

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



**Version 1.1 – August 2017**

## KEY PROJECT INFORMATION

Title of Project:	Household and Commercial Biogas Plants in Kenya
Brief description of Project:	The project activity involves installation of biogas plants for households and commercial purposes in Kenya of capacities ranging between 6m <sup>3</sup> -40m <sup>3</sup> . These biogas plants allow households, slaughterhouses and small-medium sized farms to transform their organic waste into renewable biogas to accommodate their energy demand and drive regional sustainable development. The purpose of the project is to reduce greenhouse gas emissions by displacing conventionally used non renewable biomass with renewable biogas. In addition, appropriate disposal of waste will lead to improved hygiene conditions in the areas where the project activities are implemented. Further, residue from the biodigesters is used as an organic fertilizer and will further enhance the condition of soil.
Date of Implementation:	06/12/2018
Expected duration of Project:	5 years renewable cycle
Project Developer:	Good Farmland Management Kenya, LTD
Project Representative:	Swiss Carbon Value Ltd.
Project Participants and any communities involved:	Good Farmland Management Kenya, LTD, Swiss Carbon Value Ltd.
Version of PDD:	01
Date of Version:	05/12/2019
Host Country / Location:	Kenya
Certification Pathway (Project Certification/Impact Statements & Products)	Impact Statements & Products
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG: Community Services Activity Requirements
Methodologies applied:	Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 3.1
Product Requirements applied:	GS VER
Regular/Retroactive:	Retroactive
SDG Impacts:	1– Good Health and well being (SDG 3) 2- Affordable and clean Energy (SDG 7) 3-Climate Action (SDG 13)
Estimated amount of SDG Impact Certified	SDG 13: 204,831 tCO <sub>2e</sub> /year SDG 3: 100% reduction in mortality rate SDG 7: 84,226 household access to affordable and clean energy

## SECTION A. Description of project

### A.1. Purpose and general description of project

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The aim of the project is to provide a wide range of social, economic, and environmental benefits for families and communities in Kenya by installation of Siestema.bio's digesters. These biogas digesters having a varying capacity between 6m<sup>3</sup> to 40m<sup>3</sup> are employed to treat waste, produce renewable energy and organic fertilizer. Each household or commercial unit will utilize the dung of its cows to feed the digester for the production of biogas for domestic purposes. This leads to reduction of greenhouse gas emissions by displacing conventionally used non-renewable biomass with renewable biogas. Further, residue from the biodigesters is used as organic fertilizer and will improve soil conditions in rural areas. In addition to improved sanitation due to proper disposal of waste, the residue from the biodigesters can also be used as an organic fertilizer to enhance soil productivity.

Project activity will also contribute towards sustainable development by replacing firewood with biogas generated from the biodigesters.

#### **Baseline Scenario:**

Household survey was conducted to assess the baseline fuel and quantity used. As per the Survey, firewood was the main fuel used to suffice the domestic needs which was sourced from nearby forests and open market. On an average, every house hold used approximately 512 kg of fuelwood and spent around 3209 KES to buy it. Usage of inefficient firewood leads to indoor pollution along with decrease in forest land cover and increase in degraded land. Growing pressure from human and livestock population coupled with indiscriminate and illegal exploitation of forest resources are among factors that have lead to further intensification of the problem. The closed canopy cover of Kenya is much lower when compared to the African average.<sup>1</sup> Prolonged degradation of country's forest land will eventually impact adversely on the productivity of the nation. Hence there is a dire need to maintain adequate forest cover in the country to mitigate the effects of climate change.

#### **Project Scenario:**

Project activity involves adoption of biogas digesters by the households and commercial units of Kenya constructed and maintained by Siestema.bio. The produced biogas are used in the biogas stoves for thermal energy needs. Hence, the project activity is a Greenfield project activity.

The residue from the biodigesters is used as an organic fertilizer in the fields.

Project activity will result in saving of 1,024,157 tCO<sub>2</sub>e in first crediting period from 06/12/2018 to 05/12/2023 with an average saving of 204,831 tCO<sub>2</sub>e/year

The size of the biodigesters varies, depending on the number of people and number of cattle available per household. As on year 2019, a total of 1,126 biogas plants have been installed in various parts of the country. A detailed breakdown of the plants with the respective installed capacity in 2018-19 (06/12/2018 to 05/12/2019) and the proposed biodigesters from 2020 to 2023 is given in table 1 below.

Table 1: Breakdown of the plants with the respective installed capacity

	Actual	Proposed				
	2019	2020	2021	2022	2023	Total

<sup>1</sup> See: <http://www.environment.go.ke/wp-content/uploads/2018/08/Forest-Report.pdf>

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<b>Total biodigesters installed</b>	<b>1126</b>	<b>3100</b>	<b>10000</b>	<b>20000</b>	<b>50000</b>	<b>84226</b>
Sistema 6	385	837	2100	3000	4500	10822
Sistema 8	303	899	3100	6600	17500	28402
Sistema 12	193	620	2200	4800	13000	20813
Sistema 16	63	186	600	1200	3000	5049
Sistema 20	99	372	1300	2800	7500	12071
Sistema 30	24	0	0	0	0	24
Sistema 40	59	186	700	1600	4500	7045

## A.2. Eligibility of the project under Gold Standard

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The project falls under GG4GG Community Services Activity Requirements:

Eligible Project Types & Scope: The projects leads to climate change mitigation by providing access to resources (biogas) to households. Types of project: The project falls under ‘Renewable energy” type- Waste management and handling: Management of animal waste (cattle dung) to deliver biogas, End-Use Energy Efficiency.

Project Area, Boundary and Scale: Project Area and Boundary is described under section A.4 below.

Scale: The project falls under waste handling and disposal, end use energy efficiency with emission reductions 204,831tCO<sub>2e</sub> per year with installed energy output of 12 MW<sub>thermal</sub> (Below the threshold of 45 MW<sub>thermal</sub>). Hence, the project falls under small scale projects.

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

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Implementation of the proposed project doesn’t involve any activity that causes alteration of any resource; therefore acquiring any specific legal right to do so is not applicable. However, the entitlement of the emission reductions generated by the project shall be transferred to the project developer from the beneficiary households through a signed covenant.

## A.4. Location of project

### A.4.1. Host Country

>>

Kenya

### A.4.2. Region/State/Province etc.

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The biogas plants under the proposed project will be installed throughout Kenya.

### A.4.3. City/Town/Community etc.

>> The project activity is currently implemented in Baringo, Bomet, Elgeyo-Marakwet, Embu, Kajjado, Kakamega, Kericho, Kiambu, Kirinyaga, Kissu, Kisumu, Meru, Muranga, Nukuru, Nandi, Nyamiria, Nyandarua, Tharaka-Nithi, Uasin Gishu. However, the project activity is aimed to be implemented in all parts of Kenya where the conditions to sell and install biodigesters are met.

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## A.4.4. Physical/Geographical location

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

PP has given unique identification number to each plant like #Venta 8534, #Venta 8685.... Etc. These plants are located in various parts of Baringo, Bomet, Elgeyo-Marakwet, Embu, Kajiado, Kakamega, Kericho, Kiambu, Kirinyaga, Kissu, Kisumu, Meru, Murang'a, Nukuru, Nandi, Nyamiria, Nyandarua, Tharaka-Nithi, Uasin Gishu.

The project will be implements throughout Kenya. The details of geographical location are presented below.

	Coordinates
Latitude	0.0236° S
Longitude	37.9062° E

Figure 1: Map of Kenya<sup>2</sup>



## A.5. Technologies and/or measures

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As described above project activity involves installation of biodigesters with Sistema.bio technology in Kenya. There is no technology transfer involved in the project activity. Details of working of the plant are as follows.

