KEY PROJECT INFORMATION & VPA DESIGN DOCUMENT (VPA DD)

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VERSION **v. 2.3**

RELATED SUPPORT

- Programme of Activity requirements
- TEMPLATE GUIDE VPA Design Document

This document contains the following sections

Section A – Description of project

Section B - Application of approved Gold Standard Methodology (ies) and/or demonstration of SDG Contributions

Section C – Duration and crediting period

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Section E – Summary of Local stakeholder consultation

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Appendix 1 – Safeguarding Principles Assessment (mandatory)

Appendix 2- Contact information of VPA Implementer (mandatory)
Appendix 3 – LUF Additional Information (VPA specific)
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KEY PROJECT INFORMATION

Type of VPA	☒ Real case VPA ☐ Regular VPA
Scale of VPA	☐Microscale ☒Small scale ☐Large scale
Title of corresponding real case VPA (if applicable)	N/A
GS ID of real case VPA (if applicable)	N/A
GS ID of VPA	GS5801
Title of VPA	PoA GS2747: African Biogas Carbon Programme (ABC) - Kenya – VPA006
Time of First Submission Date	30/04/2015
Date of Design Certification	14/03/2019
Version number of the VPA-DD	1.6
Completion date of version	06/09/2024
Coordinating/managing entity	Africa Bioenergy Programs Ltd
VPA Implementer (s)	Kenya Biogas Program
Project Participants and any communities involved	N/A
Host Country (ies)	Kenya
GS ID and Title of applicable Design Certified VPA	GS5801
GS ID and Title of applicable Performance Certified VPA	N/A
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Other Requirements applied	N/A

Methodology (ies) applied and version number	Methodology for animal manure management and biogas use for thermal energy generation V1.1
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A
Project Cycle:	☐ Regular ☒ Retroactive

Table 1 – Estimated Sustainable Development Contributions[1]

SUSTAINABLE DEVELOPMENT GOALS TARGETED	SDG IMPACT (DEFINED IN B.6.)	ESTIMATED ANNUAL AVERAGE	UNITS OR PRODUCTS
13 Climate Action (mandatory)	Amount of GHGs emissions avoided or sequestered	57,870	tCO2e
1 No Poverty	Average household savings in expenditure on basic services such cooking	72,800	Ksh/year cumulative whole population
		448,160	USD/year cumulative whole population
2. Zero hunger	Number of farmers adopted practices promoted by the project	7,807	Number
	Area under sustainable agriculture	11,111	Hectare
3 Good Health and Wellbeing	Number of households that observed reduction in PM2.5 & carbon monoxide (CO) concentration reductions	7,258	Number

[1] VPA03_CPII ER SDG sheet SDG impact tool A99:D114

4. Quality education	Number of employees provided skill development training	346	Number
5. Gender equality	Average time saving associated with cooking time and fuel collection	5,362,034	Hours/year
7. Affordable and clean energy	Number of beneficiaries: Individuals and households	37,381	Number
	Number of households	7,807	Number
8. Decent work and economic growth	Total number of jobs	875	Number of jobs
9. Industry, innovation and infrastructure	Total number of companies supported for their integration into value chains and markets	459	Number of companies
12. Responsible consumption and production	Compost produced and used for sustainable and local agriculture	382,730	Ton/year
15. Life on land	Total non-renewable wood fuel saved	14,958	Ton/year

SECTION A. DESCRIPTION OF PROJECT

A.1. Purpose and general description of project

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The overall objective of the VPA is to contribute to the achievement of the Sustainable Development Goals (SDGs) through the dissemination of domestic biogas systems as a local, sustainable energy source, as well as the development of a commercially viable, market-oriented biogas sector. By encouraging the switch from traditional non-renewable biomass (NRB) fuels to renewable biogas the VPA is reducing greenhouse gas (GHG) emissions. Emission reductions are accounted for only from biogas used for cooking, although some customers use biogas also for lighting.

Around 4,434 domestic biogas systems are installed as per 30/03/2023 throughout Kenya with a usage rate of 82.40%[2]. Unit sizes included vary from 4 to 58 m^3 volume with an average size of 9.134 m^3.

The baseline scenario is using non-renewable biomass (NRB) and small quantities of fossil fuel for cooking and methane emissions from manure management systems. The project scenario is renewable biogas for cooking and avoiding methane emissions by capturing and utilizing biogas for cooking in a biodigester instead of NRB or fossil fuels.

The Kenya Biogas Program (KBP) was founded by the Africa Biogas Partnership Programme (ABPP), and is the entity with the responsibility of coordinating, facilitating, and monitoring sector functions and supporting the technical, financial and institutional architecture necessary for development of the domestic biogas sector in Kenya under this VPA. KBP is owned and implemented by Africa Bioenergy Programs Ltd (ABPL).

A.1.1. Eligibility of the VPA under approved PoA

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[2] VPA06 CPII SDG database sheet SDG13 and NP cell C4 and C6
[3] VPA06 CPII SDG database sheet plant types cells A15:B17

Table 2 Eligibility for VPA inclusion as per PoA requirements

NO.	ELIGIBILITY CRITERION	DESCRIPTION/ REQUIRED CONDITION	DESCRIPTION OF THE VPA IN RELATION TO THE CRITERIA, MEANS OF VERIFICATION AND SUPPORTING EVIDENCE FOR INCLUSION
(i)	The geographical boundary of the VPA including any time-induced boundary consistent with the geographical boundary set in the PoA	All biogas systems included in the VPA will demonstrate they fall within the geographical boundary of the PoA through: – Recording the address/location of the system in Salesforce or equivalent software – Warranty or household sales agreement	Project database with address and location is provided. – Warranty or household sales contract of the first digester with plant code KE-KWA-1512-13913 is provided
(ii)	Conditions to avoid double counting of GHG emission reductions or net anthropogenic GHG removals, such as unique identifications of product and end-user locations	Double counting is avoided by unique biodigester identification and as per methodology procedure indicator BGTA 1 and 2	Project database with unique codes is provided. – Other responses are captured in parameter BGTA 1 and 2 in Section B.6.2
(iii)	Conditions to confirm that V/CPAs are neither registered as project activities with other offset Schemes, included in other registered PoAs, nor the project activities that have been deregistered;	The required condition is that the biodigester is only registered under this project	captured in parameter BGTA 2 in Section B.6.2
(iv)	Specification of the technology/measure such as the level and type of service, as well as performance specification based on, inter alia, testing/certification;	Demonstration that the plant is installed according to specifications by conducting a commission check	Only plants that are commissioned are included, the evidence is the database with the data of commissioning
(v)	Conditions to check the start dates of VPA through documentary evidence	The start date is defined as the first digester commissioned in a VPA	Warranty certificate or sales contract of the first plant installed with plant

			code KE-KWA-1512-13913 is provided
(vi)	Conditions to ensure compliance with the applicability of the applied methodologies, the applied standardised baselines and the other applied methodological regulatory document	The VPA shall provide a discussion on the applicability of the applied methodology	Description as per VPA-DD section B.2
(vii)	Conditions to ensure that VPA meet the requirements for demonstration of additionality	As per CDM tool 21 Demonstration of additionality of small-scale project activities. Version 13.1	Additionality is demonstrated in VPA-DD section B.5
(viii)	Conditions to ensure no diversion of official development assistance;	VPAs will demonstrate that any Official Development Assistance received for the VPA has not occurred on the condition that the resulting credits are transferred to the donor country	A signed ODA no diversion letter is uploaded to the registry
(ix)	Target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/offgrid)	The VPA will demonstrate which target group(s) is/are to be targeted by the VPA and the distribution mechanism.	As per table 4 in this VPA-DD, the VPA disseminates a technology developed for small farmers with sufficient manure available for feeding. Farmers typically live in rural areas.
(x)	Conditions related to sampling requirements for the PoA	The conditions as stipulated in the applied methodologies	Section B.7.2 of this VPA-DD contains the conditions related to sampling aligned with the applied methodology
(xi)	Conditions to ensure that VPAs that will be included meet the small-scale thresholds and remain within those thresholds throughout the crediting period	The VPA Implementer will ensure that each VPA remains below the small-scale limits. For activities falling under Type I, each VPA in aggregate will remain below 15 MW (45MWth) per year. For activities falling under Type III, each VPA will achieve	See section A.4 in this VPA-DD for this demonstration

		below 60,000 tCO_{2e} in emission reductions annually.	
(xii)	Conditions to confirm that technologies in V/CPAs are eligible	Demonstration that only biodigesters are included up to 100 m^3	The ER spreadsheet contains the project database with the size of each plant installed. None of the digesters included are over 100 m^3
(xiii)	Conditions to be met by each VPA regarding SDG outcomes assessment	From 13 March 2022, the SDG Impact Tools are a mandatory part of the project development cycle. This tool has been adopted	SDG impact tool is used to identify SDGs as per GS requirements

A.1.2. Legal ownership of products generated by the VPA and legal rights to alter use of resources required to service the project

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Relevant point	**Justification**
i. *full and uncontested legal ownership of all Products that are generated under Gold Standard Certification*	All household sign a warranty certificate which also serves as a sales agreement includes a clause on waiving on carbon rights to KBP.
ii. legal rights concerning changes in use of resources required to service the Project (e.g water rights)	N/A there is no change in the use of resources
iii. full and uncontested legal land title/tenure required to implement the Project (e.g. A/R projects, see LUF Activity Requirements)	N/A there is no change in land tenure required to implement the project

A.2. Location of VPA

>>The host party of this VPA is Kenya. The co-ordinates of Kenya are represented approximately by 1 00 N, 38 00 E-[4].The VPA disseminates biogas over the entire territory of Kenya.

The VPA implementer is the Kenya Biogas Programme. The physical location of their office is: Along Lenana Road, ACS Plaza, Nairobi, P.O. Box 79875-00202 Nairobi Kenya. GPS Co-ordinates: S 1◦17’19’’ S, E 36◦47’0.999’’.

A.3. Technologies and/or measures

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Installed technology

The technology implemented under the VPA06 covers biodigesters fed with a mixture of water and animal manure that is anaerobically digested. The generated biogas is intended for use as fuel for cooking.

