Gold Standard for the Global Goals
Key Project Information & VPA Design Document (PDD)



July 2017, Version 1

KEY PROJECT INFORMATION

Title of Project:	GS1247 VPA 186 Lango Safe Water Project (GS7365)
Title of the PoA:	GS1247 Improved Kitchen Regimes Multi-Country PoA
Brief description of Project:	CO2balance has worked with community groups in Lango, Uganda to rehabilitate broken down boreholes to provide access to safe water while avoiding the combustion of wood used to boil unsafe water in absence of the project.
Expected Implemetation Date: Expected duration of Project:	01/09/2019 21 years
Project Developer:	CO2Balance
Project Representative:	James Walker
Project Participants and any communities involved:	CO2Balance
Version of PDD: Date of Version:	5 06/08/2019
Host Country / Location:	Republic of Uganda
Certification Pathway (Project Certificatin/Impact Statements & Products	Impact Statements & Products - Voluntary Emission Reductions & Gender Equality Cetification
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG
Methodologies applied:	Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1
Product Requirements applied:	None
Regular/Retroactive:	Regular
SDG Impacts:	1 – SDG 3 Good Health and Well-being 2 – SDG 5 Gender Equality 3 – SDG 6 Clean Water and Sanitation 4 – SDG 13 Climate Action
Estimated amount of SDG Impact Certified	1 – SDG 3: 3,726 additional people consuming safe water 2 – SDG 5: 57.5% decrease in time spent collecting water and firewood per household per day 3 – SDG 6: 3,757 additional people with access to safe water 4 – SDG 13: Emissions reductions of 9,973 tCO2e per year

SECTION A. Description of project

A.1. Purpose and general description of project

>> *(Provide a brief description of the project including the description of scenario existing prior to the implementation of the project.)*

In Uganda over 45% of the rural population are without access to safe water and rely exclusively on unprotected wells, lakes and other open water sources that are highly susceptible to contamination. The Lango sub region is largely made up of rural communities where local people typically use wood fuel on traditional three stone fires to purify their water for drinking, cooking and basic personal hygiene. 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 will be fitted with zero emission technologies such as commonly used hand pumps. The depth of the boreholes will be limited to 150m or less.

Many existing boreholes in Lango sub-region 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 will work with community groups in the project area to identify broken down boreholes. The number of boreholes per VPA will be limited by the amount of pure water supplied by each unit; the maximum quantity of emission reductions generated by this project is limited to 10,000tCO_2e per year. CO2Balance will implement a long-term maintenance programme to ensure that the quality of the water delivered by the boreholes is fit for human consumption for the entire length of the project, which will be a minimum seven years.

CO2Balance gets funding for this project by marketing the anticipated carbon credits from the wood savings to ethical investors, so borehole owners must agree to transfer the emissions reductions over to CO2Balance in return for them supplying the work to renovate the boreholes. This project will be developed under the Gold Standard, which in addition to checking that the carbon credits from this project are real, also measures local social, environmental and economical impact.

The VPA contains 8 boreholes. This date of rehabs will be confirmed in later versions of the PDD.

BH ID	BH name	Village	District	Date of rehab	Start of crediting	No. of users
LAN153	Adak 'B'	Adak 'B'	Dokolo	*01/09/2019	*02/09/2019	380
LAN154	Ajaa 'A'	Ajaa 'A'	Dokolo	*01/09/2019	*02/09/2019	498
LAN155	Alut	Alut	Dokolo	*01/09/2019	*02/09/2019	423
LAN156	Aluti	Aluti	Dokolo	*01/09/2019	*02/09/2019	452
LAN157	Acwer	Acwer	Dokolo	*01/09/2019	*02/09/2019	454
LAN158	Otongodel	Otongodel	Kole	*01/09/2019	*02/09/2019	684
LAN159	Aringading	Aringading	Dokolo	*01/09/2019	*02/09/2019	437
LAN160	Awali	Awali	Kole	*01/09/2019	*02/09/2019	724

A.2. Eligibility of the project under approved PoA

>> *(Demonstrate how each VPA meets the eligibility criteria as defined in approved PoA)*

The VPA is located in Uganda, an LDC and therefore eligible under PoA 1247. By providing safe water through the rehabilitation of broken boreholes, the project will ensure that households consume less firewood by displacing the need to boil water for purification. This will result in a reduction of carbon dioxide emissions. This is eligible under PoA 1247 as it involves the "*repair of community wide safe water supply technologies such as hand-pumped boreholes*" as listed in section A.2. of the PoADD. The Micro-Scale Voluntary Project Activity (VPA) is eligible under the Gold Standard Methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1.0.

Eligibility Criteria	Description	Means of Verification (Checked at VPA Inclusion)
Types of Project	The project is developed around zero emission technology for safe water.	Zero emission technology for safe water, including non-fossel fuel driven borehole pumps, is provided for in GS TPDDTEC Annex 3.
Location of Project	The project is located in the Republic of Uganda.	Uganda is a UN LDC.
Host Country Requirements	The project is in compliance with Host Country's legal, environmental, ecological and social regulations.	The project is implemented with the assistance of Local Government Officials and District Water Officers.
Contact Details	The contact details of the project developer are given to the project participants at the stakeholder consultation and are available in the Continuous Input / Grievance Expression Process Book.	The contact details are shown in section E.2 (Continuous Input / Greviance Mechanism) of the SCR.
Non-Diversion of ODA	There will be no diversion of ODA for any of the VPAs.	The signed ODA declatation has been uploaded as part of the Preliminary Review.
VPA Location and Project Boundary	The geographical boundary within which the technologies are installed will be within the Project Boundary outlined in Section A.4.4.	The location of the VPA is specified in Section A.4.4, in which the CME states that the location is within Uganda; one of the countries outlined in the PoA-DD. Each VPA will be uniquely defined by a range of GPS coordinates and current administrative maps to define the project boundary.
Scale of the Activity	Emission reductions achieved by each one of the activities considered under the micro-scale programme are limited to a	The total number of emission reductions in this VPA will be limited to 10,000 tCO2e.

	maximum of 10,000 tonnes of CO2e in any year of their crediting period.	
Technology and Target Group	Each VPA will involve the repair and maintenance of boreholes, to households and/or communities currently cooking with firewood on a traditional three-stone stove, for domestic purposes and/or currently boiling water as a treatment method before consumption.	This VPA will involve the repair and rehabilitation of boreholes that supply water to households currently boiling water as a treatment method (taking into account suppressed demand). Suppressed demand will be determined through a set of questions in the baseline 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.
Technology Output	The technologies will each have continuous energy outputs of less than 150kW per unit. This will be applied to the baseline technology with regards to the water technology units.	Calculations for the specific technology show that they are within the 150kW Limit. The estimated energy output of the baseline technology is 13.46 Kw, however, following the rehabilitation of the borehole is 0 Kw.
Baseline	The characteristics and current biomass/water consumption of households in the baseline scenario will be identified for each VPA.	A modified Water Boiling Test (WBT) has been carried out for Lango sub-Region
Methodology	Each VPA will be in compliance with Gold Standard Methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1.	The applicability of the methodology is justified in Section B.2 and applies to each VPA.
Additionality	Each VPA will demonstrate additionality according to the criteria outlined in Section B.5 of the PoA-DD.	In accordance with the Micro-Programme rules, any activity meeting one of the criteria outlined in Section B.5 shall be deemed additional. This VPA is within Uganda, an LDC and is therefore additional.
Carbon Transfer	It will be clearly communicated that co2balance is the entity that is claiming ownership rights of and selling the emission	At the point of technology installation, a Carbon Transfer Form (CTF) will be signed and uploaded to our database stating

