GS10657)



Imagines A-7, A-8. Project water systems constructed in Antobe and Ankoronga villages (GS10658)



Imagines A-9, A-10. Project water systems constructed in Miary Ville and Miary Ankoronga villages (GS10659)

A.3. Reference of applied methodology

Technologies and practices to displace decentralized thermal energy consumption (TPDDTEC), version 3.1

A.4. Crediting period of project

The length of the crediting period is 5 years, twice renewable in line with Community Services Activity Requirements.

The start and end dates of all the projects crediting period are as follows:

GS6752: 18/11/2018 – 17/11/2023

GS7311: 26/11/2018 – 26/11/2023

GS7566: 22/09/2019 – 21/09/2024

GS10657: 22/09/2019 – 21/09/2024

GS10658: 23/11/2019 – 22/11/2024

GS10659: 22/09/2019 – 21/09/2024

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

As per the registered PDDs, the water systems have been installed to ensure the supply of safe drinking water for domestic use in the villages.

Table B-1. Summary of projects water systems

Borehole ID (i.e. name of the village)	Start date of the construction	End date of the construction	Model of the pump	Total number of people obtaining water
GS6752				
Betsingilo P1	13/08/2018	17/11/2018	India Mark II	300
Betsingilo P2	13/08/2018	17/11/2018	India Mark II	300
Betsingilo P3	17/08/2018	17/11/2018	India Mark II	300
Ambolofoty P6	09/08/2018	16/11/2018	India Mark II	300
Ambolofoty P7	01/09/2018	04/11/2018	India Mark II	300
GS7311				
Samotilahy	06/08/2018	16/11/2018	India Mark II	300
Andaboly	21/08/2018	29/10/2018	India Mark II	300
Ankilofolo P1	27/08/2018	30/10/2018	India Mark II	300
Ankilofolo P2	05/09/2018	25/11/2018	India Mark II	300
GS7566				
Belemboky Androvakely	15/05/2019	21/09/2019	LSPI Series DC Brush Plastic Impeller Solar Pump	2,979
Andranomena	15/05/2019	21/09/2019	LSPI Series DC Brush Plastic Impeller Solar Pump	3,019
GS10657				
Ankilimarovahatse	15/05/2019	21/09/2019	LSPI Series DC Brush Plastic	2,963

			Impeller Solar Pump	
Antanamikodoy	15/05/2019	22/11/2019	LSPI Series DC Brush Plastic Impeller Solar Pump	2,933
GS10658				
Antobe	15/05/2019	24/12/2019	LSPI Series DC Brush Plastic Impeller Solar Pump	1,959
Ankoronga Angara	15/05/2019	22/11/2019	LSPI Series DC Brush Plastic Impeller Solar Pump	3,021
GS10659				
Miary Ville	15/05/2019	21/09/2019	LSPI Series DC Brush Plastic Impeller Solar Pump	3,009
Miary Ankoronga	15/05/2019	21/09/2019	LSPI Series DC Brush Plastic Impeller Solar Pump	2,996

Table B-2. Monitoring Activities implemented during the current Monitoring Period

Monitoring Activity	Time
Annual hygiene campaigns	06/07/2020 (GS6752)
	09/07/2020 (GS7311)
	18/07/2020 (GS7566)
	27/07/2020 (GS10657)
	30/07/2020 (GS10658)
	13/07/2020 (GS10659)
Monitoring survey	14/09/2020-25/09/2020
WCFT	28/09/2020-08/10/2020

1 st water quality test	05/12/2019 (GS6752-GS7311)
	18/03/2020 (GS7566-GS10657-GS10658- GS10659)
2 nd water quality test	03/03/2020 (GS6752-GS7311)
	08/06/2020 (GS7566-GS10657-GS10658- GS10659)
3 rd water quality test	08/06/2020 (GS6752-GS7311)
	03/09/2020 (GS7566-GS10657-GS10658- GS10659)
4 th water quality test	03/09/2020 (GS6752-GS7311)

B.1.1 Forward Action Requests

GS6752-GS7311

Forward Action Request # 1: *For the next monitoring, the random selection of households shall be performed by PP and sampling protocol and screenshots of random number generation shall be provided and PP shall have a list of all users in accordance with the requirements of the methodology.*

Please refer to "Sample plan_randomly selection" for random selection of households and sampling protocol and screenshots of random number generation. Furthermore, please refer to spreadsheets "BETSINGILO_1Km" and "AMBOLOFOTY_1Km" within "GS6752 - Ex post calculation" and also to spreadsheets "Samotilahy_1Km", "Andaboly_1Km" and "Ankilofolo_1Km" within "GS7311 - Ex post calculation" for the lists of all users.

Forward Action Request # 2: *For future verification, the PP shall submit a list of total number of end users and in case of discrepancy with number of users in the 1st MP, the ERs for the 1st MP shall be suitably adjusted.*

As reported above, please refer to "GS6752 - Ex post calculation" and "GS7311 - Ex post calculation" for the lists of total number of users. Furthermore, the ERs has been updated in compliance with the end users lists.

GS7566

Forward Action Request # 1: *The PP shall provide the list of water systems and boreholes under the VPA with their GPS locations to demonstration of no double counting in time for verification.*

Please refer to Section A.2 of this Monitoring Report

Forward Action Request # 2: *PP shall submit the proof of start date in time for first verification.*

Relative evidence has been uploaded to SC App. Please refer to:

"GS7566_Andranomena_Start date" and "GS7566_Belemboky Androvakely_start date"

Forward Action Request # 3: *PP shall provide the carbon right assertions in time for verification stage.*

Relative evidence has been uploaded to SC App. Please refer to:

"GS7566_Andranomena_Carbon rights assertion" and "GS7566_Belemboky Androvakely_Carbon rights assertion"

Forward Action Request # 4: *The walking/pedaling distance of users shall be monitored during the monitoring surveys by the PP.*

The distance of users has been monitored through specific question in the monitoring survey (question n. 34), the average distance from the project borehole is 160 meters. Please refer to "Usage Survey 2020 raw data and analysis" uploaded to SC Application.

Forward Action Request # 5: *PD shall make sure that the usage survey shall cover effect of seasonality and use of other sources are adequately covered and survey is free of potential survey bias.*

The effect of seasonality has been monitored through specific questions in the monitoring survey (question n.18-23-38). Moreover, some respondents declared to use the water from the river during the raining season to water the plants and the animals.

Forward Action Request # 6: *PD shall make sure that during WCFT the total water used for all purposes by users from the project technology must be measured – along with crediting litres.*

Please refer to: "WCFT 2020 Report" and "WCFT 2020 raw data and analysis" uploaded to SC Application.

Forward Action Request # 7: *The total number of persons consuming water supplied by project through year y is a monitored parameter and PD shall submit this information during the 1st verification.*

The total number of persons using each water supply and treatment system has been monitored through the production of an end-users list which is reported in a separated spreadsheet within the ER calculation Excel. Relative documents have been uploaded to SC Application.

Forward Action Request # 8: *PD to provide full transparency on maintenance programme roles and responsibilities. This should include: the process of recording and reporting all faults/breakdowns and when a borehole starts working again. It should also include a summary of all planned annual maintenance tasks and the downtime expected for these tasks. Future monitoring reports must have % total borehole downtime (and days) recorded transparently in Project Technology Days parameter box*
Please refer to: "Maintenance plan" and uploaded to SC Application.