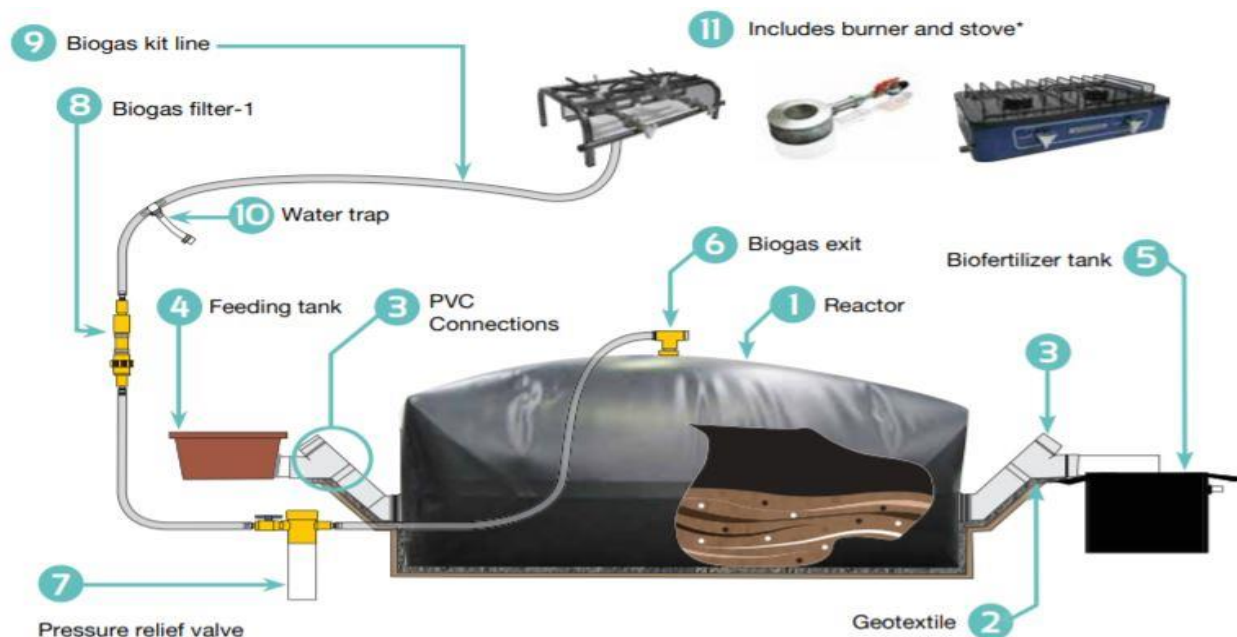
Sistema.bio is a hermetic hybrid reactor which receives the daily waste of a farm and livestock. This waste manure is then mixed with water in order to allow fermentation. In the due process of fermentation methane-rich biogas and an organic fertilizer called boil are produced. Biogas is transported to different points of use like cookings stoves, burnes etc. The mixture left behind in the

<sup>2</sup> Source: <https://www.vectorstock.com/royalty-free-vector/republic-of-kenya-map-vector-1734682>

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reactor is a powerful biofertilizer which is stored and applied in the fields as a substitute to chemical fertilizers. The various compents of the Sistema.bio reactor can be seen in Figure 1 below.

Figure 2: Sistema.bio Plant



The project contributes directly in achieving the SDG 3 & 7 in addition to SDG 13 as required by Principle- 1 of GS4GG. The project will have following benefits:

- **Environmental Benefits:** Reduction in firewood consumption and emission of greenhouse gases, forest and biodiversity conservation (SDG 13).
- **Economic Benefits:** Employment creation and saving of health cost (SDG 3).
- **Health Benefits:** Sufficiently enhance indoor air quality thereby improving health of family members and reducing incidences of smoke and fire related injuries (SDG 3).
- **Social Benefits:** The project will provide affordable and clean fuel copared to baseline scenario (SDG 7)

## A.6. Scale of the project

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The project falls under waste handling and disposal and end use energy efficiency with emission reductions of 204,831 tCO<sub>2e</sub> per annum with installed energy output of 12 MW<sub>thermal</sub> (Below the threshold of 45 MW<sub>thermal</sub>). Hence, the project falls under small scale projects.

## A.7. Funding sources of project

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No public funding from parties included in Annex I to the UNFCCC, is available to the project. The project is implemented by the client. Carbon waiver has been signed by the project owner and carbon rights are available with Good Farmland Management Kenya, LTD (local entity).

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

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Proposed project is developed pursuant to the “gender sensitive” requirements outlined in the “Gold Standard Gender Equality Guidelines and Requirements”. As required for the purpose of the PDD as specified in the guidance note to this section, the project participants presents the assessment to questions included in step 1 to 3 in the respective guidelines and requirements.

## **1M) Does the project reflect the key issues and requirements of gender-sensitive design and implementation as outlined in the gender policy? Explain how.**

The project respects the key gender issues and requirements of gender-sensitive design and implementation of the project. The project is aimed to avail the clean cooking solutions to the households. Biogas project will result in cutting down the firewood consumption. Therefore, the project will support environmentally sustainable consumption of firewood.

In the overwhelming majority of the households in Kenya, the kitchen chores (including the sourcing of fuel, cooking and cleaning) are handled by women. While getting involved most of the time with the kitchen related activities, women are more exposed to the indoor air pollution and the associated hazard. Situation is more aggravated with a fact that the women are also responsible for taking care of the children and the children who normally need mother’s support to perform their activities are bound to accompany their mother in kitchen. This situation has led to enhanced exposure of the women and children to kitchen smoke and associated health consequences. Since the project aims to displace the polluting firewood from the kitchen, the primary beneficiary would be the women and children.

On the implementation side, the project has trained and deployed women in the marketing and construction of the biogas plant. Project implementer opines that promotional activities are better addressed with women in the forefront. During the life of the project, the project participant believes to create a conducive environment where women are ably capacitated to discuss the need of a technology, create awareness of the product and process, and in long run, to organize themselves and create business opportunities for themselves. This women prioritized mode of project development and implementation helps address gender equality issues; in the meantime, addressing issues related to environmental sustainability and natural resource management.

## **2M. Does the project align with existing country policies, strategies and best practices? Explain how.**

The project respects all the rights to the women conferred to them by the Republic of Kenya. Article 21 outlines the “Implementation of rights and fundamental freedoms.”, Article 27 of the constitution highlights the “Equality and freedom from discrimination.”. All these articles embrace the gender equality and social inclusion principles in a way or other. Kenya has ratified ‘International Convention on the Elimination of All Forms of Racial Discrimination :1969’ ‘International Covenant on Civil and Political Rights :1976’, ‘International Covenant on Economic, Social and Cultural Rights :1976’, ‘Convention on the Elimination of All Forms of Discrimination’ against Women (1979). Kenya has also signed Protocol on the Rights of Women in Africa (2005). Kenya has ratified ‘International Convention on the Elimination of All Forms of Racial Discrimination :1969’ ‘International Covenant on Civil and Political Rights :1976’, ‘International Covenant on Economic, Social and Cultural Rights :1976’, ‘Convention on the Elimination of All Forms of Discrimination’ against Women (1979). Kenya has also signed Protocol on the Rights of Women in Africa (2005). The project respects the spirit of all the mentioned conventions. The project is also in line with the objective of ‘National Policy on Gender and Development’ of Kenya.

## **3M. Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document? Explain how.**

The questions on Gender Aspects raised in the Gold Standard Safeguarding Principles and Requirements document are answered in the Safeguarding Principle Assessment. There are no risks

perceived by Stakeholders and the project developer due to the strong focus of the project on women as main beneficiaries.

