

Gold standard for the global goals Monitoring report



June 2017, version 1

Title of the project	GS1247 Improved Kitchen Regimes: Lango Safe Water Project
Gold Standard project id	GS5106, 5186-94, 5196-7, 6349-51
Version number of the monitoring report	2
Completion date of the monitoring report	30/05/2019
Date of project design certification	GS5106 & 5186-94: 28/04/2017 GS5196-7 & 6349-5: 26/12/2018
Start date of crediting period	GS5106: 09/12/2016 GS5186: 08/12/2016 GS5187: 11/10/2016 GS5188: 13/10/2016 GS5189: 01/03/2017 GS5190: 02/03/2017 GS5191: 28/02/2017 GS5192: 03/05/2017 GS5193: 03/05/2017 GS5194: 18/10/2016 GS5196: 03/05/2018 GS5197: 03/05/2018 GS6349: 07/05/2018 GS6350: 21/09/2018 GS6351: 19/09/2018
Duration of this monitoring period	MP1 GS5196: 03/05/2018 to 31/03/2019 GS5197: 03/05/2018 to 31/03/2019 GS6349: 07/05/2018 to 31/03/2019 GS6350: 21/09/2018 to 31/03/2019 GS6351: 19/09/2018 to 31/03/2019 MP2 GS5189-94: 01/04/2018 to 31/03/2019 MP3 GS5106 & GS5186-8: 01/04/2018 to 31/03/2019
Duration of previous monitoring period	MP1 GS5189: 01/03/2017 to 31/03/2018 GS5190: 02/03/2017 to 31/03/2018 GS5191: 28/02/2017 to 31/03/2018 GS5192: 03/05/2017 to 31/03/2018 GS5193: 03/05/2017 to 31/03/2018 GS5194: 18/10/2016 to 31/03/2018 MP2 GS5106: 11/10/2017 to 31/03/2018 GS5186: 11/10/2017 to 31/03/2018 GS5187: 11/10/2017 to 31/03/2018 GS5188: 13/10/2017 to 31/03/2018
Project representative(s)	James Walker
Host Country	Republic of Uganda
Certification pathway (activity certification/impact certification)	Impact Certification
SDG Contributions targeted (as per approved PDD)	1 – SDG 3 – Good Health and Wellbeing 2 – SDG 5 – Gender Equality 3 – SDG 6 – Clean Water and Sanitation 4 - SDG 13 – Climate Action

Gold Standard statement/product certification sought (GSVER/ADALYs/RECs etc.)	GSVER
Selected methodology(ies)	TPDDTEC v1
Estimated amount of annual average certified SDG impact (as per approved PDD)	SDG 3 - Additional people consuming safe water GS5106 & 5186-94: 40,842 GS5196-7 & 6349-51: 3,726 SDG 5 - 53.8% decrease in time spent collecting water and firewood per household per day SDG 6 - Additional people with access to safe water GS5106 & 5186-94: 32,673 GS5196-7 & 6349-51: 3,757 SDG 13 - Emissions reductions per year (tCO₂e) GS5106: 9,977 GS5186: 9,977 GS5187: 9,977 GS5188: 9,977 GS5189: 9,977 GS5190: 9,977 GS5191: 9,977 GS5192: 9,977 GS5193: 9,977 GS5194: 9,977 GS5196: 9,973 GS5197: 9,973 GS6349: 9,973 GS6350: 9,973 GS6351: 9,973
Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period	SDG 3 - Additional people consuming safe water GS5106: 3,815 GS5186: 3,919 GS5187: 3,781 GS5188: 3,868 GS5189: 3,774 GS5190: 4,433 GS5191: 3,765 GS5192: 3,781 GS5193: 3,764 GS5194: 3,741 GS5196: 3,438 GS5197: 3,719 GS6349: 3,698 GS6350: 3,457 GS6351: 3,611Total: 56,557 SDG 5 – 72.3% decrease in time spent collecting water and firewood per household per day SDG 6 - Additional people with access to safe water GS5106: 3,846 GS5186: 3,951 GS5187: 3,812 GS5188: 3,900 GS5189: 3,804

	GS5190: 4,469
	GS5191: 3,796
	GS5192: 3,812
	GS5193: 3,795
	GS5194: 3,772
	GS5196: 3,466
	GS5197: 3,740
	GS6349: 3,728
	GS6350: 3,485
	GS6351: 3,640
	Total: 57,016
SDG 13 - Emissions reductions per year (tCO ₂ e)	
	GS5106: 10,000
	GS5186: 10,000
	GS5187: 10,000
	GS5188: 10,000
	GS5189: 10,000
	GS5190: 10,000
	GS5191: 10,000
	GS5192: 10,000
	GS5193: 10,000
	GS5194: 10,000
	GS5196: 8,274
	GS5197: 8,951
	GS6349: 7,320
	GS6350: 4,695
	GS6351: 4,989
	Total: 134,228

SECTION A. Description of project

A.1. Purpose and general description of project

>> (Provide a brief summary of the detailed description given in section B.1 including purpose of the project, brief description of the installed technology and equipment and relevant dates for the project (e.g. construction start/end, commissioning, continued operation periods, etc.)

Lango sub-region is a largely rural region in which many local people typically use wood fuel on inefficient three stone fires to purify their drinking, cleaning and washing water. This process results in the release of greenhouse gas emissions from the combustion of wood which can be avoided if a technology that does not require fuel (wood or fossil) supplies clean water desired by households. By providing safe water this project ensures that households consume less firewood during the process of water purification and therefore reduce greenhouse gas emissions from the combustion process.

The project activity involves rehabilitating and maintaining non-functioning borehole hand pumps. The hand pump models that are commonly used in the area include Afridev, U3 Modified and India Mark II pumps. In total 125 boreholes were rehabilitated across 15 VPAs between 11th October 2016 – 28th September 2018. This monitoring period covers 1st April 2018 to 31st March 2019.

A.2. Location of project

>> (Provide host country, state/province, city/town details along with GPS co-ordinates.)

This project is located in Lango sub-region, Northern Uganda. Below is the geographic reference to allow unique identification of the project boundary. The target area and the fuel collection area are defined as being contained within project boundary, with the outer limits of the project boundary being clearly defined below. As the majority of beneficiaries collect their wood fuel locally in close proximity to their homesteads, the woodfuel collection area and target area are considered the same.