- [4] Available from https://www.cia.gov/the-world-factbook/countries/kenya/

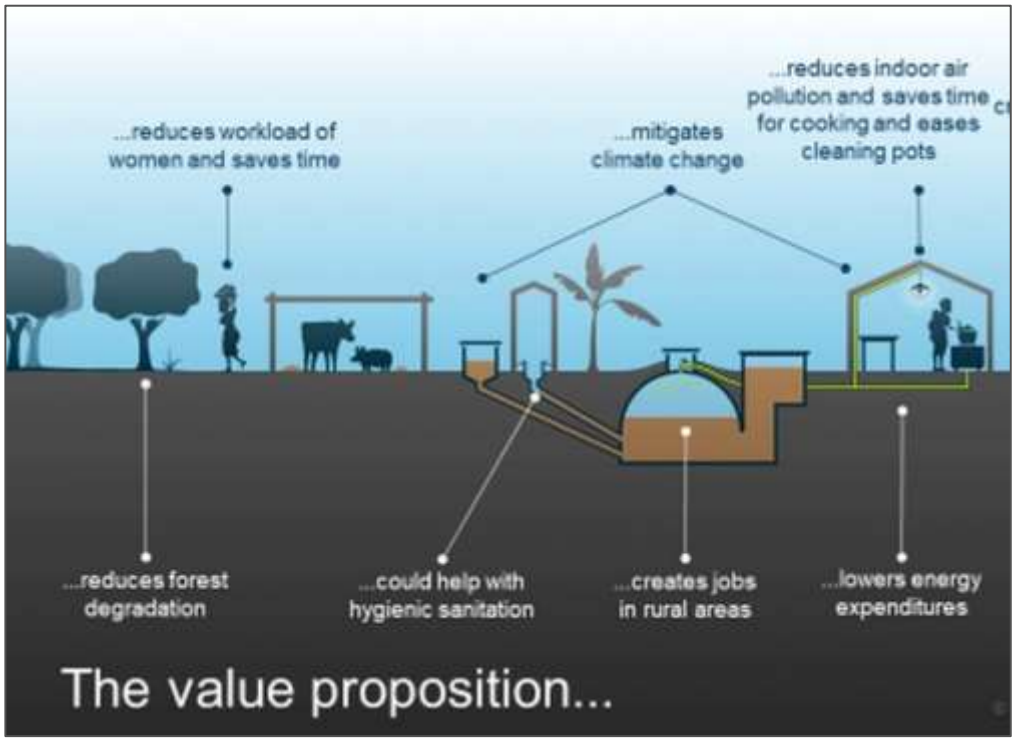
List of equipment to be installed.

The biogas system is made up of several interconnected parts. The specific role of each component is summarized below:

1. **Inlet** – The main purpose of the inlet is to mix organic material and water into a semi solid state. This mixture is fed into the digester via an inlet pipe.
2. **Digester** – The digester holds the mixture of manure and water, creating a conducive environment for anaerobic digestion where microorganisms produce biogas. The digester is cylindrical in shape and is usually made of brick masonry with a concave concrete cover, or dome. Typically, the digester is built underground with only the plumbing, inlet and outlets visible.
3. **Dome** - The purpose of the dome is to collect the gas produced in the digester. This is typically plastered in several layers and painted with a special paint in order to minimize gas leakage. Gas accumulates under the dome creating pressure and pushing down the level of the slurry and increasing the slurry level in the connected slurry tank. It is the difference in slurry levels between the slurry tank and the inside of the dome that maintains the pressure to push the gas into the outlet pipe.
4. **Outlet** - The outlet valve releases the collected gas under the dome to biogas appliances such as stoves or lamps.
5. **Slurry Tank** - The slurry tank holds the slurry that the gas pressure from under the dome displaces. This slurry overflows into a composting tank as more manure is fed into the digester. This slurry can then be used as a fertilizer.

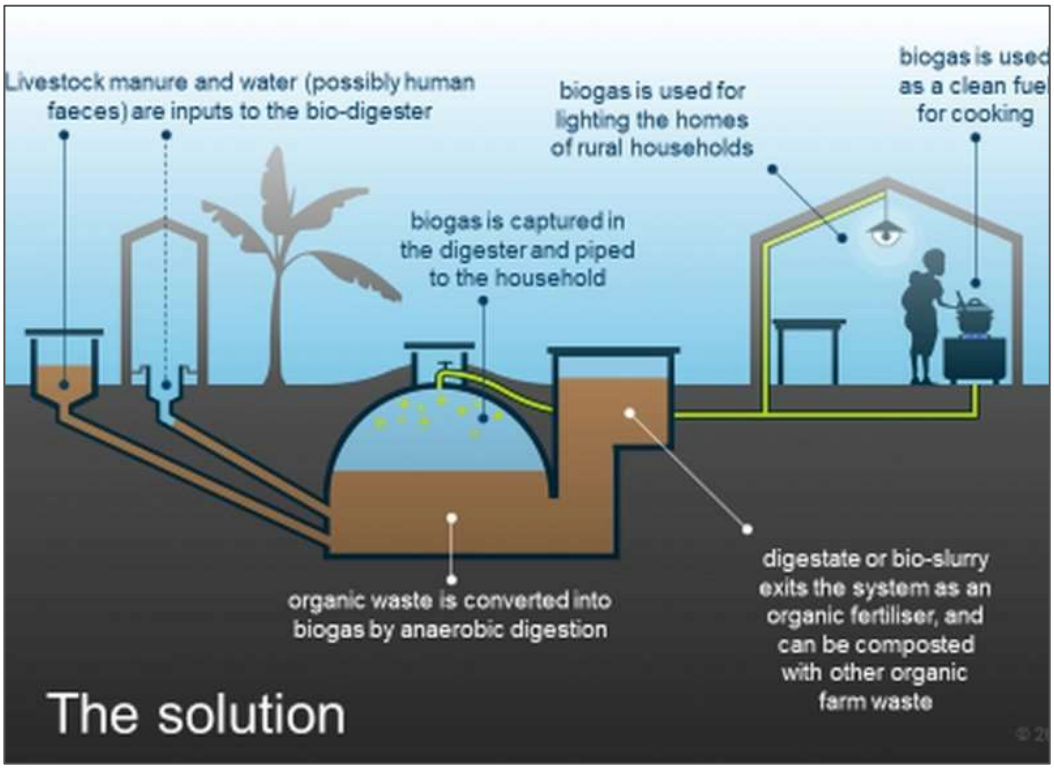
ii. The types and levels of services

Biodigesters will provide gas for cooking and bio-slurry for agricultural application. The type of services it provides, for the family, human health, the planet, economy, etc, is summarized in the figure below.



iii. The arrangement of facilities systems and equipment

Biodigesters are typically installed at the backyard of households, but depending on the space availability, could also be installed next, in front or even under the house/stable. The arrangement of the various elements and their functions is shown in the figure below:



iv. The age and average lifetime of the equipment based on the manufacturer's specifications and industry standards

The expected technical lifespan of a good quality fixed dome digester is over 21 years. This is as per specifications of the program, which developed the technology along with the SNV development Organisation. The model however is based on older Indian and Chinese digester models, namely, the Deenbandhu and the Chinese dome digester, which have a lifespan of 25 to 35 years[5].

Models with a proven track record, and their lifespan, included in this VPA are:

Type	Model	Lifespan
Fixed dome	MKD/ modified Camartec digester	The average lifespan of a well-constructed fixed dome digester is estimated to be at least 25 years but can easily reach more 35 years when
	KENBIM	

[5] https://www.mdpi.com/1996-1073/5/8/2911

	AKUT	quality materials are used during construction and O&M practices observed in its operation.
	Camartec and the modified camartec design	
Plastic digester types	Flexi biodigesters	An average of 7-10 years, with a potential of max. of 15 years with good care and protection from UV with the greenhouse
	Home Biogas	7-10 yrs, with a potential of 30 years with better care from UV and against rodents
	Kentainer	
	Takamoto	An average of 7-10 years, with a potential of 15 years

Next to this a few other types are installed but in very small quantities[6]

V. The installed capacities, load factors and efficiencies

The technical specifications of the most commonly installed digesters are:

Table 3: Technical specifications of the 5 most common installed digester sizes

Volume (m3)	Max daily feeding in litres (manure+ water)	Max daily gas production (m^3)	Digester volume (m^3)	Effective gas storage (m^3)	V buffer (m^3)	Total biodigester volume (m^3)
4	30+30	1.05	2.36	0.69	0.49	3.53
6	50+50	1.75	3.74	0.90	0.60	5.24
8	70+70	2.45	5.30	1.35	0.85	7.50
10	100+100	3.50	7.27	1.94	1.17	10.37
12	120+120	4.20	9.44	2.37	1.43	13.24

[6] The complete list of technologies installed, see VPA6 database sheet digester types

Other digester sizes are built in much smaller quantities. Their performance will be proportional to the 10 m^3 digester. Thus the 70 m^3 digester for example, can be fed 700 kg manure daily (7*100), will produce 24,500 ltr (7*3,500) gas per day. The same applies to all other values.

Thermal capacity is 4.09 KW_{th} per unit on average, with that the maximum VPA size is around number 11,004 units in operation[7]. At the end of this CP 15,474 units are expected to be built out of which 10546 in operation[8]. It is therefore expected that all units built in this CP can be included in this VPA.

vi. provide ranges in cases there is variation in equipment features.

The next table provides an overview of the number of units installed by digester model.

Table 4: Number of units installed by digester design and included in the VPA[9]

Biodigester type	Number installed
AKUT	122
BlueFlame BioSlurriGaz	58
FLEXI	340
Home Biogas	66
KENBIM	1748
MKD	1891
Modified Camartec Digester	41
Topflame	168
Grand Total	**4434**

The implementation schedule is:

[7] VPA06_CPII ER SDG sheet thermal capacity cell C6 and C12
[8] VPA06_CPII ER SDG sheet SDG13 and Np cell E15 and G15
[9] VPA06 CPII_ER SDG sheet plant types cell A3:B12.

Table 5: Implementation schedule[10]

date from	date to	Cumulative number installed
15/03/2024	15/03/2025	5,754
16/03/2025	15/03/2026	6,834
16/03/2026	15/03/2027	8,274
16/03/2027	14/03/2028	10,074
15/03/2028	15/03/2029	12,234
16/03/2029	15/03/2030	14,034
16/03/2030	15/03/2031	15,474

The temporal boundary with VPA01 in this PoA is 23/10/2015. All units with an installation date up to 23/10/2015 belong to VPA01 and those after belong to this VPA.

A.4. Scale of the VPA

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This project is a small-scale project and has the following thresholds:

- Type I: the cumulative maximum output capacity of this VPA is 45 MW_{th}
  Type III: The GHG emission reductions from methane avoidance from shall not exceed 60,000-ton CO_2/year

As per GS optional requirement 'GHG emissions reductions & sequestration product requirements' v2.1'

A.5. Funding sources of VPA

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DGIS (Directorate General Internationale Samenwerking) of the Dutch Government through RVO (Netherlands Enterprise agency) is currently funding the project-Africa Biodigester Component (ABC) in Kenya and Uganda. This project started in 2022 as a

[10] VPA06_CPII ER SDG sheet SD13 and Np cell E9:15

build-up of ABPP (Africa biogas Partnership Program) (through which public funding was provided until 2019).

Financing provided in connection with the PoA or its VPAs has come from or will come from ODA that has not been or will not be provided under the condition, whether express of implied, that any or all of the carbon credits issued as a result of the project's operation will be transferred directly or indirectly to the country of origin of the ODA. An ODA declaration is signed and uploaded to the registry[11].