GS10657-GS10658-GS10659

Forward Action Request # 1: *The PP must submit the questionnaires which include the questions for surveying the percentage of each fuel types from users. The PP shall demonstrate that the selected samples are representative for the project population by providing the sampling frame, calculation for number of samples for village and households, screenshot of the random number generator, etc.*

The percentage of users per used fuel has been monitored through the question number 22 ("What fuels do you use?" "Specify Kg/week and price/week) within the monitoring survey. Please refer to columns AL and AN of the spreadsheet "Raw data" and row 147-148 of the spreadsheet "Analysis" within "Usage Survey 2020 raw data and analysis". Please refer also to "Sample plan_randomly selection" uploaded to SC Application.

Forward Action Request # 2: *The PP must survey the actual water consumption for all demand from households besides drinking, food preparation but also other personal purposes such as washing, bathing, etc. and apply in the calculation of Cap number of users per borehole.*

During the monitoring survey all the respondents declare not to use other sources for drinking, cooking and personal hygiene (question number 35) furthermore, almost all the households indicated the to use other sources like open wells and rivers for other kind of purpose i.e. water the plant and do the laundry. For more information, please refer to row 225-281 of the spreadsheet "Analysis" within "Usage Survey 2020 raw data and analysis".

Moreover, the total consume per person has been monitored through the questions 45-46-47, where all the households indicated the total consume of water from the projects water supply systems (average 9.25 liters/person) and more precisely the total consume just for drinking, cooking and person (average 7.71 litres/person).

Forward Action Request # 4: *The walking/pedaling distance of users shall be monitored during the monitoring surveys by the PP.*

The distance of users has been monitored through specific question in the monitoring survey (question n. 34 "Distance project borehole (meters in one direction)?"). Please refer to row 214-216 of the spreadsheet "Analysis" within "Usage Survey 2020 raw data and analysis".

Forward Action Request # 5: *PD shall make sure that the usage survey shall cover effect of seasonality and use of other sources are adequately covered and survey is free of potential survey bias.*

The effect of seasonality has been monitored through specific questions in the monitoring survey (question n.18-23-38). Moreover, some respondents declared to use the water from the river during the raining season to water the plants and the animals.

Forward Action Request # 6: *PD shall make sure that during WCFT the total water used for all purposes by users from the project technology must be measured – along with crediting litres.*

Please refer to: "WCFT 2020 Report" and "WCFT 2020 raw data and analysis" uploaded to SC Application.

Forward Action Request # 7: *The total number of persons consuming water supplied by project through year y is a monitored parameter and PD shall submit this information during the 1st verification.*

The total number of persons using each water supply and treatment system has been monitored through the production of an end-users list which is reported in a separated spreadsheet within the ER calculation Excel. Relative documents have been uploaded to SC Application.

Forward Action Request # 8: *PD to provide full transparency on maintenance programme roles and responsibilities. This should include: the process of recording and reporting all faults/breakdowns and when a borehole starts working again. It should also include a summary of all planned annual maintenance tasks and the downtime expected for these tasks. Future monitoring reports must have % total borehole downtime (and days) recorded transparently in Project Technology Days parameter box.*

Please refer to: "Maintenance plan" and uploaded to SC Application.

B.2. Post-Design Certification changes

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

N/A

B.2.2. Corrections

N/A

B.2.3. Changes to start date of crediting period

N/A

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

N/A

B.2.5. Changes to project design of approved project

The applied value for charcoal and wood fuel consumption is change from the registered VPA-DD (GS6752 and GS7311) to be in line with the latest GS Update and BAMG report.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

In line the section B.7.3. of the registered VPA-DD the monitoring is to be made by keeping records on the water supply systems and by conducting the studies after the project implementation start in line with the applied methodology as described below:

1) Record of the Water Supply Systems

The records of the information collected in an electronic database in line with the Section B.3 of the PoA-DD for enabling the unique identification of the project water supply systems was been kept. The database includes the following information:

- Unique identification number of each Water Supply System
- Date of installation of each Water Supply System
- GPS location of each Water Supply System
- Model of the pump and filter used for each Water Supply System
- Total quantity of the constructed Water Supply Systems
- The total number of people obtaining their water from each Water Supply System

These data are summarised in the Emission Reduction Calculation sheet¹ as well as in the above tables A-1 and B-1.

2) Studies on Project Scenario

After the project implementation start, the following studies have been conducted for the project scenario:

A. Project Non-Renewable Biomass (NRB) Assessment – at least at renewal of crediting period

In accordance with the TPDDTEC methodology, the NRB assessment can be remained fixed for the entire crediting period and thus no updates or new assessment have been made during this monitoring period.

¹ Please refer tab "ERs" with in the ER Ex post calculations spreadsheets

B. Project Survey (PS) of end-user characteristics – completed annually

The project survey has the same requirements as the baseline survey (described in Section B.4 of this VPA-DD) but is conducted with end-users representative of the project scenario target population and currently using the safe water project technology. In the guidance data collected, questions about end-user characteristics and baseline technology and fuels should be treated as specific to safe water supply and water treatment.

During this monitoring period the Project Survey and the below described Usage Survey has been implemented together during 14/09/2020 – 25/09/2020. The summary of the obtained results is described below. A more detailed description of the results is made in a separate document².

C. Baseline Water Boiling Test (BWBT) - completed at least once

In line with BAMG report, the following conservative values for baseline fuels have been used:

- 0.4 Kg/l for wood (default value)
- 0.125 Kg/l for charcoal (capped value).

A separate baseline water boiling test (BWBT) for charcoal fuel consumption has been conducted in Spring 2021 in line the indications of the applied methodology and the BAMG report. The value obtained from the field measurement has been selected to be conservatively capped at 0.125 Kg/litre.³

Moreover, the monitoring survey has confirmed the same water boiling technologies prevalent in the baseline and in the project scenarios.

D. Water Consumption Field Test (WCFT) - completed at least biennially

² Usage Survey 2020 raw data and analysis

³ BWBT Madagascar 2021

The project proponent has carried out the WCFTs to determine the actual safe water consumption and boiling volumes (both of raw/unsafe water and safe water)⁴ for the projects scenarios. The WCFTs have been completed prior to the verification and in future will be made at least every two years after with randomly selected end-users representative of the project scenario target population and currently using the projects technology following the WCFT Procedure designed for the project⁵ .

The following three different volumetric variables are measured during the WCFTs:

Q_p	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
$Q_{p,rawboil,y}$	Quantity of raw or unsafe water boiled in the project scenario p per person per day
$Q_{p,cleanboil,y}$	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p per person per day

The Water Consumption Test was made between 28th September and 8th October 2020 in 30 randomly selected families among nine of the projects' villages (Ambolofoty, Ankilifolo, Ankilimarovahatse, Ankoronga Angara, Antanimikodoy, Betsingilo, Miray Ankoronga, Miray Ville)⁶.

E. On-going Monitoring Studies: Usage rates, leakage, water quality

Water quality testing – completed every quarter

The quality of the treated water will be assessed to ensure that it is fit for human consumption. In line with the national standard the quality shall be 0 Colony

⁴ Measured as volume per person per day

⁵ WCFT Procedure has been provided to Gold Standard at the projects validation.

⁶ WCFT 2020 Report uploaded to SC application

Forming Unit (CFU) of E. Coli / 100 ml of safe water⁷. The water quality must be tested every quarter, with the first test within 6 months of the stated project start date. In addition, project participants shall ensure that water quality is tested at least once during season where there is a high chance of contamination, for example the rainy season.

The water quality testing has been made in the local laboratory or in the accredited laboratory⁸. The detailed results of each test are provided as a separate document⁹. All the test confirmed the water to be in line with the national water quality requirements and no Colony Forming Units (CFU) were found to be present.