	reductions resulting from the project activity.	that the rights to the carbon credits will lie with co2balance. An elected representative from each water resources committee responsible for a borehole will sign a CTF on behalf of all users thereof.
Avoiding Double Counting of Emission Reductions	Each VPA will ensure double counting of emission reductions is avoided, through the unique identification of each technology with an identification number.	Each borehole rehabilitated and installed in this POA will be GPS referenced ensuring that they are uniquely identifiable to this project.
Avoiding Double Counting of Programme Activities	Each VPA will show that it is exclusive to the PoA and not registered as another project activity or VPA under another PoA.	This VPA is neither registered as a project activity with GS or any other standard or as a VPA of another PoA. The appropriate registries (Gold Standard and CDM) can be accessed to demonstrate this.
Air Quality	The water technologies will result in an improvement in indoor air quality.	The air quality will be measured indirectly through wood consumption as part of the Project Monitoring.

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

>> *(Justify that project owner has full and uncontested legal ownership of the products that are generated under Gold Standard Certification and has legal rights concerning changes in use of resources required to service the Project for e.g water rights, where applicable.*)

In this project CO2balance UK ltd, is the managing entity and is responsible for communication with the Gold Standard. CO2balance country coordinator in Uganda works together with local NGOs and local project field staff who handle all monitoring data collection and processing. CO2Balance own the legal rights to the carbon credits created by the project. A Carbon Transfer Form is signed by the Community Water Resources Management Committee on behalf of the whole community for each borehole. This entitles CO2Balance to the rights of any carbon saved by the project in exchange for the rehabilitation and mainatance of the borehole.

A.4. Location of project

A.4.1. Host Country

>>

A.4.2. Region/State/Province etc.

>>

Lango sub-region

A.4.3. City/Town/Community etc.

>>

Rural areas of the Lango sub-region

A.4.4. Physical/Geographical location

>> (*Include information allowing the unique identification of this project.)*

This project is located in Lango sub-region, Northern Uganda. The geographic reference to allow unique identification of the project boundary can be found below in section B.3.. 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 definedin section B.3.. 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.

A.5. Technologies and/or measures

>> *(Describe the technologies and measures to be employed and/or implemented by the project, including a list of the facilities, systems and equipment that will be installed and/or modified by the project. Include information essential to understand the purpose of the project and how it will contribute positively to three SDGs.)*

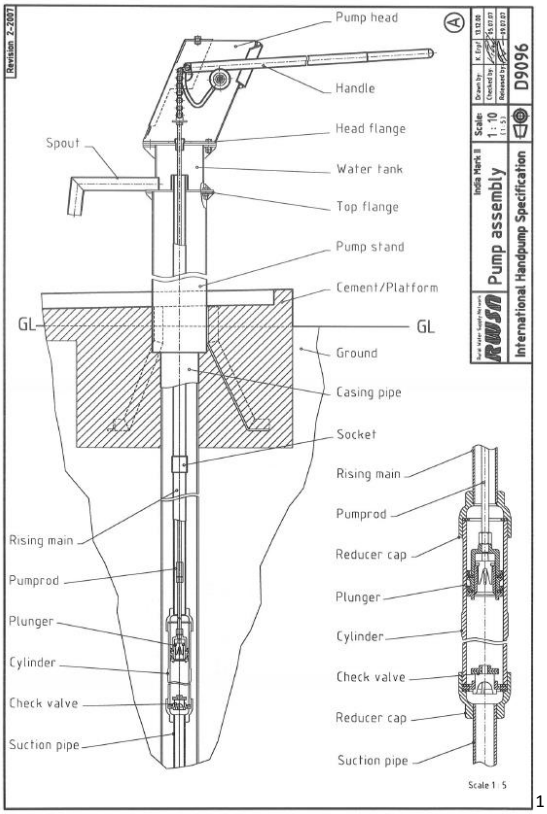
In this project, identified broken down boreholes will be rehabilitated so that they deliver clean, safe water for human consumption which contributes positively to SDG 6. Likewise, the reduction in local water-borne diseases is predicted to decrease the incidence of stomach related illnesses and diarrhoea, contributing positively to SDG 3. Many existing boreholes 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. 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 will be limited to 100m or less.





	Arfidev	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 m3/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:



[1]

[1]Rural Water Supply Network (2018) 'India Mark II'

http://www.rural-water-supply.net/en/implementation/public-domain-handpumps/india-mark-ii

A comprehensive maintenance programme is required in order to guarantee a consistent supply of pure water from the borehole pumps that have been rehabilitated. Borehole pumps contain moving parts such as chains and bearings which require an annual service and or replacement to prevent against failure. In addition, nuts and bolts commonly work themselves free and require regular replacement – these are checked and generally replaced on an annual basis. Other, more major parts in the pump assembly have a longer lifespan and require a less frequent replacement. Items such as handles, cylinders, top cones, riser pipes, connecting rods are checked over during the annual service and replaced if deemed necessary. The planned maintenance programme is carried out by local technicians under the supervision of a senior technician and will endure the activity of the project.

The boreholes are usually located close to villages. Once repaired, it is predicted that womens time spent collecting water will be reduced contributing positively to SDG 5. As mentioned above, the project location is a largely rural district where people typically use wood fuel on traditional three stone fires in order to purify their drinking water by boiling. The rehabilitation of borheoles proposes to displace the need to boil water by providing safe water from the source. This will achieve a reduction in GHG emissions and aligns with SDG 13.

A.6. Scale of the project

>> (Define whether project is micro scale, small scale or others. Justify the scale referring to relevant activity requirement.)

The project is micro-scale. The VPA is capped at 10,000 ERs per year.

A.7. Funding sources of project

>> (Provide the public and private funding sources for the project. Confidential information need not be provided.)

There is no public or ODA funding for this project activity, all revenue for the project will be derived from the sales of VERs.

A.8. Assessment that project complies with 'gender sensitive' requirements

Question 1: Does the project reflect the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy?
Yes, the project is Gender Sensitive and it is working towards gender certification. The project saves time for water collectors, who are mainly female, and monitors how much time is saved and the uses of this saved time. This data will highlight the positive impacts on women and feed into the design process of future projects,ensuring that they empower women even further.

The project aims to empower women and girls by encouraging meaningful participation in the Stakeholder Consultation and Water Resource Committees. This helps to shape the project in a gender sensitive way as women have an imput at every stage of the project, from project development to the end user. This gives women an active role in natural resources management and environmental sustainability. The Stakeholder Consultation and inclusive WRCs are Gender responsive as it requires community members to question entrenched gender roles, highlight gaps and question why they exist. The Gender Sensitive monitoring allows for the impacts of these sessions to be evaluated.

Question 2: Does the project align with existing country policies, strategies and best practices?