## SECTION B. Application of selected approved Gold Standard methodology

### B.1. Reference of approved methodology

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The relevant project type and category is: Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 3.1 Reference: <https://globalgoals.goldstandard.org/2166/>

### B.2. Applicability of methodology

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Justification for the choice of methodology is given below table:

Sr.No.	Criterion	Conditions
1	Clearly identifiable project boundary: The project boundary can be clearly identified, and the biodigesters counted in the project are not included in another voluntary market or CDM project activity (i.e. no double counting takes place). Project proponents must have a survey mechanism in place together with appropriate mitigation measures so as to prevent double-counting in case of another similar activity with some of the target area in common.	The project boundary is the physical, geographical site of Sistema.bio digester plants located within Kenya. The project is not registered with any other voluntary market thus, doesn't double count any of its emission reductions.  The unique GPS coordinate of every plant is recorded along with the complete address of the plant site.
2	The biodigesters each have continuous useful energy outputs of less than 450 kW <sub>th</sub> per unit (defined as total energy delivered usefully from start to end of operation of a unit divided by time of operation).	The maximum energy output of the biodigesters implemented in the project activities is 10.44 kW <sub>th</sub> per unit, below the indicated 450 kW <sub>th</sub> limit per unit.
3	The use of the baseline technology as a backup in parallel with the Sistema.bio fuel launched 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. The project documentation must provide a clear description of the approach chosen and the monitoring plan must allow for a good understanding of the extent to which the baseline technology is still in use after the introduction of the improved technology. The success of the mechanism put into place must therefore be monitored, and the	Monitoring of the baseline technology usage will be done periodically. Detailed surveys will be conducted in order to get a feedback on the operation of the new technology and to measure the extent to which the baseline technology is still used.



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	approach must be adjusted if proven unsuccessful.	
4	The project proponent must clearly communicate to all project participants to whom the ownership rights of the emission reductions resulting from the project activity belong. This must be communicated to the technology producers and the retailers of the by contract or clear written assertions in the transaction paperwork.	The end user of each biodigester will confirm that they transfer the ownership of VERs to the Project p. Sample Copy of agreement with the end users is provided in Appendix 3.
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.	The project activity does not involve usage of any new biomass feedstock. Thus, this condition is not applicable to the project.
6	If more than one climate zone is included in the project activity, a distinction per climate zone must be considered. The distinct geographical boundary of each project area must be clearly documented in the project documentation, using representative GPS data.	The project is applicable throughout Kenya and the most parts of the country fall under one climate zone only.

## Eligible Project Types:

### Renewable energy Supply-

Project activity meets this criteria as it generates biogas from livestock manure and organic waste. Thus avoiding the conventional usage of the fuelwood in the absence of the project activity.

### Project Types and Eligibility criterion:-

#### Project activity falls under below project type-

#### Project Type: Improved distributed heating and cooking devices (e.g. biodigesters, cook-stoves),

Project activity involves installation of household biodigesters and thereby replacing firewood. Biogas thus generated will be used for domestic thermal needs. Good Farmland Management Kenya, LTD has an agreement with all the plant owners involved in the project activity stating transferring of rights to Good Farmland Management Kenya, LTD. Every stakeholder was aware of the arrangement and ownership of the credits. Hence meeting the GS criterion.

### B.3. Project boundary

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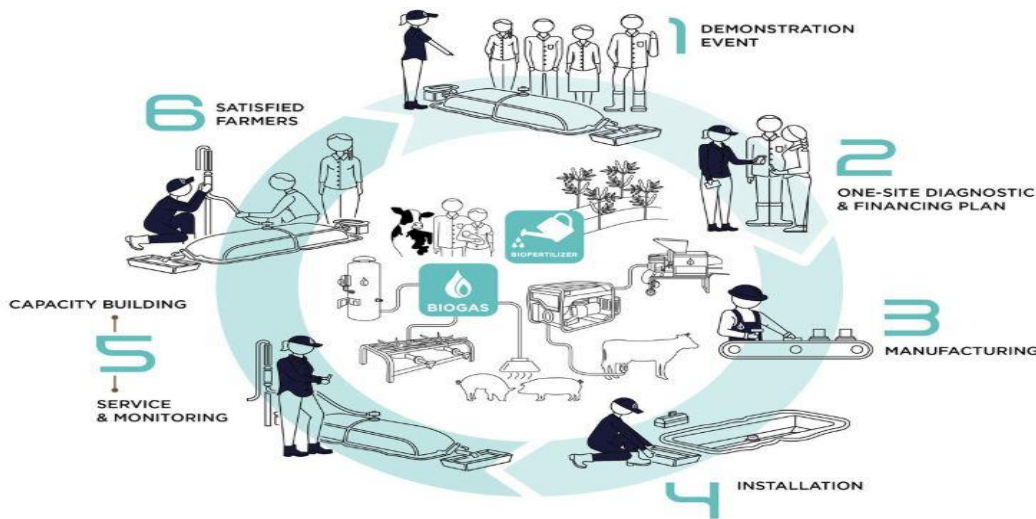
As per “Technologies and Practices to Displace Decentralized Thermal Energy Consumption” methodology the project boundary is:

The project boundary is the physical, geographical site of the use of biomass or the renewable energy through Kenya.

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Therefore, the project boundary incorporates all the physical geographical sites of the Sistem.bio's biodigesters. As of December 2019 from December 2018, a total of 1126 plants have been installed by Sistema.bio at various sites throughout the geographical boundary of Kenya. The step wise installation process of the plant at the project site is demonstrated in the Figure 3 below.

Figure 3: Step-wise demonstration of plant installation



The emissions accounted from the various sources in the physical boundary of the project activity are as follows:

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

	Source	GHGs	Included?	Justification/Explanation
Baseline scenario	Thermal Energy Need	CO <sub>2</sub>	Yes	The major source of emissions in the baseline due to burning of firewood
		CH <sub>4</sub>	No	Excluded for simplification, this is conservative.
		N <sub>2</sub> O	No	Not applicable for the project activity
	Animal waste handling and storage	CO <sub>2</sub>	No	Not Available, as baseline emissions from "feed" are not considered
		CH <sub>4</sub>	Yes	The major source of emission in baseline due to open dumping of animal manure
		N <sub>2</sub> O	No	Not Available, as baseline emissions from "feed" are not considered
Project scenario	Direct emissions from the biodigester	CO <sub>2</sub>	No	Excluded as CO <sub>2</sub> emissions from biogas incineration are CO <sub>2</sub> neutral
		CH <sub>4</sub>	No	Excluded for simplification
		N <sub>2</sub> O	No	Excluded for simplification

## B.4. establishment and description of baseline scenario

>>

Biomass contribution to Kenya's final energy demand is 70 per cent and provides for more than 90 per cent of rural household energy needs.<sup>3</sup> The main sources of biomass for Kenya include charcoal,

<sup>3</sup> <https://renewableenergy.go.ke/index.php/content/29>

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wood-fuel and agricultural waste. Therefore making the default FNRB of Kenya to be 92%.<sup>4</sup> Thus, the baseline scenario is the usage of non-renewable fuels to meet the energy requirements in households of Kenya along with GHG emissions resulting from animal waste.

The proposed project activity aims to replace the conventional usage of non-renewable sources to suffice the domestic needs with much cleaner and sustainable source of energy i.e. Biogas. A baseline survey was conducted in various parts of the country. Majority of the households were found to be dependent on biomass to fulfill their domestic energy needs.

