

**Gold standard for the global goals
Monitoring report**



June 2017, version 1

Title of the project	GS1247 VPA 71: Lango Safe Water Project (GS5106) GS1247 VPA 72 Lango Safe Water Project (GS5186) GS1247 VPA 73 Lango Safe Water Project (GS5187) GS1247 VPA 74: Lango Safe Water Project (GS5188) GS1247 VPA 75 Lango Safe Water Project (GS5189) GS1247 VPA 76 Lango Safe Water Project (GS5190) GS1247 VPA 77 Lango Safe Water Project (GS5191) GS1247 VPA 78 Lango Safe Water Project (GS5192) GS1247 VPA 79 Lango Safe Water Project (GS5193) GS1247 VPA 80 Lango Safe Water Project (GS5194) GS1247 VPA 82 Lango Safe Water Project (GS5196) GS1247 VPA 83 Lango Safe Water Project (GS5197) GS1247 VPA 139: Lango Safe Water Project (GS6349) GS1247 VPA 140 Lango Safe Water Project (GS6350) GS1247 VPA 141 Lango Safe Water Project (GS6351) GS1247 VPA 183 Lango Safe Water Project (GS7362) GS1247 VPA 184 Lango Safe Water Project (GS7363) GS1247 VPA 185 Lango Safe Water Project (GS7364) GS1247 VPA 186 Lango Safe Water Project (GS7365) GS1247 VPA 187 Lango Safe Water Project (GS7366)
Gold Standard project id	GS5106, 5186-94, 5196-97, 6349-51, 7362-66
Version number of the monitoring report	5
Completion date of the monitoring report	14/10/2020
Date of project design certification	GS5106 & 5186-94: 11/09/2017 GS5196-7 & 6349-51: 26/12/2018 GS7362-7366: 16/08/2019
Start date of crediting period	GS5106: 10/12/2016 GS5186: 09/12/2016 GS5187: 12/10/2016 GS5188: 14/10/2016 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

	<p>GS6350: 21/09/2018 GS6351: 19/09/2018 GS7362: 12/06/2019 GS7363: 12/06/2019 GS7364: 12/06/2019 GS7365: 11/09/2019 GS7366: 11/09/2019</p>
Duration of this monitoring period	<p>MP1 GS7362: 12/06/2019 to 31/03/2020 GS7363: 12/06/2019 to 31/03/2020 GS7364: 12/06/2019 to 31/03/2020 GS7365: 11/06/2019 to 31/03/2020 GS7366: 11/06/2019 to 31/03/2020</p> <p>MP2 GS5196: 03/05/2019 to 31/03/2020 GS5197: 03/05/2019 to 31/03/2020 GS6349: 07/05/2019 to 31/03/2020 GS6350: 21/09/2019 to 31/03/2020 GS6351: 19/09/2019 to 31/03/2020</p> <p>MP3 GS5189-94: 01/04/2019 to 31/03/2020</p> <p>MP4 GS5106 & GS5186-8: 01/04/2019 to 31/03/2020</p>
Duration of previous monitoring period	<p>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</p> <p>MP2 GS5189-94: 01/04/2018 to 31/03/2019</p> <p>MP3 GS5106 & GS5186-8: 01/04/2018 to 31/03/2019</p>
Project representative(s)	<p>James Walker, CO2balance Jonathan Windeatt, CO2balance</p>
Host Country	<p>Republic of Uganda</p>
Certification pathway (activity certification/impact certification)	<p>Impact Certification</p>
SDG Contributions targeted (as per approved PDD)	<p>SDG 3 – Good Health and Wellbeing By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.</p> <p>SDG 5 – Gender Equality Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.</p> <p>SDG 6 – Clean Water and Sanitation</p>

	<p>By 2030, achieve universal and equitable access to safe and affordable drinking water for all.</p> <p>SDG 13 – Climate Action 13.B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities</p>
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)	<p>SDG 3 - Additional people consuming safe water GS5106 & 5186-94: 3,713 per VPA GS5196-7 & 6349-51: 3,726 per VPA GS7362-6: 3,726 per VPA</p> <p>SDG 5 - 53.8% decrease in time spent collecting water and firewood per household per day</p> <p>SDG 6 - Additional people with access to safe water GS5106 & 5186-94: 2,970 per VPA GS5196-7, 6349-51 & GS7362-6: 3,757 per VPA</p> <p>SDG 13 - Emissions reductions per year (tCO2e) GS5106 & 5186-94: 9,977 per VPA GS5196-7, 6349-51 & GS7362-6: 9,973 per VPA</p>
Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period	<p>SDG 3 - Additional people consuming safe water</p> <p>GS5106: 3,426 GS5186: 3,459 GS5187: 3,424 GS5188: 3,455 GS5189: 3,774 GS5190: 4,433 GS5191: 3,765 GS5192: 3,781 GS5193: 3,357 GS5194: 3,741 GS5196: 3,023 GS5197: 3,710 GS6349: 3,698 GS6350: 3,457 GS6351: 3,611 GS7362: 3,790 GS7363: 4,096 GS7364: 3,839 GS7365: 3,836 GS7366: 3,963</p> <p>Total: 73,638</p>

	<p>SDG 5 – 60.7% decrease in time spent collecting water and firewood per household per day</p> <p>SDG 6 - Additional people with access to safe water</p> <p>GS5106: 3,454</p> <p>GS5186: 3,487</p> <p>GS5187: 3,452</p> <p>GS5188: 3,483</p> <p>GS5189: 3,804</p> <p>GS5190: 4,469</p> <p>GS5191: 3,796</p> <p>GS5192: 3,812</p> <p>GS5193: 3,384</p> <p>GS5194: 3,772</p> <p>GS5196: 3,047</p> <p>GS5197: 3,740</p> <p>GS6349: 3,728</p> <p>GS6350: 3,485</p> <p>GS6351: 3,640</p> <p>GS7362: 3,820</p> <p>GS7363: 4,129</p> <p>GS7364: 3,870</p> <p>GS7365: 3,867</p> <p>GS7366: 3,995</p> <p>Total: 74,235</p> <p>SDG 13 - Emissions reductions per year (tCO2e)</p> <p>GS5106: 8,828</p> <p>GS5186: 9,075</p> <p>GS5187: 8,958</p> <p>GS5188: 9,149</p> <p>GS5189: 10,000</p> <p>GS5190: 10,000</p> <p>GS5191: 9,964</p> <p>GS5192: 9,950</p> <p>GS5193: 8,891</p> <p>GS5194: 9,806</p> <p>GS5196: 7,889</p> <p>GS5197: 9,726</p> <p>GS6349: 9,859</p> <p>GS6350: 8,952</p> <p>GS6351: 9,424</p> <p>GS7362: 7,843</p> <p>GS7363: 8,530</p> <p>GS7364: 6,416</p> <p>GS7365: 5,631</p> <p>GS7366: 5,520</p> <p>Total: 174,411</p>
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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. The crediting periods for each VPA are given in section A.4 and have a lifetime of 7 years.