Uganda's official National Gender Policy was released by the Ministry of Gender, Labor and Social Development in 2007 with a 10 year time frame (2007-2017). A mid-term evaluation was to be carried out in the fifth year of implementation (2012) but there is no documentation to distinguish whether this happened or not. As of now there is no updated Gender Policy since the last document expired in 2017. However, given this was the last official gender documentation released, it was used to align the projects with National Gender Policy.

The Gender Policy outlines several main objectives, including the following which the project is aiming to meet:

1. **To reduce gender inequalities so that all women and men, girls and boys, are able to move out of poverty and to achieve improved and sustainable livelihoods** – the projects actively seek to reduce equalities along the lines of gender and age discrimination. In providing clean water, the projects are allowing communities to develop and lead more sustainable lives without the need to boil water for purification. The projects will help to close community and household gender gaps through the provision of clean water, regardless of existing social structures.
2. **To increase knowledge and understanding of human rights among women and men so that they can identify violations, demand, access, seek redress and enjoy their rights –** the project seeks to educate and empower participants to realise adopted social norms which may be damaging to development and the empowerment of women and girls. Once educated, men and women can begin to facilitate a more equitable living environment in households and in the community that delivers agency for men and women to make their own choices and demands, and exercise their rights without discrimination.
3. **To strengthen women's presence and capacities in decision making for their meaningful participation in administrative and political processes** – as part of the projects, women will be encouraged to take part in community groups, particularly local WRCs, including presence in leadership roles where their contribution to decisions will be followed through to the projects in order to improve access for project beneficiaries.

Question 3: Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document?

Yes, this has been included in section D.1.i of the SCR.

Question 4: Does the project apply the Gold Standard Stakeholder Consultation & Engagement Procedure Requirements?

The LSC for the VPA was conducted prior to the introduction of GS4GGs, meaning that the previous stakeholder guidelines were used and the GS4GG requirements of conducting a safeguarding assessment were not applied. However, a safeguarding assessment has been conducted as visible in section D.1.i of the SCR. Moreover, there was a strong representation of women at the original LSC meeting and all sections of attendees were encouraged to participate actively and provide feedback.

Further to this, the VPA forms part of a homogenous group of borehole VPAs in Lango, Uganda, which will be applying the Gold Standard Gender Equality methodology. As part of this process, a gender-focused LSC and baseline have been conducted which are separately under review by GS. The project actions agreed upon through that process will be applied to this VPA once the gender equality review process is complete.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

>>

Gold Standard Methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1.0.

B.2. Applicability of methodology

>> (Justify the choice of the selected methodology(ies) by demonstrating that the project meets each applicability condition of the applied methodology(ies))

In accordance with the Gold Standard Methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1.0, micro scale VPAs listed in the Lango Project boundary adhere to the following conditions:

Methodology Requirement	Project
1. The project boundary can be clearly identified, and the technologies counted in the project are not included in another voluntary market or CDM project activity.	The project area has been clearly demarcated using political boundaries recognized in Uganda. Each technology will be recorded using GPS coordinates and individually tagged with an identification code which is stored securely in the project database. Regular project surveys together with distribution records will ensure that the technologies included in the project are not double counted.
2. Technologies have a continuous useful energy output of less than 150kW per unit (defined as total energy delivered usefully from start to end of operation of a unit divided by time of operation). For technologies or practices that do not deliver thermal energy in the project scenario but only displace thermal energy supplied in the baseline scenario, the 150kW threshold applies to the displaced baseline technology.	The project technology does not deliver thermal energy; the rehabilitation and installation of boreholes displace energy supplied in the baseline as they eliminate the need to purify water through boiling; the 150kw threshold therefore applies to the baseline technology. Boreholes displace energy supplied in the baseline as they eliminate the need to purify water through boiling. Based on the results of the WBT, the estimated energy output is 13.46 Kw which is well within the methodological limit of 150kw. This has been proven via calculation.
3. The use of the baseline technology as a backup or auxiliary technology in parallel with the improved technology introduced by the project activity is permitted as long as a mechanism is put into place to encourage the removal of the old technology and the definitive discontinuity of its use.	As noted in the Gold Standard Methodology p.5. 'the removal and continued non-use of three stone fires and other easily constructed traditional devices (the baseline technology replaced by this project activity) is in many cases unlikely and impractical to monitor.' However, local people will be educated on the health and environmental benefits of abandoning inefficient use of the baseline technology. Furthermore a WASH program will be carried out parallel to the project which will help to increase awareness regarding water use, health and hygiene among local communities. This education programme will act as a mechanism to encourage the removal of old technology.
a) The project documentation must provide a clear description of the approach chosen and the monitoring plan must allow for a good	Overall use of the baseline technology will be monitored in conjunction with that of the project technology, as will the emergence of any other

understanding of the extent to which the baseline technology is still in use after the introduction of the improved technology, whether the existing baseline technology is not surrendered at the time of the introduction of the improved technology, or whether a new baseline technology is acquired and put to use by targeted end users during the project crediting period.	baseline technology by targeted end users. As per the Methodology kitchen surveys will be carried out at regular intervals to determine any changes in baseline technology use. The baseline survey indicated that all respondents were using a traditional wood fire to boil water which consists of a three-stone fire.
b)''The success of the mechanism put into place must therefore be monitored, and the approach must be adjusted if proven unsuccessful. If an old technology remains in use in parallel with the improved technology, corresponding emissions must of course be accounted for as part of the project emissions.''	Parallel baseline technology use (three stone fires or traditional equivalent) will be revealed during monitoring and its effect on emissions reductions will be captured in the parameter Q, p, clean boil, y and in the usage surveys. The uptake rate U will also be determined by surveys and hence used to account for parallel baseline and project technology use.
4. The project proponent must clearly communicate to all project participants the entity that is claiming ownership rights of and selling the emission reductions resulting from the project activity. This must be communicated to the technology producers and the retailers of the improved technology or the renewable fuel in use in the project situation by contract or clear written assertions in the transaction paperwork. If the claimants are not the project technology end users, the end users should be notified that they cannot claim for emission reductions from the project.	A full explanation will be given to elected representatives of borehole users that CO2Balance have committed to provide them with a rehabilitated and fully maintained for free on the basis that the emissions reductions will be transferred to CO2Balance. This will be recorded using a Carbon Transfer Form, which elected representatives of borehole owners will sign confirming that they understand the agreement and will explain it to borehole users.
5. Project activities making use of a new biomass feedstock in the project situation (e.g. shift from non-renewable to green charcoal, plant oil or renewable biomass briquettes) must comply with relevant Gold Standard specific requirements for biomass related project activities, as defined in the latest version of the Gold Standard rules.	As the technology used in this project has been specifically designed to displace baseline feedstock use via fuelwood, rather than a new biomass feedstock, this criterion is not applicable to this project. The emission reductions from this project will result from a change in quantity of fuel consumed, rather than change of fuel type.
a) Adequate evidence is supplied to demonstrate that indoor air pollution (IAP) levels are not worsened compared to the baseline, and greenhouse gases (as listed in section 2.1) emitted by the project fuel/stove combination are estimated with adequate precision. The project fuel/stove combination may include instances in which the project stove is a baseline stove.	The fuel used in both the project and baseline scenario is the same, as such there are no additional harmful gases released in the project scenario. The baseline technology has also not changed; rather its use will have been eliminated.
b) Records of renewable fuel sales may not be used as sole parameters for emission reduction calculation, but may be used as data informing the	Renewable fuels are not sold as part of this project therefore this point is not applicable.

equations in section 2.0 of this methodology if correlated to data on distribution and results of field tests and surveys confirming (a) actual use of the renewable fuel and usage patterns such as average fraction of non-renewable fuels used in mixed combustion or seasonal variation of fuel types, (b) GHG emissions, (c) evidence of CO levels not deteriorating (d) any further factors effecting emission reductions significantly.	