The hygienic campaigns organized during this monitoring period have further enhanced awareness raising regarding the hygienic water usage in the project area. The detailed description of the made hygienic campaigns is provided in a separate document¹⁰.

Usage Survey – completed at least annually

In line with the registered VPA-DDs, the Usage Survey is completed annually, or more frequently, and all cases on time for any request of issuance. The usage survey provides a single usage parameter that is weighted based on drop off rates that are representative of age distribution for project technologies in the sales/distribution/construction record.

For this monitoring period Usage Survey and the above described Project Survey have been implemented together during 14/09/2020-25/09/2020. Totally 110 households were interviewed. Below are summarized the obtained main results.

⁷ See the document "Décret MECIE - 2004" uploaded in SC application at project validation

⁸ Institut Pasteur de Madagascar, Laboratoire d'Hygiène des Aliments et de l'Environnement, Antananarivo and LNB Laboratoire d'Analyses Médicales, Immeuble "Aro Immobilier", Hell-Ville, Centre Nosy Be.

⁹ Results of the quality tests 2020

¹⁰ Reports on hygiene campaign uploaded to SC Application

- 110 persons were interviewed within 12 out of 13 project villages. 45% of the respondents were women.
- Averagely the households are composed of around 7 members, from which 58% are children.
- All the households are using traditional charcoal stoves as their principal cooking device. Moreover, the 100% affirmed to use charcoal as fuel and 6% declared to use both charcoal and wood as fuels and also declared to have three stone fire as additional stove. No variations on the used stove models were found to be between different seasons but 3 out of 110 state to use a different stove in different occasions like ceremonies.
- No other fuels than wood and charcoal are used in the project area. Neither significant seasonal variations in the used fuel types was found. The perception of the respondents was that the fuel prices have got higher during the last 5 years.
- Averagely 2 meals are cooked per day
- 100% of the households obtain the water from project boreholes for drinking, cooking and personal hygiene purposes. Other sources like open well and river are used for other reasons like water the plants, wash clothes and to provide water for the animals.
- The water is fetched from the projects water systems averagely 4-5 times per day. The one-way distance to the project boreholes were averagely 160 meters.
- No one of the respondents stated to purify the water deriving from project borehole before drinking it.

Leakage Assessment – completed every other year

As the leakage risks related to the safe water supply and treatment technologies can be deemed very low, the leakage can be ignored, and leakage is expected to be 0.

However, to confirm that leakage can be deemed very low, the below described leakage assessment regarding the potential leakage sources (listed in the methodology TPDDTEC, pages 12-13) shall be completed every other year, starting on time for the first verification in line with the section 2.6 ("Leakage") of the applied TPDDTEC methodology.

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

Not applicable and therefore not counted. In these VPAs the baseline technologies are referring to the methodologies used for water boiling which are three stone fires and traditional charcoal stoves. As confirmed by the made Monitoring Survey made in 2019 these baseline methodologies have continued to be used by the families for cooking activities (even though the project has replaced the need for boiling the water) and it's not foreseen that the project would have led to the displacement of the baseline technologies outside the project boundary.

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

Not applicable and therefore not counted. As confirmed by the Monitoring Survey made in 2019, the energy used in the area for eventual water boiling are firewood and charcoal. It is very unlikely that users who previously (in the baseline) used for example non-GHG emitting methods like chlorine treatment for water purification would switch to boiling drinking water because another 'zero emission' technology is promoted by the project.

c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario. Due to the small size of these VPAs, it's not expected that it will have significant influence on the national NRB fraction.

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

Not applicable and therefore not counted. It is unlikely that households would had used the boiling of drinking water for space heating. In addition, end-users retain use of the baseline technologies for cooking and the difference in heat effects from no longer boiling water can be considered minimal. Any retaining use of inefficient technology for water boiling will, anyhow, be covered in the results of the water consumption field test (WCFT).

e) By virtue of promotion and marketing of 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.

Not applicable and therefore not counted. As confirmed by the Monitoring Survey made in 2019, the technologies used in the baseline for water boiling are three stone fires and traditional charcoal stoves with either non-renewable biomass or fossil fuels and/or the end-users are lacking access to safe water. It is very unlikely that users who previously (in the baseline) used for example non-GHG emitting methods like chlorine treatment for water purification would switch to boiling drinking water because another 'zero emission' technology is promoted by the project.

F. Hygiene Survey – completed annually

The hygiene campaigns are to be carried out in the project area annually. All the hygiene campaigns are foreseen to be based on "Water, Sanitation, and Hygiene Improvement, Training Package for the Prevention of Diarrheal Disease, Guide for Training Outreach Workers, USAID Hygiene Improvement Project, 2009" which is referred to in the applied methodology and to be in line with the plan described in the section B.7.2 of the registered VPA-DDs.

The conducted activities as well as the number of the participants in the organized campaigns and the number of the trained personnel are to be described annually in the monitoring reports. Moreover, any major changes on the health status of the water users as a result of contaminated water (e.g. an outbreak of water related disease) should be reported and, if relevant, a strategy put in place to address it through the hygiene campaign. Hygiene refers here to access to sanitation amenities, equipment and infrastructure, as well as to the behaviour in respect to regular and correct use of such amenities. It also refers to behaviour that prevents infections from water-related diseases.

The success of education on hygiene issue will also be monitored through the WCFT which will study the ratio of end-user that are still boiling their drinking water in the project scenario and through the usage/monitoring survey to check on the use of clean/safe containers and devices for transport and storage of water used for drinking, cooking, food preparation and basic personal hygiene. In case needed the education on the hygiene will be adjusted if proven unsuccessful.

During this monitoring period the following hygiene campaigns and have been organized:

- Hygiene Campaign GS6752 (Ambolofoty village)
- Hygiene Campaign GS7311 (Andaboly village)
- Hygiene Campaign GS7566 (Belemboky Androvakely village)
- Hygiene Campaign GS10657 (Antanamikodoy village)
- Hygiene Campaign GS10658 (Ankoronga Angara village)
- Hygiene Campaigns GS10659 (Ankoronga Miary and Miary Ville villages)

During the events water, sanitation and health related issues were discussed and the benefits of consumption of clean water and the ways for hygienic handling during transport, storage and usage of clean water have been highlighted. The detailed description of the hygienic campaigns made during this monitoring period is provided in a separate document¹¹.

SECTION D. DATA AND PARAMETERS

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

SDG 13

Data/parameter:	X _{boil}
Unit	Percentage
Description	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary.

¹¹ GS6752-Report on hygiene campaign, GS7311-Report on hygiene campaign, GS7566 - Report on hygiene campaign, GS10657 - Report on hygiene campaign, GS10658 - Report on hygiene campaign, GS10659 - Report on hygiene campaign_Ankoronga Miary, GS10659 - Report on hygiene campaign_Miary Ville.