[11] See file ODA-Declaration-Form VPA06

SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

B.1. Reference of approved methodology (ies)

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Methodology for animal manure management and biogas use for thermal energy generation V1.1. URL: https://globalgoals.goldstandard.org/433-ee-ics-methodology-for-animal-waste-managment-and-biogas-application/

The methodology refers to the following tools:

- CDM tool 30: Calculation of the fraction of non-renewable biomass. Version 4.0
- CDM tool 33: Default values for common parameters. Version 2.0

B.2. Applicability of methodology (ies)

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Reference	Condition	Applicability
2.2.1	This methodology applies only to the fraction of the manure[12] which would decay anaerobically in the absence of the project activity, which is established by a survey	The ER calculations are based on fraction of manure that would decay anaerobically in absence of the project activity and this is captured in the parameter BGTA 12 and BGTA 8
2.2.2	The methodology offers two methods for baseline emission quantification from AWMS a. AWMS method 1 - IPCC Tier 1 approach, b. AWMS method 2 - IPCC Tier 2 approach,	This VPA will apply Tier 1 for household farms

[12] Co-digestion of manure with other organic waste streams such as agricultural residue, kitchen food waste, fresh septic tank sludge etc. is permitted.

2.2.3	The methodology is applicable under the following conditions when applying AWMS method 1: a. The category is limited to measures at individual households, small farms (e.g., installation of a domestic biogas digester) or livestock farms or institutional settings. b. The activity shall ensure that: i. The digestate must be handled aerobically. In soil application of the final digestate, proper conditions and procedures (resulting in negligible methane emissions) must be ensured. ii. The biogas captured from the biodigesters is utilised (e.g., combusted or burnt for thermal applications).	a) biodigester are installed at individual households, small farms (e.g., installation of a domestic biogas digester) or livestock farms or institutional settings b) The activity ensures that: i. Digestate is a potent organic fertilizer and used by the vast majority of the households as fertilizer. Households are encouraged to compost the digestate in case storage is necessary. Both systems are aerobic. ii. All biodigesters sold include a biogas stove to ensure effective and efficient use of gas for cooking
2.24	The methodology is applicable under the following conditions when applying AWMS method 2 a. The livestock population in the farm is managed fully or partly under confined conditions; b. Manure or the streams obtained after treatment are not discharged into natural water resources (e.g., river or estuaries); c. The annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C; d. In the baseline scenario, the retention time of manure waste in the anaerobic treatment system is greater than one month, and if anaerobic lagoons are used in the baseline, their depths are at least 1 m; e. The baseline scenario should not involve methane recovery and	Not applicable as this VPA applies Tier 1 for household scale digesters.

	destruction by flaring or combustion for gainful use. f. The storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. If the project developer can demonstrate that the dry matter content of the manure when removed from the animal barns is larger than 20%, this time constraint will not apply. g. A technical measure to ensure that the gas holding capacity of the biodigester is sufficiently large to capture the biogas during periods of non-usage. A justification to demonstrate compliance with this requirement pertaining to the biogas digester size shall be included in the Project Design Documentation (PDD).	
2.2.5	The activity is implemented by a project developer and can include additional project participants listed in Appendix 2 of the PDD template. The individual households may be represented collectively by community organisations, etc., but do not individually act as project participants	The VPA is implemented by KBP, the project developer. There are no additional participants
2.2.6	The developer must design incentive mechanism(s)[13], which should be effective as fast as possible, for the displacing the use of inefficient baseline stoves or cooking practices	The VPA implementer has set up an elaborative system to ensure that biodigesters are used including encouragement to biogas and bio-slurry. This includes: - Households trainings on biogas and bio-slurry use

[13] Incentive mechanism could be of any form which motivates user for adoption of biogas use as early as possible. For example, not limited to, frequent education campaigns, awareness raising programme, operation and maintenance services at discounted cost.

	by the project cooking devices for daily usage and describe the incentive mechanism(s) in the PDD/VPA-DD at the time of validation	-Warranty of 1 year for technical issues (if identified, these are repaid at cost) - 100% of newly constructed plants are called by the client support center to ensure biodigesters are installed properly - Mandatory after sales physical visits by biodigester construction company to rectify potential issues and ensure proper use of biogas and bio-slurry - Grievance mechanism has been set-up for households to report issues.
2.2.7	To avoid double counting or double claiming, the project developer must: a. clearly communicate its ownership rights and intention of claiming the emission reductions resulting from the project activity to the following parties by contract or clear written assertions in the transaction paperwork: all other project participants; project technology manufacturers; and retailers of the project technology; and b. inform and notify the end users that they cannot claim emission reductions from the project, and c. exclude from the project activity, any biodigester and cookstoves that are included in any other voluntary market or CDM or Article 6 based mechanisms project activity/PoA and strive not to displace the cooking devices of another CDM or voluntary project/PoA. See data and parameters not monitored (section 3.11), Avoidance of double counting or double claiming with other mitigation actions (BGTA 2), for details on this demonstration.	a. Captured in parameter BGTA1 b. End users of a biodigester are informed and notified that they cannot claim emission reductions. This is a standard clause in the warranty certificate. The certificates are retained at the household and digital copies are available in the data management system used called Salesforce. c. Captured in parameter BGTA 2

B.3. VPA boundary

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Source		GHG	Included ?	Justification/Explanation
Baseline scenario	Animal Waste Management System	CO_2	No	CO_2 emissions from the decomposition of organic waste are not included.
		CH_4	Yes	Major source of emissions.
		N_2O	No	Excluded as because Tier 1 is applied
	Delivery of thermal energy	CO_2	Yes	Important source of emissions.
		CH_4	Yes	Important source of emissions, unless justified negligible.
		N_2O	Yes	Can be significant for some fuels, unless justified negligible.
	Production of fuel, transport of fuel	CO_2	no	Excluded as because Tier 1 is applied and production of fuel and transport of fuel does not take place
		CH_4	no	Excluded as because Tier 1 is applied and production of fuel and transport of fuel does not take place
		N_2O	No	Excluded as because Tier 1 is applied and production of fuel and transport of fuel does not take place
Project scenario	Animal waste management system	CO_2	No	CO_2 emissions from the decomposition of organic waste are not included.
		CH_4	Yes	Emissions from physical leakage, as well as emissions from the animal waste not treated in the bio-digester.
		N_2O	No	Excluded as a biodigester does not produce N_2O gasses.
	Delivery of thermal energy	CO_2	Yes	Important source of emissions.
		CH_4	Yes	Important source of emissions.
		N_2O	Yes	Can be significant for some fuels.
	Production of fuel, transport of fuel	CO_2	no	Excluded as production of fuel and transport does not take place and the VPA applies Tier 1 approach
		CH_4	no	Excluded as production of fuel and transport does not take place and the VPA applies Tier 1 approach
		N_2O	NO	Excluded as production of fuel and transport does not take place and the VPA applies Tier 1 approach

B.4. Establishment and description of baseline scenario

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Animal waste management: The baseline scenario is the situation where, in the absence of the project activity, animal manure is left to decay anaerobically within the project boundary and methane is emitted to the atmosphere.

Thermal application: The baseline is the fuel consumption of the thermal application used or that would have been used in the absence of the project activity times an emission factor for the fossil fuel and non-renewable biomass displaced.

The baseline scenario of both pathways has been defined with a baseline survey amongst a representative sample of the population which have the technical potential to install a biodigester, see B7.2. for details of the survey design

The results, the list of facilities, systems and equipment is captured in BGTA 6. A succinct summary of the key findings are:

- The baseline technologies serve 4.95 people for cooking
- Most people prepare breakfast, dinner and lunch, but only 65% boil water with the baseline technology.
- Wood is the predominant cooking fuel
- Three stone stove is the most used stove.
- Most wood is collected.
- Poultry followed by dairy cows are the most common animals held.

The KPT was executed in July-August 2023

The baseline survey was executed in the period 28/11/2021 to 02/12/2021

See section B7.2 for details of the survey design

B.5. Demonstration of additionality

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As per Principles and Requirements section 5.1.47 it is not required to re-assess the demonstration of additionality. Additionality was demonstrated during the initial project design validation/registration for CPI and further demonstration of additionality is not required during project design renewal.

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B.5.1. Prior Consideration

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Prior consideration was demonstrated in the first crediting period, see VPA06-DD of CPI section D.5 item 15.

B.5.2. Ongoing Financial Need

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N/A as per GS template guide VPA design document, ongoing financial has to be demonstrated by projects that are required to demonstrate financial additionality. This project did not have to demonstrate financial additionality during the initial project design validation/registration for CPI.

B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the three SDGs

Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact
		Indicator (Selected in SDG tool)
13 Climate Action (mandatory)	13.2 Integrate climate change measures into national policies, strategies and planning	Amount of GHGs emissions avoided or sequestered
1 No Poverty	1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	Average household savings in expenditure on basic services such cooking
2. Zero hunger	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that	Number of farmers adopted practices promoted by the project
		Area under sustainable agriculture

	progressively improve land and soil quality	
3 Good Health and Wellbeing	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	Number of households that observed reduction in PM2.5 & carbon monoxide (CO) concentration reductions
4. Quality education	4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	Number of employees provided skill development training
5. Gender equality	5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate	Average time saving associated with cooking time and fuel collection
7. Affordable and clean energy	7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	Number of beneficiaries: Individuals and households
8. Decent work and economic growth	8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	Total number of jobs
9. Industry, innovation and infrastructure	9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	Total number of companies supported for their integration into value chains and markets

12. Responsible consumption and production	12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	Bio-slurry produced and used for sustainable agriculture
15. Life on land	15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	Total non-renewable wood fuel saved

B.6.1. Explanation of methodological choices/approaches for estimating the SDG Impact

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SDG 13

This is achieved through the roll-out of a national programme that promotes the generation of GHG emission reductions due to the displacement of fossil fuels and non-renewable biomass and improved manure management practices. The parameter monitored are verified emission reductions (VERs).

GHG emission reductions are calculated as the difference between the baseline emissions and the project emissions. This project includes two sources of emission reduction:

1. Avoidance of methane emissions from AWMS.
2. Displacement of non-renewable biomass and fossil fuels

a. Baseline emissions AWMS

The applied methodology offers two methods for baseline emission quantification from AWMS:

a) AWMS method 1 - IPCC Tier 1 approach,

b) AWMS method 2 - IPCC Tier 2 approach,

In this VPA IPCC Tier 1 approach is applied as the target is household farms.

AWMS method 1 requires livestock population data by animal species/category, climate region or temperature and data on baseline animal manure management practice in the

project boundary. Baseline emissions for the production system (low productivity systems) are determined as follows:

$$BE_{AWMS,y} = N_{b,p,y} \div 365 \times GWP_{CH4} \times UF_b \times U_{p,y} \times \sum_{j,LT} (N_{LT,y} \times VS_{LT,y} \times MS\%_{Bl,j} \times EF_{LT,y}) \div 1000 \quad \textit{Eq. 1}$$

Where:

$BE_{AWMS,y}$	=	Baseline emissions in year *y* (t CO_2e)
$N_{b,p,y}$	=	Number of project technology-days included in the project database for each project scenario in year y
GWP_{CH4}	=	Global Warming Potential (GWP) of CH_4 applicable to the crediting period
UF_b		Model correction factor to account for model uncertainties (0.89)
$U_{p,y}$	=	Usage rate for technologies in project scenario p in year y (fraction).
LT	=	Index for all types of livestock
j	=	Index for animal waste management system
$N_{LT,y}$	=	Annual average number of animals of type *LT* in year *y* (numbers)
$VS_{LT,y}$	=	Volatile solids production/excretion per animal of livestock *LT* in year *y* (on a dry matter weight basis, kg-dm/animal/year)
$MS\%_{Bl,j}$	=	Fraction of animal manure handled in baseline animal manure management system *j*. (%). The project developer may apply the default IPCC values or conduct surveys to assess the animal manure management practices in the baseline.
$EF_{LT,y}$	=	Emission factor for direct CH_4 emissions by livestock *LT*, in manure management system j.