B.3. Project boundary

>> *(Present a flow diagram of the project boundary, physically delineating the project, based on the description provided in section A.5 above.)*

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

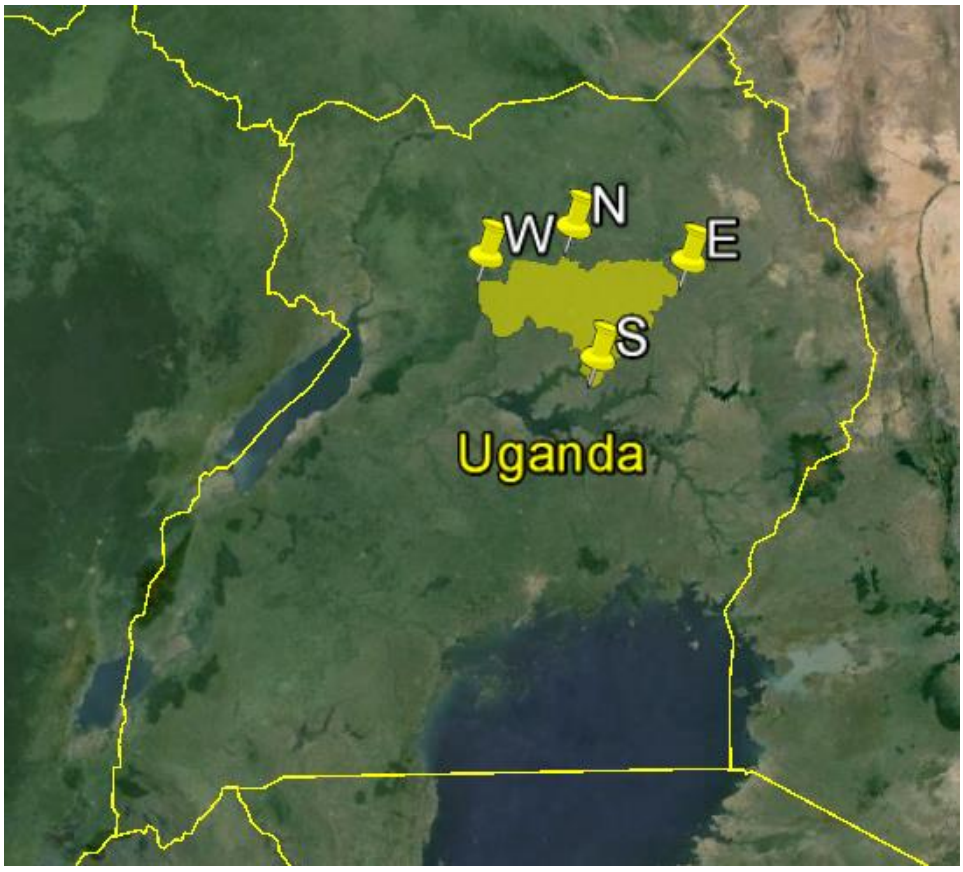


Table 1: Geographical characteristics of the Lango sub-region

Project Area	Country	Region	Population	Geographical Reference	
Lango sub-Region	Uganda	Northern Uganda	Estimated 2.3 million	Lat 02.3000000°	Long 033.0000000°

For the purpose of GHG mitigation/sequestration following table shall be completed (delete if not required)

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Combustion of wood fuel to boil water	CO2	Yes	Important source of emissions
		CH4	Yes	Important source of emissions
		N2O	Yes	Gas included in the calculations. Emissions factors for fuel in stationery combustion by the IPCC
Project scenario	Combustion of wood fuel to boil water	CO2	Yes	Important source of emissions
		CH4	Yes	Important source of emissions
		N2O	Yes	Gas included in the calculations. Emissions factors for fuel in stationery combustion by the IPCC

B.4. Establishment and description of baseline scenario

>> (Explain how the baseline scenario is established in accordance with guidelines provided in GS4GG Principles & Requirements and the selected methodology(ies). In case suppressed demand baseline is used then same should be explained and justified.)

In the baseline scenario local people typically use wood fuel on inefficient three stone fires for cooking and water purification. This process results in the release of greenhouse gas emissions from the combustion of wood. This can be avoided if local communities have access to safe water and therefore do not need to boil water as a treatment method.

Over 45% of the rural population of Uganda are without access to safe water and rely exclusively on unprotected wells, lakes and other open water sources that are highly susceptible to contamination. Many depend on boiling as the only treatment method available or are forced to drink dirty water due to suppressed demand factors such as lack of access to fuel, time and financial resources.

This micro scale project will use the methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1". Many existing boreholes have been poorly managed, or proven too expensive to maintain properly. CO2Balance will work with community groups in the Lango sub-region to identify broken down boreholes and renovate them so that they deliver clean and safe water. The number of boreholes per VPA will be limited by the amount of safe water supplied by each unit, with emission reductions capped at 10,000 tCO_2e. CO2balance will rehabilitate and deliver the maintenance programme for each borehole to ensure that the quality of the water delivered by the boreholes is fit for human consumption for the entire 21-year length of the project.

The baseline situation is not expected to change significantly during the next years considering the current situation in Uganda, its economic development of the last years and predictions for the future. Uganda is an LDC with a Human Development Index ranking of 163 out of 188 countries.

B.5. Demonstration of additionality

>> (If the proposed project is not a type of project that is deemed additional, as stated below, then follow guidelines in section 3.5.1 of GS4GG Principles & Requirements to demonstrate additionality.)

The table below is only applicable if the proposed project is deemed additional, as defined by the applied approved methodology or activity requirement or product requirement.

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	As demonstrated in the Gold Standard for the Global Goals Community Services Activity Requirements section 2.5.2 - Projects that meet any of the following criteria are considered as deemed additional and therefore are not required to prove Financial Additionality at the time of Design Certification: 1. (a) Positive list (Annex B) 2. (b) Projects located in LDC, SIDS, LLDC 3. (c) Micro-scale projects
Describe how the proposed project meets the criteria for deemed additionality.	Uganda is an LDC. This project is also a Micro-scale project and so is deemed additional by the relevant activity requirement.

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

>> (Specify the relevant SDG target for each of three SDGs addressed by the project. Refer most recent version of targets here .)

SDG 3: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

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

SDG 6: By 2030, achieve universal and equitable access to safe and affordable drinking water for all

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

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

>> (Explain how the methodological steps in the selected methodology(ies) or proposed approach for calculating baseline and project outcomes are applied. Clearly state which equations will be used in calculating net benefit.)

Outcomes for 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. Calculations are as follows:

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

Where:

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

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

C_j Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.

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

Outcome for SDG 5 (Gender Equality)

By ensuring that there is a safe water source at the centre of communities, the projects have the potential to reduce the *time poverty* of women, because the time burden of collecting water, which falls disproportionately on women, will be reduced. As the safe water sources are located centrally within communities, closer to public institutions and villages, the distance travelled to collect water will be reduced, reducing the time per trip spent collecting water. In addition, as the water sources will be maintained, they will 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 will be taken as a proxy contribution towards the SDG target.