The details of the survey from the study are given in table 2 as follows:

Table 2: Details of the Baseline Survey

Capacity	Number of Biodigesters	Average Wood Consumption (kg/month)	Average LPG Consumption (kg/month)
6	40	331	77
8	52	462	7
12	45	617	96
16	13	304	11
20	12	673	12
30	1	25	13
40	9	1278	13
<b>Total</b>	<b>172</b>	<b>3689</b>	<b>230</b>

## B.5. Demonstration of additionality

>> As described in section A.2 above, the project falls under GG4GG Community Services Activity Requirements. As per Annex-B Positive list under 'GG4GG Community Services Activity Requirements' the project meets the criteria 3

Prior Consideration:

As per GS4GG rule for retroactive projects, project documents need to submit to GS within one year of the project start date to meet prior consideration. In this case, the start date is 06/12/2018 and PP has submitted the initial project documents to GS on 06/12/2019. Therefore, the project meets the prior consideration requirements.

Ongoing financial Need:

Ongoing Financial Need shall be demonstrated at Design Certification Renewal (Refer clause 3.5.2.2 of GS4GG 'principle and requirements').

## B.6. Sustainable Development Goals (SDG) outcomes

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




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The table below discusses the relevant SDG target for each three SDGs addressed by the project.

SDGs	Targets
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<sup>4</sup> <https://cdm.unfccc.int/DNA/fNRB/index.html>

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 <p><b>3</b> GOOD HEALTH AND WELL-BEING</p>	<p>The project will contribute to the SDG goal “ By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination ”. The project replaces firewood consumption with biogas. Therefore, the indoor air quality at user point will improve and will contribute to the SDG goal.</p>
 <p><b>7</b> AFFORDABLE AND CLEAN ENERGY</p>	<p>The project will contribute towards below SGD goals:</p> <ul style="list-style-type: none"> <li>• By 2030, ensure universal access to affordable, reliable and modern energy services</li> <li>• By 2030, increase substantially the share of renewable energy in the global energy mix</li> </ul>
 <p><b>13</b> CLIMATE ACTION</p>	<p>The project will contribute towards below SGD goals:</p> <ul style="list-style-type: none"> <li>▪ Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning</li> <li>▪ Integrate climate change measures into national policies, strategies and planning</li> </ul>

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

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As per “Technologies and Practices to Displace Decentralized Thermal Energy Consumption”

The emission reductions would be accounted from the following two sources:

(i) Methane emissions from Manure Management:

Emission reductions due to Manure management have been accounted using IPCC TIER 1 approach. The following equation has been used:

Equation (1)

$$BE_{awms,h} = GWP_{CH4} * \sum_T (EF_{awms(T)} * N_{(T),h})$$

Where:

$BE_{awms,h}$  = The baseline emission from handling of animal waste in premise h (tCO<sub>2</sub>e per year)

$GWP_{CH4}$  = 21

$N_{(T),h}$  = The number of animals of livestock species per category T

$EF_{awms,T}$  = Emission factor for the defined livestock population category T, (tonCH<sub>4</sub> per head per year)

(ii) Carbon dioxide emissions from the combustion of non renewable energy sources (Fuelwood and LPG)

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Emission reduction due to the consumption of non-renewable energy sources has been accounted in accordance with the “Technologies and Practices to Displace Decentralized Thermal Energy Consumption” methodology using the following equation .

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

Where:

- $B_{b,y}$  = Quantity of fuel consumed in baseline scenario b during year y, in tons,
- $f_{nrB}$  = Fraction of biomass used during year y for the considered scenario that can be established as non-renewable biomass
- $NCV_{b,fuel}$  = Net calorific value of the fuel that is substituted or reduced (IPCC default for wood fuel, 0.015 TJ/ton)
- $Ef_{b,fuel,CO2}$  = CO<sub>2</sub> emission factor of the fuel that is substituted or reduced. 112 tCO<sub>2</sub>/TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel
- $Ef_{b,fuel,non- CO2}$  = Non-CO<sub>2</sub> emission factor of the fuel that is substituted or reduced

Project Emissions (PE<sub>y</sub>): As per applied the GS TPDDTEC methodology version 3.1 , project emissions are accounted for below activities:

- a) CO<sub>2</sub> emissions from on-site consumption of fossil fuels due to the project activity
- b) CO<sub>2</sub> Emissions due continued use of the old technology.
- c) CO<sub>2</sub> emissions from electricity consumption by the project activity
- d) Methane emission from the biodigester which includes physical leakage and incomplete combustion of the biogas, as well as emissions from the animal waste not treated in the biodigester.
- e) Project emissions related to cultivation of feedstock
- f) Project emissions from transportation

The project activity does not involve any of the above activity and hence, project emissions for the project activity is not applicable.

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

<b>Relevant Indicator</b>	SDG 13 (Climate Action)	
<b>Data/parameter</b>	EF <sub>awms,T</sub>	
<b>Unit</b>	Kg per CH <sub>4</sub> per head	
<b>Description</b>	Animal waste methane emission factor by average Temperature	
<b>Source of data</b>	2006 IPCC Guidelines for National Greenhouse Gas Inventories	
<b>Value(s) applied</b>	Livestock Category	EF (kg CH <sub>4</sub> per head)
	Cattle	1

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<b>Purpose of data</b>	Baseline emissions
<b>Additional comment</b>	NA

<b>Relevant Indicator</b>	<b>SDG</b> 13 (Climate Action)
<b>Data/parameter</b>	GWP CH <sub>4</sub>
<b>Unit</b>	tCO <sub>2</sub> e per tCH <sub>4</sub>
<b>Description</b>	Global Warming Potential (GWP) of methane
<b>Source of data</b>	IPCC
<b>Value(s) applied</b>	21
<b>Purpose of data</b>	Baseline emissions
<b>Additional comment</b>	25 for the second commitment period. It shall be updated according to any future COP/MOP decisions.

<b>Relevant Indicator</b>	<b>SDG</b> 13 (Climate Action)
<b>Data/parameter</b>	f <sub>NRB,y</sub>
<b>Unit</b>	%
<b>Description</b>	Fraction of biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using nationally approved methods
<b>Source of data</b>	Default f <sub>NRB,y</sub> factors from the CDM, available from <a href="http://cdm.unfccc.int/DNA/fNRB/index.html">http://cdm.unfccc.int/DNA/fNRB/index.html</a>
<b>Value(s) applied</b>	Kenya: 92%
<b>Purpose of data</b>	Baseline emissions
<b>Additional comment</b>	NA

<b>Relevant Indicator</b>	<b>SDG</b> 13 (Climate Action)
<b>Data/parameter</b>	E <sub>f,fuel,CO2</sub>
<b>Unit</b>	tCO <sub>2</sub> /TJ
<b>Description</b>	CO <sub>2</sub> emission factor of the fuel that is substituted or reduced
<b>Source of data</b>	2006 IPCC Guidelines for National Greenhouse Gas Inventories
<b>Value(s) applied</b>	Wood= 112 LPG= 63.1
<b>Choice of data or Measurement methods and procedures</b>	As per requirement of the methodology and Table 2.2 and 2.3, Chapter 2, Volume 2 of the 2006 IPCC Guidelines  The IPCC is a standard, credible source of emissions factors.