Survey methods are used to determine $MS\%_{bl,j}$ and the annual average animal population ($N_{LT,y}$) in this VPA. The annual average number of animals ($N_{LT,y}$) is determined as follows:

$$N_{LT,y} = N_{da,y} \times \left(\frac{N_{p,y}}{365}\right) \quad \textit{Eq. 2}$$

Where:

$N_{da,y}$	=	Number of days animal is alive in the farm in the year *y* (numbers)
$N_{p,y}$	=	Number of animals produced annually of type *LT* for the year *y* (numbers)

Volatile solids (*VS)* are the organic material in livestock manure and consist of both biodegradable and non-biodegradable fractions. The parameter $VS_{LT,y}$ shall be calculated as per the equation below:

$$VS_{LT,y} = (VS_{rate,LT} \times \frac{TAM_{LT}}{1000}) \times nd_y \quad \text{Eq. 3}$$

Where:

$VS_{LT,y}$	=	Annual volatile solid excretions for livestock *LT* entering all animal waste management systems on a dry matter weight basis (kg-dm/animal/yr)
$VS_{rate,LT}$	=	VS excretion rate (kg VS / (1000 kg animal mass) / day)
TAM_{LT}	=	Typical animal mass for livestock LT (kg/animal).
nd_y	=	Number of days that the animal manure management system was operational in year *y*

As per applied methodology paragraph 3.4.1, only the fraction of manure that would decay anaerobically in the baseline in absence of the project is considered for the baseline calculation. Thus, total VS_{rate} is multiplied with the fraction (parameter BGTA 31):

$MS\%_{i,y}$	=	Fraction of manure handled in project animal manure management system i

to obtain the fraction of manure that would decay anaerobically in the baseline in absence of the project.

b. Thermal application method 1: Based on avoided quantity of fuel consumption

The baseline emission from thermal application in year y shall be calculated as per the methods outlined below. Note that the methods below are only applicable where each unit (e.g., cook stove, heater) have a rated capacity equal to or less than 150 kW thermal[14].

[14] Projects that include thermal generation units with rated capacity greater than 150 kW or electricity generation component shall apply other applicable GS or CDM methodologies for energy generation and applications component.

$$BE_{TA,y} = \sum_{b,p} (N_{b,p,y} \times U_{p,y} \times (f_{NRB,i,y} \times SE_{b,y,CO2} + SE_{b,y,non-CO2})) \quad \textit{Eq. 4}$$

Where:

$BE_{TA,y}$ = Baseline emissions for total project activity in year y (tCO_2e/yr)

$\sum_{b,p}$ = Sum over all relevant baseline b/project p pairs

$N_{b,p,y}$ = Number of project technology-days included in the project database for each project scenario in year y. The start date is the day a plant start producing biogas. A default of 2 weeks will be used for the period from installation date and start date.

$U_{p,y}$ = Usage rate for technologies in project scenario p in year y (fraction)

$SE_{b,y,CO2}$ = Specific CO_2 emissions for a baseline b technology in year y (tCO_2/technology*day)

$SE_{b,y,non-CO2}$ = Specific non-CO_2 emissions for a baseline b technology in year y (tCO_2e/technology*day)

$f_{NRB,i,y}$ = Fraction of biomass used in year y for baseline scenario b that can be established as non-renewable biomass (fraction). The parameter $f_{NRB,b,y}$ is excluded from this equation when the observed baseline fuel is fossil fuel.

Specific emission CO_2 & non-CO_2 are determined by using one of the following options below, for each[15] baseline scenario b /project scenario p pair separately.

$$SE_{b,y,Co2} = \sum_{i} P_{b,i,y} \times NCV_{b,i,fuel} \times EF_{b,i,CO2} \quad \textit{Eq. 5}$$

[15] In the baseline situation, there might be different types of fuel, stove technologies which must be identified as different baseline scenarios. Stacking fuel could be a baseline scenario, but it would be distinguished to the single fuel baseline situation.

$$SE_{b,y,non-Co2} = \sum_{i} P_{b,i,y} \times NCV_{b,fuel} \times EF_{b,i,non-CO2} \quad \text{Eq. 6}$$

Where:

i	=	Index for the type of baseline/fossil fuel consumed
$P_{b,i,y}$	=	Average yearly consumption of baseline fuel *i* per household before the start of the project activity or at the renewal of each crediting period, whichever is later (tonnes/household/day)
$NCV_{b,i}$	=	Net calorific value of the fuel(s) *i* that is substituted in baseline b (TJ/tonne)
$EF_{b,i,CO2}$	=	CO_2 emission factor arising from use of fuels *i* in baseline scenario (tCO_2/TJ)
$EF_{b,i,non-CO2}$	=	Non-CO2 emission factor arising from use of fuels in baseline scenario (tCO_{2e}/TJ)

$P_{b,i,y}$ will be determined via KPT survey

The fNRB is calculated as per CDM Tool 30 v.4.0 guidance using the following calculations. Section B.6.2 presents the outcome and references the data used.

NRB Assessment

The calculations are aligned to the CDM Methodological tool Calculation of the fraction of non-renewable biomass Version 04.0.
Source: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v4.0.pdf

f_{NRB} : fraction of non-renewable biomass

fNRB = NRB/(NRB+RB)

Where:	NRB	Quantity of non-renewable biomass consumed in the applicable area in the relevant period (tonnes)
	RB	Quantity of renewable biomass that is available on a sustainable basis in the applicable area in the relevant period (tonnes)

NRB=H-RB

Where	H	Total consumption of woody biomass in the applicable area in the relevant period (tonnes)
	RB	Quantity of renewable biomass that is available on a sustainable basis in the applicable area in the relevant period (tonnes)

$$H = HW \times N + CE + NE$$

	HW	Average consumption of wood fuel per household, including fuelwood and charcoal, in the applicable area in the relevant period (tonnes/household)
	CE	Commercial woody biomass consumption for energy applications (e.g. commercial, industrial or institutional uses of woody biomass in ovens, boilers etc.) that are extracted from forests or other land areas in the applicable area in the relevant period (tonnes)
	NE	Commercial woody biomass consumption for non-energy applications (e.g. construction, furniture) that are extracted from forests or other land areas in the applicable area in the relevant period (tonnes)
	N	Number of households consuming wood fuel within the applicable area in the relevant period (number)

$$RB = \sum(MAIforest,i \times (Fforest,i - Pforest)) + \sum(MAIother,i \times (Fother,i - Pother))$$

Where

MAIforest,i	Mean Annual Increment of woody biomass growth per hectare in subcategory i of forest areas in the relevant period (tonnes/ha/yr)
MAIother,i	Mean Annual Increment of woody biomass growth per hectare in subcategory i of other land areas in the relevant period (tonnes/ha/yr)
Fforest,i	Extent of forest in sub-category i in the relevant period (ha)
Fother,i	Extent of other land in sub-category i in the relevant period (ha)
Pforest,i	Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within forest areas (in subcategory i) in the relevant period (ha)
Pother,i	Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within other land areas (in sub-category i) in the relevant period (ha)
i	Sub-category i of forest areas and other land areas

Calculation of RB

$$RB = \sum(MAIforest,i \times (Fforest,i - Pforest)) + \sum(MAIother,i \times (Fother,i - Pother))$$

The VPA implementer could also apply method 2:

b. Thermal application method 2: Based on thermal energy generated using measured quantity of biogas

The baseline emissions are calculated by multiplying the useful energy delivered by the biogas technologies with the emission factor of the baseline devices with their established fuel mix:

$$BE_{TA,y} = EG_{p,useful,y} \times EF_b \qquad \textit{Eq. 7}$$

Where:

$BE_{TA,y}$ = Baseline emissions (tCO_2e) in the year y

$EG_{p,useful,y}$ = The amount of useful energy applied in the project in year y (TJ)

EF_b = Baseline emissions factor (tCO_2e per TJ of useful energy)

The baseline emissions factor is determined applying the equation below:

$$EF_b = \sum_k \left(\sum_{i,j} P_{b,i,j} \times Percentage\ of\ fuel_i \times NCV_{b,i} \times (EF_{b,i,CO2} \times fNRB_{i,y} + EF_{b,i,non-CO2} \right)_k \div \sum_k \left(\sum_{i,j} P_{b,i,j} \times Percentage\ of\ fuel_i \times NCV_{b,i} \times \eta_{b,i,j} \right)_k \quad \textit{Eq. 8}$$

Where:

EF_b = Baseline emissions factor (tCO_2e per TJ of useful energy)

$P_{b,i,j}$ = Amount of baseline fuel *i* used in device *j* in the baseline (tonnes)

$EF_{b,i,CO2}$ = CO_2 Emission factor of the baseline fuel *i* (tCO_2e/TJ)

$EF_{b,i,non-CO2}$ = Non-CO_2 Emission factor of the baseline fuel *i* (tCO_2e/TJ)

$fNRB_{i,y}$ = Non-renewability status of woody biomass fuel i during year y

$NCV_{b,i}$ The net calorific value of the baseline fuel type *i* (TJ/tonne)

$\eta_{b,i,j}$ = Efficiency of baseline device *j* with fuel i (fraction)

$Percentage\ of\ fuel_i$ = Percentage of fuel type i in the baseline situation (%).

k = Household *k* from the target population, where applicable

j = Baseline devices *j*

i = Baseline fuel *i*

Useful thermal energy generated in the project activity is calculated as below:

$$EG_{p,useful,y} = \sum_d N_{b,p,y} \div 365 \times U_{p,y} \times Q_{biogas,d,y} \times NCV_{biogas} \times \eta_{p,d,y}/1000 \quad \textit{Eq. 9}$$

Where:

$EG_{p,useful,y}$ = Quantity of useful thermal energy generated by biogas in the project in year *y* (TJ)

$Q_{biogas,d,y}$ = The volume of biogas used in the project by device d in year y (m^3).

NCV_{biogas} = Net calorific value of the biogas (GJ/unit mass or volume, dry basis). Use default value: 0.02154 GJ/m^3 biogas (calculating from NCV of the methane: 0.0359 GJ/m^3 multiply with default methane content in biogas: 60%)

$\eta_{p,d,y}$ = Thermal efficiency of the project device (fraction)

In this VPA method 1 is applied. However, the VPA implementer could opt for method 2, when for example, biogas meters become more practical and affordable to use. This will be justified in the monitoring report.