Source of data	Baseline Survey ¹²
Value(s) applied)	0.149
Choice of data or measurement methods and procedures	Baseline Study found 14.9% of the interviewed families, in the absence of the project activity, would have preferred to use liquid chlorine for water purification if it would be available for them.
Purpose of data	Estimation of CO2e emission reductions
Additional comments	Transparent data analysis and reporting. This parameter is only applied for premises that are under suppressed demand situation. Parameter is also used to calculate: SDG 3 and SDG 6

Data/parameter:	C _j
Unit	Percentage
Description	Percentage of users of project safe water supply who were already in baseline using a non-boiling safe water supply
Source of data	Baseline Survey
Value(s) applied)	0.02
Choice of data or measurement methods and procedures	Baseline Study found 2% of the interviewed families to consume non-boiling safe water supply (water purified with liquid chlorine).
Purpose of data	Estimation of CO2e emission reductions
Additional comments	Transparent data analysis and reporting. Parameter is also used to calculate: SDG 3 and SDG 6

Data/parameter:	Specific fuel consumption
Unit	Kg/Litre
Description	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representatives of baseline scenario b during year y
Source of data	BAMG report BWBT ¹³
Value(s) applied)	0.40 for wood (default value, BAMG report) 0.125 for charcoal (capped value, BWBT)

¹² See the document "GS6752_GS7311 Baseline Survey Report_2018", uploaded to SC application

¹³ BWBT Madagascar 2021

Choice of data or measurement methods and procedures	Default value for wood (from BAMG report) A separate baseline water boiling test (BWBT) for charcoal fuel consumption has been conducted in Spring 2021 in line the indications of the applied methodology and the BAMG report. The value obtained from the field measurement has been selected to be conservatively capped at 0.125 Kg/litre
Purpose of data	Estimation of CO ₂ e emission reductions
Additional comments	

Data/parameter:	EF _{b,co2}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value for wood
Value(s) applied)	112
Choice of data or measurement methods and procedures	Deemed valid by TPDDTEC Methodology
Purpose of data	Estimation of CO ₂ e emission reductions
Additional comments	

Data/parameter:	EF _{b,non co2}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor arising from use of fuels in project scenario
Source of data	IPCC default value for wood
Value(s) applied)	8.692
Choice of data or measurement methods and procedures	Deemed valid by TPDDTEC Methodology
Purpose of data	Estimation of CO ₂ e emission reductions
Additional comments	If EF is in units of tCO ₂ /t _{fuel} , remove NCV term from emission calculations. Term can include a combination of emission factors from fuel production, transport and use in line with the emission sources included in the project. CO ₂ -emission factors for charcoal may be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent EF for wood.

Data/parameter:	EF _{p,co2}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor arising from use of fuels in project scenario
Source of data	IPCC default value for wood

Value(s) applied)	112
Choice of data or measurement methods and procedures	Deemed valid by TPDDTEC Methodology
Purpose of data	Estimation of CO ₂ e emission reductions
Additional comments	If EF is in units of tCO₂/t_{fuel}, remove NCV term from emission calculations. Term can include a combination of emission factors from fuel production, transport and use in line with the emission sources included in the project. CO₂-emission factors for charcoal may be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent EF for wood.
Data/parameter:	EF _{p,non-co2}
Unit	tCO ₂ /TJ
Description	Non-CO ₂ emission factor arising from use of fuels in project scenario
Source of data	IPCC default value for wood
Value(s) applied)	8.692
Choice of data or measurement methods and procedures	Deemed valid by TPDDTEC Methodology
Purpose of data	Estimation of CO ₂ e emission reductions
Additional comments	If EF is in units of tCO₂/t_{fuel}, remove NCV term from emission calculations. Term can include a combination of emission factors from fuel production, transport and use in line with the emission sources included in the project. Non-CO₂-emission factors for charcoal may be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent EF for wood.

Data/parameter:	f _{NRB,i,y}
Unit	Fraction

Description	Non-renewability status of woody biomass fuel in scenario I during the year y
Source of data	Default f _{NRB} value provided by CDM Executive Board and endorsed by the host country DNA ¹⁴ .
Value(s) applied)	0.72
Choice of data or measurement methods and procedures	The default NRB value provided by the CDM Executive Board and endorsed by the host country DNA is deemed valid by the applied TPDDTEC methodology.
Purpose of data	Estimation of CO ₂ e emission reductions
Additional comments	The value of f _{NRB} is fixed ex-ante for entire crediting period even though the project activity may choose to update the f _{NRB} during the crediting period. In case CDM/DNA updates on this value, PP may continue to use the registered value by demonstrating it's to be a conservative approach. Otherwise, PP shall use an updated value

Data/parameter:	NCV _{b, fuel}
Unit	TJ/ton
Description	Net calorific value of the fuels used in the baseline
Source of data	IPCC default value for wood
Value(s) applied)	0.0156
Choice of data or measurement methods and procedures	Deemed valid by TPDDTEC Methodology
Purpose of data	Estimation of CO ₂ e emission reductions
Additional comments	Fixed for the entire VPA crediting period Term can include a combination of emission factors from fuel production, transport and use in line with the emission sources included in the project.

Data/parameter:	NCV _{p, fuel}
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project
Source of data	IPCC default value for wood
Value(s) applied)	0.0156
Choice of data or measurement methods and procedures	Deemed valid by Methodology

¹⁴ Available at <http://cdm.unfccc.int/DNA/fNRB/index.html> (Site visited 02/12/2019)

Purpose of data	Estimation of CO ₂ e emission reductions
Additional comments	Fixed for the entire VPA crediting period Term can include a combination of emission factors from fuel production, transport and use in line with the emission sources included in the project. If EF in units of tCO₂/t_{fuel}, remove NCV term from emission calculations. This has same values as NCV_{baseline} in projects which reduce use of the same fuel.

D.2 Data and parameters monitored

SDG 13

Data/parameter:	N _{p,y}
Unit	Persons.days
Description	Number of person.days consuming water supplied by project scenario p through year y

Source of data	The total number of persons using each water supply and treatment system is monitored through the production of an end-users list¹⁵ The total number of operational days is monitored¹⁶.												
Value(s) applied	GS6752 <table border="1"> <tr> <td>18/11/2019 - 08/10/2020</td><td>461,700</td></tr> </table> GS7311 <table border="1"> <tr> <td>18/11/2019 - 08/10/2020</td><td>369,360</td></tr> </table> GS7566 <table border="1"> <tr> <td>22/09/2019 - 08/10/2020</td><td>2,176,674</td></tr> </table> GS10657 <table border="1"> <tr> <td>22/09/2019 - 08/10/2020</td><td>1,966,905</td></tr> </table> GS10658 <table border="1"> <tr> <td>23/11/2019 - 08/10/2020</td><td>1,457,236</td></tr> </table> GS10659 <table border="1"> <tr> <td>22/09/2019 - 08/10/2020</td><td>2,179,215</td></tr> </table>	18/11/2019 - 08/10/2020	461,700	18/11/2019 - 08/10/2020	369,360	22/09/2019 - 08/10/2020	2,176,674	22/09/2019 - 08/10/2020	1,966,905	23/11/2019 - 08/10/2020	1,457,236	22/09/2019 - 08/10/2020	2,179,215
18/11/2019 - 08/10/2020	461,700												
18/11/2019 - 08/10/2020	369,360												
22/09/2019 - 08/10/2020	2,176,674												
22/09/2019 - 08/10/2020	1,966,905												
23/11/2019 - 08/10/2020	1,457,236												
22/09/2019 - 08/10/2020	2,179,215												
Measurement methods and procedures	As per FT updates												
Monitoring frequency	Annually												
QA/QC procedures:	Transparent data analysis and reporting												
Purpose of data:	Estimation of CO2e emission reductions												
Additional comments:	Example of calculation methods: GS6752: 2,500 persons * 308 days= 769,500 persons.days For the complete calculations please refer the ER spreadsheet (tap ERs, column E)												

Data/parameter:	Percentage of users per used fuel
Unit	%
Description	Percentage of user that are using firewood or charcoal
Source of data	Monitoring survey
Value(s) applied	0.94 charcoal; 0.06 firewood
Measurement methods and procedures	This parameter is used to calculate Wb,y and Wp,y

¹⁵ Please refer to the relative spreadsheet in the Ex-post calculation documents uploaded to SC Application. "GS6752 - Ex post calculation_ver02", "GS7311 - Ex post calculation_ver02", "GS7566 - Ex post calculation_ver02", "GS10657 - Ex post calculation_ver02", "GS10658 - Ex post calculation_ver02" and "GS10659 - Ex post calculation_ver02"

¹⁶ The number of operation days ("Technology days") has been monitored for each supply systems, please refer to "maintenance plan" uploaded to SC Application. To be conservative the value of technology days has been capped at 347 days as per GS recommendations.