Figure 1: Map of Uganda with the Lango sub region outlined

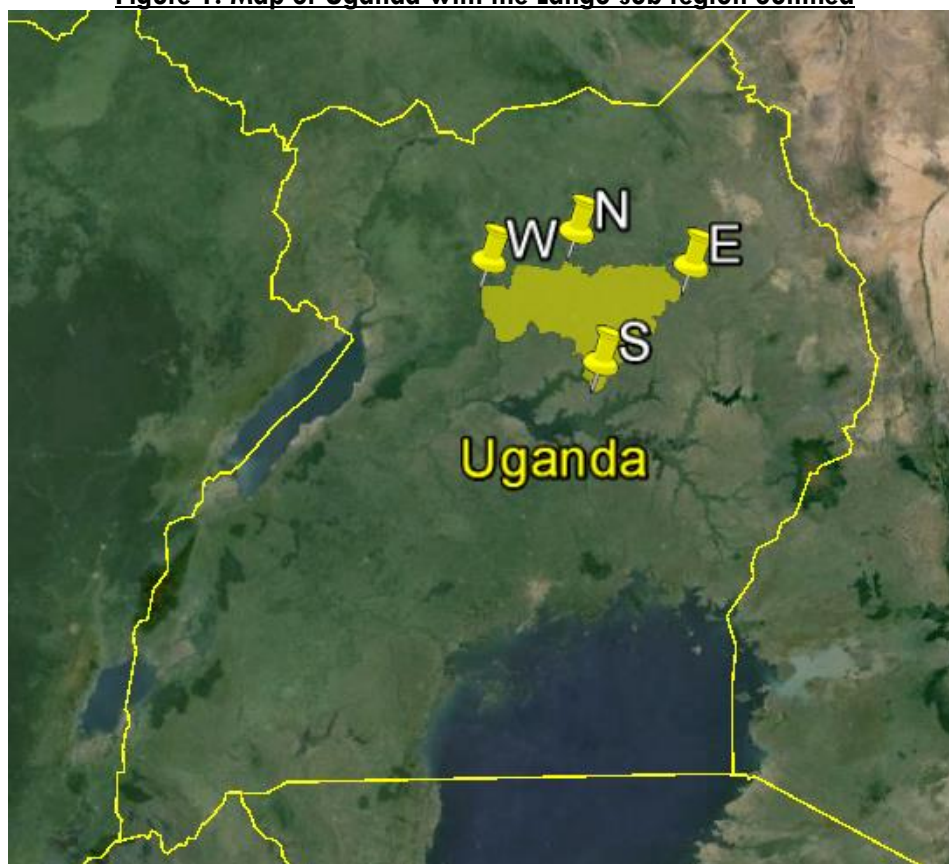


Figure 2: Map outlining the four surveyed districts

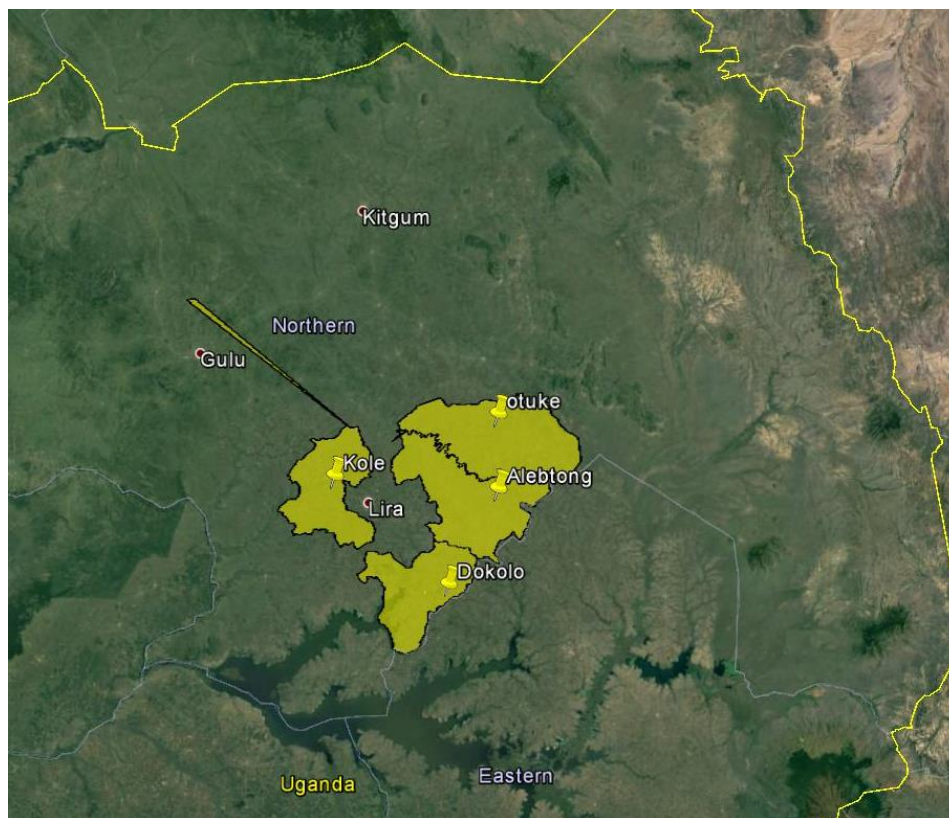


Table 1: Geographical characteristics of Alebtong, Dokolo, Otuke and Kole Districts

Country	Region	District	Population	Geographical Reference	
Uganda	Northern Uganda	Alebtong	227,541 (2014 Census)	Lat 2.257959	Lon 33.290910
Uganda	Northern Uganda	Dokolo	183,093 (2014 Census)	Lat 1.927760	Lon 33.075794
Uganda	Northern Uganda	Otuke	104,254 (2014 Census)	Lat 2.518926	Lon 33.397837
Uganda	Northern Uganda	Kole	239,327 (2014 Census)	Lat 2.370110	Lon 32.763304

A.3. Reference of applied methodology

>> (Indicate title and version number of the methodology.)

Technologies and Practices to Displace Decentralised Thermal Energy Consumption v1.

A.4. Crediting period of project

>> (Provide start date and length of the crediting period as given in approved PDD.)

GS5106: 09/12/2016 to 10/12/2023
 GS5186: 09/12/2016 to 09/12/2023
 GS5187: 12/10/2016 to 12/10/2023
 GS5188: 14/10/2016 to 14/10/2023
 GS5189: 01/03/2017 to 01/03/2024
 GS5190: 02/03/2017 to 02/03/2024

GS5191: 28/02/2017 to 28/02/2024
 GS5192: 03/05/2017 to 03/05/2024
 GS5193: 03/05/2017 to 03/05/2024
 GS5194: 18/10/2016 to 18/10/2023
 GS5196: 03/05/2018 to 03/05/2025
 GS5197: 03/05/2018 to 03/05/2025
 GS6349: 07/05/2018 to 07/05/2025
 GS6350: 21/09/2018 to 21/09/2025
 GS6351: 19/09/2018 to 19/09/2025

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.)

In Uganda over 45% of the rural population do not have access to safe water and rely exclusively on unprotected wells, lakes and other open water sources that are highly susceptible to contamination. Many existing boreholes in Lango sub-region, including the districts of Alebtong, Dokolo, Otuke and Kole, are owned by community groups or community-based organizations (CBOs) and have fallen into disrepair because maintenance programmes have been poorly managed, or proven too expensive. CO2balance has worked with community groups in these districts to identify broken down boreholes, renovate them and supply a maintenance programme to ensure that clean, safe water is delivered as a result of this project. The boreholes included under the project are entirely human operated and fitted with hand pump models that are commonly used in the area such as Afridev, U3 Modified and India Mark II pumps.

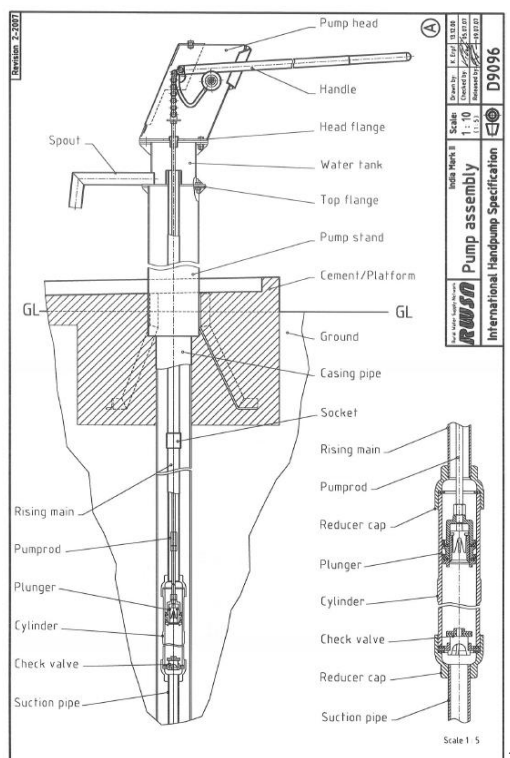
Lango sub-region is a largely rural region in which many local people typically use wood fuel on inefficient three stone fires to purify their drinking, cleaning and washing water. This process results in the release of greenhouse gas emissions from the combustion of wood which can be avoided if a technology that does not require fuel (wood or fossil) supplies clean water desired by households. By providing safe water this project ensures that households consume less firewood during the process of water purification and therefore reduce greenhouse gas emissions from the combustion process.

The boreholes included under the project are entirely human operated and fitted with hand pump models that are commonly used in the area such as Afridev, U3 Modified and India Mark II pumps. The depth of the boreholes are limited to 100m or less.



	Afridev	India Mark II	U3 Modified
Cylinder diameter (mm):	63.5	50	50
Maximum Stroke (mm):	125	225	125
Approx. discharge at about 75 watt input m ³ /h:	at 10 m head 1.4	at 10 m head 1.8	at 10 m head 1.2
	at 15 m head 1.1	at 15 m head 1.3	at 15 m head 1.0
	at 20 m head 0.9	at 20 m head 1.0	at 20 m head 0.8
	at 30 m head 0.7	at 30 m head 0.8	at 30 m head 0.6
Pumping lift (m):	10-50	10-45	20-45
Water consumption (lpcd):	15-20	15-20	15-20

India Mark II Specification:



The maintenance programme ensures that all project boreholes are functional. The Water Resource Committees are trained to maintain the boreholes and carry out small repairs. For more technical maintenance the CO2balance field team arrange for technicians to visit the boreholes. Each borehole is visited bimonthly to meet with the WRC and inspect the hand pump and surrounding area. The project ensures that the boreholes provide water of a sufficient quality through a programme of quarterly chlorination, WASH training and management of the surrounding areas, and confirmed by annual water quality tests.