Project emissions

A. Project emission from AWMS system

AWMS method 1 (IPCC 2019 TIER 1 approach)

The project emissions involve emissions from the biodigester, which include:

a. Physical leakage biogas

b. Emissions from the use of fossil fuels or electricity for the operation

$$PE_{AWMS,y} = PE_{PL,y} + PE_{power,y} \quad \textit{Eq. 10}$$

Where:

$PE_{AWMS,y}$ = Project emissions in year y (t CO2e)

$PE_{PL,y}$ = Emissions due to physical leakage of biogas in year y (t CO2e)

$PE_{power,y}$ = Emissions from the use of fossil fuel or electricity for the operation of the installed facilities in the year *y* (t CO_2e)

The physical leakage from biodigesters is calculated as 10% of the maximum methane producing potential of the manure fed into the management systems implemented by the project activity, as per the following equation:

Eq. 11

$$PE_{PL,y} = 0.10 \times N_{b,p,y} \div 365 \times U_{p,y} \times GWP_{CH4} \times D_{CH4} \times \sum_{k} \sum_{i,LT} B_{0,LT} \times N_{LT,y} \times VS_{LT,y} \times MS\%_{i,y}$$

Where:

$PE_{PL,y}$ = Project emissions from physical leakage in year y (t CO2e)

GWP_{CH4} = Global Warming Potential (GWP) of CH4 applicable to the crediting period.

D_{CH4} = CH4 density (0.00067 t/m^3 at room temperature (20 ºC) and 1 atm pressure)

LT = Index for all types of livestock

i = Index for animal manure management system

k = Climate region k

$B_{0,LT}$ = Maximum methane producing potential of the volatile solid generated for animal type LT.

$MS\%_{i,y}$ = Fraction of manure handled in project animal manure management system i

Emissions from use of fossil fuels or electricity for operation of the AWMS shall be determined via UNFCCC Methodological tool "Tool 03: Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" and "Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation"

However, this is not applicable for this VPA as all digesters are manually fed and operate passively (no external source of energy required).

B. Project emission from thermal application

Thermal application method 1: Based on avoided quantity of fuel consumption

The Project emission from thermal application in year y shall be calculated as follows:

$$PE_y = \sum_{b,p} (N_{b,p,y} \times U_{p,y} \times (f_{NRB,i,y} \times SE_{p,y,CO2} + SE_{p,y,non-CO2})) \quad \textit{Eq. 12}$$

Where:

PE_y = Project emissions for total project activity in year y (tCO_2e/yr)

$\sum_{b,p}$ = Sum over all relevant baseline b/project p pairs

$N_{b,p,y}$ = Number of project technology-days included in the project database for each project scenario in year y

$U_{p,y}$ = Usage rate for technologies in project scenario p in year y (fraction)

$SE_{p,y,CO2}$ = Specific CO_2 emissions for a project p technology in year y (tCO_2/technology*day)

$SE_{p,y,non-CO2}$ = Specific non-CO_2 emissions for a project p technology in year y (tCO_2e/technology*day)

$f_{NRB,i,y}$ = Fraction of biomass used in year y for project scenario p that can be established as non-renewable biomass (fraction). The parameter $f_{NRB,p,y}$ is excluded from this when the observed project additional fuel is fossil fuel.

Specific emission CO_2 & non-CO_2 are determined below, for each baseline b /project p pair separately.

$$SE_{p,y,Co2} = \sum_i P_{p,i,y} \times NCV_{p,i,fuel} \times EF_{p,i,fuel,CO2} \quad \textit{Eq. 13}$$

$$SE_{p,y,non-Co2} = \sum_i P_{p,i,y} \times NCV_{p,fuel} \times EF_{p,i,fuel,non-CO2} \quad \textit{Eq. 14}$$

Where:

i = Index for the type of project/fossil fuel consumed

$P_{p,i,y}$ = Average daily consumption of project fuel i per household (tonnes/household/day)

$NCV_{p,i,fuel}$ = Net calorific value of the fuel(s) i that is used in project p (TJ/tonne)

$EF_{p,i,fuel,CO2}$ = CO_2 emission factor arising from use of fuels i in project scenario (tCO_2e/TJ)

$EF_{p,i,fuel,non-CO2}$ = Non-CO_2 emission factor arising from use of fuels in baseline scenario (tCO_2e/TJ)

$P_{p,i,y}$ shall be determined via KPT survey.

b. Thermal application method 2: Based on thermal energy generated using measured quantity of biogas

In case the project developer follows Option 2 for thermal application then no project emission is considered for thermal application under the project activity

C. Leakage emissions

a. Animal waste management system

AWMS method 1 The proper soil application (which not resulting in methane emissions) of the digestate shall be verified on a sampling basis following the Requirements in the "Standard for sampling and surveys for CDM project activities and programme of activities". This will be part of the SMS and is captured in montoring parameters BGTA 32. The verification will be part of the SDG monitoring survey.

In addition to this, households may use bio-slurry as animal feed, insecticide, sell it as fertilizer, etc. These options do not result in methane emissions as well.

b. Thermal application

For all of the preceding methods, leakage emissions, $LE_{p,y}$, shall be determined ollowing one of two options below.

Option 1 - Apply a default adjustment factor of 0.95 to the emission reductions to approximate leakage emissions for thermal application.

Option 2 - The project developer must evaluate the following potential sources of leakage and provide an evidence-based description and preliminary quantification of each potential source and its relevance for the project:

a. The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or with a higher intensity than would have occurred in the absence of the project.

b. Members of the population who do not participate in the project, and previously used lower emitting energy sources, instead use the non-renewable biomass or fossil fuels saved under the project activity.

c. The project significantly reduces the NRB fraction within an area where other GHG mitigation project activities account for NRB fraction in their baseline scenario.

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

e. By virtue of promotion and marketing of a new technology, the project stimulates substitution with this technology by households who commonly used a technology with relatively lower emissions.

For each source for which the leakage assessment expects an increase in fuel consumption by non-project households/users attributable to the project activity, then calculations must be undertaken to account for the leakage from this source. Leakage is either calculated as a quantitative emissions volume (tCO_2e) or as a percentage of total emission reductions. The project documentation shall include a projection of leakage emissions based on available data and information. The monitoring plan must include monitoring parameters to be registered during the leakage investigation every two years to populate the leakage calculation.

Option 1 and 2 is captured in BGTA 43.

D. Emission reductions

The emission reductions for each of the component (AWMS and thermal energy) are calculated separately as follows:

$$ER_y = BE_y - PE_y - LE_y \qquad \textit{Eq. 15}$$

Where:

ER_y	=	Emission reductions in year y (t CO_2e/yr)
BE_y	=	Baseline emissions in year y (t CO_2e/yr)
PE_y	=	Project emissions in year y (t CO_2e/yr)
LE_y	=	Leakage emissions in year y (t CO_2e/yr)

The total emission reduction from project activity will be the sum of emission reductions from each component i.e., AWMS and Thermal energy.

SDG 1: GSDM-I1.1.1: Financial savings

The average household savings will be determined by asking the household have much money is saved on cooking fuel expenditure since using biogas. The savings will be annualized and reported as USD/year and in the local currency per year.

The contribution will then be calculated as:

$$GSDM - I.1.1.1 = (SDG_1 - OM) \times FOREX \times N_{b,p,y} \qquad \textbf{Eq. SDG1}$$

$GSDM - I.1.1.1$	Financial savings (KSH or USD saved in the MP)
$SDG1$	Gross savings (local currency/day)
OM	Operation and maintenance cost (local currency/day)

Forex	Foreign exchange rate at time of MR writing (for expression in USD only)
$N_{b,p,y}$	Technology days included
$U_{p,y}$	Usage rate for technologies in project scenario p in year y (fraction)

SDG2: Zero hunger

- **GSDM-I2.4.2 Number of farmers adopted the practice by the project**

Bio-slurry is promoted as potent organic fertilizer to improve agricultural production and reduce reliance on artificial inputs. The number of farmers using bio-slurry will be obtained by including a question on bio-slurry usage in the SMS. The total contribution is then calculated by multiplying this with the number of biodigesters in use with the following equation:

$$GSDM - I.2.4.2 = U_{p,y} \times N_d \times BIO_u \qquad \text{Eq. SDG2}$$

$GSDM - I.2.4.2$	Number of farmers using bio-slurry
$U_{p,y}$	Usage rate for technologies in project scenario p in year y (fraction)
N_d	Number of biodigesters constructed
$BIOu$	Bio-slurry usage rate (% farmers using bio-slurry)

- **GSDM-I2.4.3: Area under sustainable agriculture**

This will be calculated by multiplying the outcome of GSDM-I.2.4.2 with the land area (Fa) measured in hectares on which bio-slurry is applied. The land area will be obtained by asking the farmer interviewed for the SMS how much land is owned and the share on which bio-slurry is applied.

SDG 3: GSDM-I3.9.3: Reduced incidence of disease caused by air pollutants.

Biogas is a clean fuel and using the gas for cooking instead of biomass will reduce the exposure to harmful pollutants and improve household air quality. The number of households reporting a decrease in harmful pollutants attributed to cooking will be obtained with the following equation:

$$GSDM - I3.9.3 = U_{p,y} \times N_d \times HAPr \qquad \text{Eq. SDG3}$$

Where

$GSDM - I3.9.3$	Number of households reporting a decrease in PM2.5 and CO

$U_{p,y}$	Usage rate for technologies in project scenario p in year y (fraction)
N_d	Number of biodigesters constructed
HAPr	% of families mentioning reduction in household air pollution

SDG 4: GSDM-I.4.4.1 Number of employees provided skill development training

The number of trainings provided will be determined by summing the number of masons trained during the monitoring period on biogas construction, refresher training and other biogas related trainings. This could also include training to other participants in the biogas value chain (bio-slurry capacity building).

SDG 5: GSDM-I5.4.1: Women empowerment and gender equality

The contribution will be reported as: (1) hours/year saved on fuel wood collection and cooking time (including cleaning) attributed to the installation of a biodigester and (2) **usage of saved time**. Time savings will be determined as follows:

1. The female member of the household in charge of cooking and/or cooking fuel collection, will be asked:
    - *How much time did you save on cooking and other cooking activities due to cooking on biogas*

Time savings will be calculated with this equation:

$$GSDM - I5.4.1 = Ts \times N_{b,p,y} \times U_{p,y}$$

Eq. SDG5

Where

$GSDM - I5.4.1$	Hours' time saved in the MP
Ts	Time savings (hours per day)
$N_{b,p,y}$	Technology days included in the MP
$U_{p,y}$	Usage rate for technologies in project scenario p in year y (fraction)

2. The same female member will be asked
    - *What did you do with your saved time? or if no time savings were reported, the reason why will be asked*

Answers will be categorized as much as possible. Categories likely to be considered are I use my time for: productive use/leisure/family/education/social etc.

SDG 7: GSDM-I7.1.1: Increased access to energy

Refers to access to affordable and clean energy (SDG 7.1)

Description: Refers to number of unique households and individuals that were provided access to clean fuels and technologies for domestic cooking they were unable to access prior to project activity.

Increased access to clean energy will be calculated with this equation:

$$GSDM - I7..1.1 = U_{p,y} \times N_d \times HH_s \qquad \text{Eq. SDG7}$$

Where

$GSDM - I7.1.1$	Contribution to SDG 7 in number beneficiaries with increased access to energy
$U_{p,y}$	Usage rate for technologies in project scenario p in year y (fraction)
N_d	Number of biodigesters constructed
HHs	Household size (dropped when the SDG contribution is expressed in number of households)

The contribution will be calculated both for total number of individuals and number households. In the latter case, the term 'HHs' is excluded from the equation.