Prior to this monitoring period, a total of 125 boreholes were rehabilitated across 15 VPAs between 11th October 2016 – 28th September 2018. This monitoring period covers 1st April 2019 to 31st March 2020. An additional 43 boreholes were rehabilitated across 5x new VPAs between 11/06/2019 – 16/09/2019, which are also included in this monitoring period, to make a total of 2 VPAs.

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

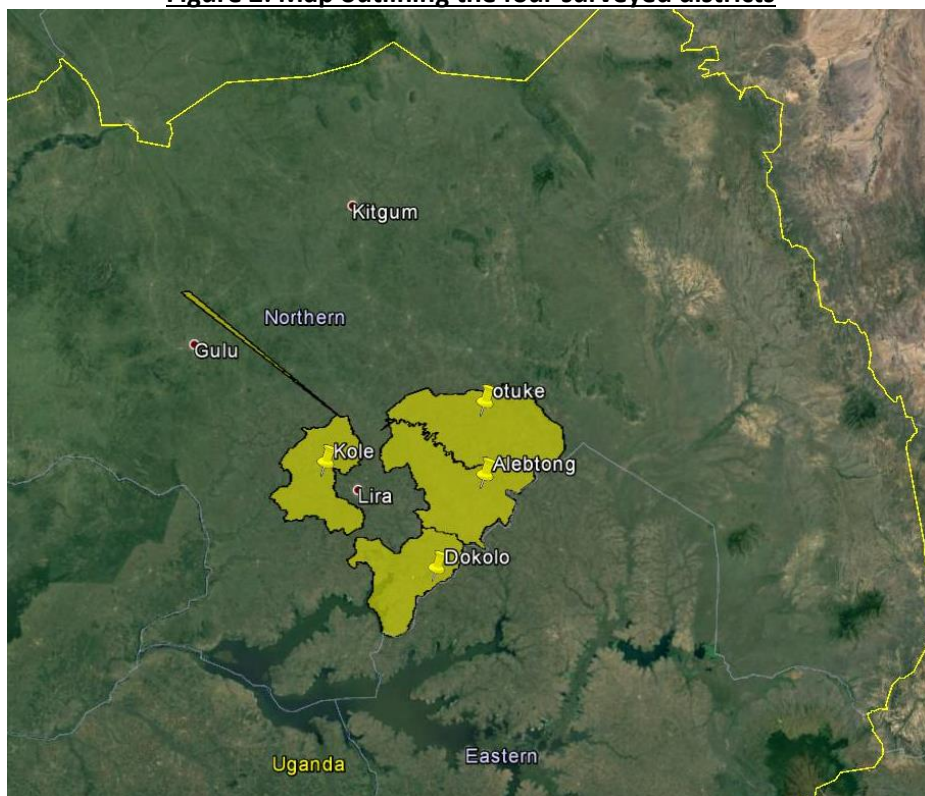


Table 1: Geographical characteristics of Alebtong, Dokolo, Otuke and Kole Districts

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: 10/12/2016 to 09/12/2023
 GS5186: 09/12/2016 to 08/12/2023
 GS5187: 12/10/2016 to 11/10/2023
 GS5188: 14/10/2016 to 13/10/2023
 GS5189: 01/03/2017 to 28/02/2024
 GS5190: 02/03/2017 to 01/03/2024
 GS5191: 28/02/2017 to 27/02/2024
 GS5192: 03/05/2017 to 02/05/2024
 GS5193: 03/05/2017 to 02/05/2024
 GS5194: 18/10/2016 to 17/10/2023
 GS5196: 03/05/2018 to 02/05/2025
 GS5197: 03/05/2018 to 02/05/2025
 GS6349: 07/05/2018 to 06/05/2025
 GS6350: 21/09/2018 to 20/09/2025
 GS6351: 19/09/2018 to 18/09/2025
 GS7362: 12/06/2019 to 11/06/2026
 GS7363: 12/06/2019 to 11/06/2026
 GS7364: 12/06/2019 to 11/06/2026
 GS7365: 11/06/2019 to 10/06/2026
 GS7366: 11/06/2019 to 10/06/2026

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

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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.

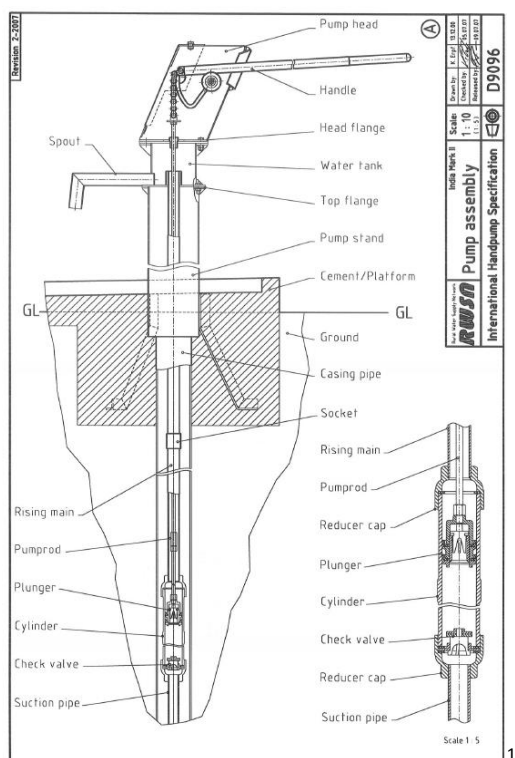
Lango sub-region is a largely rural region in which many local people typically use wood fuel on inefficient three stone fires to purify their drinking, cleaning and washing water. This process results in the release of greenhouse gas emissions from the combustion of wood which can be avoided if a technology 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 168 boreholes have been rehabilitated across 20 VPAs between 11th October 2016 – 16th September 2019. The date, location and number of people served by each borehole is given in the table below, which forms the project database. 6 Boreholes had to be removed from crediting because of not meeting standards required from the water quality tests.