<b>Purpose of data</b>	Baseline emissions
<b>Additional comment</b>	NA

<b>Relevant Indicator</b>	<b>SDG</b>	13 (Climate Action)
<b>Data/parameter</b>	$E_{f,b,fuel,non-CO_2}$	
<b>Unit</b>	tCO <sub>2</sub> /TJ	
<b>Description</b>	Non- CO <sub>2</sub> emission factor of the fuel that is substituted or reduced.	
<b>Source of data</b>	NA	
<b>Value(s) applied</b>	0, As no non-CO <sub>2</sub> emissions occur in the baseline scenario	
<b>Choice of data or Measurement methods and procedures</b>	NA	
<b>Purpose of data</b>	Baseline emissions	
<b>Additional comment</b>	NA	

<b>Relevant Indicator</b>	<b>SDG</b>	13 (Climate Action)
<b>Data/parameter</b>	NCV <sub>b,fuel</sub>	
<b>Unit</b>	TJ/tonne	
<b>Description</b>	Net calorific value of fossil fuels used in the baseline scenario	
<b>Source of data</b>	2006 IPCC Guidelines for National Greenhouse Gas Inventories	
<b>Value(s) applied</b>	Wood= 0.015 LPG= 0.0473	
<b>Choice of data or Measurement methods and procedures</b>	As per requirement of the methodology and Table 1.2 , Chapter 1, Volume 2 of the 2006 IPCC Guidelines.  The IPCC is a standard, credible source of emissions factors.	
<b>Purpose of data</b>	Baseline emissions	
<b>Additional comment</b>	NA	

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

>>

(i) Methane emissions from Manure Management:

Emission reduction from manure management using IPCC 2006, tier-I methodology was estimated to be 0.13 tCO<sub>2</sub>e per household while the overall avoided emissions were estimated to be 10612 tCO<sub>2</sub>e.

(ii) CO<sub>2</sub> emissions from Fuelwood and LPG combustion:

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The amount of firewood saved due to the project activity will be the baseline for calculating the emission reductions. This will be calculated using the following equation.

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

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/month

Value of  $B_{b,y}$  was estimated using the following the following information as given below.

Capacity (m <sup>3</sup> )	Average Fuelwood Consumption (kg/month)	Average LPG Consumption (kg/month)
6	331	77
8	462	7
12	617	96
16	304	11
20	673	12
30	25	13
40	1278	13

Therefore, the following values of  $B_{b,y}$  were derived.

Capacity (m <sup>3</sup> )	$B_{b,y}$ =Total Fuelwood Consumption (ton/year)				
	2019	2020	2021	2022	2023
6	1528	3323	8336	11909	17864
8	1679	4981	17177	36571	96968
12	1429	4590	16286	35532	96233
16	230	678	2188	4375	10938
20	800	3005	10500	22616	60578
30	7	0	0	0	0
40	905	2852	10735	24538	69012
<b>Total</b>	<b>6577</b>	<b>19429</b>	<b>65222</b>	<b>135541</b>	<b>351592</b>

Capacity (m <sup>3</sup> )	$B_{b,y}$ =Total LPG Consumption (ton/year)				
	2019	2020	2021	2022	2023
6	357	775	1945	2779	4168
8	26	78	270	574	1523
12	223	716	2540	5543	15012
16	8	25	79	158	396
20	14	54	189	407	1089
30	4	0	0	0	0
40	9	30	112	257	722
<b>Total</b>	<b>642</b>	<b>1678</b>	<b>5135</b>	<b>9717</b>	<b>22909</b>

The following parameters were used to estimate emission reduction due to the project activity.



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Parameter	Fuelwood	LPG	Unit
$f_{nrB}$	92%	100%	Fraction
$E_{f,b,fuel,CO_2}$	112	63.1	tCO <sub>2</sub> /TJ
$E_{f,b,fuel,non-CO_2}$	0	0	tCO <sub>2</sub> /TJ
$NCV_{b,fuel}$	0.015	0.047	TJ/ton

Accordingly, the following values of  $BE_{b,y}$  were estimated as follows:

Year	$BE_{b,y}$ (tCO <sub>2e</sub> )
2019	12,081
2020	35,037
2021	116,135
2022	238,494
2023	611,797
<b>Total</b>	<b>1,013,544</b>

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

Year	Baseline estimate	Project estimate	Net benefit
Year 1	12,223	0	12,223
Year 2	35,428	0	35,428
Year 3	117,395	0	117,395
Year 4	241,014	0	241,014
Year 5	618,097	0	618,097
<b>Total</b>	<b>1,024,157</b>	<b>0</b>	<b>1,024,157</b>
<b>Total number of crediting years</b>	<b>5</b>		
<b>Annual average over the crediting period</b>	204,831	<b>0</b>	204,831

## B.7. Monitoring plan

### B.7.1. Data and parameters to be monitored

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<b>Relevant SDG Indicator</b>	Climate Action (SDG 13)					
<b>Data / Parameter</b>	N <sub>(T)</sub>					
<b>Unit</b>	Number per household					
<b>Description</b>	Number of animals of livestock category T					
<b>Source of data</b>	Survey					
<b>Value(s) applied</b>	<table border="1"> <thead> <tr> <th>Livestock Category</th> <th>Number per household</th> </tr> </thead> <tbody> <tr> <td>Cattle</td> <td>6</td> </tr> </tbody> </table>		Livestock Category	Number per household	Cattle	6
Livestock Category	Number per household					
Cattle	6					
<b>Measurement methods and procedures</b>	Monitoring shall consist of estimation of the livestock or a representative sample thereof, at least once every year.					
<b>Monitoring frequency</b>	Annually					
<b>QA/QC procedures</b>	Annual survey to be conducted					
<b>Purpose of data</b>	Baseline Emissions estimation					
<b>Additional comment</b>	NA					

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<b>Relevant SDG Indicator</b>	Climate Action (SDG 13)		
<b>Data / Parameter</b>	$B_{b,y}$		
<b>Unit</b>	Tonnes/year		
<b>Description</b>	Quantity of fuel consumed in baseline scenario b during year y, in tons		
<b>Source of data</b>	Survey		
<b>Value(s) applied</b>	Capacity (m <sup>3</sup> )	Average Fuelwood Consumption (kg/month)	Average LPG Consumption (kg/month)
	6	331	77
	8	462	7
	12	617	96
	16	304	11
	20	673	12
	30	25	13
	40	1278	13
<b>Measurement methods and procedures</b>	A simple random sampling will be adopted for estimating the sample size for the monitoring surveys. Simple random sampling is suitable for homogenous populations.		
<b>Monitoring frequency</b>	Continuous		
<b>QA/QC procedures</b>	NA		
<b>Purpose of data</b>	Baseline Emissions estimations		
<b>Additional comment</b>	NA		

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<b>Relevant SDG Indicator</b>	Climate Action (SDG 13)
<b>Data / Parameter</b>	$N_{p,y}$
<b>Unit</b>	Number
<b>Description</b>	Cumulative number of project technology-days included in the project database for project scenario against baseline scenario b in year y
<b>Source of data</b>	Total sales record from the Project Database
<b>Value(s) applied</b>	84,226
<b>Measurement methods and procedures</b>	Monitoring consist of checking of representative sample, to ensure the biodidgester's operating
<b>Monitoring frequency</b>	Continuous
<b>QA/QC procedures</b>	$N_{p,y}$ shall be calculated from (a) the number of installed system (parameter $N_{o,p,y}$ ); and (b) the average operational days of the system ( $O_{p,y}$ ). The equation is therefore ( $N_{p,y} = N_{o,p,y} * (O_{p,y} / 365)$ ). The average operational days have been take as 365 and will be confirmed upon verification.
<b>Purpose of data</b>	Baseline Emissions estimations
<b>Additional comment</b>	NA

<b>Relevant SDG Indicator</b>	Climate Action (SDG 13)
<b>Data / Parameter</b>	$N_{Op,y}$
<b>Unit</b>	Number
<b>Description</b>	Cumulative number of project technologies included in the project database for project scenario p1 in year y
<b>Source of data</b>	Project Database
<b>Value(s) applied</b>	84,226
<b>Measurement methods and procedures</b>	Monitoring consist of checking of representative sample, to ensure that biodidgesters are operating
<b>Monitoring frequency</b>	Continous
<b>QA/QC procedures</b>	NA
<b>Purpose of data</b>	Baseline Emissions estimations
<b>Additional comment</b>	NA