In total 125 boreholes were rehabilitated across 15 VPAs between 11th October 2016 – 28th September 2018. The date, location and number of people served by each borehole is given in the table below, which forms the project database:

Borehole ID	Date of Rehabilitation	Village	Lat	Long	No. of users
VPA 71 - GS5106					
LAN001	16/12/2016	Aderolongo	5.21135	25.94	358
LAN002	16/12/2016	Awito	5.24233	25.5815	411
LAN003	16/12/2016	Ejang	5.19727	25.8582	349
LAN004	15/12/2016	Kulu Omara	5.21118	24.4231	414
LAN005	15/12/2016	Te-Cwao	5.22833	25.3894	379
LAN006	15/12/2016	St Paul Amoi	5.47284	23.8059	418
LAN007	12/12/2016	Acikom	5.08416	21.7377	357
LAN008	12/12/2016	Aweloge	5.144383	22.1126	459
LAN009	09/12/2016	Aber	5.25195	27.3107	383
LAN010	13/12/2016	Kongotye	5.03928	28.1158	502
Total					4,030
VPA 72 - GS5186					

¹ Rural Water Supply Network (2018) 'India Mark II' <http://www.rural-water-supply.net/en/implementation/public-domain-handpumps/india-mark-ii>

LAN011	09/12/2016	Aduru	5.2214	27.4198	254
LAN012	08/12/2016	Apel II	5.25986	26.6644	421
LAN013	09/12/2016	Apur B	5.25549	26.3867	385
LAN014	13/12/2016	Te-Abwolo	5.22837	27.4837	303
LAN015	14/12/2016	Amunga SW	5.18523	28.0409	553
LAN016	14/12/2016	Amunga P/S	5.18424	27.9181	568
LAN017	10/12/2016	Kulu Okani	4.74276	26.2795	367
LAN018	10/12/2016	Kulu Eluk	4.75547	26.8452	441
LAN019	10/12/2016	Alito T/C	4.80927	26.9637	486
LAN020	10/12/2016	Otkwac Amalo	4.83081	27.3926	362
				Total	4,140
VPA 73 - GS5187					
LAN021	11/10/2016	Tangala	5.25527	25.5448	390
LAN022	12/10/2016	Otikokin	5.18795	26.0691	482
LAN023	11/10/2016	Aliwok	5.26505	25.3644	404
LAN024	19/10/2016	Atelela	5.43035	24.2099	503
LAN025	19/10/2016	Awat	5.1572	21.4968	473
LAN026	27/10/2016	Center Lira	5.06036	21.3068	372
LAN027	21/10/2016	Abongo Ipale	5.10141	20.9403	640
LAN028	18/10/2016	Apuru	4.78472	26.5104	353
LAN029	17/10/2016	Bar Ibule	4.7431	25.9661	377
				Total	3,994
VPA 74 - GS5188					
LAN030	19/10/2016	Adak	5.13456	21.7508	496
LAN031	19/10/2016	Abucero	5.12464	22.2353	450
LAN032	14/11/2016	Akwac A	5.08376	28.3204	575
LAN033	14/10/2016	Awonayap A	5.14644	28.244	417
LAN034	15/10/2016	Baropiro	5.1682	27.7278	416
LAN035	13/10/2016	Baroceco	5.17243	28.23	475
LAN036	13/10/2016	Barabolo	5.18214	28.3463	437
LAN037	15/10/2016	Baralegi	5.1821	28.3463	383
LAN038	18/10/2016	Anyonomac	4.82197	27.177	437
				Total	4,086
VPA 75 - GS5189					
LAN039	07/03/2017	Apala 'A'			990
LAN040	28/02/2017	Telela			736
LAN041	09/03/2017	Lwala			969
LAN042	06/03/2017	Okar			397
LAN043	01/03/2017	Araodyang			450
LAN044	07/03/2017	Teyago			444
				Total	3,986
VPA 76 - GS5190					

LAN045	07/03/2017	Corner Apii			730
LAN046	01/03/2017	Alake			1191
LAN047	01/03/2017	Omerogweno			752
LAN048	09/03/2017	Apala Telela			699
LAN049	06/03/2017	Abur			1310
Total					4,682
VPA 77 - GS5191					
LAN050	01/03/2017	Abuka 'A'			534
LAN051	06/03/2017	Abolonyero			538
LAN052	28/02/2017	Awiro			476
LAN053	28/02/2017	Abak			483
LAN054	27/02/2017	Atop			463
LAN055	01/03/2017	Amoli			426
LAN056	09/03/2017	Awili			502
LAN057	09/03/2017	Witim			555
Total					3,977
VPA 78 - GS5192					
LAN058	05/05/2017	Akaidebe			243
LAN059	09/05/2017	Odoo Jeremiah			322
LAN060	04/05/2017	Okoto			263
LAN061	04/05/2017	Olengo 'A'			482
LAN062	04/05/2017	Tem Gumi			428
LAN063	05/05/2017	Omino			352
LAN064	03/05/2017	Atwako 'B'			322
LAN065	03/05/2017	Otoro			514
LAN066	02/05/2017	Aminalucu			253
LAN067	02/05/2017	Aminakech			377
LAN068	19/05/2017	Awiotang			438
Total					3,994
VPA 79 - GS5193					
LAN069	03/05/2017	Acede			388
LAN070	02/05/2017	Aming			410
LAN071	08/05/2017	Alango			252
LAN072	08/05/2017	Onger			430
LAN073	08/05/2017	Aminogwang			164
LAN074	23/05/2017	Ilera			437
LAN075	08/05/2017	Te-Ebule			280
LAN076	09/05/2017	Te-Yao			638
LAN077	22/05/2017	Nyamkere			298
LAN078	06/11/2017	Abiting			679
Total					3,976
VPA 80 - GS5194					

LAN079	18/10/2016	Alilo			400
LAN080	17/10/2016	Ayile			411
LAN081	27/02/2017	Aton			1216
LAN082	07/11/2017	Lela Opuk			610
LAN083	06/11/2017	Alango Okwangole			355
LAN084	06/11/2017	Amakilaka			351
LAN085	19/11/2017	Ober			609
Total					3,952
VPA 82 - GS5196					
LAN087	11/05/2018	Abongoawobe	36°N0503127	2.53357	488
LAN088	06/05/2018	Abuabura	36°N0529026	2.66428	394
LAN089	08/05/2018	Adagawaka	36°N0504198	2.66459	465
LAN090	04/05/2018	Agali Alingadyel	36°N0528294	2.70805	457
LAN091	05/05/2018	Akon	36°N0512312	2.75541	396
LAN092	02/05/2018	Alala	36°N0542810	2.69412	439
LAN093	07/05/2018	Arwenyo	36°N0508281	2.6322	535
LAN094	03/05/2018	Aweodike	36°N0517215	2.75734	458
Total					3,144
VPA 83 - GS5197					
LAN095	09/05/2018	Ilera Amintenyio	36°N0523486	2.69693	309
LAN096	05/05/2018	Otongero B	36°N0507554	2.79614	439
LAN097	09/05/2018	Teyao Aluti	36°N0503127	2.59674	554
LAN098	07/05/2018	Okeda A	36°N0509794	2.6161	475
LAN099	04/05/2018	Okeorkok	36°N0520177	2.82011	576
LAN100	02/05/2018	Okum	36°N0545530	2.66127	636
LAN101	03/05/2018	Olarolobo	36°N0515629	2.81242	461
LAN102	03/05/2018	Oloakero	36°N0521164	2.67738	469
Total					3,610
VPA 139 - GS6349					
LAN103	06/05/2018	Acoké	36°N0526282	2.75513	312
LAN104	08/05/2018	Obalodeo	36°N0523418	2.62354	672
LAN105	08/05/2018	Teyao Aloï	36°N0525029	2.57784	519
LAN106	20/09/2018	Aduru Okwangole	33° 00.100	02°23.779	462
LAN107	08/05/2018	Obal	36°N0499561	2.61717	780
LAN108	18/09/2018	Akwac B	33° 04.985	02°34.586	458
LAN109	19/09/2018	Yabwangi	33° 07.646	02°36.456	407
LAN110	26/09/2018	Aloï 'A'	33° 11.197	02°15.745	296
Total					3,594
VPA 140 - GS6350					
LAN111	26/09/2018	Alumeri	33° 10.183	02°33.113	410
LAN112	27/09/2018	Amintato B	32° 50.848	02° 26.563	412
LAN113	20/09/2018	Amonomito	33° 01.364	02° 24.117	321