Borehole ID	Date of Rehabilitation	Village	No. of users
LAN001	16/12/2016	Aderolongo	358
LAN003	16/12/2016	Ejang	349
LAN004	15/12/2016	Kulu Omara	414
LAN005	15/12/2016	Te-Cwao	379
LAN006	15/12/2016	St Paul Amoi	418
LAN007	12/12/2016	Acilkom	357
LAN008	12/12/2016	Awelogei	459
LAN009	09/12/2016	Aber	383
LAN010	13/12/2016	Kongotye	502
Total			4,030

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

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LAN011	09/12/2016	Aduru	254
LAN012	08/12/2016	Apel II	421
LAN013	09/12/2016	Apur B	385
LAN014	13/12/2016	Te-Abwolo	303
LAN015	14/12/2016	Amunga SW	553
LAN016	14/12/2016	Amunga P/S	568
LAN017	10/12/2016	Kulu Okani	367
LAN018	10/12/2016	Kulu Eluk	441
LAN020	10/12/2016	Otkwac Amalo	362
Total			4,140
LAN021	11/10/2016	Tangala	390
LAN022	12/10/2016	Otikokin	482
LAN023	11/10/2016	Aliwok	404
LAN024	19/10/2016	Atelela	503
LAN025	19/10/2016	Awat 'A'	473
LAN026	27/10/2016	Center Lira	372
LAN027	21/10/2016	Abongo Ipale	640
LAN028	18/10/2016	Apuru	353
Total			3,994
LAN030	19/10/2016	Adak	496
LAN031	19/10/2016	Abucero	450
LAN032	14/11/2016	Akwac A	575
LAN033	14/10/2016	Awonayap A	417
LAN034	15/10/2016	Baropiro	416
LAN035	13/10/2016	Baroceco	475
LAN037	15/10/2016	Baralegi	383
LAN038	18/10/2016	Anyonomac	437
Total			4,086
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
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
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

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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
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
LAN069	03/05/2017	Acede	388
LAN070	02/05/2017	Aming	410
LAN071	08/05/2017	Alango	252
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
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
LAN087	11/05/2018	Abongoawobe	488
LAN088	06/05/2018	Abuabura	394
LAN089	08/05/2018	Adagawaka	465
LAN090	04/05/2018	Agali Alingadyel	457
LAN091	05/05/2018	Akon	396
LAN093	07/05/2018	Arwenyo	535
LAN094	03/05/2018	Aweodike	458
Total			3,144
LAN095	09/05/2018	Ilera Amintenyio	309

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LAN096	05/05/2018	Otongero B	439
LAN097	09/05/2018	Teyao Aluti	554
LAN098	07/05/2018	Okeda A	475
LAN099	04/05/2018	Okeorkok	576
LAN100	02/05/2018	Okum	636
LAN101	03/05/2018	Olarolobo	461
LAN102	03/05/2018	Oloakero	469
Total			3,610
LAN103	06/05/2018	Acoke	312
LAN104	08/05/2018	Obalodeo	672
LAN105	08/05/2018	Teyao Aloï	519
LAN106	20/09/2018	Aduro Okwangole	462
LAN107	08/05/2018	Obal	780
LAN108	18/09/2018	Akwac B	458
LAN109	19/09/2018	Yabwangi	407
LAN110	26/09/2018	Aloï 'A'	296
Total			3,594
LAN111	26/09/2018	Alumeri	410
LAN112	27/09/2018	Amintato B	412
LAN113	20/09/2018	Amonomito	321
LAN114	25/09/2018	Apado	637
LAN115	25/09/2018	Awiny	352
LAN116	27/09/2018	Ayitatwon	567
LAN117	28/09/2018	Bung	376
LAN118	27/09/2018	Entebbe	577
Total			3,242
LAN119	25/09/2018	Lakcani	472
LAN120	28/09/2018	Lela Ocika	578
LAN121	20/09/2018	Ober 2	491
LAN122	18/09/2018	Okeda "B"	464
LAN123	19/09/2018	Okuronyang A	471
LAN124	19/09/2018	Adwei	583
LAN125	26/09/2018	Aliwok B	515
LAN126	27/09/2018	Te-Okutu	240
Total			3,342
LAN127	11/06/2019	Abalokara	463
LAN128	14/06/2019	Abilonino Tegot	516
LAN129	12/06/2019	Alwala	392
LAN130	16/06/2019	Acae-Ogik	563
LAN131	15/06/2019	Bar-Onger	524
LAN132	13/06/2019	Adag-Anii Alito	490
LAN133	12/06/2019	Adakingo	409
LAN134	13/06/2019	Akena B	646
Total			4,003
LAN135	13/06/2019	Worekeni	458

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LAN136	14/06/2019	Alelibanya	947
LAN137	16/06/2019	Abongo Papa	569
LAN138	15/06/2019	Aputi	441
LAN139	16/06/2019	Bar Pii Atidi	610
LAN140	15/06/2019	Acan-Mwol	517
LAN141	11/06/2019	Dogikore	313
LAN142	12/06/2019	Odeo	471
Total			4,326
LAN143	11/06/2019	Omoladyang Dani	289
LAN144	14/06/2019	St. Anne	319
LAN145	13/06/2019	Te-Opok	533
LAN146	12/06/2019	Akao	330
LAN147	16/09/2019	Cungapenyi	323
LAN148	13/09/2019	Adagani Dokolo	393
LAN149	12/09/2019	Ageni 'A'	526
LAN150	16/09/2019	Adwongdokinyom	518
LAN151	14/09/2019	Angeta	390
LAN152	16/09/2019	Apanyapany	434
Total			4,055
LAN153	16/09/2019	Adak 'B'	380
LAN154	12/09/2019	Ajaa 'A'	498
LAN155	12/09/2019	Alut	423
LAN156	11/09/2019	Aluti	452
LAN157	13/09/2019	Acwer	454
LAN158	10/09/2019	Otongodel	684
LAN159	14/09/2019	Aringading	437
LAN160	15/09/2019	Awali	724
Total			4,052
LAN161	11/09/2019	Awat 'B'	406
LAN162	11/09/2019	Aweiwoo	493
LAN163	10/09/2019	Ayetayet 'A'	561
LAN164	16/09/2019	Aminalaki	497
LAN165	10/09/2019	Obelower	537
LAN166	16/09/2019	Onango	219
LAN167	12/09/2019	Oyengopere 'A'	557
LAN168	16/09/2019	Oyengopere 'B'	388
LAN169	14/09/2019	Adicwiny	528
Total			4,186

Each borehole undergoes an annual water quality test based on the national standard of potable water by a Ministry of Water and Environment laboratory. The water from 6 handpumps (in grey above) showed traces of coliform, and therefore 3 months of crediting has been conservatively removed for each handpump. These boreholes will be treated with chlorine and an investigation will be conducted as to why the groundwater was contaminated once the field team are able to do so. It is not possible to do some immediately due to the country's covid-19 lockdown. Once treated, water quality tests will be conducted to ensure that the water meets the national standard.