SDG 8: GSDM-I.8.5.1 total number of jobs

The total number of jobs are defined as the total number of masons provided biodigester jobs. This data will be collected from the project database and constitutes a simple count of the individual masons provided employment.

SDG9: GSDM-I.9.3.1 Total number of companies supported for their integration into value chains and markets

The total number of companies supported are defined as the total number of biodigester construction enterprises (BCE) involved in biodigester construction. This data will be collected from the project database and constitutes a simple count of individual BCE. On top of that, other companies active in the biodigester value chain, can be included, i.e. stove importers or assemblers.

SDG12: GSDM-I.12.5.2 Improved waste management services

This is defined as the total amount of bio-slurry produced by multiplying feeding (kg manure/day) with the total number of digesters in operation with the following equation:

$$GSDM - I.12..5.2 = F_{b,p} \times N_{b,p,y} \times U_{p,y} \div 1000 \qquad \text{Eq. SDG12}$$

$GSDM - I.12.5.2$	Contribution to GSDM-I.12.5.2 in ton bio-slurry
$F_{p,b,y}$	Biodigester feeding rate (kg manure/day)
$N_{b,p,y}$	Number of technology days in included
1000	Conversion from kg to ton
$U_{p,y}$	Usage rate for technologies in project scenario p in year y (fraction)

SDG 15: Parameter: GSDM-1 15.1.1

This is defined as the total amount of non-renewable wood saved and is calculated with the following equation:

$$GSDM - 1\ 15.1.1 = N_{b,p,y} \times U_{p,y}(P_{b,wood,y} + P_{b,charcoal,y} \times C_C) - (P_{p,wood,y} + P_{p,charcoal,y} \times C_C))$$

Eq. SDG15

Where

$GSDM - 1\ 15.1.1$	=	Contribution to SDG 15 in tonne/year
$N_{b,p,y}$		Number of technology days in included
$U_{p,y}$		Usage rate for technologies in project scenario p in year y (fraction)
$P_{b,wood,y}$	=	Average daily consumption of wood in the baseline scenario per household obtained from the BFT (tonnes/household/day)
$P_{b,charcoal,y}$	=	Average daily consumption of charcoal in the baseline scenario per household obtained from the BFT (tonnes/household/day)
C_C	=	Wood to charcoal conversion factor
$P_{p,wood,y}$	=	Average daily consumption of wood in the project scenario per household obtained from the PFT (tonnes/household/day)
$P_{p,charcoal,y}$	=	Average daily consumption of charcoal in the project scenario per household obtained from the PFT (tonnes/household/day)

Thus, the wood and charcoal savings will be multiplied with the number of technology days in a monitoring period that are in operation. See BGTA 7.5 in section B6.2 for the CC value.

Since wood saved in year 1, is also saved in year 2, the total contribution will include the savings of the previous years, e.g., year 1 = savings of month 1 to 12, year 2 is savings of year 1, plus the savings of month 13 to 24, etc.

B.6.2. Data and parameters fixed ex ante

SDG13

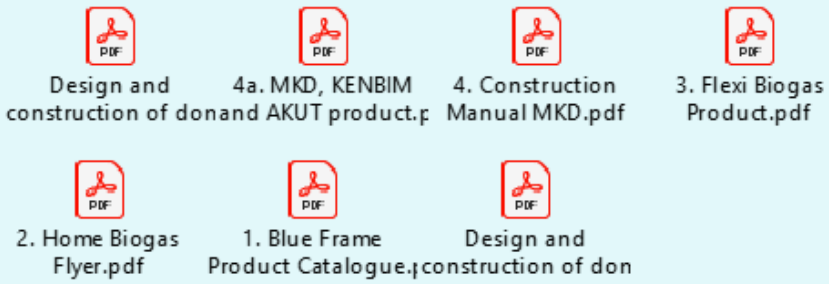
Data/parameter	BGTA 1: Avoidance of double counting or double claiming among project participants.
Unit	NA
Description	Evidence of avoidance of double counting or double claiming with other parties directly involved with the project or programme.
Source of data	Warranty certificates
Value(s) applied	Warranty certificates require a tri-party signature, the VPA implementer, the technology providers and the households which includes a clause of the ownership rights and intention of selling the emission reductions resulting from the project activity and transfer of those rights to the VPA implementer
Choice of data or Measurement methods and procedures	Warranty certificates or equivalent
Purpose of data	Calculation of project outcome
Additional comment	-

Data/parameter	BGTA 2: Avoidance of double counting or double claiming with other mitigation actions.
Unit	NA

Description	Review and analysis of mitigation actions in other voluntary market or UNFCCC/compliance mechanisms.
Source of data	Applied methodology
Value(s) applied	As per methodology, this is undertaken at the time of project design review and VPA inclusion review. Since this VPA has already been included with a validated design, additional review is not required
Choice of data or Measurement methods and procedures	NA
Purpose of data	NA
Additional comment	Undertake at the time of project design review and VPA inclusion review.

Data/parameter	BGTA 3: Regulatory framework for provision of animal waste management and thermal energy services.
Unit	NA
Description	Evidence that the project does not undermine or conflict with any national, sub-national or local regulations or guidance for thermal energy supply/devices or fuel supply or use.
Source of data	Government policy documents
Value(s) applied	On the contrary. This VPA supports the implementation of various goals. Such as: Promote the use of efficient off-grid Productive Use of Energy (p31) of minister of industry: kenya-national-energy-efficiency-and-conservation-strategy-2020-1.pdf (unepccc.org)
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of baseline scenario

Additional comment	Undertake at the start of each crediting period.

Data/parameter	BGTA 4: Project technology description
Unit	NA
Description	The detailed description of the project technology (including both biodigester and biogas stove) manufacturer name (if applicable), - product name (if applicable), - technology type, - capacity characteristics (e.g., volume of digester[16]), - continuous useful energy output demonstration, - rated thermal efficiency of biogas stove, any performance certifications from national standards body or certification body recognized by national standards body also shall be provided.
Source of data	The following documents: 
Value(s) applied	The various technical documents are shared with the VVB

[16] A technical measure to ensure that the gas holding capacity of the biodigester is sufficiently large to capture the biogas during periods of non-usage. A justification to demonstrate compliance with this requirement pertaining to the biogas digester size shall be included in the PDD.

Choice of data or Measurement methods and procedures	N/A
Purpose of data	Calculation of project outcome
Additional comment	N/A

Data/parameter	BGTA 5: Expected technical life of project technology.
Unit	years
Description	The expected technical life of an individual project technology
Source of data	FAO BEFS Rapid Appraisal – Biogas Community Component p8 https://www.fao.org/3/bp844e/bp844e.pdf Fixed dome: information from the entity that designed the digester (SNV, Jan Lam) Plastic digester: manufacturer information
Value(s) applied	(see table below)
Choice of data or Measurement methods and procedures	n/a
Purpose of data	Calculation of project outcome
Additional comment	The expected or remaining technical life of most project technologies is longer than the crediting period, thus description of measures to ensure that end users are provided replacement technology of comparable service and

Type	Model	Lifespan
Fixed dome	Modified Kenbim Model	The average lifespan of a well-constructed fixed dome digester is estimated to be at least 25 years but can easily reach more 35 years when quality materials are used during construction and O&M practices observed in its operation.
	KENBIM	
	AKUT	
	Camartec	
Plastic digester types	Flexi biodigesters	An average of 7-10 years, with a potential of max. of 15 years with good care and protection from UV with the greenhouse
	Kentainer	7-10 yrs, with a potential of 30 years with better care from UV and against rodents
	Takamoto	An average of 7-10 years, with a potential of 15 years

	quality level at the end of the technical life is not required

Data/parameter	**BGTA 6:** Baseline scenario survey results.
Unit	NA
Description	Report of the results of the baseline scenario survey.
Source of data	ER spreadsheet VPA06_CPII ER SDG sheet BGTA6

Value(s) applied	1. User follow up	i. Address or location ii. Mobile telephone number and/or landline telephone number (when possible)	See sheet baseline data column F to O
	2. End user characteristics	iii. Number of people served by baseline technology	Number of people served: 4.95 Breakfast: 99% Lunch: 92% Dinner: 99% Boil water for human Consumption: 65%
		iv. Typical baseline technology usage patterns and tasks (commercial, institutional, domestic, etc.)	as per selection criteria: domestic cooking
	3. Baseline technology and fuels	v. Types of baseline technologies used and estimated frequency (unit % of households with the technology)	Three stone: 41% conventional wood: 1% improved wood: 26% conventional charcoal: 1% improved charcoal: 2% LPG: 25%
		vi. Types of fuels used and estimated quantities (share of households by fuel	Firewood: 71% LPG: 25% Charcoal: 4% Maize cobs: 1% ton wood/year: 3.85 ton charcoal/year: 0.25 ton LPG/year: 0.04 ton maize cob/year: 0.33
		vii. Seasonal variations in baseline technology and fuel use	No seasonal variation: 66.9% more fuel use in dry season: 1.5% More in wet season: 31.5% Conclusion: higher fuel use in wet season
		viii. Sources of fuels; purchased, collected, etc.	% wood collected: 70% % Wood purchased: 30% % charcoal purchased: 100% % charcoal hand collected: 90% % LPG purchased: 100%
	4. AWMS	x. Type of animals	See indicator BGTA 26
		xi. Average number of animal for each system type.	See indicator BGTA 26
		xii. The amount of waste or raw materials that would decay anaerobically in the baseline situation *(since only VS degrades anaerobically, the information is expressed here as VS/day degraded anaerobically by animal type)*	Dairy cow: 4.85 Other cattle: 0.46 Growing swine: 0.12 Market swine: 0.15 Sheep: 1.13 Goat: 0.74 Poultry: 38.32
		xiii. Fraction of manure handled in baseline animal manure management system	See indicator BGTA 26
		xiv. If the livestock is raised in shared centralized farms, the project proponent shall be able to show the baseline animal manure management practices at each farm, either individually or through sampling	N/A all farms are household farms
Choice of data or Measurement	Household survey amongst 130 randomly selected. The results apply both to VPA01 and VPA06		

methods and procedures	
Purpose of data	Calculation of baseline scenario
Additional comment	Undertake at the start of the first crediting period. The AWMS baseline will be reassessed for the first verification. This is necessary as the current baseline is based on the IPCC 2006 guidelines and the 2019 revision as mandated by the methodology

Data/parameter	BGTA 7: **GWP_{CH4}**
Unit	tCO_{2e} per tCH_4
Description	Global Warming Potential (GWP) of methane applicable to the crediting period
Source of data	IPCC
Value(s) applied	28
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of project scenario Calculation of baseline scenario
Additional comment	It shall be updated according to any future COP/MOP decisions.