LAN114	25/09/2018	Apado	33° 01.335	02°25.595	637
LAN115	25/09/2018	Awiny	33° 00.322	02° 22.752	352
LAN116	27/09/2018	Ayitatwon	32° 51.074	02°28.725	567
LAN117	28/09/2018	Bung	32° 46.983	02° 27.374	376
LAN118	27/09/2018	Entebbe	32° 49.408	02° 24.166	577
Total					3,242
VPA 141 - GS6351					
LAN119	25/09/2018	Lakcani	33° 09.781	02° 12.848	472
LAN120	28/09/2018	Lela Ocika	32° 50.433	02°25.002	578
LAN121	20/09/2018	Ober 2	33°01.705	02° 20.639	491
LAN122	18/09/2018	Okeda "B"	33°06.541	02°22.684	464
LAN123	19/09/2018	Okuronyang A	33° 07.303	02°35.100	471
LAN124	19/09/2018	Adwei	33° 10.347	02°30.401	583
LAN125	26/09/2018	Aliwok B	33°14.039	02°16.622	515
LAN126	27/09/2018	Te-Okutu	32° 51.545	02° 22.769	240
Total					3,342

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

>> (Indicate whether any temporary deviations have been applied during this monitoring period. If applied, provide a description of the deviation(s). Include the reasons for the deviation(s), how it deviates from the monitoring plan, applied methodology(ies) and/or applied approaches, the duration for which the deviation(s) is(are) applicable and justification on the conservativeness of the approach. Also indicate if prior approval from GS-TAC have been sought on the deviation.)

No temporary deviations have been made.

B.2.2. Corrections

>> (Indicate whether any corrections to project information or parameters fixed at validation have been applied.)

No corrections have been made.

B.2.3. Changes to start date of crediting period

>> (Indicate whether any changes to the start date of the crediting period have been approved by Gold Standard that is relevant for this monitoring period.)

No changes have been made to any crediting periods.

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

>> (Indicate whether any permanent changes from the approved monitoring plan, applied methodologies or applied approaches have been approved by GS-TAC that is relevant for this monitoring period.)

No permanent changes have been made.

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.)*

No changes have been made to the project design.

SECTION C. Description of monitoring system applied by the project

>>

During this monitoring period, 101 project and usage surveys were conducted between the 5th and 8th February 2019. The random sample was made up of 150 HHs, but 49 were not able to be reached by the field staff. The 101 HHs surveyed satisfies the methodological requirement of >100. 60 WCFT took place over 19th to 22nd of February 2018. As per the methodology, the WCFT is biennial requirement. The WQT took place between October 2018 and March 2019.

All surveys are administered by trained CO2balance staff and partner NGOs that are local to the area and conversant in the local dialects to ensure that the responses are consistent and not biased by any regional language barriers. Each participant is provided with a briefing on the purpose of the survey and is assured that no individual names are used in the analysis.

The results of the surveys are collated in excel spreadsheets and stored on a central server in an electronic format then is sent to the UK head office for data analysis. The documentation procedure that co2balance has devised ensures a minimum chance of original data being lost – all original copies of our project documentation are retained in the Uganda office and are available scanned upon request of the UK team.

In accordance with the Gold Standard methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, the survey samples are randomly selected from the borehole user record. The sample employs age sensitive sampling as the boreholes are been rehabilitated over multiple years. The boreholes are grouped into those rehabilitated in 2016 (40), 2017 (46) and 2018 (40). This totals 126 boreholes, 125 of which fill the VPAs covered in this monitoring report, and the other 1 borehole has a separate monitoring report, but all are monitored as a homogenous group. Based on the 90/30 precision defined in the methodology, 7 boreholes from each age group are included in the sample. The boreholes of each age group are assigned a random number. This is then sorted from lowest to highest, and the boreholes numbered 1-7 selected for the sample.

The household (HH) list for each randomly selected borehole is collated and each HH assigned a random number. This is then sorted in order from lowest to highest; the first 50th HHs are selected for the survey. This provides a random sample of 50 HHs from each age group, and a total of 150 HHs to be surveyed. This more than satisfies the minimum required sample of 100.

Below is a summary of the key information that has been collected and monitored as part of this project.

Borehole database

The borehole installation/rehabilitation record includes the following information:

- Date of installation/rehabilitation
- GPS location of the borehole
- Model of the borehole
- Quantity of boreholes installed
- The total number of people obtaining their water from each borehole
- Mode of use: commercial/domestic

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The total number of households using each borehole has been determined through the lists supplied by the community group and district officials. Further studies are conducted to screen and determine the exact number of people using the rehabilitated boreholes. Using this method, the total number of people using each borehole has been fixed and hence a figure for person days can be calculated.

Ongoing Monitoring Studies

The following ongoing monitoring studies were conducted; the results are given in the parameter boxes tables in Section 6.

- **Water consumption field test** - (Equation parameters $Q_{p,y}$ and $Q_{p,rawboil,y}$) – Conducted during last monitoring period in line with the biennial requirement.
- **Quality of the treated water** - The quality of the treated water was assessed to ensure that it is fit for human consumption. The parameters used to assess the water quality is in line with Ugandan standards for potable water and all parameters are shown to be within levels considered acceptable for domestic human consumption.
- **Usage Survey** -.The annual usage survey was conducted using a sample size of 150. 49 were unavailable or not able to take part. 101 HHs were surveyed, meeting the minimum requirements of over 100
- **Project Survey** – The project survey was conducted using the same sample as the Usage Survey, surveying end users currently using project technologies to explore changes in project scenario over time
- **Leakage** - The PDD has described which sources of leakage detailed within the methodology are relevant to this project and which have been discounted. Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements.

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter)

Relevant SDG Indicator	SDG 3, 6 and 13
Data/parameter:	C_i
Unit	Percentage
Description	Portion of users of project safe water supply who were already in baseline using a non- boiling safe water supply.
Source of data	Baseline study. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied)	4.56%
Choice of data or measurement methods and procedures	The portion of safe water users is determined though the baseline project survey and refers to the number of users that already use safe water from water sources such as boreholes.
Purpose of data	Calculating ERs, SDG 3 & 6
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	$EF_{b,co2}$
Unit	tco2/TJ
Description	co2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value
Value(s) applied)	112

Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	EF _{b,non co2}
Unit	tco ₂ /TJ
Description	Non-co ₂ emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value
Value(s) applied)	8.692
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
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
Value(s) applied)	112
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
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
Value(s) applied)	8.692
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	NCV _b
Unit	TJ/ton
Description	Net calorific value of the fuels used in the baseline
Source of data	IPCC default value
Value(s) applied)	0.0156

Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	NCV _p
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project
Source of data	IPCC default value
Value(s) applied	0.0156
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	f _{NRB,i,y}
Unit	Fractional non-renewability
Description	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data	CDM Default National Figure
Value(s) applied	0.82
Choice of data or measurement methods and procedures	CDM default value
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	W _{b,y}
Unit	T/litre
Description	Quantity of fuel that is used to treat 1 litre of water in the baseline scenario b during year y
Source of data	Baseline Water Boiling Test
Value(s) applied	0.0006789
Choice of data or measurement methods and procedures	The baseline water boiling test is used to determine the amount of wood used to purify 1 litre of water by boiling. This data is gathered according to: <i>Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1, Draft General Guidelines On Sampling And Surveys</i> ; EB37 Annex 27; and <i>Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities (Version 02)</i> ; EB65 Annex 2
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	W _{p,y}
Unit	T/litre
Description	Quantity of fuel that is used to treat 1 litre of water in the project scenario p during year y

Source of data	Baseline Water Boiling Test
Value(s) applied)	0.0006789
Choice of data or measurement methods and procedures	The baseline water boiling test is used to determine the amount of wood used to purify 1 litre of water by boiling. This data is gathered according to: <i>Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1, Draft General Guidelines On Sampling And Surveys</i> ; EB37 Annex 27; and <i>Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities (Version 02)</i> ; EB65 Annex 2
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	Non-Suppressed demand
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,
Source of data	Baseline study. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied)	8.91
Choice of data or measurement methods and procedures	Suppressed demand is determined through a set of questions in the project survey that establish the method households use to purify their water, if any, and how they would choose to purify if they were not subject to monetary and access barriers. This is in line with the Gold Standard principles of suppressed demand outline in annex 2. A fixed suppressed demand baseline has been opted for.
Purpose of data	Calculating ERs
Additional comments	-