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Boreholes that required maintenance in the monitoring period are reported in the 'Lango MP4 Maintenance Reactive repair log' spreadsheet submitted. The number of days non-functional has been recorded in the Failure Days monitored parameter box and removed from crediting.

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

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During this monitoring period, 124 project and usage surveys were conducted between the 4th and 7th February 2020. The random sample was made up of 140HHs, but 16 were not able to be reached by the field staff. The 124 HHs surveyed satisfies the methodological requirement of >100.

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Due to the outbreak of the Coronavirus, travel restrictions have been put in place in Uganda, which has meant PP has not been able to update the WCFT, which is required every other year. As PP has not been able to carry out the WCFT, PP is seeking to apply the value measured in the 2018 WCFT ("Lango_WCFT_2018) (based on Covid-19 Interim Measures section 3.1.1.b.), with a reduction of 20% to ensure conservativeness. The value from the 2018 test is 9.45L per person per day:

$$9.45 - 20\% = 7.56.$$

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 2016-17 (81), 2017-18 (45) and 2018-19 (43). This totals 169 boreholes, 168 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 and based on a weighted average, the number of HHs are selected for the survey. This provides a random sample of a total of 140 HHs in total. This more than satisfies the minimum required sample of 30 households per age group.

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

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.

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 $Q_{p,rawboil,y}$) – Due to the outbreak of the Coronavirus PP has not been able to update the WCFT, which is required every other year. Please see start of section C of how PP plans to accommodate these circumstances.
- **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 but for 6 boreholes listed in section B.1, which failed to meet the national standards. A conservative 3 months was removed from the PTDs of the 6 boreholes.
- **Usage Survey** - The annual usage survey was conducted using a sample size of 140. 16 were unavailable or not able to take part. 124 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.

Leakage Assessment

The potential sources of leakage listed in the methodology have been investigated, and addressed below:

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.

The baseline technologies displaced are predominantly three stone fires; these have no market value and are not a product as such. There is nothing limiting the use of three stone cooking across the country (the technology is lowest rung on the energy ladder and the price is zero), which is why this cooking method is so widespread. The primary purpose of these three rocks is for cooking so they will not be replaced/displaced in their entirety as a result of this project - which means they will not be reused outside the project boundary. This leakage source can therefore be discounted.

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

There is no evidence to suggest significant (if any) use of renewable energy for purifying water in the project region as found in the Baseline Surveys. As solar purification devices are not used, renewable energy used for purifying water would likely be animal dung or crop residues which will be used due to ease of availability/proximity to the home rather than due to a shortage of wood fuel, therefore it is an independent factor. This leakage source can therefore be discounted.

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.

There are currently no other CDM or VER projects in the project area, however, this will be reviewed biennially.

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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.

The space heating effect of boiling water for purification purposes will be minimal, as the predominant use of baseline technology is for cooking. Therefore, it is highly unlikely that another technology will be used for heating when users no longer boil water.

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.

This project is not marketing efficient technology; it is eliminating the need for a fuel-based technology to deliver pure water. Lower emission technology substitution within households is therefore not possible and this leakage source can therefore be discounted.

A value of 0 is applied for leakage, which will be monitored biennially, following first verification as per the requirements of the methodology.

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	<p>SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p> <p>3.9.1: Mortality rate attributed to household and ambient air pollution.</p> <p>3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services</p> <p>SDG 6 (Clean Water and Sanitation) 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.</p> <p>6.1.1: Proportion of population using safely managed drinking water services</p> <p>SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>
Data/parameter:	C _j
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 through 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	<p>SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>
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
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. 3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services
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 (Gender Equality) 5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate. 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location
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	SDG 5: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.

D.2. Data and parameters monitored

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

Relevant SDG Indicator	SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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: 1,271,882 GS5186: 1,307,347 GS5187: 1,290,406 GS5188: 1,318,124 GS5189: 1,454,890 GS5190: 1,631,640 GS5191: 1,447,095 GS5192: 1,433,374 GS5193: 1,280,743 GS5194: 1,412,689 GS5196: 1,136,511 GS5197: 1,401,140 GS6349: 1,420,314 GS6350: 1,289,611 GS6351: 1,357,713 GS7362: 1,129,877 GS7363: 1,228,870 GS7364: 924,294 GS7365: 811,252 GS7366: 795,330 Total: 25,342,102
Monitoring equipment	Borehole database
Measuring/reading/recording frequency:	Measured per MP
Calculation method (if applicable):	Borehole users x days in MP – failure days
QA/QC procedures:	-
Purpose of data:	Calculating ERs
Additional comments:	SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

Relevant SDG Indicator	<p>SDG 6 (Clean Water and Sanitation) 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.</p> <p>6.1.1: Proportion of population using safely managed drinking water services</p> <p>SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>
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 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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 "Lango_WCFT_2018"
Value(s) of monitored parameter	7.56 (capped at 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:	<p>Due to the outbreak of the Coronavirus, travel restrictions have been put in place in Uganda, which has meant PP has not been able to update the WCFT, which is required every other year. As PP has not been able to carry out the WCFT, PP is seeking to apply the value measured in the 2018 WCFT (based on Covid-19 Interim Measures section 3.1.1.b.), with a reduction of 20% to ensure conservativeness. The value from the 2018 test is 9.45L per person per day:</p> <p>$9.45 - 20\% = 7.56$</p> <p>SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.</p>

Relevant SDG Indicator	SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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:	SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

Relevant SDG Indicator	SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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:	SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

Relevant SDG Indicator	SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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, except from 6 boreholes which have failed to meet the standards.
Monitoring equipment	Laboratory Tests
Measuring/reading/recording frequency:	Tested annually
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	-
Additional comments:	SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

Relevant SDG Indicator	SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
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:	SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

Relevant SDG Indicator	<p>SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p> <p>3.9.1: Mortality rate attributed to household and ambient air pollution.</p> <p>3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services</p> <p>SDG 6 (Clean Water and Sanitation) 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.</p>
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 GS7362: 4,003 GS7363: 4,326 GS7364: 4,055 GS7365: 4,052 GS7366: 4,186 Total: 80,362
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/Safeguarding Principle	SDG 5
Data / Parameter	Usage of time saved on water collection
Unit	Percentage
Description	Uses of time saved which was previously spent on water collection
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	<ol style="list-style-type: none"> 1. (Unpaid) Domestic work (includes cooking and caring for family members): 43% 2. Income generating activities: 38% 3. Religious activities: 23% 4. Social and leisure activities: 12% 5. Voluntary activities: 0% 6. Education and training: 0% 7. Other (Specify): 0%
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Ask users how time saved on water collection in the project scenario, as opposed to the baseline scenario, is now being used.
QA/QC procedures:	-
Purpose of data	To quantify how time which was previously spent on water collection is now being used
Additional comments:	SDG 5: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.