The overall reduction in time spent collecting water by the project activity are then calculated as follows:

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

Where:

TR_y Total reduction time spent collecting water for project activity in year y (%)
$T_{b,y}$ Time spent collecting water per household per day prior to project (hours)
$T_{p,y}$ Time spent collecting water per household per day in project (hours)

Outcomes for 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) will be determined through the baseline survey. Calculations are as follows:

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

Where:

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

Number of additional persons having access to safe water in the project activity compared to the baseline scenario.

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

C_j Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.

$U_{p,y}$ Usage rate in project scenario p during year y

Outcome for 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 VPA's emission reductions calculations.

Baseline Emissions

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

Where:

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

Where:

$N_{j,y}$	Number of person.days consuming water supplied by project scenario p through year y[47]
C_j	Expressed as a percentage, this is the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it
$B_{b,y}$	Quantity of fuel consumed in baseline scenario b during the year y in tons
$Q_{p,y}$	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
$Q_{p,rawboil,y}$	Quantity of raw water boiled in the project scenario p per person per day
$W_{b,y}$	Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b during project year y, as per Baseline Water Boiling Test.

Project Emissions

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

Where:

Bp,y = (1 – Cj) * Np,y * Wp,y * (Qp,rawboil,y + Qp,cleanboil,y)

$N_{p,y}$	Number of person.days consuming water supplied by project scenario p through year y
C_j	Expressed as a percentage, this is the portion of users of the project technology j or who in the baseline were already consuming safe water without boiling it
$B_{p,y}$	Quantity of fuel consumed in project scenario p during the year y in tons
$Q_{p,rawboil,y}$	Quantity of raw water boiled in the project scenario p per person per day
$Q_{p,cleanboil,y}$	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

Leakage:
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.

In all cases the baseline technologies displaced are three stones; 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. In any case 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) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.

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 Water 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.

The NRB fraction will be monitored every 2 years. However as the majority of participants collect wood from within the project boundary, it is not expected that the NRB in other areas will be affected. There are currently no other CDM or VER projects in the project area.
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.

Overall Emission Reductions

$$ER_y = \left(\left((\Sigma BE_{b,y} - \Sigma PE_{p,y}) * Up,y\right) - LEp,y\right) * (1 - XBoil)$$

The percentage of non-suppressed demand premises (Xboil) shall be conservatively omitted from the total emission reductions.

For full calculations please see accompanying Ex-Ante Calculations Spreadsheet.

B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

(Include a compilation of information on the data and parameters that are not monitored during the crediting period but are determined before the design certification and remain fixed throughout the crediting period like IPCC defaults and other methodology defaults. Copy this table for each piece of data and parameter.)

Relevant SDG Indicator/Safeguarding Principle	SDG 3 (Good Health and Wellbeing) SDG 6 (Clean Water and Sanitation) SDG 13 (Climate Action)
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 project survey
Value(s) applied	4.56%
Measurement methods and procedures	Established through questions in the baseline on a representative sample of the end users
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 comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 3 (Good Health and Wellbeing)
Data / Parameter	$P_{b,\ boil}$
Unit	Number
Description	Percentage of persons boiling water in the baseline
Source of data	Baseline surveys*
Value(s) applied	0.008046
Measurement methods and procedures	The percentage of people stating that they used to boil their water for purification in the baseline scenario, evaluated through the baseline survey.
Purpose of data	Determination of number of persons boiling water in the baseline
Additional comment	*The baseline data for this VPA (and other homogenous VPAs) is a combination of a baseline surveys from Alebtong, Otuke and Dokolo, and Kole. The parameter is calculated using the weighted average of the respondents who relied on firewood as a treatment method in the baseline study: Districts | Sample size | Firewood use | Weighted average AOD | 321 | 0% | 0.8046% Kole | 98 | 3.44%

Relevant SDG Indicator/Safeguarding Principle	SDG 13 (Climate Action)
Data / Parameter	$EF_{b,co2}$

Unit	Number
Description	co2 emission factor arising from use of fuels in baseline scenario
Source of data	Calculated from IPCC defaults; Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5; https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf
Value(s) applied	112
Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 13 (Climate Action)
Data / Parameter	$EF_{b,non\ co2}$
Unit	tco2/TJ
Description	Non-co2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC Default emissions factor: Non-CO2 Emissions from Stationary Combustion. Annex 1, Table 2 and Table 3. https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_2_Non-CO2_Stationary_Combustion.pdf Global Warming Potential: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14
Value(s) applied	8.692
Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 13 (Climate Action)
Data / Parameter	$EF_{p,co2}$
Unit	Number
Description	co2 emission factor arising from use of fuels in project scenario
Source of data	Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5; https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf
Value(s) applied	112
Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 13 (Climate Action)
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 emissions factor: Non-CO2 Emissions from Stationary Combustion. Annex 1, Table 2 and Table 3. https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_2_Non-CO2_Stationary_Combustion.pdf Global Warming Potential: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14
Value(s) applied	8.692
Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 13 (Climate Action)
Data / Parameter	NCV_b
Unit	TJ/ton
Description	Net calorific value of the fuels used in the baseline
Source of data	Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 1, Table 1.2; http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf_Table 1.2
Value(s) applied	0.0156
Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 13 (Climate Action)
Data / Parameter	NCV_p
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project
Source of data	Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 1, Table 1.2; http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf_Table 1.2
Value(s) applied	0.0156

Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 13 (Climate Action)
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
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: *Technologies and Practices to Displace Decentralized Thermal Energy Consumption* Version 1*, Draft General Guidelines On Sampling And Surveys*; EB37 Annex 27; and *Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities* (Version 02); EB65 Annex 2
Purpose of data	Calculation of baseline emissions
Additional comment	The value will be updated if ongoing monitoring shows that the baseline technology has changed over time, such as a switch to LPG or kerosene for boiling water

Relevant SDG Indicator/Safeguarding Principle	SDG 13 (Climate Action)
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
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: *Technologies and Practices to Displace Decentralized Thermal Energy Consumption* Version 1*, Draft General Guidelines On Sampling And Surveys*; EB37 Annex 27; and *Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities* (Version 02); EB65 Annex 2
Purpose of data	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 3 (Good Health and Wellbeing) SDG 6 (Clean Water and Sanitation) SDG 13 (Climate Action)

Data / Parameter	Xboil (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 Survey: 'AOD Results' Qs 15-20; 'Kole': Suppressed Demand Survey Qs 9-12 For Xboil analysis please see 'Lango_Baseline Report_v.1' pages 14-17
Value(s) applied	8.91%
Measurement methods and procedures	Suppressed demand will be 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	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	SDG 5 (Gender Equality)
Data / Parameter	Tb,y
Unit	Hours
Description	Time spent collecting water per household per day prior to project
Source of data	Q14 Gender Baseline Survey
Value(s) applied	169.5
Measurement methods and procedures	Survey
Purpose of data	Calculating time saved by project
Additional comment	-

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

>> (Provide a transparent ex ante calculation of baseline and project outcomes (or, where applicable, direct calculation of net benefit) during the crediting period, applying all relevant equations provided in the selected methodology(ies) or as per proposed approach. For data or parameters available before design certification, use values contained in the table in section B.6.3 above. For data/parameters not available before design certification and monitored during the crediting period, use estimates contained in the table in section B.7.1 below)

Estimation for SDG 3 (Good Health and Wellbeing):

3,726 = 3,936 * (1 – 0.0456) * (1 – 0.008046)

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

Where:

P_{safe}	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
P_y	Number of persons having access to safe water in the project activity.
C_j	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.
$P_{b, boil}$	Percentage of persons boiling water for purification in the baseline scenario.