Relevant SDG Indicator	SDG 3
Data/parameter:	Pb,boil
Unit	Percentage
Description	Percentage of persons boiling water for purification in the baseline scenario
Source of data	Baseline study
Value(s) applied)	0.8%
Choice of data or measurement methods and procedures	-
Purpose of data	Calculating SDG 3 impact
Additional comments	-

Relevant SDG Indicator	SDG 5
Data/parameter:	Tb,y
Unit	Minutes
Description	Time spent collecting water in the baseline scenario
Source of data	Gender Baseline study
Value(s) applied)	169.5
Choice of data or measurement methods and procedures	-
Purpose of data	Calculating SDG 5 impact
Additional comments	-

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter)

Relevant SDG Indicator	SDG 13
Data/parameter:	Np,y
Unit	Project Technology Days
Description	Number of persons consuming water supplied by project scenario p per day through year y
Measured/calculated/default	Measured
Source of data	Borehole Project Database
Value(s) of monitored parameter	GS5106: 1,470,950 GS5186: 1,511,100 GS5187: 1,457,810 GS5188: 1,491,390 GS5189: 1,454,890 GS5190: 1,708,930 GS5191: 1,451,605 GS5192: 1,457,810 GS5193: 1,451,240 GS5194: 1,442,480 GS5196: 1,191,831 GS5197: 1,289,293 GS6349: 1,054,422 GS6350: 676,227 GS6351: 718,702 Total: 14,898,205
Monitoring equipment	Borehole database
Measuring/reading/recording frequency:	Measured per MP
Calculation method (if applicable):	Borehole users x days in MP
QA/QC procedures:	-
Purpose of data:	Calculating ERs
Additional comments:	-

Relevant SDG Indicator	SDG 6 and 13
Data/parameter:	Up,y
Unit	Percentage
Description	Usage rate in project scenario p through year y
Measured/calculated/default	Annual Usage Survey
Source of data	Usage Survey
Value(s) of monitored parameter	100%
Monitoring equipment	Usage Survey
Measuring/reading/recording frequency:	Measured annually
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculating ERs
Additional comments:	-

Relevant SDG Indicator	SDG 13
Data/parameter:	Qp,y
Unit	Litres per person per 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
Measured/calculated/default	Measured
Source of data	Water Consumption Field Test (WCFT)
Value(s) of monitored parameter	7.5
Monitoring equipment	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. Volume capped at 7.5 litres per person per day as per the methodology The WCFT is be carried out by staff trained by CO2balance to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by CO2balance UK Ltd
Measuring/reading/recording frequency:	Measured biennially
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculating ERs
Additional comments:	-

Relevant SDG Indicator	SDG 13
Data/parameter:	Qp,cleanboil,y
Unit	Litres per person per day
Description	Quantity of safe water boiled in the project scenario p during the year y using the zero or low emissions clean water supply technology
Measured/calculated/default	Measured
Source of data	WCFT
Value(s) of monitored parameter	0
Monitoring equipment	WCFT
Measuring/reading/recording frequency:	Measured biennially
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculating ERs
Additional comments:	-

Relevant SDG Indicator	SDG 13
Data/parameter:	Qp,rawboil, y
Unit	Litres per person per day
Description	The raw of unsafe water that is still boiled after installation of the water treatment technology
Measured/calculated/default	Measured
Source of data	WCFT
Value(s) of monitored parameter	0
Monitoring equipment	WCFT
Measuring/reading/recording frequency:	Measured biennially

Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculating ERs
Additional comments:	-

Relevant SDG Indicator	SDG 13
Data/parameter:	Quality of Treated Water
Unit	Parameters as per national standards
Description	Performance of the treatment technology
Measured/calculated/default	Measured
Source of data	Water quality tests
Value(s) of monitored parameter	Pass - the National Water Quality Reference Laboratory has certified each water supply in line with national standards.
Monitoring equipment	Laboratory Tests
Measuring/reading/recording frequency:	Tested annually
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	-
Additional comments:	-

Relevant SDG Indicator	SDG 13
Data/parameter:	LEp,y
Unit	tCO2e per year
Description	Leakage in project scenario p during year y
Measured/calculated/default	Calculated
Source of data	Baseline and monitoring surveys
Value(s) of monitored parameter	0
Monitoring equipment	Surveys
Measuring/reading/recording frequency:	Measured annually
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculating ERs
Additional comments:	-

Relevant SDG Indicator	SDG 3 & 6
Data/parameter:	Py
Unit	Number
Description	Number of persons having access to safe water in the project activity
Measured/calculated/default	Calculated
Source of data	User lists

Value(s) of monitored parameter	GS5106: 4,030 GS5186: 4,140 GS5187: 3,994 GS5188: 4,086 GS5189: 3,986 GS5190: 4,682 GS5191: 3,977 GS5192: 3,994 GS5193: 3,976 GS5194: 3,952 GS5196: 3,632 GS5197: 3,919 GS6349: 3,906 GS6350: 3,652 GS6351: 3,814
Monitoring equipment	User lists
Measuring/reading/recording frequency:	Recorded continuously
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculating access to safe water
Additional comments:	-

Relevant SDG Indicator	SDG 5
Data/parameter:	Tp,y
Unit	Minutes
Description	Time spent collecting water per household per day in project
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	46.93
Monitoring equipment	Project Survey
Measuring/reading/recording frequency:	Measured annually
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculating time saved by project
Additional comments:	-

Relevant SDG Indicator	SDG 3
Data/parameter:	P_{safe}
Unit	Number
Description	Number of additional persons consuming safe water in the project activity compared to the baseline scenario
Measured/calculated/default	Calculated
Source of data	HH lists and Usage Survey

Value(s) of monitored parameter	GS5106: 3,815 GS5186: 3,919 GS5187: 3,781 GS5188: 3,868 GS5189: 3,774 GS5190: 4,433 GS5191: 3,765 GS5192: 3,781 GS5193: 3,764 GS5194: 3,741 GS5196: 3,438 GS5197: 3,719 GS6349: 3,698 GS6350: 3,457 GS6351: 3,611
Monitoring equipment	HH lists and surveys
Measuring/reading/recording frequency:	Measured annually
Calculation method (if applicable):	See Section E
QA/QC procedures:	-
Purpose of data:	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comments:	-

Relevant SDG Indicator	SDG 5
Data/parameter:	TR,y
Unit	Percentage
Description	Total reduction time spent collecting water for project activity in year y (%)
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	72.3%
Monitoring equipment	Project Survey
Measuring/reading/recording frequency:	Measured annually
Calculation method (if applicable):	See Section E
QA/QC procedures:	-
Purpose of data:	To quantify whether the project has contributed to a reduction in the amount of time spent collecting water compared to the pre-project scenario
Additional comments:	-

Relevant SDG Indicator	SDG 6
Data/parameter:	P_{access}
Unit	Number
Description	Number of additional persons having access to safe water in the project activity compared to the baseline scenario
Measured/calculated/default	Measured annually
Source of data	HH lists and Usage Survey

Value(s) of monitored parameter	GS5106: 3,846 GS5186: 3,951 GS5187: 3,812 GS5188: 3,900 GS5189: 3,804 GS5190: 4,469 GS5191: 3,796 GS5192: 3,812 GS5193: 3,795 GS5194: 3,772 GS5196: 3,466 GS5197: 3,740 GS6349: 3,728 GS6350: 3,485 GS6351: 3,640
Monitoring equipment	HH lists and surveys
Measuring/reading/recording frequency:	Measured annually
Calculation method (if applicable):	See Section E
QA/QC procedures:	-
Purpose of data:	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comments:	-

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.)

The project proponent has elected to cross-sample technologies across all its homogenous borehole VPAs located within the Lango sub-regions. Cross sampling of devices was applied across VPAs GS5106, GS5186, GS5187, GS5188, GS5189, GS5190, GS5191, GS5192, GS5193, GS5194, GS5195, GS5196, GS5197, GS6349, GS6350 and GS6351. As all VPAs are homogenous; located in the same region, use the same technology and share a common baseline - cross sampling of devices shall be applied across all VPAs rather than on a VPA by VPA basis.