Monitoring frequency	Annually
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Estimation of CO ₂ e emission reductions
Additional comments:	

Data/parameter:	$Q_{p,y}$
Unit	Liters per person per day (l/person/day)
Description	Quantity of safe water supplied in the project scenario p during the year y, using the “zero or low” emissions’ clean water supply technology
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	7
Measurement methods and procedures	As per WCFT
Monitoring frequency	At least biennially
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Estimation of CO ₂ e emission reductions
Additional comments:	WCFT made in 2020 resulted as 8.8 litre/person/day. This value has been capped to 7 litres in line with the page 39 of the applied methodology. For further details on WCFT please refer the separate WCFT Report 2020

Data/parameter:	$Q_{p,rawboil,y}$
Unit	Litres per person per day (l/person/day)
Description	Quantity of raw or unsafe water that is still boiled after installation of the water treatment technology.
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	0
Measurement methods and procedures	As per WCFT
Monitoring frequency	At least biennially
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Estimation of CO ₂ e emission reductions
Additional comments:	For further details on WCFT please refer the separate WCFT Report 2020.

Data/parameter:	$Q_{p,cleanboil,y}$
Unit	Litres per person per day (l/person/day)
Description	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	0
Measurement methods and procedures	As per WCFT

Monitoring frequency	At least biennially
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Estimation of CO ₂ e emission reductions
Additional comments:	For further details on WCFT please refer the separate WCFT Report 2020.

Data/parameter:	$U_{p,y}$
Unit	Percentage
Description	Usage rate in project scenario p during year y
Source of data	Annual usage survey
Value(s) applied	90%
Measurement methods and procedures	Field survey
Monitoring frequency	Annual or more frequently, in all cases on time for any request for issuance
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Estimation of CO ₂ e emission reductions and monitoring of SDG 3
Additional comments:	Parameter is also used to calculate SDG 3

Data/parameter:	$LE_{p,y}$
Unit	tCO ₂ e /year
Description	Leakage in project scenario p during year y
Source of data	Baseline and monitoring surveys
Value(s) applied	0
Measurement methods and procedures	Field survey
Monitoring frequency	Every two years
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Estimation of CO ₂ e emission reductions
Additional comments:	Aggregate leakage can be assessed for multiple project scenarios

Data/parameter:	Quality of the treated water
Unit	As appropriate in alignment with QA/QC procedures

Description	Performance of the treatment technology – less than 1 Colony Forming Unit (CFU) of E.Coli / 100 ml of safe water ¹⁷
Source of data	Water quality test
Value(s) applied	Zero Colony Forming Units (CFU) of E.Coli / 100 ml of safe water
Measurement methods and procedures	As per the local laboratory procedures for measuring E. Coli.
Monitoring frequency	Quarterly
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Estimation of CO ₂ e emission reductions
Additional comments:	N/A

Data/parameter:	Hygiene campaigns
Unit	N/A
Description	Hygiene campaigns carried out among project technology users. The description of the campaigns is provided in Section B.6.1.
Source of data	Annual hygiene campaigns results
Value(s) applied	Report of the annual hygiene campaign
Measurement methods and procedures	N/A
Monitoring frequency	Annually
QA/QC procedures:	N/A
Purpose of data:	Estimation of CO ₂ e emission reductions and monitoring of SDG 12
Additional comments:	Prior to the project the local communities received no regular training on water, sanitation and health related issues Parameter is also used to calculate SDG 12

Data/parameter:	Capacity ¹⁸
Unit	Litres per day
Description	Treatment capacity of the project technology/improved sources
Source of data	Manufacturer specification/design specification

¹⁷ See the National Water Quality Standard Madagascar uploaded to Sustaincert

¹⁸ In line with the GS TAC rule update at <http://www.goldstandard.org/articles/tac-rule-updates> (Site visited 25/02/2020)

Value(s) applied	GS6752-GS7311: 14,400 litres per day / each water supply system GS7566-GS10657-GS10658-GS10659: 34,792 litres per day ¹⁹
Measurement methods and procedures	GS6752-GS7311: The capacity of the pump model (India Mark II) is 1,800 litres/h at 10 m head. Assuming an average 8 hours/day consecutive usage, the pump can estimate to be able to supply averagely 14,400 litres of water per day (1,800 l/h * 8 h ²⁰ = 14,400 l/day). GS7566-GS10657-GS10658-GS10659: The calculation is based on: - Capacity water pump - Capacity of the batteryNumber of water taps - Flow rate of each water tap - Peak demand simulation - Capacity of the tank
Monitoring frequency	Once at the time of registration or at inclusion of new technology.
QA/QC procedures:	N/A
Purpose of data:	Estimation of CO ₂ e emission reductions
Additional comments:	The water volume values used in the calculations of emission reductions must be justified in terms of capacity of the project technology/improved sources.

SDG 3

Data/parameter:	Frequency of water-borne diseases (like e.g. diarrhea)
Unit	N/A
Description	Frequency of water-borne diseases with the project families estimated via qualitatively self-estimation by the families
Source of data	Monitoring Survey
Value(s) applied	100% of people are suffering less of diarrhea and other water-borne diseases in the project scenario compared to the baseline scenario
Measurement methods and procedures	Monitoring Survey studied qualitatively the frequency of suffering diarrhea and other water-borne diseases in the project scenario in comparison with the baseline scenario (The sample of project households are asked to evaluate if they experience less, more or the same amount of diarrhea and other water-borne diseases than prior to the project).
Monitoring frequency	Annually
QA/QC procedures:	N/A
Purpose of data:	Monitoring of SDG 3

¹⁹ Please refer to spreadsheet "BenConsAndStorage" in ERs calculation uploaded to SC Application. "GS6752 - Ex post calculation_ver02", "GS7311 - Ex post calculation_ver02", "GS7566 - Ex post calculation_ver02", "GS10657 - Ex post calculation_ver02", "GS10658 - Ex post calculation_ver02" and "GS10659 - Ex post calculation_ver02"

²⁰ The average length of the day in the Tulear area in Madagascar is 10-13 hours/day depending the month (<https://www.timeanddate.com/sun/madagascar/toliara>). Here estimated that water fetching is done during 8 hours/day.