<b>Relevant SDG Indicator</b>	SDG: Good health and well being (SDG 3)  Indicator: 3.9.1 - Mortality rate attributed to household and ambient air pollution
<b>Data / Parameter</b>	Improvement in health and illness
<b>Unit</b>	Qualitative
<b>Description</b>	Decrease in illness and improvement in health
<b>Source of data</b>	Sampling survey/annual usage survey/monitoring survey
<b>Value(s) applied</b>	100% users confirmed improvement in health
<b>Measurement methods and procedures</b>	Decrease in illness and improvement in health will be assessed through interview with end users due to project implementation. Publicly available results may be referred. In addition, training to the operationa and maintenance technicians and field supervisors to be provided to increase awareness in safe operation and handling emergency situations.
<b>Monitoring frequency</b>	Annual
<b>QA/QC procedures</b>	Sample number shall be determined using UNFCCC sample standard. Publicly available data may referred.
<b>Purpose of data</b>	Sustaible development assessment
<b>Additional comment</b>	NA

<b>Relevant SDG Indicator</b>	SDG: Affordable and clean energy (SDG 7) Indicator: 7.1.2: Proportion of population with primary reliance on clean fuels and technology
<b>Data / Parameter</b>	Access to affordable and clean energy services
<b>Unit</b>	Numbers
<b>Description</b>	Number of biogas system operational under the project activity
<b>Source of data</b>	Project Participant/Project proponent
<b>Value(s) applied</b>	84,226
<b>Measurement methods and procedures</b>	Sample survey to confirm if project biogas systems are operational. Operational status will confirm that the users are accessed to affordable and clean energy and proportion of users reliance on clean fuel and technology.
<b>Monitoring frequency</b>	Annual
<b>QA/QC procedures</b>	Required sample size shall be determined following UNFCCC sampling standard
<b>Purpose of data</b>	Sustaible development assessment
<b>Additional comment</b>	NA

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## **B.7.2. Monitoring plan**

>> The monitoring plan chalks out the relevant data to be monitored, collected, assessed and archived according to the methodology. Data from the monitoring procedures will be recorded in the electronic project database and summarised in an annual Monitoring Report. Data collection will be in accordance with "Sampling and surveys for CDM project activities and programme of activities (Version05)".

### **Objectives and reliability requirements**

The objective of the sampling effort is to meet the monitoring requirements set forth in the methodology 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption' (Version 3.1). An annual monitoring system will be set up for most parameters. However, for parameters which can be tracked on a biennial basis will be monitored once every two years.

### **Target population**

The monitoring procedure is targeted to be applied on the households, local communities and SMEs with installed Sistemabio's devices, as identified through the Project Database managed by Sistema.bio.

### **Sampling method**

A simple random sampling will be adopted for estimating the sample size for the monitoring surveys. Simple random sampling is suitable for homogenous populations.

### **Sample Size:**

In accordance with the requirements set forth in the methodology, a minimum sample size of 100 is required. To evaluate the drop-off rate of usage, which requires that digesters of different age groups are assessed, monitoring should be carried out on a random sample of digesters of different ages. The minimum total sample size is 100, with at least 30 samples for biogas digesters of each age bracket (measured in annual increments) being surveyed.

**Sampling frame:** All the households with biogas digester within the project will be the sampling frame.

### **Data to be monitored:**

The necessary data as stated in section B.7.1 above will be collected and monitored by the project proponent as required.

### **Quality Assurance/Quality Control:**

A survey questionnaire will be prepared to check the operating status (yes or no) of the biogas digesters within the project activity. The survey will be performed by the project developer appointing a third party. In order to remove the possibilities of low response rate and answer bias, 10% oversampling will be applied.

### **Analysis:**

The survey data will then be analysed by the project developer to derive at the working status of each biodigester and the consumption of firewood/LPG at the project site (if any). The analysis will form the basis of the monitoring report to be prepared by the developer.

### **Implementation:**

Preparation and pre-testing of the survey questionnaire will be done. Field personnel will be trained to conduct the surveys so as to ensure the quality of data collected is high. The schedule for implementing the sampling effort shall be defined prior to the field activity.

## **SECTION C. Duration and crediting period**

### **C.1. Duration of project**

#### **C.1.1. Start date of project**

>>

06/12/2018 is considered as start date of the project. The date represents first batch of biogas digesters installed within the project activity. PP has submitted initial documents for preliminary review on 06/12/2019. Therefore, as per clause 3.4.7 under principle and requirement one year prior to first submission date is taken as start date of the project activity.

#### **C.1.2. Expected operational lifetime of project**

>>

*15 years*

### **C.2. Crediting period of project**

#### **C.2.1. Start date of crediting period**

>> 06/12/2018

#### **C.2.2. Total length of crediting period**

>>

*5 years renewable*

## **SECTION D. Safeguarding principles assessment**

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

>>

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
<b>SOCIAL &amp; ECONOMIC SAFEGUARDING PRINCIPLES</b>			
<b>Principle 1 - Human Rights</b>			
a) Recognises the centrality of human rights to sustainable development, poverty alleviation and ensuring fair distribution of development opportunities and benefits; and supports “universal respect for, and observance of, human rights and fundamental freedoms for all”.	The project replaces conventional firewood usage with biogas for domestic cooking and heating purpose. Therefore, it provides development opportunity to all section of people proving cleaner fuel, better livelihood and empowering specially rural women. Hence, the project positively recognizes human rights to sustainable development.	No	Not Applicable
(b) Does not recognise or support Projects that contribute to violations of a state’s human rights obligations and the core international human rights treaties, and seeks to support the protection and fulfilment of human rights.	The project is in accordance with constitution of Kenya and is bound to follow the rules and ruglation of host country. Hence, the project does violate human rights obligations adopted by the host country.	No	Not Applicable
(c) Upholds the principles of accountability and the rule of law, participation and inclusion, and equality and non-discrimination, noting that prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority.	Article 21 outlines the “Implementation of rights and fundamental freedoms.”, Article 27 of the constitution hilighgths the “Equality and freedom from discrimination.”Therefore, the project being in Kenya upholds the principles of accountability and the rule of law, participation and inclusion, and equality and non-discrimination.	No	Not Applicable



Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
<p>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</p>	<p>The constitution of Kenya upholds the protection of Human rights thus, the project is bound to follow the rules and regulation of host country. In addition, Kenya has ratified 'International Convention on the Elimination of All Forms of Racial Discrimination :1969' 'International Covenant on Civil and Political Rights :1976', 'International Covenant on Economic, Social and Cultural Rights :1976', 'Convention on the Elimination of All Forms of Discrimination' against Women (1979). Kenya has also signed Protocol on the Rights of Women in Africa (2005). Therefore, the project developer and the project do respect nationally and internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind.</p>	<p>No</p>	<p>Not Applicable</p>
<p>The Project shall not discriminate with regards to participation and inclusion.</p>	<p>Kenya has ratified 'International Convention on the Elimination of All Forms of Racial Discrimination :1969', Convention on the Elimination of All Forms of Discrimination against Women (1979) in addition to Article 27 of its constitution. Therefore, the project will not discriminate with regards to participation and inclusion.</p>	<p>No</p>	<p>Not Applicable</p>