Cross sampling was applied to the following surveys:

- Project surveys
- Usage Surveys

As per the methodology, for sampling purposes the boreholes were separated by age groups. Rehabilitation took place between October 2016 and September 2018. Therefore, boreholes were split into those from 2016 (40), from 2017 (46) and from 2018 (40). The monitoring system follows the 90/30 rule set out in TPDDTEC for selecting a sample. Based on this rule, the appropriate sample size for each age group is 7 boreholes. For both age groups, each borehole was assigned a random number using an online tool, with the first 7 selected for sampling. The household lists for these 7 boreholes were put together and assigned a random number with the same online tool. Numbers 1-50 were selected from each group to provide 150 households for the Project and Usage Surveys.

The surveys have been conducted so as to ensure that they are within the end date of the respective monitoring periods for each VPA.

SECTION E. Calculation of SDG outcomes

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

>> (Provide details of equations and approaches used to calculate/estimate baseline values.)

SDG 3 (Good Health and Wellbeing)

The outcome for SDG 3 is quantified as the additional number of persons consuming safe water in the project activity compared to the baseline scenario (P_{safe}). The number of persons using each borehole is determined in the sensitization process during the rehabilitation. The percentage of users who were already consuming safe water in the baseline without boiling it (C_i) is determined through the baseline survey and deducted. Additionally, the percentage of users who consumed safe water by boiling it in the baseline ($P_{b, boil}$) is deducted.

C_i 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.

$P_{b, boil}$ Percentage of persons boiling water for purification in the baseline scenario.

SDG 5 (Gender Equality)

By ensuring that there is a safe water source at the centre of communities, the projects reduce the *time poverty* of women, because the time burden of collecting water, which falls disproportionately on women, is reduced. As the safe water sources are located centrally within communities, closer to public institutions and villages, the distance travelled to collect water is reduced, reducing the time per trip spent collecting water. In addition, as the water sources is maintained, they provide a reliable water supply, ensuring that water needs for cooking, drinking, and food preparation can be met by one central water source, so the time spent collecting water is minimised. The average % decrease per household in time spent collecting water is taken as a proxy contribution towards the SDG target.

$T_{b,y}$ Time spent collecting water per household per day prior to project (minutes)

SDG 6 (Clean Water and Sanitation)

The outcome for SDG 6 is quantified as the additional number of persons having access to safe water in the project activity compared to the baseline scenario (P_{access}). The number of persons using each borehole is determined in the sensitization process during the rehabilitation. The percentage of users who were already consuming safe water in the baseline without boiling it (C_i) is determined through the baseline survey.

C_i 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.

SDG 13 (Climate Action)

CO₂ emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management. This outcome is measured using the emission reduction calculations.

Baseline Emissions

$$BE_{b,y} = B_{b,y} * \left((fNRB_y * EF_{b,fuel,co2}) + EF_{b,fuel,nonco2} \right) * NCV_{b,fuel}$$

Where:

$$B_{p,y} = (1 - C_j) * N_{j,y} * W_{i,y} * (Q_{i,y} + Q_{j,rawboil,y}) \quad (11)$$

Where:

$N_{j,y}$	Number of person.days consuming water supplied by project scenario p through year y ⁴⁷
C_j	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
$B_{b,y}$	Quantity of fuel consumed in baseline scenario b during the year y in tons
$Q_{p,y}$	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 water boiled in the project scenario p per person per day
$W_{b,y}$	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.

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

>> (Provide details of equations and approaches used to calculate/estimate project values.)

SDG 3 (Good Health and Wellbeing)

P_y Number of persons having access to safe water in the project activity

SDG 5 (Gender Equality)

$T_{p,y}$ Time spent collecting water per household per day in project (minutes)

SDG 6 (Clean Water and Sanitation)

P_y Number of persons having access to safe water in the project activity
 $U_{p,y}$ Usage rate in project scenario p during year y

SDG 13 (Climate Action)

$$PE_{p,y} = B_{p,y} * \left((fNRB_y * EF_{p,fuel,co2}) + EF_{p,fuel,nonco2} \right) * NCV_{p,fuel}$$

Where:

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

$N_{p,y}$ Number of person.days consuming water supplied by project scenario p through year y

C_j	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
$B_{p,y}$	Quantity of fuel consumed in project scenario p during the year y in tons
$Q_{p,rawboil,y}$	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
$W_{p,y}$	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

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

>>

SDG 3 (Good Health and Wellbeing)

$$P_{safe} = P_y * (1 - 0.0456) * (1 - 0.008046)$$

GS ID	P_{safe}	P_y
GS5106	3,815	4,030
GS5186	3,919	4,140
GS5187	3,781	3,994
GS5188	3,868	4,086
GS5189	3,774	3,986
GS5190	4,433	4,682
GS5191	3,765	3,977
GS5192	3,781	3,994
GS5193	3,764	3,976
GS5194	3,741	3,952
GS5196	3,438	3,632
GS5197	3,710	3,919
GS6349	3,698	3,906
GS6350	3,457	3,652
GS6351	3,611	3,814
Total	56,557	59,740

$$P_{safe} = P_y * (1 - C_j) * (1 - P_{b,boil})$$

Where:

P_{safe}	Number of additional persons consuming 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_i 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.

$P_{b, \text{boil}}$ Percentage of persons boiling water for purification in the baseline scenario.

SDG 5 (Gender Equality)

$$72.3\% = (169.5 - 46.93) / 169.5$$

$$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$$

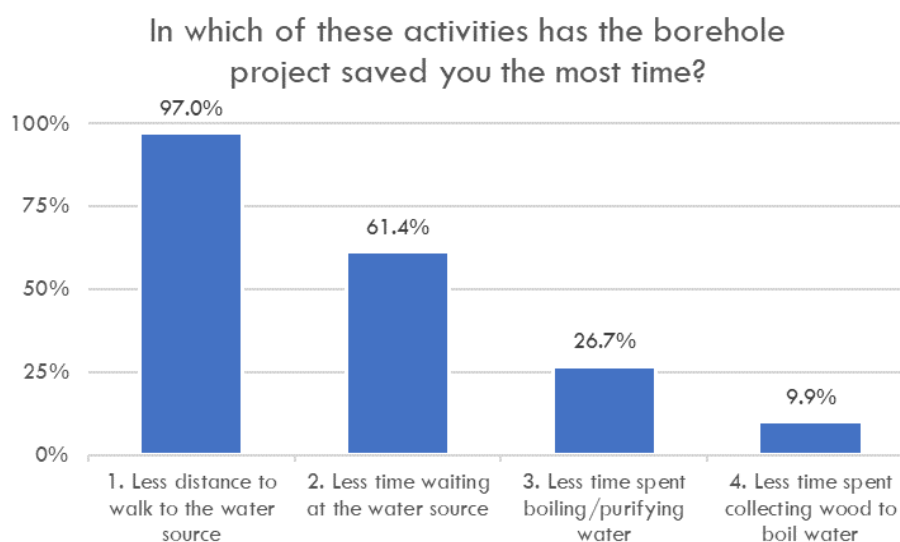
Where:

TR_y Total reduction time spent collecting water for project activity in year y (%)

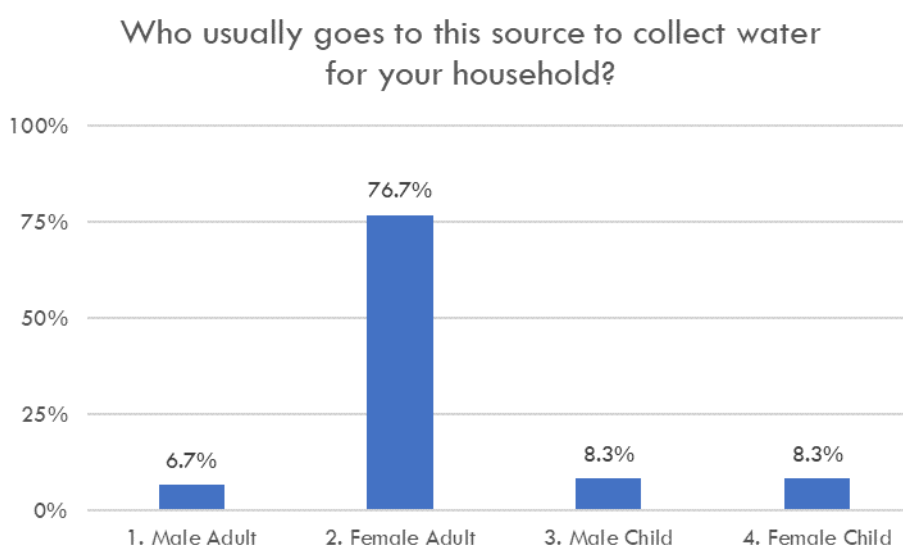
$T_{b,y}$ Time spent collecting water per household per day prior to project (hours)