Additional comments:	Based on the Baseline Survey averagely 52.5 % of the families living in the project are suffering diarrhea and other water-borne diseases. The Monitoring Survey studied qualitatively the frequency of water-borne diseases in the project scenario and found that all the people (100%) auto evaluated to suffer less of water-borne diseases like diarrhoea in confront with the baseline scenario.
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Data/parameter:	Py
Unit	Number of persons
Description	Number of persons having access to safe water in the project activity compared to the baseline scenario
Source of data	The total number of persons using each water supply and treatment system will be monitored through the production of an end-users list
Value(s) applied	GS6752: 1,500 GS7311: 1,200 GS7566: 5,998 GS10657: 5,896 GS10658: 4,980 GS10659: 6,005
Measurement methods and procedures	The total number of persons using each water supply and treatment system is monitored through the production of an end-users list
Monitoring frequency	Annually
QA/QC procedures:	N/A
Purpose of data:	Monitoring SDG 3 and SDG 6
Additional comments:	The number of users included in the Project Database will be monitored throughout the project duration. Parameter is also used to calculate SDG 6

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

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
$N_{p,y}$	GS6752: 461,700 GS7311: 369,360	GS6752: 1,534,250 GS7311: 1,227,400
Percentage of users per used fuel	Charcoal: 0.96 Firewood: 0.06	Charcoal: 0.73 Firewood: 0.27
$Q_{p,y}$	7	7
$Q_{p,rawboil,y}$	0	0
$Q_{p,cleanboil,y}$	0	0
$U_{p,y}$	90%	100%
$LE_{p,y}$	0	0

Quality of the treated water	Zero Colony Forming Units (CFU) of E.Coli / 100 ml of safe water	Zero Colony Forming Units (CFU) of E.Coli / 100 ml of safe water
Hygiene campaigns	One annual hygiene campaign	One annual hygiene campaign
Capacity	14,400 litres per day / each water supply system	14,400 litres per day / each water supply system
Frequency of water-borne diseases (like e.g. diarrhea)	100% of people are suffering less of diarrhea and other water-borne diseases in the project scenario compared to the baseline scenario	100% of people are suffering less of diarrhea and other water-borne diseases in the project scenario compared to the baseline scenario
P _y	GS6752: 1,500 GS7311: 1,200	GS6752: 4,250 GS7311: 3,400

Percentage of users per used fuel: the percentage of users has been monitored during the monitoring survey.

During the monitoring all the interviewed declared to use charcoal as main fuel and 6 out of 110 households reported to use both charcoal and wood as main fuels. For conservativeness, the families that declared to use both fuels have been considered as firewood user only.

Furthermore, during the monitoring survey conducted in 2019 all the interviewed declared to use charcoal as main fuel and 9 out of 128 households reported to use both charcoal and wood as main fuels.

P_y: the values have been updated according to the end-users lists.

D.4. Implementation of sampling plan

The sampling approach (line in Section B.7.2 of the registered VPA-DD has been used for the following surveys as summaries below:

Project Survey (PS) of end-user characteristics:

- The Project Survey has the same requirements as the Baseline Survey (described in Section B.4 of the VPA-DDs) regarding the representativeness and sample sizing i.e. at least 100 households need to be sampled when the target groups size is > 1000.
- The Project Survey and the Usage Survey were implemented together using the same sample.

Usage Survey.:

- The minimum total sample of 100 has been respected with 110 interviewed households. All the households were selected randomly within the project's area villages in Betsingilo, Samotilahy, Ambolofoty, Ankilofolo, Andaboly, Beleboky Androvakely, Andranomena, Ankilimarovahatse , Antanamikodoy, Ankoronga Miary Ville and Miary Ankoronga villages.
- The Usage Survey was carried out between the 14/09/2020 – 25/09/2020.
- The total number of villages to be included in the sample was set as 12 using the 95/10 rule. The sample was selected using the simple random approach from the total villages list covering all the VPAs. The random number generator of Excel was used for this purpose²¹.

Table D-1

<i>Randomly selection</i>	<i>Village</i>	<i>VPA</i>	<i>Start date of the VPA</i>
0.0283075	Ankilifolo	GS7311	26/11/2018
0.0511395	Ankoronga Angara	GS10658	23/11/2019
0.1022454	Ankoronga (Miary)	GS10660	22/09/2019
0.1788072	Beleboky Androvakely	GS7566	22/09/2019
0.1813773	Antanamikodoy	GS10657	22/09/2019
0.331526	Betsingilo	GS6752	18/11/2018
0.3607536	Samotilahi	GS7311	26/11/2018
0.5448844	Andranomena	GS10657	22/09/2019
0.6391174	Andaboly	GS7311	26/11/2018
0.6877213	Ambolofoty	GS6752	18/11/2018
0.7797686	Ankilimarovatse	GS10657	22/09/2019
0.8096244	Miary ville	GS10659	22/09/2019
0.8109648	Antobe	GS10658	23/11/2019

- The total number of end-user households to be included in the sample was set 110 and the sample was selected using the simple random approach from the

²¹ Please refer to the spreadsheet "Sampling villages" within "Sample plan_randomly selection" uploaded to SC Application.

total end-user household list covering both VPAs. The random number generator of Excel was used for this purpose.

Table D-2

<i>Village</i>	<i>VPA</i>	<i>Start date of the VPA</i>	<i>No. of people living in 1km radius accessing water</i>	<i>Age of the technologies</i>	<i>No. Surveys (Monitoring Survey)</i>	<i>No. Surveys (WCFT)</i>
Betsingilo	GS6752	18/11/2018	2565	1_2	11	2
Ambolofoty	GS6752	18/11/2018	1755	1_2	10	3
Samontilahy	GS7311	26/11/2018	855	1_2	7	0
Andaboly	GS7311	26/11/2018	866	1_2	7	0
Ankilifolo	GS7311	26/11/2018	1687	1_2	9	3
Belemboky	GS7566	22/09/2019	2979	0_1	12	3
Ankilimarovahatse	GS10657	22/09/2019	2963	0_1	8	3
Antanimikodoy	GS10657	22/09/2019	2933	0_1	3	2
Andranomena	GS10657	22/09/2019	3019	0_1	3	0
Miary Ville	GS10659	22/09/2019	3009	0_1	21	7
Miary Ankoronga	GS10660	22/09/2019	2996	0_1	9	3
Ankoronga Angara	GS10658	23/11/2019	3021	0_1	10	4
					110	30

The above table shows the resulted sample for each village. The made sample selection fulfills also the methodology requirement regarding that at least 30 for project technologies of each age being credited (ie. 44 for the first age group and 66 for the second).

Leakage Assessment:

- Leakage assessment regarding the potential leakage sources was completed with the Usage Survey and therefore no separate sampling approach was used for the leakage assessment.

Water Consumption Field Test (WCFT):

- The minimum sample size requirement of the applied Gold Standard methodology has been reached as the sample size was 30.
- All the sample households where selected randomly within the project's areas in Betsingilo, Samotilahy, Ambolofoty, Ankilofolo, Andaboly, Belemboky Androvakely, Andranomena, Ankilimarovahatse , Antanamikodoy, Ankoronga Miary Ville and Miary Ankoronga villages.

- According to CDM's standard when two or more projects activities are grouped for undertaking a common survey, as for GS6752, GS7311, GS7566, GS10657, GS10658 and GS10659, it shall be ensured that a confidence/precision of 95/10 is achieved for each of the project activity or alternatively lower bound of the 95% confidence level is to be used.
- WCFT was performed during 28/09/2020 – 08/10/2020.
- Detailed description on the made survey and its results is described in a separate report WCFT Report.
- The samples were randomly selected (simple random sample using the random number generator of Excel) out from the 110 end-user households who were previously selected for the Usage Survey²².

Water quality testing:

- The sample for water quality testing was made following the 90/10 precision rule indicated by the applied TPDDTEC methodology.
- Totally three water quality tests have been made for each borehole of the projects GS7566, GS10657, GS10658 and GS10659. For the projects GS6752 and GS7311 four water quality tests have been made for each borehole.
- Detailed results of each test are provided as a separate document. All the tests confirmed the water quality to be in line with the national water quality requirements as no Colony Forming Units (CFU) were found to be present.