Data/parameter	BGTA 3.5: CC
Unit	Wood to charcoal conversion factor
Description	Amount of wood used to produce charcoal
Source of data	CDM tool 33 version 02.0: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-33-v2.0.pdf

Value(s) applied	4
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of baseline and project scenario
Additional comment	-

a. Parameters related to AWMS

Data/parameter	BGTA 4: $MS\%_{Bl,j}$
Unit	%
Description	Fraction of manure handled in baseline animal manure management system j
Source of data	Baseline survey, see sheet AWMS in VPA06_CPII ER SDG spreadsheet cell B170:I179
Value(s) applied	Ex-ante, will be updated for the first verification, see additional comments

Summary	Dairy cow	Other cattle	Market swine	Breeding swine	Sheep	Goat	Poultry
Anaerobic lagoon	9%	4%	3%	2%	0%	10%	4%
liquid/slurry	9%	1%	12%	10%	3%	4%	2%
solid storage	28%	23%	46%	52%	31%	36%	31%
dry lot	9%	4%	22%	15%	4%	6%	11%
daily spread	16%	4%	13%	16%	7%	16%	14%
Pasture	9%	40%	0%	0%	34%	20%	21%
burned as fuel	0%	0%	0%	0%	0%	0%	0%
composting static pile	11%	21%	4%	3%	4%	6%	8%
another way	8%	3%	0%	0%	19%	3%	9%

Choice of data or Measurement	Applicable for AWMS method 1

methods and procedures	
Purpose of data	Calculation of baseline scenario
Additional comment	The AWMS baseline will be reassessed for the first verification. This is necessary as the current baseline is based on the IPCC 2006 guidelines and the 2019 revision as mandated by the methodology. The results from that survey will be fixed for the whole CP.

Data/parameter	BGTA 5: EF_{LT}
Unit	kgCH_4 per animal per year for livestock type LT
Description	Animal manure methane emission factor by average temperature
Source of data	IPCC 2019 guidelines volume 4, chapter 10 table 10.14 for low productivity species and montane tropical climate and VPA06 CPII ER SDG sheet AWMS cell B186:I195
Value(s) applied	
Choice of data or Measurement	IPCC 2019 guidelines

EF_{LT}	Dairy cow	Other cattle	Growing swine	Breeding swine	Sheep	Goat	Poultry
Uncovered Anaerobic lagoon	66.20	66.20	147.70	147.70	66.20	66.20	198.60
liquid/slurry pit > 1 month	51.40	51.40	114.60	114.60	37.45	37.45	154.20
solid storage	4.40	4.40	9.70	9.70	4.40	4.40	13.10
dry lot	1.70	1.70	3.90	3.90	1.70	1.70	5.20
daily spread	0.90	0.90	1.90	1.90	0.87	0.87	1.61
Pasture	0.41	0.41	0.91	0.91	0.41	0.41	0.76
burned as fuel	8.70	8.70	19.40	19.40	8.71	8.71	2.60
composting passive windrow	2.18	2.18	4.86	4.86	2.18	2.18	4.02
another way	0.90	0.90	1.90	1.90	0.41	0.41	2.40

methods and procedures	
Purpose of data	Calculation of baseline scenario
Additional comment	The IPCC does not provide EF defaults for the categories for some values. However, the IPCC mentions: all values are calculated based on MCF and B_0 reported in Tables 10.17 and 10.16a, respectively, using the equation MCF*B_0*0.67. Based on this the bottom 4 categories are calculated. This is consistent with Tier 1 and consistent with how the IPCC calculated the values. In the excel sheet the calculated values are in red for transparency The liquid slurry system for sheep and goat is calculated based on an MCF of 43%, it is assumed that manure resides 3 months in those systems before usage. This is an ex-ante estimation and will be re-assessed for the first verification

Data/parameter	BGTA 6: $VS_{rate,LT}$
Unit	kg VS / (1000 kg animal mass) / day
Description	Default Volatile solids production/excretion rate per animal of livestock LT in year y.
Source of data	Default values from table 10.13A of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas Inventories (kg VS / (1000 kg animal mass) / day)
Value(s) applied	Values for the region Africa and low productivity system are applied.

Dairy cow	15.2
Other cattle	12.7
Swine finishing	9.40
Swine breeding	6.00

	Sheep: 8.30 Goat: 10.40 Poultry: 13.00
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of baseline scenario
Additional comment	In the baseline survey swine finished is referred to market swine. Low productivity system is the norm. However in case are high productivity systems, the VS of high productivity systems will be applied

Data/parameter	BGTA 10a: $VS_{,LT,y}$
Unit	kg VS / animal mass / day
Description	Default Volatile solids production/excretion rate per animal of livestock LT in year y.
Source of data	VPA06 CPII SDG database sheet VS cell D10, D17, D24, D31, D38, D45 and D52.
Value(s) applied	Dairy cow: 4.104 Other cattle: 2.642 Swine finishing: 0.310 Breeding swine: 0.366 Sheep: 0.257 Goat: 0.250 Poultry: 0.010
Choice of data or Measurement methods and procedures	Calculated using default values from table 10.13A of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas) for the region Africa and low

	productivity system are applied.
Purpose of data	Calculation of baseline scenario
Additional comment	In the baseline survey swine finished is referred to market swine.

Data/parameter	BGTA 7: $B_{0,LT}$
Unit	m^3 CH_4/kg-dm
Description	Maximum methane production potential of the volatile solid generated for animal type LT.
Source of data	IPCC default values from tables 10.16 of 2019 IPCC Guidelines for National Greenhouse Gas Inventories volume 4 Chapter 10
Value(s) applied	Values for low productivity systems are applied. Dairy cow: 0.13 Other cattle: 0.13 Swine finishing: 0.29 Swine breeding: 0.29 Sheep: 0.13 Goat: 0.13 Poultry: 0.24
Choice of data or Measurement methods and procedures	Literature date
Purpose of data	Calculation of baseline and leakage scenario
Additional comment	No in-country values are available to assess the suitability of the data to the specific situation of the treatment site

b. Parameters related to Thermal application

Data/parameter	BGTA 8: $EF_{b,i,CO2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor arising from use of fuels in baseline scenario
Source of data	Methodology defaults
Value(s) applied	**Wood**: Methodology default, 112 tCO_2/TJ **Charcoal**: The default including charcoal production is applied of 165.22 tCO_2/TJ (includes charcoal production emissions) **LPG**: 63.1 tCO_2/TJ **Other fuels**: IPCC defaults
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is used to calculate $SE_{b,y,CO2}$ Applicable for Thermal application method 1 and Thermal application method 2

Data/parameter	**BGTA 14**: $EF_{b,i,non-CO2}$
Unit	tCO_2/TJ
Description	Non-CO_2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC 2019 default data and methodology defaults. For LPG non-CO_2 emission factor, see sheet BE in VPA06 CPII SDG database BE cell E99
Value(s) applied	**Wood**: Methodology default: - 9.46 tCO_2e/TJ (AR5 GWP)

	Charcoal: Methodology defaults: - 44.83 tCO_2e/TJ (AR5 GWP) (includes charcoal production emissions) **LPG** - 0.17 tCO_2/TJ (AR5 GWP, calculated based on IPCC 2006 guidelines (no 2019 update to the valueas)
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of baseline scenario
Additional comment	This parameter is used to calculate $SE_{b,y,non-CO2}$ Applicable for Thermal application method 1 and Thermal application method 2

Data/parameter	BGTA 9: $EF_{p,i,CO2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor arising from use of fuels in project scenario
Source of data	Methodology defaults and IPCC 2006, volume 2, chapter 2 table 2.5 for LPG (no 2019 update of the value)
Value(s) applied	**Wood**: Methodology default, 112 tCO_2/TJ **Charcoal**: The default including charcoal production is applied of 165.22 tCO_2/TJ (includes charcoal production emissions) **LPG**: 63.1 tCO_2/TJ
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of project emissions
Additional comment	This parameter is used to calculate $SE_{p,y,CO2}$ Applicable for Thermal application method 1 and Thermal

	application method 2

Data/parameter	**BGTA 16**: $EF_{p,i,non-CO2}$
Unit	tCO_2/TJ
Description	Non-CO_2 emission factor arising from use of fuels in project scenario
Source of data	IPCC 2019 default data and methodology defaults. For LPG non-CO_2 emission factor, see sheet BE in VPA06 CPII SDG database BE cell E99
Value(s) applied	**Wood**: Methodology default: - 9.46 tCO_2e/TJ (AR5 GWP) - **Charcoal: Methodology defaults:** - 44.83 tCO_2e/TJ (AR5 GWP) (includes charcoal production emissions), **LPG** - 0.17 tCO_2/TJ (AR5 GWP, calculated based on IPCC 2006 guidelines (no 2019 update of the values)
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of project scenario
Additional comment	This parameter is used to calculate $SE_{p,y,non-CO2}$ Applicable for Thermal application method 1

Data/parameter	BGTA 17 $NCV_{b,i}$
Unit	TJ/ton
Description	Net calorific value of the fuels used in the baseline
Source of data	Methodology default and IPCC 2006, volume 2, chapter 1 table 1.2 for LPG (no 2019 update of the value)
Value(s) applied	Wood: Methodology default, 0.0156 TJ/ton Charcoal: Methodology default, 0.0295 TJ/ton

	LPG 0.0473 TJ/ton
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of baseline scenario
Additional comment	The methodology default emission factor must be applied when the methodology default NCV is applied. This parameter is used to calculate $SE_{b,y,CO2}$ and $SE_{b,y,non-CO2}$ Applicable for Thermal application method 1 and Thermal application method 2

Data/parameter	BGTA 18: $NCV_{p,i}$
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project
Source of data	Methodology default and IPCC 2006, volume 2, chapter 1 table 1.2 for LPG (no 2019 update of the value)
Value(s) applied	Wood: Methodology default, 0.0156 TJ/ton Charcoal: Methodology default, 0.0295 TJ/ton LPG 0.0473 TJ/ton
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of baseline scenario
Additional comment	The methodology default emission factor must be applied when the methodology default NCV is applied. This parameter is used to calculate $SE_{p,y,CO2}$ and $SE_{p,y,non-CO2}$ Applicable for Thermal application method 1

Data/parameter	$BGTA\ 19\ NCV_{biogas}$
Unit	GJ/m^3
Description	Net calorific value of the biogas (GJ/unit mass or volume, dry basis)
Source of data	Methodology default
Value(s) applied	Use default value: 0.0215 GJ/m^3 biogas (assuming NCV of the methane: 0.0359 GJ/m^3, default methane content in biogas: 60%)
Choice of data or Measurement methods and procedures	NA
Purpose of data	Calculation of baseline scenario
Additional comment	Applicable for Thermal application method 2

Data/parameter	BGTA 20 $P_{b,i,y}$
Unit	tonnes/household/year
Description	Average yearly consumption of baseline fuel i per household at the renewal of each crediting period
Source of data	KPT, Sheet BE in VPA06 SDG database cell E71,76 and E81
Value(s) applied	Wood: 2.670 Charcoal 0.073 LPG: 0.045
Choice of data or Measurement methods and procedures	As per KPT protocol
Purpose of data	Calculation of baseline scenario
Additional comment	Applicable for Thermal application method 1 and Thermal application method 2

	The value is much lower than the cap value. The average hh size is 4.788 (parameter GSDM-I7.1.1: HHs), and thus the per capita wood use is 2.670/4.788= 0.556 ton/person/year (cap =0.75 ton/person/year) and for charcoal 0.294/4.788= 0.006 ton/person/year (cap = 0.25 ton/person/year) Note that in the baseline survey the hh size is 4.95 (see BGTA6), but in the first monitoring survey this is 4.788 (see GSDM-I7.1.1: HHs). The lowest value is applied which is conservative

Data/parameter	BGTA 21: $Percentage\ of\ fuel_i$
Unit	%
Description	Percentage of fuel type i in the baseline situation.
Source of data	VPA01-DD CPII
Value(s) applied	Wood: 76% Charcoal: 8% LPG: 16%
Choice of data or Measurement methods and procedures	Once per CP. This value will be fixed during the first verification for the whole CP
Purpose of data	Calculation of baseline scenario
Additional comment	Applicable for Thermal application method 1 and 2. The percentages from the first monitoring survey are applied here and not those from the baseline survey. The values from actual biogas users are deemed more representative.