$T_{p,y}$ Time spent collecting water per household per day in project (hours)

The Project Survey shows that the project reduces time collecting water by 72.3%. Respondents answered that time was saved due to the following effects of the project:

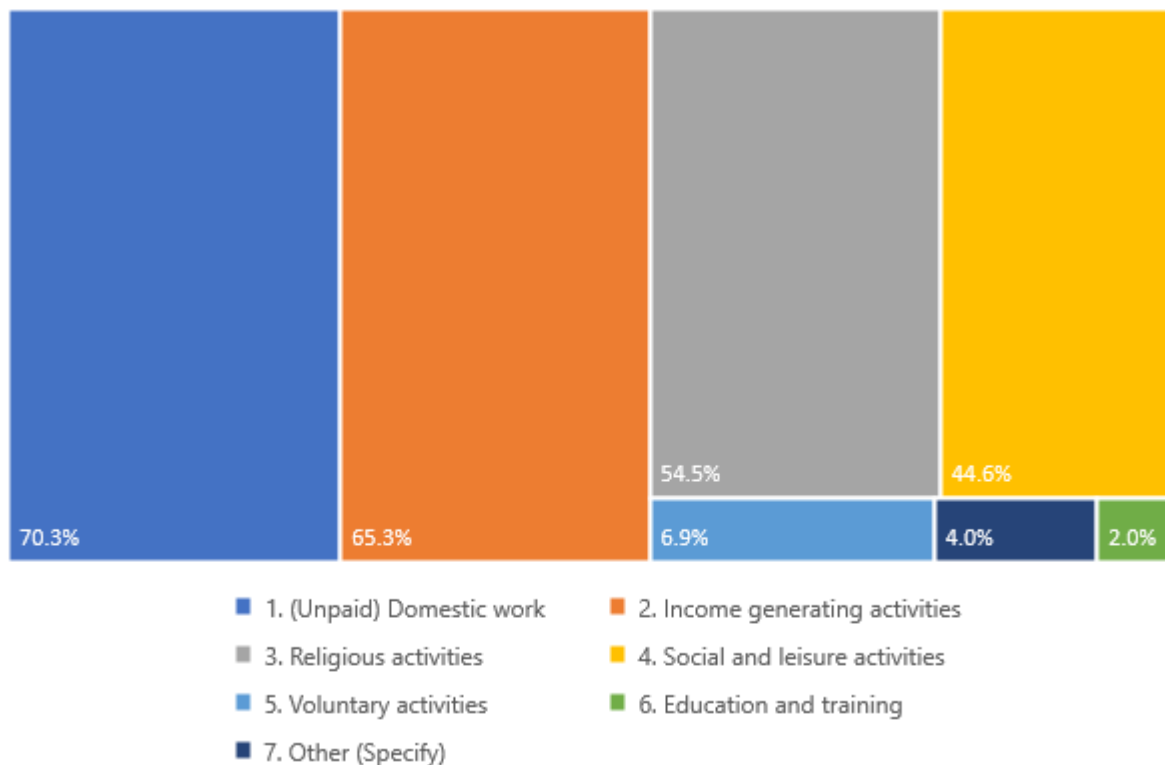


The graph shows that the burden of collecting water falls disproportionately on females (85%):



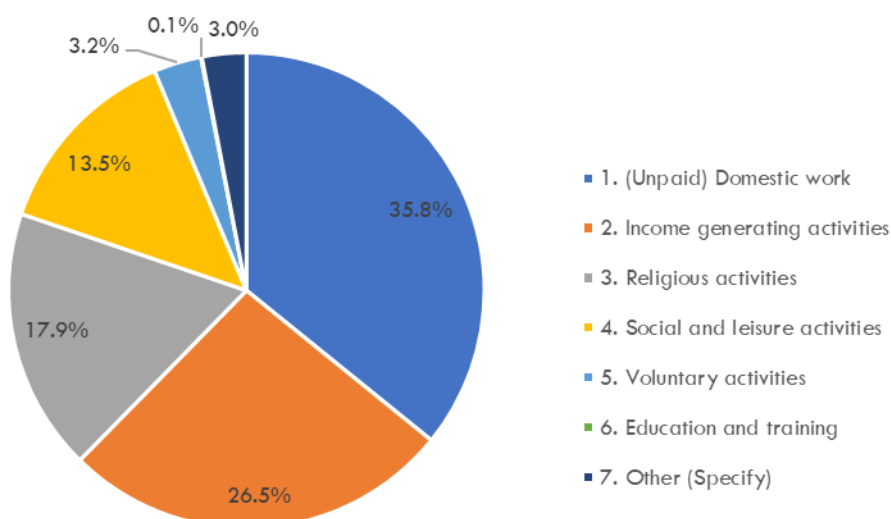
The time saved was spent on activities shown in the graph below. The responses show that the most significant activities that women engage in are domestic work (70.3%), income generating activities (65.3%), religious activities (54.5%) and social and leisure activities (44.6%)

What do you do with the time saved from the project?



The analysis of the time spent on each type of activity shows that women can now spend a significant amount of time on empowering activities such as income generating (26.5%), religious activities (17.9%) and social and leisure activities (13.5%).

How much time saved from the project is spent on each selected activity?



SDG 6 (Clean Water and Sanitation):

$$P_{\text{access}} = P_y * (1 - 0.0456) * 1$$

GS ID	P _{access}	P _y
GS5106	3,846	4,030
GS5186	3,951	4,140
GS5187	3,812	3,994
GS5188	3,900	4,086
GS5189	3,804	3,986
GS5190	4,469	4,682
GS5191	3,796	3,977
GS5192	3,812	3,994
GS5193	3,795	3,976
GS5194	3,772	3,952
GS5196	3,466	3,632
GS5197	3,740	3,919
GS6349	3,728	3,906
GS6350	3,485	3,652
GS6351	3,640	3,814
Total	57,016	59,740

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

Where:

P _{access}	Number of additional persons having access to 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.
U _{p,y}	Usage rate in project scenario p during year y

SDG 13 (Climate Action)

GS ID	Uncapped ERs	Capped ERs Total
GS5106	10,212	10,000
GS5186	10,490	10,000
GS5187	10,120	10,000
GS5188	10,354	10,000
GS5189	10,100	10,000
GS5190	11,864	10,000
GS5191	10,077	10,000
GS5192	10,120	10,000
GS5193	10,075	10,000
GS5194	10,014	10,000

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GS5196	8,274	8,274
GS5197	8,951	8,951
GS6349	7,320	7,320
GS6350	4,695	4,695
GS6351	4,989	4,989
Total	137,655	134,228

GS5106

Total Emission Reductions for Monitoring Period 3			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,470,950
Fuel to treat 1 litre of water using baseline tech	Wb.y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp.y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb.y	T	7148.18
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,470,950
Fossil fuel required to treat 1 litre for water in project scenario	Wp.y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp.y	T	0
Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156
Emissions Reductions			
Baseline emissions per year	BEb.y	tCO2/y	11,210
Project emissions per year	PEp.y	tCO2/y	0
Usage rate	Up.y	fraction	1
Leakage	LEp.y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	11,210
Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,212
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5186

Total Emission Reductions for Monitoring Period 3			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,511,100
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	7343.29

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1511100
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	11,516
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	11516

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,490
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5187

Total Emission Reductions for Monitoring Period 3			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,457,810
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	7084.32

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,457,810
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	11,110
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	11,110

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,120
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5188

Total Emission Reductions for Monitoring Period 3			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,491,390
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	7247.51

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,491,390
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	11,366
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	11,366

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,354
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5189

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,454,890
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	7070.13

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,454,890
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	11,088
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	11,088

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,100
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5190

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,708,930
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	8304.66

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,708,930
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	13,024
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	13,024

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	11,864
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5191

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,451,605
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	7054.17

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,451,605
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	11,063
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	11,063

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,077
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5192

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,457,810
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	7084.32

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,457,810
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	11,110
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	11,110

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,120
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5193

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,451,240
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	7052.40

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,451,240
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	11,060
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	11,060

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,075
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5194

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,442,480
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	7009.83

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,442,480
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	10,994
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	10,994

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	10,014
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5196

Total Emission Reductions for Monitoring Period 1			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,191,831
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5791.78