Relevant SDG Indicator	<p>SDG 5 (Gender Equality) 5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.</p> <p>5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location</p>
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	66.6
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	<p>SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p> <p>3.9.1: Mortality rate attributed to household and ambient air pollution.</p> <p>3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services</p>
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: 3,426 GS5186: 3,459 GS5187: 3,424 GS5188: 3,455 GS5189: 3,774 GS5190: 4,433 GS5191: 3,765 GS5192: 3,781 GS5193: 3,357 GS5194: 3,741 GS5196: 3,023 GS5197: 3,719 GS6349: 3,698 GS6350: 3,457 GS6351: 3,611 GS7362: 3,790 GS7363: 4,096 GS7364: 3,839 GS7365: 3,836 GS7366: 3,963 Total: 73,638
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 (Gender Equality) 5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate. 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location
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	60.7%
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 (Clean Water and Sanitation) 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.
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: 3,454 GS5186: 3,487 GS5187: 3,452 GS5188: 3,483 GS5189: 3,804 GS5190: 4,469 GS5191: 3,796 GS5192: 3,812 GS5193: 3,384 GS5194: 3,772 GS5196: 3,047 GS5197: 3,740 GS6349: 3,728 GS6350: 3,485 GS6351: 3,640 GS7362: 3,820 GS7363: 4,129 GS7364: 3,870 GS7365: 3,867 GS7366: 3,995 Total: 74,235
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 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
Data / Parameter	Failure Days,y
Unit	Number
Description	Number of days a particular borehole was non-functioning during year y
Source of data	Borehole visits, communications from WRC
Value(s) applied	1135 days
Measurement methods and procedures	Please see document 'Lango MP4 Maintenance and Repairs Log V2.xlsx'
Monitoring frequency	Ongoing
QA/QC procedures	-
Purpose of data	Calculating ERs
Additional comment	SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

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, GS5196, GS5197, GS6349, GS6350, GS6351, GS7362, GS7363, GS7364, GS7365 and GS7366. 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 October 2019. Therefore, boreholes were split into those from 2016-17 (81), from 2017-18 (45) and from 2018-19 (43). 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. 60 HHs were selected from 2016-17 age group, 40 HHs from 2017-18 and 40 HHs from 2018-19, to provide 140 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.

The 2018 WCFT surveys used for this monitoring period, as outlined in section C, were conducted between 19/02/2018 – 22/02/2018.

The water quality tests were conducted by the ministry of water & environment of Uganda. The tests include a wide range of parameters to cover safe water consumption. Key parameters include turbidity, metal contents and presence of faecal coliform.

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_j) 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_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.

$P_{b, boil}$ 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_j) is determined through the baseline survey.

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.

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

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

Where:

$$B_{b,y} = N_{p,y} * P_{b,y}$$

Where:

$N_{p,y}$ Project technology-days in the project database for project scenario p through year y

$P_{b,y}$ Specific fuel consumption for an individual technology in baseline scenario b during year y converted to tons/day

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 consuming safe water in the project activity

Parameter P_y is calculated from the user lists of the Project Waterpoints.

SDG 5 (Gender Equality)

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

Parameter $T_{p,y}$ is taken from Q17 Project Survey.

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

Parameter P_y is calculated from the user lists of the Project Waterpoints.

Parameter $U_{p,y}$ is taken from Q11 Usage Survey

SDG 13 (Climate Action)

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

Where:

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

Where:

$N_{p,y}$ 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

$Q_{p,cleanboil,y}$ 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	3,426	4,030
GS5186	3,459	4,140
GS5187	3,424	3,994
GS5188	3,455	4,086
GS5189	3,774	3,986
GS5190	4,433	4,682
GS5191	3,765	3,977
GS5192	3,781	3,994
GS5193	3,357	3,976
GS5194	3,741	3,952
GS5196	3,023	3,632
GS5197	3,710	3,919
GS6349	3,698	3,906
GS6350	3,457	3,652
GS6351	3,611	3,814
GS7362	3,790	4,003
GS7363	4,096	4,326
GS7364	3,839	4,055
GS7365	3,836	4,052
GS7366	3,963	4,186
Total	73,638	80,362

$$P_{safe} = (P_y - \text{Failure days},y) * (1 - C_j) * (1 - P_{b, \text{boil}})$$

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.
- Failure days,y Number of days a particular borehole was non-functioning during year.
- 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.
- P_{b, boil} Percentage of persons boiling water for purification in the baseline scenario.

SDG 5 (Gender Equality)

$$60.7\% = (169.5 - 66.6) / 169.5$$

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

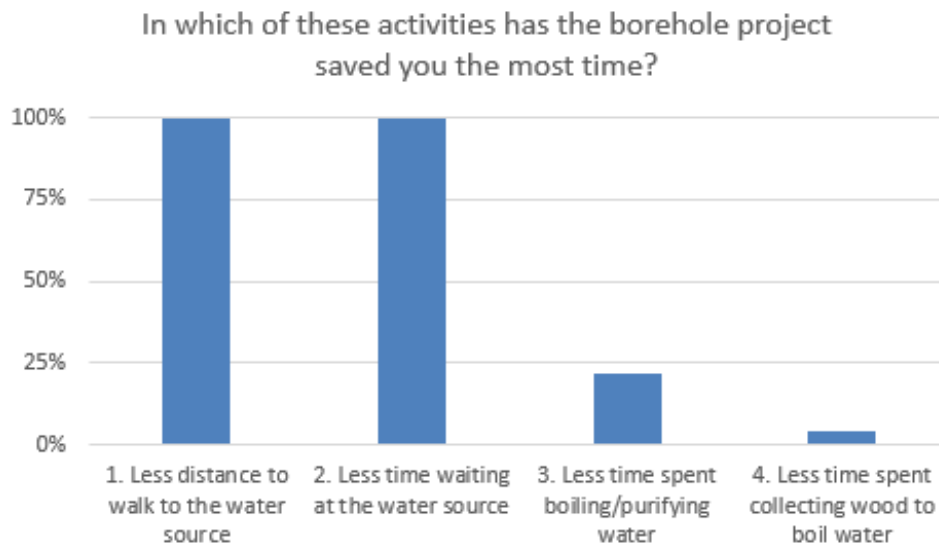
Where:

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

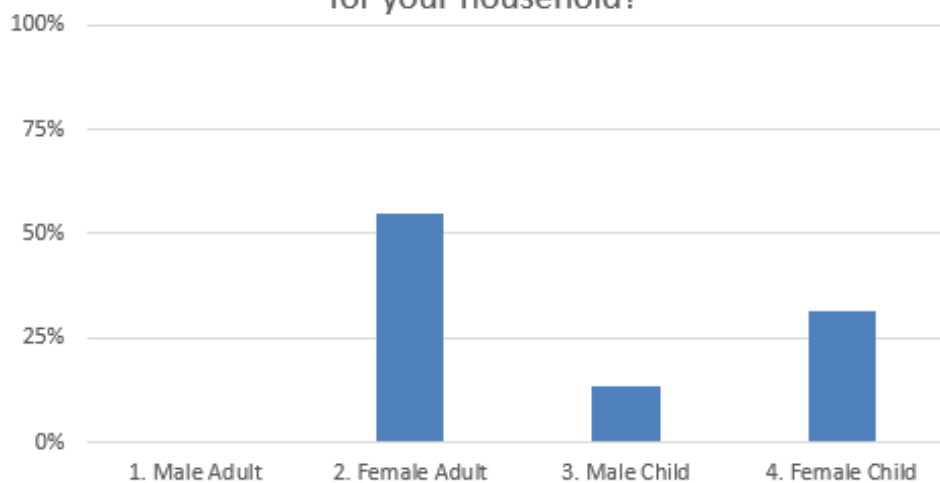
$T_{p,y}$ Time spent collecting water per household per day in project

The baseline figure ($T_{b,y}$) for time spent collecting water is set in the Gender Baseline Report at 169.5 minutes per household per day. The Project Survey shows that, by using the project borehole, households now spend 66.6 minutes per day collecting water ($T_{p,y}$). This is a time saving of 102.9 minutes and shows that the project reduces time collecting water by 60.7%. Respondents answered that time was saved due to the following effects of the project:



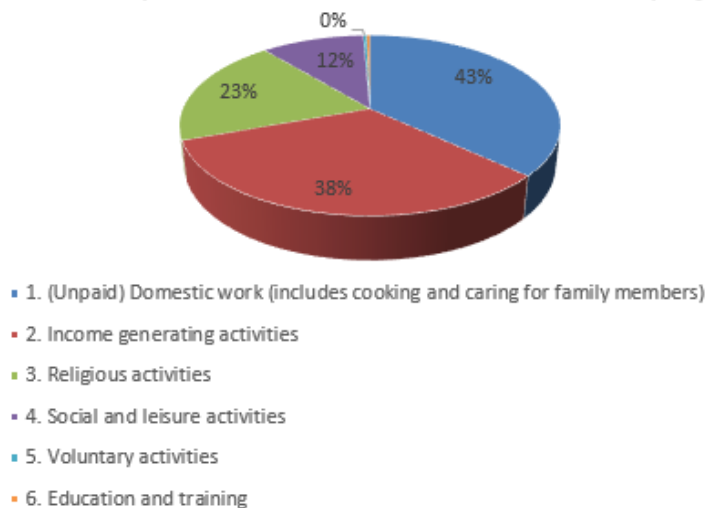
The graph shows that the burden of collecting water falls disproportionately on females (86%):

Who usually goes to this source to collect water for your household?



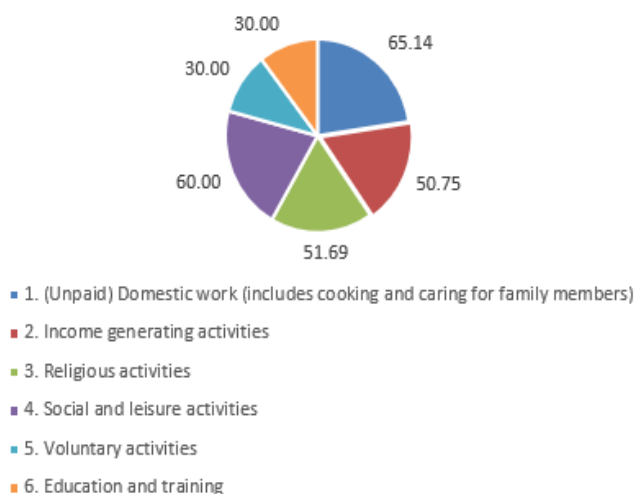
The time saved was spent on activities shown in the graph below. The responses show that the most significant activities that women engage in are domestic work (43%), income generating activities (38%), religious activities (23%) and social and leisure activities (12%).

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 (50.75 minutes), religious activities (51.6 minutes) and social and leisure activities (1 hour).

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



SDG 6 (Clean Water and Sanitation):

$$P_{\text{access}} = (P_y - \text{Failure days},y) * (1 - 0.0456) * 1$$

GS ID	P _{access}	P _y
GS5106	3,454	4,030
GS5186	3,487	4,140
GS5187	3,452	3,994
GS5188	3,483	4,086
GS5189	3,804	3,986
GS5190	4,469	4,682
GS5191	3,796	3,977
GS5192	3,812	3,994
GS5193	3,384	3,976
GS5194	3,772	3,952
GS5196	3,047	3,632
GS5197	3,740	3,919
GS6349	3,728	3,906
GS6350	3,485	3,652
GS6351	3,640	3,814
GS7362	3,820	4,003
GS7363	4,129	4,326
GS7364	3,870	4,055
GS7365	3,867	4,052
GS7366	3,995	4,186
Total	74,235	80,362

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

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.
- Failure days, y Number of days a particular borehole was non-functioning during year.
- 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	8,828	8,828
GS5186	9,075	9,075
GS5187	8,958	8,958
GS5188	9,149	9,149
GS5189	10,100	10,000
GS5190	11,326	10,000
GS5191	10,046	9,964
GS5192	9,950	9,950
GS5193	8,891	8,891
GS5194	9,806	9,806
GS5196	7,889	7,889
GS5197	9,726	9,726
GS6349	9,859	9,859
GS6350	8,952	8,952
GS6351	9,424	9,424
GS7362	7,843	7,843
GS7363	8,530	8,530
GS7364	6,416	6,416
GS7365	5,631	5,631
GS7366	5,520	5,520
Total	175,919	174,411

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GS5106

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,271,882
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	6180.79
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,271,882
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	9,693
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	9,693
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	8,828
Emission Reductions claimed	ERy	tCO2/y	8,828

GS5186

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,307,347
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	6353.14
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,307,347
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	9,964
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	9,964
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	9,075
Emission Reductions claimed	ERy	tCO2/y	9,075

GS5187

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,290,406
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	6270.81
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,290,406
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	T/JT	0.0156
Emissions Reductions			
Baseline emissions per year	BEB,y	tCO2/y	9,835
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	9,835
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	8,958
Emission Reductions claimed	ERy	tCO2/y	8,958