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
<b>Principle 2 - Gender Equality and Women's Rights</b>			
(i) Promotes gender equality and the empowerment of women.	Apart from being a member of the above mentioned conventions, Kenya has 'National Policy on Gender and Development' which aims to guarantee Kenyan men and women equality before the law, and to enable men and women to have equal access to economic and employment opportunities. The project positively contributes towards the vision of this policy which promotes gender equality and women empowerment.	No	Not Applicable
(ii) Does not recognise Projects that contribute to discrimination against women or reinforce gender-based discrimination and/or inequalities.	As explained above the project does not contribute to discrimination against women or reinforce gender-based discrimination and/or inequalities.	No	Not Applicable
(iii) Recognises and seeks to contribute to SDG 5, (Achieve gender equality and empower all women and girls).	Project compliance to SDG 5 is explained in section A.8 above.	No	Not Applicable
<b>Mandatory requirements:</b>			
<b>1. The Project shall complete the following gender assessment questions</b>			
Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?	No. The project uses cattle dung and waste as resource to generate biogas. Therefore, it does not put any risk to women's access or control of resources, entitlements and benefits.	No	Not Applicable
Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on	No, the project will be implemented in households where users depend firewood and conventional cooking stoves. The project replaces the conventional cooking practice with clean biogas based system. Hence, the project does not	No	Not Applicable

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Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
women or social isolation of men)?	affect any marginalized or vulnerable communities.		
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 actually takes care the upliftment of women and men who otherwise spent more time in sourcing firewood which in the project case not needed, This provides more time to the users. Also biogas being clean fuel, leads to low smoke generation resulting health benefits to end users.	No	Not Applicable
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)?	Yes, the project takes care the role of women in cooking. In presence of the project activity, women who generally who in most cases are responsible for cooking, spend less time in sourcing firewood. This time can be utilize for other productive work. Also due to clean nature of the fuel, smoke related health issues are reduced due to the project activity.	No	Not Applicable
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 takes care of the role of women in cooking. Due to the project women (generally the caretaker of cooking) spend less time in sourcing firewood and can utilize the saved time in other productive works. Also due to clean nature of the fuel, smoke related health issues are reduced due to the project activity.	No	Not Applicable
Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance,	No, the project does not have any scope which may result to discrimination against women. The project contributes positively to	No	Not Applicable

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
regarding their full participation in design and implementation or access to opportunities and benefits?	uplift women in its work culture.		
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?	No, the project helps in protecting NRB. Thus, it does not limit women's ability to use or protecting natural resources.	No	Not Applicable
Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?	No, the project replaces conventional cooking system with clean biogas. Biogas is safe to use and handle. Compared to firewood based cooking system the likelihood of fire hazard is negligible in the project scenario. It also provide someless cooking system. Hence, project does not lead to more hazardous conditions.	No	Not Applicable
<b>2. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women. Specifically, this shall include (not exhaustive):</b>			
Sexual harassment and/or any forms of violence against women - address the multiple risks of gender-based violence, including sexual exploitation or human trafficking	The project happens in individual households. It does not involve any women workforce which may lead to sexual harassment.		Not Applicable
Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.	No, The project happens in individual households. It does not involve any women workforce which may lead to sexual harassment.	No	Not Applicable
Restriction of women's rights or access to resources (natural or economic).	No, The project actually takes care the upliftment of women and men who otherwise spent more time in sourcing firewood which in the project case not needed,	No	Not Applicable

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
	This provides more time to the users. Also biogas being clean fuel, leads to low smoke generation resulting health benefits to end users.		
Recognise women's ownership rights regardless of marital status - adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources	Yes, The project does not have any scope which needs to recognise the women's ownership rights. The project replaces conventional firewood based cooking system with clean biogas. This helps women to have access to cleaner cooking technologies.	No	Not Applicable
<b>3. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work, specifically</b>			
Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities	Yes, the project involves construction of biogas digesters at households. Trained labours are used for the same. Local people are engaged for the same. No discrimination either in gender or any other form is followed to engage local people.	No	Not Applicable
Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status	This is not applicable. The project does not have any scope of men and women participation where project developer has to ensure condition of benefits related to pregnancy, maternity/paternity leave, or marital status .	No	Not Applicable
Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits	Not applicable. Project happens at individual households where household people operate the biogas system as per their requirements.	No	Not Applicable
4. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks	The project does not has any scope to apply gender strategy as such. Although the project positively contributes towards the National Policy on Gender and Development .	No	Not Applicable

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
<b>Principle 3 - Community Health, Safety and Working Conditions</b>			
(a) Requires Projects to anticipate and avoid adverse impacts on the health and safety of affected communities during the Project's life cycle from both routine and non-routine circumstances	The project leads to safe working condition and improvement in health as it will replace firewood as fuel with biogas which is clean and safe.	No	Not Applicable
b) Requires Projects to provide workers with safe and healthy working conditions and to prevent accidents, injuries, and disease.	The project leads to safe working condition and improvement in health as it will replace firwood as fuel with biogas which is clean and safe. Further, periodic maintenance by implementing agency ensure prevention of any unsafe working condition.	No	Not Applicable
<b>Principle 4 - Cultural Heritage, Indigenous Peoples, Displacement and Resettlement</b>			
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)?	The project area covers households which does not have any structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture. Hence, not applicable.	No	Not Applicable
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	The project area covers households which does not require relocation of peoples; hence not applicable.	No	Not Applicable
Does the Project require any change to land tenure arrangements and/or other rights?	No, the project does not require any change to land tenure arrangements and/or other rights?	No	Not Applicable
For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?	No, the project does not involve any land use which will have issues related to land tenure or access right.	No	Not Applicable

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
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 project involves household biogas digesters. Therefore, it does not involve any influence towards indigenous people.	No	Not Applicable
<b>Principle 5 – Corruption</b>			
The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	The project benefits households with clean fuel (biogas). There is no corruption provision in the project activity.	No	Not Applicable
<b>Principle 6 - Economic Impacts</b>			
Labour Rights: 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	The project does not require labour force for implementation of the project. Trained technicians are involved in construction and operation and maintenance of plants. Therefore, no forced labour is involved in the project. No child labour is involved.	No	Not Applicable
<b>ENVIRONMENTAL &amp; ECOLOGICAL SAFEGUARDING PRINCIPLES</b>			
<b>Principle 1 - Climate and Energy</b>			
Emissions: Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No, the project will replace firewood use with biogas. Hence, it will reduce greenhouse gas emissions over the Baseline Scenario.	No	Not Applicable

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
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 uses inhouse cattle dung and waste only.	No	Not Applicable
<b>Principle 2 – Water</b>			
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, Water in huge quantity is not required for the project which can impact the ground water level or any seasonal flow.	No	Not Applicable
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? If 'Yes' or 'Potentially' proceed to question 2.	No, Water in huge quantity is not required for the project which can impact the ground water level or any seasonal flow.	No	Not Applicable
<b>Principle 3 – Environment, ecology and land use</b>			
<b>Landscape Modification and Soil</b>			
Does the Project involve the use of land and soil for production of crops or other products?	No, the project does not involve any crop production.	No	Not Applicable
<b>Vulnerability to Natural Disaster</b>			
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, draught or other	No, the project activity takes place at individual households. There is no activity which can affect adversely the natural system to cause earthquake, landslides, erosion, flooding, draught or other extreme climatic conditions.	No	Not Applicable



Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
extreme climatic conditions?			
<b>Genetic Resources</b>			
Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	Not applicable. The project does not involve any crop production or cultivation.	No	Not Applicable
<b>Release of pollutants</b>			
Could the Project potentially result in the release of pollutants to the environment?	No, the project does not release any pollutants to the environment.	No	Not Applicable
<b>Hazardous and Non-hazardous Waste</b>			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	Not applicable. The project does not involve any production process.	No	Not Applicable
<b>Pesticides &amp; Fertilisers</b>			
Will the Project involve the application of pesticides and/or fertilisers?	Not applicable. The project does not involve any crop production or cultivation.	No	Not Applicable
<b>Harvesting of Forests</b>			
Will the Project involve the harvesting of forests?	Not applicable. The project happens at individual households.	No	Not Applicable
Food: Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	Not applicable	No	Not Applicable
Animal husbandry: Will the Project involve animal husbandry?	No	No	Not Applicable