Estimation for SDG 5 (Gender Equality)

57.5% = (169.5 – 72) / 169.5

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

Where:

TR_y	Total reduction time spent collecting water for project activity in year y (%)
$T_{b,y}$	Time spent collecting water per household per day prior to project (hours)
$T_{p,y}$	Time spent collecting water per household per day in project (hours)

Estimation for SDG 6 (Clean Water and Sanitation):

3,757 = 3,936 * (1 – 0.0456) * 1

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

Where:

P_{access}	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
P_y	Number of persons having access to safe water in the project activity.
C_j	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.
$U_{p,y}$	Usage rate in project scenario p during year y

Estimation for 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. These are calculated according to the description in Section B of the VPA-DD.

Baseline

10,949 = 6981 * ((0.82 * 112) + 8.692) * 0.0156

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

Project emissions

0 = 0 * ((0.82 * 112) + 8.692) * 0.0156

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

Where:

$B_{p,y}$ = 0 = (1 – 0.0456) * 1,436,640 * 0.0006789 * (0 + 0)

Bp,y = (1 – Cj) * Np,y * Wp,y * (Qp,rawboil,y + Qp,cleanboil,y)

9,973 = (((10,949 – 0) * 1) – 0) * (1 – 0.0891)

$$ER_y = \left(\left(\left(\Sigma BE_{b,y} - \Sigma PE_{p,y} \right) * Up,y \right) - LEp,y \right) * (1 - XBoil)$$

B.6.5. Summary of ex ante estimates of each SDG outcome

SDG 3

Year	Baseline estimate	Project estimate	Net benefit
MP1 2019-2020	211 people consuming safe or boiled water	3,936 people consuming safe water	Additional 3,726 people consuming safe water
MP2 2020-2021	211 people consuming safe or boiled water	3,936 people consuming safe water	Additional 3,726 people consuming safe water
MP3 2021-2022	211 people consuming safe or boiled water	3,936 people consuming safe water	Additional 3,726 people consuming safe water
MP4 2022-2023	211 people consuming safe or boiled water	3,936 people consuming safe water	Additional 3,726 people consuming safe water
MP5 2023-2024	211 people consuming safe or boiled water	3,936 people consuming safe water	Additional 3,726 people consuming safe water
MP6 2024-2025	211 people consuming safe or boiled water	3,936 people consuming safe water	Additional 3,726 people consuming safe water
MP7 2025-2026	211 people consuming safe or boiled water	3,936 people consuming safe water	Additional 3,726 people consuming safe water
Total	1,477 people consuming safe or boiled water	27,552 people consuming safe water	Additional 26,075 people consuming safe water

Total number of crediting years: 7			
Annual average over the crediting period	211 people consuming safe or boiled water	3,936 people consuming safe water	Additional 3,726 people consuming safe water

SDG 5

Year	Baseline estimate	Project estimate	Net benefit
MP1 2019-2020	169.5 minutes collecting water	72 minutes collecting water	57.5% reduction in time spent collecting water
MP2 2020-2021	169.5 minutes collecting water	72 minutes collecting water	57.5% reduction in time spent collecting water
MP3 2021-2022	169.5 minutes collecting water	72 minutes collecting water	57.5% reduction in time spent collecting water
MP4 2022-2023	169.5 minutes collecting water	72 minutes collecting water	57.5% reduction in time spent collecting water
MP5 2023-2024	169.5 minutes collecting water	72 minutes collecting water	57.5% reduction in time spent collecting water
MP6 2024-2025	169.5 minutes collecting water	72 minutes collecting water	57.5% reduction in time spent collecting water
MP7 2025-2026	169.5 minutes collecting water	72 minutes collecting water	57.5% reduction in time spent collecting water
Total	1,186.5 minutes collecting	504 minutes collecting water	57.5% reduction in time spent collecting water
Total number of crediting years: 7			
Annual average over the crediting period	169.5 minutes collecting water	72 minutes collecting water	57.5% reduction in time spent collecting water

SDG 6

Year	Baseline estimate	Project estimate	Net benefit
MP1 2019-2020	179 people with access to safe water	3,936 people with access to safe water	Additional 3,757 persons with access to safe water
MP2 2020-2021	179 people with access to safe water	3,936 people with access to safe water	Additional 3,757 persons with access to safe water
MP3 2021-2022	179 people with access to safe water	3,936 people with access to safe water	Additional 3,757 persons with access to safe water

MP4 2022-2023	179 people with access to safe water	3,936 people with access to safe water	Additional 3,757 persons with access to safe water
MP5 2023-2024	179 people with access to safe water	3,936 people with access to safe water	Additional 3,757 persons with access to safe water
MP6 2024-2025	179 people with access to safe water	3,936 people with access to safe water	Additional 3,757 persons with access to safe water
MP7 2025-2026	179 people with access to safe water	3,936 people with access to safe water	Additional 3,757 persons with access to safe water
Total	1,256 people with access to safe water	27,552 people with access to safe water	Additional 26,295 persons with access to safe water
Total number of crediting years: 7			
Annual average over the crediting period	179 people with access to safe water	3,936 people with access to safe water	Additional 3,757 persons with access to safe water

SDG 13

Year	Baseline estimate	Project estimate	Net benefit
MP1 2019-2020	9,973 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,973 tCO2e
MP2 2020-2021	9,973 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,973 tCO2e
MP3 2021-2022	9,973 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,973 tCO2e
MP4 2022-2023	9,973 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,973 tCO2e
MP5 2023-2024	9,973 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,973 tCO2e
MP6 2024-2025	9,973 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,973 tCO2e
MP7 2025-2026	9,973 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,973 tCO2e
Total	69,811 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 69,811 tCO2e
Total number of crediting years: 7			
Annual average over the crediting period	9,973 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 9,973 tCO2e

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

(Include specific information on how the data and parameters that need to be monitored in the selected methodology(ies) or proposed approaches or as per mitigation measures from safeguarding principles assessment or as per feedback from stakeholder consultations would actually be collected during monitoring. Copy this table for each piece of data and parameter.)