GS5188

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,318,124
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	6405.51
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,318,124
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	T/JT	0.0156
Emissions Reductions			
Baseline emissions per year	BEB,y	tCO2/y	10,046
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	10,046
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	9,149
Emission Reductions claimed	ERy	tCO2/y	9,149

GS5189

Total Emission Reductions for Monitoring Period 4			
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	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	T/J/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		Percentage	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 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,631,640
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	7929.06
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,631,640
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	T/J/T	0.0156
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	12,435
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	12,435
Suppressed Demand Assessment			
Percentage of suppressed demand users		Percentage	91.09%
Percentage of non-suppressed demand users	Xboil	Percentage	8.91%
Emission Reductions	ERy	tCO2/y	11,326
Emission Reductions claimed	ERy	tCO2/y	10,000

GS5191

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,447,095
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	7032.25
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,447,095
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	11,029
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	11,029
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	10,046
Emission Reductions claimed	ERy	tCO2/y	9,964

GS5192

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,433,374
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	6965.58
Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,433,374
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	10,924
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	10,924
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	9,950
Emission Reductions claimed	ERy	tCO2/y	9,950

GS5193

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,280,743
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	6223.86

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,280,743
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	9,761
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	9,761

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	8,891
Emission Reductions claimed	ERy	tCO2/y	8,891

GS5194

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,412,689
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	6865.06

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,412,689
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	10,766
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	10,766

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	9,806
Emission Reductions claimed	ERy	tCO2/y	9,806

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GS5196

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,136,511
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	5522.95

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,136,511
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	TCD2/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	8,662
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	8,662

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	7,889
Emission Reductions claimed	ERy	tCO2/y	7,889

GS5197

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,401,140
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	6808.93

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,401,140
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	TCD2/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	10,678
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	10,678

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	9,726
Emission Reductions claimed	ERy	tCO2/y	9,726

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GS6349

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,420,314
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	6902.11

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,420,314
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	10,825
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	10,825

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	9,859
Emission Reductions claimed	ERy	tCO2/y	9,859

GS6350

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,289,611
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	6266.95

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,289,611
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	9,828
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	9,828

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	8,952
Emission Reductions claimed	ERy	tCO2/y	8,952

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GS6351

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,357,713
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	6597.90

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,357,713
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	T/JT	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	10,347
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	10,347

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	9,424
Emission Reductions claimed	ERy	tCO2/y	9,424

GS7362

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,129,877
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	5490.71

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,129,877
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	T/JT	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,611
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	8,611

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	7,843
Emission Reductions claimed	ERy	tCO2/y	7,843

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GS7363

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		1,228,870
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	5971.78

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		1,228,870
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	TCCO2/TJ	8.632
Net calorific value of fuel	NCV,b,fuel	T/JT	0.0156

Emissions Reductions			
Baseline emissions per year	BEb.y	tCO2/y	9,366
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	9,366

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	8,530
Emission Reductions claimed	ERy	tCO2/y	8,530

GS7364

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	Njy		924,294
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	4491.67

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	Njy		924,294
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	TCCO2/TJ	8.632
Net calorific value of fuel	NCV,b,fuel	T/JT	0.0156

Emissions Reductions			
Baseline emissions per year	BEb.y	tCO2/y	7,044
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	7,044

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	6,416
Emission Reductions claimed	ERy	tCO2/y	6,416

Gold Standard

GS7365

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	N _{py}		811,252
Fuel to treat 1 litre of water using baseline tech	w _{b,y}	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Q _{p,y}	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Q _{p,raw,y}	L/pd	0
Quantity fuel consumed in baseline scenario	B _{b,y}	T	3942.33

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	N _{py}		811,252
Fossil fuel required to treat 1 litre for water in project scenario	w _{p,y}	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Q _{p,raw,y}	L/pd	0
Quantity of safe water boiled	Q _{p,cleanboil,y}	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	B _{p,y}	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EF _{b,fuel,co2}	tCO2/TJ	112
Emissions factor fuel (non-co2)	EF _{b,fuel,non-co2}	TCD2/TJ	8.632
Net calorific value of fuel	NCV _{b,fuel}	T/JT	0.0156

Emissions Reductions			
Baseline emissions per year	BE _{b,y}	tCO2/y	6,183
Project emissions per year	PE _{p,y}	tCO2/y	0
Usage rate	U _{p,y}	fraction	1
Leakage	LE _{p,y}	tCO2/y	0
Emission Reductions	E _{ry}	tCO2/y	6,183

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	X _{boil}	Percentage	8.91%
Emission Reductions	ER _y	tCO2/y	5,631
Emission Reductions claimed	ER _y	tCO2/y	5,631

GS7366

Total Emission Reductions for Monitoring Period 4			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	4.56%
Project Technology Days	N _{py}		795,330
Fuel to treat 1 litre of water using baseline tech	w _{b,y}	T/L	0.0006789
Quantity safe water litres consumed in project scenario supplied by project technology	Q _{p,y}	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Q _{p,raw,y}	L/pd	0
Quantity fuel consumed in baseline scenario	B _{b,y}	T	3864.96

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	0.0456
Project Technology Days	N _{py}		795,330
Fossil fuel required to treat 1 litre for water in project scenario	w _{p,y}	T/L	0.0006789
Quantity of raw water boiled in addition to project tech water	Q _{p,raw,y}	L/pd	0
Quantity of safe water boiled	Q _{p,cleanboil,y}	L/pd	0.00
Quantity of fuel consumed in project scenario per HH	B _{p,y}	T	0

Constants			
NRB	NRB	Fraction	0.82000
Emissions factor fuel (co2)	EF _{b,fuel,co2}	tCO2/TJ	112
Emissions factor fuel (non-co2)	EF _{b,fuel,non-co2}	TCD2/TJ	8.632
Net calorific value of fuel	NCV _{b,fuel}	T/JT	0.0156

Emissions Reductions			
Baseline emissions per year	BE _{b,y}	tCO2/y	6,061
Project emissions per year	PE _{p,y}	tCO2/y	0
Usage rate	U _{p,y}	fraction	1
Leakage	LE _{p,y}	tCO2/y	0
Emission Reductions	E _{ry}	tCO2/y	6,061

Suppressed Demand Assessment			
Percentage of suppressed demand users			91.09%
Percentage of non-suppressed demand users	X _{boil}	Percentage	8.91%
Emission Reductions	ER _y	tCO2/y	5,520
Emission Reductions claimed	ER _y	tCO2/y	5,520

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	604 people consuming safe or boiled water	4,030 people consuming safe water	Additional 3,426 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	576 people with access to safe water	4,030 people with access to safe water	Additional 3,454 persons with access to safe water
SDG 13	8,828 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 8,828 tCO2e