Safeguarding principle	Description of relevance to the project	Assessment (Yes/Potentially/No)	Mitigation Measures
<b>High Conservation Value Areas and Critical Habitats</b>			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	Not Applicable	No	Not Applicable
Endangered Species: Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?	Not Applicable	No	Not Applicable

## SECTION E. Local stakeholder consultation

### E.1. Solicitation of comments from stakeholders

>>

Will include later

### E.2. Summary of comments received

>>

Will include later

### E.3. Report on consideration of comments received

>>

Will include later

## Appendix 1. Contact information of project participants

<b>Organization name</b>	Good Farmland Management Kenya, LTD
<b>Registration number with relevant authority</b>	
<b>Street/P.O. Box</b>	Off Lenana Road
<b>Building</b>	Kims Court along Theta lane,
<b>City</b>	Nairobi
<b>State/Region</b>	Nairobi
<b>Postcode</b>	
<b>Country</b>	Kenya
<b>Telephone</b>	+254 715 970 131
<b>Fax</b>	
<b>E-mail</b>	esther@sistemabiobolsa.com
<b>Website</b>	
<b>Contact person</b>	Esther Altorfer
<b>Title</b>	COO & Kenya Country Director
<b>Salutation</b>	
<b>Last name</b>	Altorfer
<b>Middle name</b>	
<b>First name</b>	Esther
<b>Department</b>	
<b>Mobile</b>	+33(7) 81 45 30 07
<b>Direct fax</b>	
<b>Direct tel.</b>	
<b>Personal e-mail</b>	

<b>Organization name</b>	Swiss Carbon Value Ltd.
<b>Registration number with relevant authority</b>	
<b>Street/P.O. Box</b>	Technoparkstrasse 1
<b>Building</b>	
<b>City</b>	Zurich
<b>State/Region</b>	Switzerland
<b>Postcode</b>	
<b>Country</b>	Switzerland
<b>Telephone</b>	
<b>Fax</b>	
<b>E-mail</b>	t.bagh@southpole.com
<b>Website</b>	www.southpole.com
<b>Contact person</b>	Tanushree Bagh
<b>Title</b>	Chief Financial Officer
<b>Salutation</b>	Mr.
<b>Last name</b>	Grobberl
<b>Middle name</b>	
<b>First name</b>	Christoph
<b>Department</b>	

<b>Mobile</b>	
<b>Direct fax</b>	
<b>Direct tel.</b>	
<b>Personal e-mail</b>	t.bagh@southpole.com

## Appendix 2. Summary of post registration design changes

Not Applicable

### Revision History

Version	Date	Remarks
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1	10 July 2017	Initial adoption

## Appendix 3. Sample Copy of agreement with the end users

GOOD FARMLAND MANAGEMENT KENYA LIMITED  
 Kim's Court, Thika Lane, Off Lamana Road  
 Nairobi, Kenya - P.O. Box 239 -00606

0101

**ADDRESS AND CONTACTS**  
 The Seller's address and contact details are indicated in the header of this contract. Contact details are as follows:  
 Email: [info@systems.bio](mailto:info@systems.bio)  
 Tel: +254 715 970 121

The Buyer's address and contact details are (PO BOX, landmark, village, town, sub-county and county):  
3370 Eldoret, Kipsamoo primary school, Kipsamoo  
village, Eldoret, Kericho, Uasin Gishu

Both parties must notify each other promptly of any changes to the above details.  
 Further, the Buyer may request for payment statuses from the Seller using the above contact details. The requests should be made within office hours, that is, 9am to 5pm.

**CREDIT REFERENCING**  
 The Buyer authorizes the Seller, during the period of this contract, to obtain information regarding his/her credit rating from any of the Credit Reference Bureau in Kenya and allows for the registration of this transaction within the same bureaus.

**CARBON CREDITS**  
 The Buyer agrees that he/she has the right to install the Sistema bio on the designated site. Once installed, the Buyer agrees to utilize the Sistema bio in accordance with all instructions and manuals. The Buyer will utilize or burn all of the biogas that is produced. The Buyer will add the indicated amount of fresh animal manure to the Sistema bio. The Buyer will utilize the resulting biofertilizer or otherwise provide the biofertilizer for use by others. The Buyer agrees that if he/she is not utilizing the Sistema bio, he/she may be requested to sell it back to the Seller so that it will return to use. As part of this agreement, the Buyer transfers all of his/her rights to carbon credits, or any other impacts (including health, social, economic or environment) resulting from the use of his/her Sistema bio unit to the Seller and will not attempt to transfer or sell carbon credits or any other impact to third parties. The Buyer agrees to cooperate with the Seller on any efforts to collect information of verify any data related to the verification and monitoring related to carbon credits and impacts.

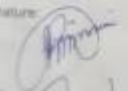

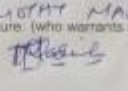
**RISK AND PREVENTION**  
 The Buyer acknowledges that staff of the Seller has communicated the risks associated with the production and handling of biogas and biofertilizer verbally and in writing, as well as the preventive measures derived from the risks of production and handling of biogas and biofertilizer, and as a consequence the Buyer releases all civil, labor and judicial liability to The Seller, their employees and legal representatives, of any accident derived from the production and handling of biogas and biofertilizer. The Buyer agrees to follow the preventive measures derived from the risks of production and handling of biogas and biofertilizer.

**DISPUTE RESOLUTION**  
 Any dispute arising out of or relating to this contract shall be resolved by a single Arbitrator appointed by agreement between the parties or in default of such agreement to be appointed, at the request of either party upon notification to the other Party, by the Chairperson for the time being of the Chartered Institute of Arbitrators (Kenyan Branch) in accordance with and subject to the provisions of the Arbitration Act, 1995 or any statutory modification or re-enactment thereof for the time being in force. The place of arbitration shall be Nairobi, Kenya and the language of the arbitration shall be English. Each party shall bear its own costs for the arbitration process; however, the cost of the arbitrator shall be borne equally by both parties. The award of the arbitrator shall be final and binding upon the parties and any party may apply to a court of competent jurisdiction in Kenya for enforcement of such award.

**MISCELLANEOUS**  
 No variation, suspension, deletion, amendment or modification of this contract shall be of any force or effect, unless recorded in writing and signed by the parties, and shall be effective only in the specific instance and for the purpose and to the extent set out. Each provision of this contract is severable from all the others and if finally determined by a court, regulatory authority or agreed forum of competent jurisdiction to be invalid, illegal or unenforceable, such provision shall (to the extent of invalidity, illegality or unenforceability) be deemed severed from this contract.

The validity, construction and performance of this contract shall be governed by the laws of the Republic of Kenya.

**IN WITNESS WHEREOF**, the parties have executed this contract on the dates set forth first above, with full knowledge of its content and significance and intending to be legally bound by the terms hereof.

<p><b>ACCEPTANCE BY BUYER</b>                  Name: <u>Alexander Brwamba</u>                  Signature:                   Date: <u>30/03/19</u></p>	<p><b>ACCEPTANCE BY GUARANTOR</b>                  Name: <u>Immaculate Opiyo</u>                  Signature:                   Date: <u>30-03-19</u></p>	<p><b>ACCEPTANCE BY SELLER</b>                  Name: <u>TIMOTHY MASINDE</u>                  Signature (who warrants authority to):                   Date: <u>30/03/19</u></p>
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