Relevant SDG Indicator	SDG 13 (Climate Action)
Data / Parameter	N p,y
Unit	Project Technology Days
Description	Number of persons consuming water supplied by project scenario p through year y
Source of data	Borehole Project Database
Value(s) applied	1,436,640 (Estimated value. To be monitored.)
Measurement methods and procedures	Sum of the total number of people using each borehole in the project multiplied by the number of days crediting each borehole earns in this monitoring period
Monitoring frequency	Continuous
QA/QC procedures	Calculations are double-checked
Purpose of data	Emission reduction calculations
Additional comment	Household lists of borehole users including details for the main contact from the household

Relevant SDG Indicator	SDG 6 (Clean Water and Sanitation) SDG 13 (Climate Action)
Data / Parameter	Up,y
Unit	Percentage
Description	Usage rate in project scenario p through year y
Source of data	Annual Usage Survey
Value(s) applied	100% (Estimated value. To be monitored.)
Measurement methods and procedures	The usage survey has been 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
Monitoring frequency	Annual
QA/QC procedures	Clear guidance is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Emission reduction calculations
Additional comment	Questions are asked in a face-to-face survey and designed to establish whether a household can be considered a regular user of the borehole

Relevant SDG Indicator	SDG 13 (Climate Action)
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

Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	To be measured (capped at 7.5)
Measurement methods and procedures	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 will 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.
Monitoring frequency	Biennial (Every 2 years)
QA/QC procedures	Clear guidance is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Emission reduction calculations
Additional comment	Measured water consumption is limited to drinking, food preparation and basic personal hygiene. The quantity of safe water under these categories consumed in the project scenario is quantified through measurements and a survey.

Relevant SDG Indicator	SDG 13 (Climate Action)
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
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	0 (Estimated value. To be monitored.)
Measurement methods and procedures	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT will 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.
Monitoring frequency	Biennial (Every 2 years)
QA/QC procedures	Clear guidance is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Emission reduction calculations
Additional comment	Measured boiled water consumed for drinking, cooking and basic personal hygiene considered safe for human consumption prior to boiling. This is assumed from the stated water source.

Relevant SDG Indicator	SDG 13 (Climate Action)
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
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	0 (Estimated value. To be monitored.)

Measurement methods and procedures	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT will 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.
Monitoring frequency	Biennial (Every 2 years)
QA/QC procedures	Clear guidance is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Emission reduction calculations
Additional comment	Measured boiled water consumed for drinking, cooking and basic personal hygiene considered unsafe for human consumption prior to boiling. This is assumed from the stated water source.

Relevant SDG Indicator	SDG 6 (Clean Water and Sanitation)
Data / Parameter	Quality of Treated Water
Unit	Parameters as per national standards
Description	Performance of the treatment technology
Source of data	Laboratory Tests
Value(s) applied	Pass (Estimated value. To be monitored.)
Measurement methods and procedures	The National Water Quality Reference Laboratory has certified each water supply in line with national standards.
Monitoring frequency	Annually
QA/QC procedures	The first test will be within 6 months of the rehabilitation. At least one test each year conducted by accredited laboratory.
Purpose of data	Criteria of methodology
Additional comment	Water is tested in accredited laboritories. Tested water is collected from source. The project water is tested against the US 201 Drinking Potable Water Specification, which can be found here: https://archive.org/details/us.201.2008

Relevant SDG Indicator	SDG 13 (Climate Action)
Data / Parameter	LEp,y
Unit	tCO2e per year
Description	Leakage in project scenario p during year y
Source of data	Baseline and monitoring surveys
Value(s) applied	0
Measurement methods and procedures	Assessed every two years using baseline and monitoring surveys
Monitoring frequency	Biennial
QA/QC procedures	
Purpose of data	Emission reduction calculations
Additional comment	

Relevant SDG Indicator	SDG 13 (Climate Action)
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
Measurement methods and procedures	Deemed valid by Methodology
Monitoring frequency	Annually
QA/QC procedures	
Purpose of data	Calculation of baseline emissions
Additional comment	A conservative value shall be applied in case the value is updated in future

Relevant SDG Indicator	SDG 3 (Good Health and Well-being) SDG 6 (Clean Water and Sanitation)
Data / Parameter	Py
Unit	Number
Description	Number of persons having access to safe water in the project activity
Source of data	Household list
Value(s) applied	3,936
Measurement methods and procedures	Measured through the household user list
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	Measure number of persons with access to clean water in the project
Additional comment	

Relevant SDG Indicator	SDG 5 (Gender Equality)
Data / Parameter	Tp,y
Unit	Hours
Description	Time spent collecting water per household per day in project
Source of data	Project survey
Value(s) applied	1.2
Measurement methods and procedures	Measured in the project survey
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	Calculate time saved for women by the project
Additional comment	

Relevant SDG Indicator	SDG 13 (Climate Action)
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	To be measured
Measurement methods and procedures	

Monitoring frequency	Ongoing
QA/QC procedures	-
Purpose of data	Calculating ERs
Additional comment	Re-functionality of boreholes will be evidenced by signed RCF

B.7.2. Sampling plan

>> (If data and parameters monitored in section B.7.1 above are to be determined by a sampling approach, provide a description of the sampling plan.)

Cross sampling will be applied across all homogenous VPAs in Lango sub-region. Homogenous VPAs are defined as those that are sharing a common baseline. The number of boreholes that will need to be sampled for a 90/30 confidence/precision will be determined. Out of those boreholes, households will be randomly sampled, complying with the minimum sample size for the particular survey/test.

Individual participants will be selected from the borehole user data base using the random selection process outlined in the monitoring plan. See Monitoring Plan document. Sample sizes will be in line with the Gold Standard requirements. The surveys below will be monitored under the cross sampling approach;

- Project Surveys- Completed annually
- Usage Surveys- Completed annually
- Water Consumption Field Tests- Completed bienially

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

B.7.3. Other elements of monitoring plan

>>

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 Qp,y and Qp,rawboil,y) – Completed prior to first verification and then biennially with a sample of at least 30 households.

- **Quality of the treated water** - The quality of the treated water will be assessed to ensure that it is fit for human consumption. The parameters used to assess the water quality will be in line with Ugandan standards for potable water and all parameters will be shown to be within levels considered acceptable for domestic human consumption.

- **Usage Survey** - As all boreholes will be installed within 1 year of the start of the crediting period and are expected to last the lifetime of the project, minimum samples of 30 for different aged technologies will not be necessary. Therefore the annual usage survey will be conducted using a minimum sample size of 100.

- **Project Survey** – Conducted on a minimum sample size of 100 households, surveying end users currently using project technologies to explore changes in project scenario over time

- **Leakage -** The PDD has described which sources of leakage detailed within the methodology are relevant to this project and which have been discounted.Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements.

SECTION C. Duration and crediting period

C.1. Duration of project

21 years

C.1.1. Start date of project

>> *(Specify start date of the project, in the format of DD/MM/YYYY. Describe how this date has been determined as per the definition of start date provided in section 3.4.3 of GS4GG Principles & Requirements document and provide evidence to support this date.)*

The start date of the project is 01/09/2019. This will be evidenced by the Repair Confirmation Forms which show the date on which the boreholes were rehabilitated.

C.1.2. Expected operational lifetime of project

>> (*Specify in years)*

21 years

C.2. Crediting period of project

7 years twice renewable

C.2.1. Start date of crediting period

>> (Specify in dd/mm/yyyy. This can be start of project operation or two years prior to the date of Project Design Certification, whichever is later.)

02/09/2019

C.2.2. Total length of crediting period

>> (Specify the total length of crediting period sought in line with GS4GG Principles & Requirements or relevant activity requirements.)

7 years twice renewable

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

>> (Refer the GS4GG Safeguarding Principles and Requirements document for detailed guidance on carrying out this assessment.)