GS5186

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	681 people consuming safe or boiled water	4,140 people consuming safe water	Additional 3,459 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	653 people with access to safe water	4,140 people with access to safe water	Additional 3,487 persons with access to safe water
SDG 13	9,075 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,075tCO2e

GS5187

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	570 people consuming safe or boiled water	3,994 people consuming safe water	Additional 3,424 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	542 people with access to safe water	3,994 people with access to safe water	Additional 3,452 persons with access to safe water
SDG 13	8,958 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 8,958 tCO2e

GS5188

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	631 people consuming safe or boiled water	4,086 people consuming safe water	Additional 3,455 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	603 people with access to safe water	4,086 people with access to safe water	Additional 3,483 persons with access to safe water
SDG 13	9,149 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,149 tCO2e

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	66.6 minutes collecting water	60.7% 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 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 10,000 tCO2e

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	66.6 minutes collecting water	60.7% 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 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 10,000 tCO2e

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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	66.6 minutes collecting water	60.7% 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	9,964 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,964 tCO2e

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	66.6 minutes collecting water	60.7% 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	9,950 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,950tCO2e

GS5193

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	619 people consuming safe or boiled water	3,976 people consuming safe water	Additional 3,357 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	592 people with access to safe water	3,976 people with access to safe water	Additional 3,384 persons with access to safe water
SDG 13	8,890 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 8,890tCO2e

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	66.6 minutes collecting water	60.7% 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	9,806 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,806 tCO2e

GS5196

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	609 people consuming safe or boiled water	3,632 people consuming safe water	Additional 3,023 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	585 people with access to safe water	3,632 people with access to safe water	Additional 3,047 persons with access to safe water
SDG 13	7,889 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 7,889 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	66.6 minutes collecting water	60.7% 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	9,726 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,726tCO2e

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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	66.6 minutes collecting water	60.7% 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	9,859 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,859 tCO2e

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	66.6 minutes collecting water	60.7% 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	8,952 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 8,952tCO2e

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	66.6 minutes collecting water	60.7% 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	9,424 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,424 tCO2e

GS7362

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	213 people consuming safe or boiled water	4,003 people consuming safe water	Additional 3,790 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	183 people with access to safe water	4,003 people with access to safe water	Additional 3,820 persons with access to safe water
SDG 13	7,843 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 7,843 tCO2e

GS7363

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	230 people consuming safe or boiled water	4,326 people consuming safe water	Additional 4,096 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	197 people with access to safe water	4,326 people with access to safe water	Additional 4,129 persons with access to safe water
SDG 13	8,530 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 8,530 tCO2e

GS7364

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	216 people consuming safe or boiled water	4,055 people consuming safe water	Additional 3,839 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	185 people with access to safe water	4,055 people with access to safe water	Additional 3,870 persons with access to safe water
SDG 13	6,416 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 6,416 tCO2e

GS7365

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	216 people consuming safe or boiled water	4,052 people consuming safe water	Additional 3,836 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	185 people with access to safe water	4,052 people with access to safe water	Additional 3,867 persons with access to safe water
SDG 13	5,631 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 5,631 tCO2e

GS7366

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	223 people consuming safe or boiled water	4,186 people consuming safe water	Additional 3,963 people consuming safe water
SDG 5	169.5 minutes collecting water	66.6 minutes collecting water	60.7% reduction in time spent collecting water
SDG 6	223 people with access to safe water	4,186 people with access to safe water	Additional 3,963 persons with access to safe water
SDG 13	5,520 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 5,520 tCO2e

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
<p>SDG 3</p>	<p>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</p> <p>GS5196: 3,726 GS5197: 3,726 GS6349: 3,726 GS6350: 3,726 GS6351: 3,726 GS7362: 3,726 GS7363: 3,726 GS7364: 3,726 GS7365: 3,726 GS7366: 3,726</p>	<p>GS5106: 3,426 GS5186: 3,459 GS5187: 3,424 GS5188: 3,455 GS5189: 3,774 GS5190: 4,433 GS5191: 3,765 GS5192: 3,781 GS5193: 3,357 GS5194: 3,741</p> <p>GS5196: 3,023 GS5197: 3,710 GS6349: 3,698 GS6350: 3,457 GS6351: 3,611 GS7362: 3,790 GS7363: 4,096 GS7364: 3,839 GS7365: 3,836 GS7366: 3,963</p> <p>Total: 73,638</p>
<p>SDG 5</p>	<p>53.8% reduction in time spent collecting water</p>	<p>60.7% reduction in time spent collecting water</p>
<p>SDG 6</p>	<p>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: 2,970</p> <p>GS5196: 3,757 GS5197: 3,757 GS6349: 3,757 GS6350: 3,757 GS6351: 3,757</p> <p>GS7362: 3,757 GS7363: 3,757 GS7364: 3,757 GS7365: 3,757 GS7366: 3,757</p>	<p>GS5106: 3,454 GS5186: 3,487 GS5187: 3,452 GS5188: 3,483 GS5189: 3,804 GS5190: 4,469 GS5191: 3,796 GS5192: 3,812 GS5193: 3,384 GS5194: 3,772</p> <p>GS5196: 3,047 GS5197: 3,740 GS6349: 3,728 GS6350: 3,485 GS6351: 3,640</p> <p>GS7362: 3,820 GS7363: 4,129 GS7364: 3,870 GS7365: 3,867 GS7366: 3,995</p> <p>Total: 74,235</p>
<p>SDG 13</p>	<p>GS5106: 9,977 GS5186: 9,977 GS5187: 9,977</p>	<p>GS5106: 8,828 GS5186: 9,075 GS5187: 8,958</p>

GS5188: 9,977	GS5188: 9,149
GS5189: 9,977	GS5189: 10,000
GS5190: 9,977	GS5190: 10,000
GS5191: 9,977	GS5191: 9,964
GS5192: 9,977	GS5192: 9,950
GS5193: 9,977	GS5193: 8,891
GS5194: 9,977	GS5194: 9,806
GS5196: 9,973	GS5196: 7,889
GS5197: 9,973	GS5197: 9,726
GS6349: 9,973	GS6349: 9,859
GS6350: 9,973	GS6350: 8,952
GS6351: 9,973	GS6351: 9,424
GS7362: 9,973	GS7362: 7,843
GS7363: 9,973	GS7363: 8,530
GS7364: 9,973	GS7364: 6,416
GS7365: 9,973	GS7365: 5,631
GS7366: 9,973	GS7366: 5,520
Total: 149,635	Total: 174,411

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 60.7%% 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

>>

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.