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,191,831
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,083
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9,083

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	8,274
Emission Reductions claimed	ERy	tCO2/y	8,274

GS5197

Total Emission Reductions for Monitoring Period 1			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,289,293
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	6265.40
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,289,293
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0
Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,826
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9,826
Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	8,951
Emission Reductions claimed	ERy	tCO2/y	8,951

GS6349

Total Emission Reductions for Monitoring Period 1			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		1,054,422
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5124.03
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		1,054,422
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0
Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,036
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8,036
Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	7,320
Emission Reductions claimed	ERy	tCO2/y	7,320

GS6350

Total Emission Reductions for Monitoring Period 1			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		676,227
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	3286.17
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		676,227
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0
Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	5,154
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	5,154
Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	4,695
Emission Reductions claimed	ERy	tCO2/y	4,695

GS6351

Total Emission Reductions for Monitoring Period 1			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Person Days	Njy		718,702
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	3492.58
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Person Days	Njy		718,702
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0
Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	5,477
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	5,477
Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	4,989
Emission Reductions claimed	ERy	tCO2/y	4,989

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

GS5106

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	215 people consuming safe or boiled water	4,030 people consuming safe water	Additional 3,815 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	184 people with access to safe water	4,030 people with access to safe water	Additional 3,846 persons with access to safe water
SDG 13	10,000 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 10,000 tCO ₂ e

GS5186

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	221 people consuming safe or boiled water	4,140 people consuming safe water	Additional 3,919 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	189 people with access to safe water	4,140 people with access to safe water	Additional 3,951 persons with access to safe water
SDG 13	10,000 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 10,000 tCO ₂ e

GS5187

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	213 people consuming safe or boiled water	3,994 people consuming safe water	Additional 3,781 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	182 people with access to safe water	3,994 people with access to safe water	Additional 3,812 persons with access to safe water
SDG 13	10,000 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 10,000 tCO ₂ e

GS5188

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	218 people consuming safe or boiled water	4,086 people consuming safe water	Additional 3,868 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	186 people with access to safe water	4,086 people with access to safe water	Additional 3,900 persons with access to safe water

SDG 13	10,000 tCO₂e emitted	0 tCO₂e emitted	Emissions reduced by 10,000 tCO₂e
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GS5189

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	212 people consuming safe or boiled water	3,986 people consuming safe water	Additional 3,774 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	182 people with access to safe water	3,986 people with access to safe water	Additional 3,804 persons with access to safe water
SDG 13	10,000 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 10,000 tCO ₂ e

GS5190

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	249 people consuming safe or boiled water	4,682 people consuming safe water	Additional 4,433 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	213 people with access to safe water	4,682 people with access to safe water	Additional 4,469 persons with access to safe water
SDG 13	10,000 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 10,000 tCO ₂ e

GS5191

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	212 people consuming safe or boiled water	3,977 people consuming safe water	Additional 3,765 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	181 people with access to safe water	3,977 people with access to safe water	Additional 3,796 persons with access to safe water
SDG 13	10,000 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 10,000 tCO ₂ e

GS5192

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	213 people consuming safe or boiled water	3,994 people consuming safe water	Additional 3,781 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	182 people with access to safe water	3,994 people with access to safe water	Additional 3,812 persons with access to safe water
SDG 13	10,000 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 10,000 tCO2e

GS5193

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	212 people consuming safe or boiled water	3,976 people consuming safe water	Additional 3,764 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	181 people with access to safe water	3,976 people with access to safe water	Additional 3,795 persons with access to safe water
SDG 13	10,000 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 10,000 tCO2e

GS5194

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	211 people consuming safe or boiled water	3,952 people consuming safe water	Additional 3,741 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	180 people with access to safe water	3,952 people with access to safe water	Additional 3,772 persons with access to safe water
SDG 13	10,000 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 10,000 tCO2e

GS5196

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	194 people consuming safe or boiled water	3,632 people consuming safe water	Additional 3,438 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	166 people with access to safe water	3,632 people with access to safe water	Additional 3,466 persons with access to safe water
SDG 13	8,274 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 8,274 tCO2e

GS5197

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	209 people consuming safe or boiled water	3,919 people consuming safe water	Additional 3,710 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	179 people with access to safe water	3,919 people with access to safe water	Additional 3,740 persons with access to safe water
SDG 13	8,951 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 8, 951 tCO ₂ e

GS6349

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	208 people consuming safe or boiled water	3,906 people consuming safe water	Additional 3,698 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	178 people with access to safe water	3,906 people with access to safe water	Additional 3,728 persons with access to safe water
SDG 13	7,320 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 7,320 tCO ₂ e

GS6350

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	195 people consuming safe or boiled water	3,652 people consuming safe water	Additional 3,457 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	167 people with access to safe water	3, 652 people with access to safe water	Additional 3,485 persons with access to safe water
SDG 13	4,695 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 4,695 tCO ₂ e

GS6351

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	203 people consuming safe or boiled water	3,814 people consuming safe water	Additional 3,611 people consuming safe water
SDG 5	169.5 minutes collecting water	46.93 minutes collecting water	72.3% reduction in time spent collecting water
SDG 6	174 people with access to safe water	3,814 people with access to safe water	Additional 3,640 persons with access to safe water
SDG 13	4,989 tCO ₂ e emitted	0 tCO ₂ e emitted	Emissions reduced by 4,989 tCO ₂ e

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

Item	Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
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SDG 3	GS5106: 3,713 GS5186: 3,713 GS5187: 3,713 GS5188: 3,713 GS5189: 3,713 GS5190: 3,713 GS5191: 3,713 GS5192: 3,713 GS5193: 3,713 GS5194: 3,713 GS5196: 3,726 GS5197: 3,726 GS6349: 3,726 GS6350: 3,726 GS6351: 3,726	GS5106: 3,815 GS5186: 3,919 GS5187: 3,781 GS5188: 3,868 GS5189: 3,774 GS5190: 4,433 GS5191: 3,765 GS5192: 3,781 GS5193: 3,764 GS5194: 3,741 GS5196: 3,438 GS5197: 3,710 GS6349: 3,698 GS6350: 3,457 GS6351: 3,611
SDG 5	53.8% reduction in time spent collecting water	72.3% reduction in time spent collecting water
SDG 6	GS5106: 2,970 GS5186: 2,970 GS5187: 2,970 GS5188: 2,970 GS5189: 2,970 GS5190: 2,970 GS5191: 2,970 GS5192: 2,970 GS5193: 2,970 GS5194: 2,970GS5196: 3,757 GS5197: 3,757 GS6349: 3,757 GS6350: 3,757 GS6351: 3,757	GS5106: 3,846 GS5186: 3,951 GS5187: 3,812 GS5188: 3,900 GS5189: 3,804 GS5190: 4,469 GS5191: 3,796 GS5192: 3,812 GS5193: 3,795 GS5194: 3,772GS5196: 3,466 GS5197: 3,740 GS6349: 3,728 GS6350: 3,485 GS6351: 3,640
SDG 13	GS5106: 9,977 GS5186: 9,977 GS5187: 9,977 GS5188: 9,977 GS5189: 9,977 GS5190: 9,977 GS5191: 9,977 GS5192: 9,977 GS5193: 9,977 GS5194: 9,977 GS5196: 9,973 GS5197: 9,973 GS6349: 9,973 GS6350: 9,973 GS6351: 9,973 Total: 149,635	GS5106: 10,000 GS5186: 10,000 GS5187: 10,000 GS5188: 10,000 GS5189: 10,000 GS5190: 10,000 GS5191: 10,000 GS5192: 10,000 GS5193: 10,000 GS5194: 10,000 GS5196: 8,274 GS5197: 8,951 GS6349: 7,320 GS6350: 4,695 GS6351: 4,989 Total: 134,228

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

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SDG 3

The estimation provided in the Transition Annex was based on conservative figures.

SDG 5

The transition Annex estimated a 53.8% reduction in time spent collecting water. The actual figure of 72.3% is higher as the estimation was based on conservative figures.

SDG 6

The estimation provided in the Transition Annex was based on conservative figures.

SDG 13

The estimated VERs of the older VPAs is slightly lower than the actual VERs. This is due to conservative user numbers in the ex ante calculations.

For the 5 new VPAs, the actual VERs is lower than the ex ante VERs due to a shorter monitoring period.

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

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No inputs or grievances were received during the monitoring period.

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

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No inputs or grievances were received during the previous monitoring period.

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

No legal contests or disputes arose during the monitoring period.