Safeguarding principles	Assessment	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
3.1 – Human Rights	a. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights b. The Project shall not discriminate with regards to participation and inclusion	No No	The project is based on rehabilitating boreholes and ongoing community management. The project includes all community members and actively engages with women	
3.2 - Gender Equality and Women's Rights	a. Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits? b. Is there a possibility that the Project can adversely	No No	The project will increase the access of women to safe water There will be less of a burden on women	

	affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?		and children especially, as less firewood for purification needs to be collected.	
	c. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?	No	The project takes into account gender roles during the LSC and throughout. Both men and women are encouraged to give feedback about the project during the LSC in varius formats of communication.	
	d. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?	No	No groups are excluded from participating in the project. Measures to include women, children and minority groups are excercised in the LSC and will continue to be throughout the project.	
	e. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?	No	The project leads to a decrease in womens workload due to the provision of safe water, thereby allowing more time to engage in other activities.	
	f. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance,		The project aims to benefit the whole community equally and women's equal	

	regarding their full participation in design and implementation or access to opportunities and benefits? g. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services? h. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?	No No	participation in the LSC and water resource committees is encouraged. The project increases natural protection by removing the need to collect wood fuel for water purification. The project is not found to impose further risks for women and girls.	
3.3 Community Health, Safety and Working Conditions	The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.	No	The WRCs are trained to keep the area surrounding the borehole safe by keeping it clean, erecting fences and covering soak-away pits.	
3.4.1 Sites of Cultural and Historical Heritage	Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations, or practices)?	No	The project area does not include cultural and historic sites. The focus of the project is rehabilitating existing borehole infrastuctrure only.	
3.4.2 Forced Eviction and Displacement	Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	The project rehabilitates existing boreholes that have been in place for many years.	
3.4.3 Land Tenure and Other Rights	Does the Project require any change to land tenure arrangements and/or other	No	No changes to land tenure arrangements and/or rights are	

	rights?		required.	
3.4.4 Indigenous Peoples	Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No	The boreholes are located on government owned land and cater to local communities near the borehole.	
3.5 Corruption	The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	Financial resources are managed by CO2balance in country team and by the Project Proponent.	
3.6.1 Labour Rights	1. The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions. Where these are contradictory and a breach of one or other cannot be avoided, then guidance shall be sought from Gold Standard.	No	The PD hires in-country consultants. The contracts are in-line with national labour law.	
	2. Workers shall be able to establish and join labour organisations.	No	The PD does not restrict this.	
	3. Working agreements with all individual workers shall be documented and implemented.	No	Consultants have written contracts.	
	4. The Project Developer shall justify that the employment model applied is locally and	No	The model is culturally appropriate and local customs are followed, such as	

	culturally appropriate. 5. Child labour, as defined by the ILO Minimum Age Convention, is not allowed. 6. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.	No No	local holidays. No child labour is used. Local consultants are trained and are able to report incidents in the field.	
3.6.2 Negative Economic Consequences	1. The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also including those that will occur beyond the Project Certification period. 2. The Projects shall consider economic impacts and demonstrate a consideration of potential risks to the local economy and how these have been taken into account in Project design, implementation, operation and after the Project. Particular focus shall be given to vulnerable and marginalised social groups in targeted communities and that benefits are socially-inclusive and sustainable.	No No	Carbon finance provides project financial sustainability. The project engages with communities and trains WRCs to manage the water points to provide post-project sustainability. The project benefits all community members. The project surveys monitor how communities, and in particular women, benefit economically from the time saved by the project.	
4.1.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	GHG emissions will be reduced in the project through replacing water purification using firewood with access to safe water.	

4.1.2 Energy Supply	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project will reduce consumption of biomass through the provision of access to clean water.	
4.2.1 Impact on Natural Water Patterns/Flows	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The project uses existing aquifers and the volume of water consumed by residents is not predicted to change by having access to safe water.	
4.2.2 Erosion and/or Water Body Instability	Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?	No	The water is taken from boreholes at household usage levels. Therefore it is extremely unlikely that there will be additional erosion and/or water body instability or disruption of the natural pattern of erosion.	
4.3.1 Landscape Modification and Soil	Does the Project involve the use of land and soil for production of crops or other products?	No	No crops or other products are produced in the project.	
4.3.2 Vulnerability to Natural Disaster	Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	There will be no impact by the project to natural disasters.	
4.3.3 Genetic Resources	Could the Project be negatively impacted by the use of genetically modified	No	No GMOs will be used in the project.	

	organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?			
4.3.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	No	As safe ground water is used, there is no risk or releasing pollutants to the environment.	
4.3.5 Hazardous and Non-hazardous Waste	Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	The project does not deal with harzardous or non-hazardous chemicals and/or materials.	
4.3.6 Pesticides & Fertilisers	Will the Project involve the application of pesticides and/or fertilisers?	No	No pesticides and/or fertilisers are to be used in the project.	
4.3.7 Harvesting of Forests	Will the Project involve the harvesting of forests?	No	The project reduces the consumption of firewood, therefore having a positive impact on forest conservation.	
4.3.8 Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The project has no impact on modifying foods or altering crop regimes.	
4.3.9 Animal husbandry	Will the Project involve animal husbandry?	No	The project does not involve animal husbandry.	
4.3.10 High Conservation Value Areas and Critical Habitats	Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	The project rehabilitates existing boreholes and decreases the consumption of firewood having a positive impact on conserving forest ecosystems.	
4.3.11 Endangered Species	a. Are there any endangered species identified as potentially being present	No	The project activity does not have any foreseeable negative	

	within the Project boundary (including those that may route through the area)?		impacts on any endangered species.	
	b. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	The project only impacts existing infrastructure and does not impact areas where endangered species are present.	

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

>> *(Describe how stakeholder consultation was conducted in accordance with GS4GG Stakeholder Procedure Requirements and Guidelines.)*

The Stakeholder Consultation was conducted in accordance with the Requirements and Guildines. See SCR for details.

E.2. Summary of comments received

>> *(Provide a summary of key comments received during the consultation process.)*

Overall, stakeholder feedback on the project was very positive. Most of the stakeholders stated that there was nothing they didn't like about the project. Some comments were made on gender issues, which will be monitored in the annual project surveys. Please see section C.3.iii. of the SCR for comments received.

E.3. Report on consideration of comments received

>> *(Describe how the comments have been addressed by providing a clarification to the stakeholder or by altering the design of the project or by proposing to monitor any anticipated negative impacts etc.)*

Most of the suggestions are inline with CO2balance's monitoring plan, such as surveys which cover usage and gender issues, and community training. The WRC are trained in Gender Equality, and this will be surveyed annually. Water storage is covered by the annual WASH trainings and monitored by the project surveys.

The potential negative impacts will be monitored through annual Gender Workshops with the WRCs and through the Gender Project Surveys. See SCR for details.

Appendix 1. Contact information of project participants

Organization name	Co2balance
Registration number with relevant authority	
Street/P.O. Box	Cook Way
Building	1 Discovery house
City	Taunton
State/Region	Somerset
Postcode	TA2 6BJ
Country	United Kingdom
Telephone	+44 (0)1823 332233
Fax	
E-mail	james.walker@co2balance.com
Website	www.co2balance.com
Contact person	
Title	Project Manager
Salutation	Mr
Last name	Walker
Middle name	
First name	James
Department	Carbon Projects
Mobile	
Direct fax	
Direct tel.	+44 (0)1823 332233
Personal e-mail	james.walker@co2balance.com

Appendix 2. Summary of post registration design changes