Baseline Water Boiling Test (BWBT):

In line with BAMG report, the following conservative values for baseline fuels have been used:

- 0.4 Kg/l for wood (default value)
- 0.125 Kg/l for charcoal (capped value)

A separate baseline water boiling test (BWBT) for charcoal fuel consumption has been conducted in Spring 2021 in line with the indications of the applied methodology and the BAMG report. The value obtained from the field measurement has been

²² For further information, please refer to "Sample plan_randomly selection" uploaded to SC Application.

selected to be conservatively capped at 0.125 Kg/litre. For further information regarding the sampling protocol and sample selection of the BWBT please refer to a separate document²³.

²³ BWBT Madagascar 2021

SECTION E. CALCULATION OF SDG IMPACTS

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

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

Calculation of baseline for SDG 13 outcomes

The equation used to calculate the baseline fuel consumption is calculated in line with the Gold Standard TPDDTEC methodology version 3.1 and registered VPA-DD is as follows:

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

Where:

$B_{b,y}$	Quantity of fuel consumed in baseline scenario b during the year in tons (L/p/d)
X_{boil}	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary
C_j	Percentage of users of project safe water supply who were already in baseline using a non-boiling safe water supply
$N_{p,y}$	Number of person.days consuming water supplied by project scenario p through year y
$W_{b,y}$	Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per Baseline Water Boiling Test.
$Q_{p,y}$	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day in year y
$Q_{p,rawboil,y}$	Quantity of raw water boiled in the project scenario p per person per day

The total safe water consumed in the project scenario is the amount of safe water supplied by the project technology and consumed in the project scenario, plus the amount of raw water boiled after introducing the project technology (respectively represented above as $Q_{p,y} + Q_{p,rawboil,y}$). This total is assumed to be equivalent to the

water boiled in the baseline. Even though the total of these two volumes exceed the cap of 7 liters stipulated in the applied TPDDTEC methodology (the page 39 of applied TPDDTEC methodology), the project proponent's claim for emission reductions may however not exceed the cap.

The transparent calculations of the outcomes of SDG 13 (i.e. CO2e reductions) are provided in a separate Excel Spreadsheet uploaded to GS Registry. For the used data/parameters the sections D.1 and D.2 can be referred.

Calculation of baseline for SDG 3, SDG 6 and SDG 12 outcomes

The baseline situation related to the SDG 3, SDG 6 and SDG 12 is estimated based on the results of the Baseline Survey made in the project area in the year 2018.

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

Calculation of project scenario for SDG 13 outcomes

The equation used to calculate the project scenario fuel consumption is calculated in line with the Gold Standard TPDDTEC methodology version 3.1 and registered VPA-DD is as follows:

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

Where:

$B_{p,y}$	Quantity of fuel f consumed in project scenario p during the year y in tons
C_j	Percentage of users of project safe water supply who were already in baseline using a non boiling safe water supply
$N_{p,y}$	Number of person.days consuming water supplied by project scenario p through year y
$W_{b,y}$	Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per Baseline Water Boiling Test.
$Q_{p,rawboil,y}$	Quantity of raw water boiled in the project scenario p per person per day
$Q_{p,cleannoil,y}$	Quantity of safe water boiled in the project scenario p per person per day in year y

The transparent calculations of the outcomes of SDG 13 (i.e. CO2e reductions) are provided in a separate Excel Spreadsheet uploaded to GS Registry. For the used data/parameters the sections D.1 and D.2 can be referred.

Calculation of Project Scenario for SDG 3, SDG 6 and SDG 12 outcomes

The project outcomes of the SDG 3, SDG 6 and SDG 12 were made following the below described approaches²⁴.

SDG Indicator	Selected parameter	Approach for estimation of the outcome
SDG 3 / Indicator 3.9.2	"Number of additional persons using safe water in the project activity compared to the baseline scenario"	The following equation will be used for calculating the outcomes: $P_{\text{safe}} = P_y * (1 - C_j) * (1 - X_{\text{boil}}) * U_{p,y}$ The more specific explanation is provided below this table.
	"Frequency of water-borne diseases (like e.g. diarrhea)"	No specific calculation. Annual Usage Survey will study based on the qualitative auto-evaluation of the sample families the frequency of suffering of diarrhea and other water-borne diseases in the project scenario in comparison with the baseline scenario (The sample of project households are asked to evaluate if they experience less, more

²⁴ The calculation of Project Scenario for SDG3 and SDG6 have been updated for both GS6752 and GS7311 to be more accurate and in line with the other projects.

		or the same amount of diarrhea and other water-borne diseases than prior to the project).
SDG 6 / Indicator 6.1.1	"Number of additional persons having access to a safe water source in the project activity compared to the baseline scenario"	The following equation will be used for calculating the outcomes: $P_{\text{access}} = P_y * (1 - C_j) * (1 - X_{\text{boil}})$ The more specific explanation is provided below this table.
SDG 12 / Indicator 12.8.1	"Number of campaigns on water, sanitation and health related issues"	<i>No specific calculations.</i> Number and description of the made hygiene campaigns will be reported annually.

E.3. Calculation of leakage

As the leakage risks related to the safe water supply and treatment technologies can be deemed very low, the leakage can be ignored and leakage is expected to be 0. However, to confirm that leakage can be deemed very low, the below described leakage assessment regarding the potential leakage sources (listed in the methodology TPDDTEC, pages 12-13) shall be completed every other year, starting on time for the first verification in line with the section 2.6 ("Leakage") of the applied TPDDTEC methodology.

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

Not applicable and therefore not counted. In this VPA the baseline technologies are referring to the methodologies used for water boiling which are traditional charcoal stoves and three stone fires. As these baseline methodologies will be continued to be used by the families for cooking activities (even though the project will replace the need

for boiling the water for purification purposes), it's not foreseen that the project would lead to the displacement of the baseline technologies outside the project boundary.

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

Not applicable and therefore not counted. The energy sources used in the baseline for water boiling are charcoal and firewood. It is very unlikely that users who previously (in the baseline) used for example non-GHG emitting methods like use of liquid chlorine for water purification would switch to boiling drinking water because another 'zero emission' technology is promoted by the project.

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

Not applicable and therefore not counted. Due to the small size of the VPA, it's not expected that it will have significant influence on the national NRB fraction.

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

Not applicable and therefore not counted. It is unlikely that households would had used the boiling of drinking water for space heating. In addition, end-users retain use of the baseline technologies for cooking and the difference in heat effects from no longer boiling water can be considered minimal. Any retaining use of inefficient technology for water boiling will, anyhow, be covered in the results of the water consumption field test (WCFT).

e) By virtue of promotion and marketing of 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.

Not applicable and therefore not counted. The technologies used in the baseline for water boiling are three stone fires and traditional charcoal stoves with either non-renewable biomass or fossil fuels and/or the end-users are lacking access to safe water. It is very unlikely that users who previously (in the baseline) used for example non-GHG emitting methods like use of liquid chlorine for water purification would switch to

boiling drinking water because another 'zero emission' technology is promoted by the project.

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

GS6752

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emissions Reductions	2,629	N/A	2,366
3	Additional persons using safe water in the project activity compared to the baseline scenario	249	1,500	1,126
6	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	249	1,500	1,251
12	Hygiene campaign on water, sanitation and health related issues made in the project area	0	1	1

GS7311

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emissions Reductions	2,103	N/A	1,838
3	Additional persons using safe water in the project activity compared to the baseline scenario	199	1,200	901
6	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	199	1,200	1,001
12	Hygiene campaign on water, sanitation and health related issues made in the project area	0	1	1

GS7566

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emissions Reductions	12,909	N/A	10,517
3	Additional persons using safe water in the project activity compared to the baseline scenario	1,496	5,998	4,502
6	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	996	5,998	5,002
12	Hygiene campaign on water, sanitation and health related issues made in the project area	0	1	1

GS10657

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emissions Reductions	11,665	N/A	10,499
3	Additional persons using safe water in the project activity compared to the baseline scenario	979	5,896	4,425
6	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	979	5,896	4,917
12	Hygiene campaign on water, sanitation and health related issues made in the project area	0	1	1

GS10658

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emissions Reductions	8,643	N/A	7,778
3	Additional persons using safe water in the project activity compared to the baseline scenario	827	4,980	3,738
6	Additional persons having access to a safe water source in the project activity compared to the baseline scenario	827	4,980	4,153
12	Hygiene campaign on water, sanitation and health related issues made in the project area	0	1	1

GS10659

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emissions Reductions	12,924	N/A	10,517
3	Additional persons using safe water in the project activity compared to the baseline scenario	997	6,005	4,507
6	Additional persons having access to a safe water source in the project activity	997	6,005	5,008

	compared to the baseline scenario			
12	Hygiene campaign on water, sanitation and health related issues made in the project area	0	1	2

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

GS6752

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ²⁵ achieved during this monitoring period
13	8,562 tCO ₂ e	2,366 tCO ₂ e
3	Less people suffering of diarrhoea and other water-borne diseases in the project scenario compared to the baseline scenario ²⁶	1,126
6	Persons having access to the safe and clean water provided by the project: ²⁷ 4,250 persons	1,251
12	One hygiene campaign within the first 12 months for each VPA	Hygiene campaign: 6/07/2020

²⁵ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

²⁶ The calculation of Project Scenario for SDG3 and SDG6 have been updated for both GS6752 and GS7311 to be more accurate and in line with the other projects

²⁷ The calculation of Project Scenario for SDG3 and SDG6 have been updated for both GS6752 and GS7311 to be more accurate and in line with the other projects

GS7311

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ²⁸ achieved during this monitoring period
13	6,850 tCO ₂ e	1,838 tCO ₂ e
3	Less people suffering of diarrhoea and other water-borne diseases in the project scenario compared to the baseline scenario ²⁹	901
6	Persons having access to the safe and clean water provided by the project: ³⁰ 3,400 persons	1,001
12	One hygiene campaign within the first 12 months for each VPA	Hygiene campaign: 9/07/2020

GS7566

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ³¹ achieved during this monitoring period
13	8,694 tCO ₂ e	10,517 tCO ₂ e (11,618 tCO ₂ e)
3	4,503	4,502
6	5,004	5,002
12	One hygiene campaign within the first 12 months for each VPA	Hygiene campaign: 18/07/2020

²⁸ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

²⁹ The calculation of Project Scenario for SDG3 and SDG6 have been updated for both GS6752 and GS7311 to be more accurate and in line with the other projects

³⁰ The calculation of Project Scenario for SDG3 and SDG6 have been updated for both GS6752 and GS7311 to be more accurate and in line with the other projects

³¹ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

GS10657

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ³² achieved during this monitoring period
13	7,988 tCO ₂ e	10,499 tCO ₂ e
3	4,503	4,425
6	5,004	4,917
12	One hygiene campaign within the first 12 months for each VPA	Hygiene campaign: 27/07/2020

GS10658

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ³³ achieved during this monitoring period
13	6,932 tCO ₂ e	7,778 tCO ₂ e
3	4,503	3,738
6	5,004	4,153
12	One hygiene campaign within the first 12 months for each VPA	Hygiene campaign: 30/07/2020

GS10659

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ³⁴ achieved during this monitoring period
13	8,694 tCO ₂ e	10,517 tCO ₂ e (11,632 tCO ₂ e)
3	4,503	4,507
6	5,004	5,008

³² Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

³³ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

³⁴ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

12 One hygiene campaign within the first 12 months for each VPA

Hygiene campaigns: 13/07/2020

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

Calculation of Emission Reductions i.e. SDG 13 outcomes

The equation used to calculate the emission reductions in line with the Gold Standard TPDDTEC methodology version 3.1 and registered VPA-DD is as follows:

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

$$PE_{p,y} = B_{p,y} * ((f_{NRB} * EF_{fuel,CO2}) + EF_{fuel,non-CO2}) * NCV_{p,fuel}$$

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

Where:

$BE_{b,y}$ Emissions for baseline scenario b during year y in tCO₂e

$PE_{p,y}$ Emissions for project scenario p during year y in tCO₂e

f_{NRB} Fraction of biomass used that can be established as non-renewable biomass

$EF_{fuel,CO2}$ CO₂ emission factor of the fuel that is substituted or reduced

$EF_{fuel,non-CO2}$ Non-CO₂ emission factor arising from use of fuels in baseline scenario

$NCV_{b,fuel}$ Net calorific value of the fuels used in the baseline

$NCV_{p,fuel}$ Net calorific value of the fuels used in the project

ER_y Emission reduction for total project activity in year y (tCO₂e/yr)

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

$LE_{p,y}$ Leakage from project scenario p in year y (tCO₂e/yr)

The transparent calculations of the outcomes of SDG 13 (i.e. CO2e reductions) are provided in a separate Excel Spreadsheet uploaded to GS Registry. For the used data/parameters the sections D.1 and D.2 can be referred.

Calculation of net benefits for SDG 3, SDG 6 and SDG 12 outcomes

Outcomes of SDG 3 regarding the parameter indicating the additional number of persons using safe water thanks to the project activities compared to the baseline scenario (P_{safe}) are calculated as follows:

$$P_{\text{safe}} = P_y * (1 - C_j) * (1 - X_{\text{boil}}) * U_{p,y}$$

Where:

P_{safe}	Number of additional persons using safe water in the project activity compared to the baseline scenario
P_y	Number of persons having access to safe water in the project activity
C_j	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it
X_{boil}	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary
$U_{p,y}$	Cumulative usage rate for technologies in project scenario p during year y, based on cumulative installation rate and drop off rate

Outcomes of SDG 6 regarding the parameter indicating the number of additional persons having access to a safe water source in the project activity compared to the baseline scenario (P_{access}) are calculated as follows:

$$P_{\text{access}} = P_y * (1 - C_j) * (1 - X_{\text{boil}})$$

Where:

P_{access}	Number of additional persons having access to a safe water source in the project activity compared to the baseline scenario
P_y	Number of persons having access to safe water in the project activity

C_j	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it
X_{boil}	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary

Outcomes of SDG 12 regarding the parameter indicating the number of campaigns on water, sanitation and health related issues don't need specific calculation. Please refer to hygiene campaigns reports.

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

Regarding the outcome of SDG 13 "Climate Change Mitigation measured as reduced tCO₂e" the real achieved values are slightly higher than the one estimated ex-ante for projects: GS7566, GS10657, GS10658 and GS10659. This difference is explained mainly by the $W_{charcoal}$ (Quantity of charcoal required to boil 1 litre of water using charcoal technologies representatives of baseline scenario b during year y), which was ex-ante estimated conservatively to be 0.1 Kg/l but which was confirmed by the latest BWBT to be 0.125 Kg/l (capped value in compliance with BAMG report). Moreover, the percentage of users per used fuel has been updated in line with the Monitoring Survey.

SECTION F. SAFEGUARDS REPORTING

No mitigation measures added to the monitoring plan, hence no safeguarding reporting is needed.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

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

No inputs/grievances have been received for this project during this monitoring period.

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

N/A

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

N/A

Revision History

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