Data/parameter	BGTA 22: $\eta_{b,i,j}$

Unit	Fraction
Description	Efficiency of baseline device *j* with fuel i (fraction)
Source of data	Default values or WBT or literature data
Value(s) applied	The efficiency of baseline stove(s) shall be established following any of the below options: a. **Default values:** The following default values may be applied for this parameter and for cases when it is not possible to conduct efficiency tests. – Three-stone fire or a conventional system for woody biomass lacking improved combustion air supply mechanism and flue gas ventilation system, that is without either a grate or a chimney: default efficiency 10%. – Other conventional systems using woody biomass: default efficiency 20% – Improved cookstoves: manufacturer specification, or if not available, default efficiency 30% – Fossil fuel combusting system: manufacturer specification, if available. b. **Sample testing:** The baseline stove efficiency may be established based on water boiling test (WBT) conducted on randomly selected sample stoves. The WBT shall be carried out in accordance with national standards (if available) or international standards or guidelines (e.g., the WBT Protocol[17,18] or ISO 19867-1 listed by Clean Cooking Alliance and available at: https://cleancookingalliance.org/research-evidence-learning/standards-testing/protocols/) At minimum, a sample test on three stoves with three tests conducted for each baseline stove type by a recognised certification body.

[17] The project developer may conduct only the first two phases of the stove tests: cold-start high-power phase and hot-start high-power phase (not including the simmer phase) for calculation of the high-power thermal efficiency.
[18] The guidance provided in the WBT protocol may be followed for calibration of testing equipment.

	c. **Published third party reference:** The baseline stove(s) efficiency may be applied from; – Credible published literature, or – Studies by academia, NGOs or multilateral institutions, – Official government publications or statistics, Source applied must not be more than 3 years old and shall be relevant to the project region and baseline technology.
Choice of data or Measurement methods and procedures	Default values or sample testing of third party references. To be determined during monitoring
Purpose of data	Calculation of baseline scenario
Additional comment	Applicable for Thermal application method 2.

Data/parameter	BGTA 23 $\eta_{p,d,y}$
Unit	%
Description	Thermal efficiency of the project device.
Source of data	VPA01-DD CPI section B6.2
Value(s) applied	55 ex-ante
Choice of data or Measurement methods and procedures	if method 2 is applied, stove efficiency shall be confirmed using literature or manufacturer data as per applied methodology
Purpose of data	Calculation of baseline scenario
Additional comment	Applicable for Thermal application method 2. In the VPA01 this is referred to as combustion efficiency. However, this is incorrect and should have been referred to as thermal efficiency. Combustion efficiency for example is near 100% (VPA06-DD CPI section B4.2)

Data / Parameter	BGTA 41: $fNRB_{,i,y}$
Unit	percentage
Description	Fractional non-renewability status of woody biomass fuel during year *y*, in case the baseline fuel is biomass or charcoal.
Source of data	fNRB excel sheet Kenya VPA01 and VPA06 sheet fNRB cell C6
Value(s) applied	74.38
Choice of data or Measurement methods and procedures	Requirements of the CDM TOOL30
Purpose of data	Calculation of project outcome
Additional comment	fixed at project design certification stage. See other notes in the excel sheet justification of the value against Bailis et al and comparison with above ground extraction of fuelwood.

B.6.3. Ex ante estimation of SDG Impact

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SDG 13

Accounting for emission reductions due to the avoidance of methane emissions from manure handling.

The baseline emissions from the handling of animal waste are determined using IPCC Tier 1 approach using household surveys to establish $MS_{\%BL,j}$.

Baseline data was collected of the manure management systems by animal type of target households, taking into consideration hours stabled and seasonality. Animals that are in the field for 6 hours for example, it is assumed that 6/24 of the manure is excreted in the field. If 40% of that manure is collected and composted, then 40% * 6/24 of the manure is composted of the manure excreted in the field. The outcome by animal type is pasted here below:

Table 6: baseline MS by animal T[19]

Summary	Dairy cow	Other cattle	Market swine	Breeding swine	Sheep	Goat	Poultry
Anaerobic lagoon	9%	4%	3%	2%	0%	10%	4%
liquid/slurry	9%	1%	12%	10%	3%	4%	2%
solid storage	28%	23%	46%	52%	31%	36%	31%
dry lot	9%	4%	22%	15%	4%	6%	11%
daily spread	16%	4%	13%	16%	7%	16%	14%
Pasture	9%	40%	0%	0%	34%	20%	21%
burned as fuel	0%	0%	0%	0%	0%	0%	0%
composting static pile	11%	21%	4%	3%	4%	6%	8%
another way	8%	3%	0%	0%	19%	3%	9%

Using equation 1 in this document the obtained MS are subsequently multiplied with IPCC default VS values, animal numbers obtained from the first monitoring survey and the respective emission factors (EF_{amws}), for each animal LT. and the fraction of manure which would decay anaerobically in absence of the project to obtain $BE_{AWMS.}$ The results are shown in the table below:

Table 7: Baseline emissions from animal waste management[20]

[19] See VPA06_CPII ER SDG database sheet AWMS cell B170:I179
[20] See VPA06 CPII SDG database sheet BE C2:G52

Reference	Description	Data	Unit	Source
1				
CH4	Global Warming Potential of methane	28		https://globalgoals.goldstandard.org/standards/RU-2020-PR-V1.2-GWP-values
N2O	Global Warming Potential of Nitrous dioxide	265		https://globalgoals.goldstandard.org/standards/RU-2020-PR-V1.2-GWP-values
D_{CH4}	Density of methane (conversion factor)	0.00067	tonne/m3	IPCC default
Days	Days per year	365	units	
BGTA 30: $N_{p,y}$	Number of dairy cows	4.85	units/hh	static population, annual average taken from survey data
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter per dairy cows	4.104	kg/hd/day	linked to sheet VS, calculated using eq 3 of the methodology
BGTA 9:EF	kgCH4 per animal per year for livestock type LT	12.910	%	calculation
BGTA 31: MS%i,y	Fraction of manure handled in project animal manure management system i	87%	kgCH/animal	linked to survey data
$BE_{LT,y}$	Baseline emissions /animal	223.426	tCH4/hh	calculation
BGTA 30: $N_{p,y}$	Number of other cattle	0.46	units	VPA01 CPII MRI
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter per other cattle	2.6416	kg/hd/day	linked to sheet VS, calculated using eq 3 of the methodology
BGTA 9:EF	kgCH4 per animal per year for livestock type LT	5.317		linked to sheet AMWS
BGTA 31: MS%i,y	Fraction of manure handled in project animal manure management system i	57%	kgCH/animal	calculation
$BE_{LT,y}$	Baseline emissions /animal	3.669	tCH4/hh	calculation
BGTA 30: $N_{p,y}$	Swine finishing	0.12	units	VPA01 CPII MRI
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter per market swine	0.3102	kg/hd/day	linked to sheet VS, calculated using eq 3 of the methodology
BGTA 9:EF	kgCH4 per animal per year for livestock type LT	23.398		linked to sheet AMWS
BGTA 31: MS%i,y	Fraction of manure handled in project animal manure management system i	25%	kgCH/animal	calculation
$BE_{LT,y}$	Baseline emissions /animal	0.218	tCH4/hh	calculation
BGTA 30: $N_{p,y}$	Number of breeding swine	0.15	units	VPA01 CPII MRI
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter per breeding swine	0.366	kg/hd/day	linked to sheet VS, calculated using eq 3 of the methodology
BGTA 9:EF	kgCH4 per animal per year for livestock type LT	21.654		linked to sheet AMWS
BGTA 31: MS%i,y	Fraction of manure handled in project animal manure management system i	62%	kgCH/animal	calculation
$BE_{LT,y}$	Baseline emissions /animal	0.729	tCH4/hh	calculation
BGTA 30: $N_{p,y}$	Number of sheep	1.13	units	VPA01 CPII MRI
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter per sheep	0.2573	kg/hd/day	linked to sheet VS, calculated using eq 3 of the methodology
BGTA 9:EF	kgCH4 per animal per year for livestock type LT	2.877		linked to sheet AMWS
BGTA 31: MS%i,y	Fraction of manure handled in project animal manure management system i	0%		
$BE_{LT,y}$	Baseline emissions /animal	0.000	tCH4/hh	calculation
BGTA 30: $N_{p,y}$	Number of goat	0.74	units	VPA01 CPII MRI
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter per goat	0.2496	kg/hd/day	linked to sheet VS, calculated using eq 3 of the methodology
BGTA 9:EF	kgCH4 per animal per year for livestock type LT	0.116		baseline survey, linked to sheet AWMS with full calculations
BGTA 31: MS%i,y	Fraction of manure handled in project animal manure management system i	4%		calculation
$BE_{LT,y}$	Baseline emissions /animal	0.001	tCH4/hh	calculation
BGTA 30: $N_{p,y}$	Number of poultry	38.32	units	VPA01 CPII MRI
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter per poultry	0.0104	kg/hd/day	linked to sheet VS, calculated using eq 3 of the methodology
BGTA 9:EF	kgCH4 per animal per year for livestock type LT	17.694		baseline survey, linked to sheet AWMS with full calculations
BGTA 31: MS%i,y	Fraction of manure handled in project animal manure management system i	6%		calculation
$BE_{LT,y}$	Baseline emissions /animal	0.405	tCH4/hh	calculation
Uf	Model correction for uncertainties	0.89		Model correction factor as per methodology
BEAWMS,y	Baseline emissions in year y	5.6929	tCO_{2e} / yr/hh	Calculated with equation 1in the methodology

The summation of these emissions by animals type as shown in the table, and multiplying this with the GWP of methane, and correction for uncertainties yields the baseline emissions from manure management.

Project emissions from AWMS are the emissions from physical leakage (LE) and continued baseline emissions and are calculated using equations 10 and 11 for LE. The results are shown here below:

Table 8: Project PE AMWS calculation[21]

Reference	Description	Data	Unit	Source
CH4	Global Warming Potential of methane	28		https://globalgoals.goldstandard.org/standards/RU-2020-PR-V1.2-GWP-values.pdf
N2O	Global Warming Potential of Nitrous dioxide	265		https://globalgoals.goldstandard.org/standards/RU-2020-PR-V1.2-GWP-values.pdf
DCH4	Density of methane (conversion factor)	0.00067	tonne/m3	IPCC default
Days	Days per year	365	units	
BGTA 30: $N_{LT,y}$	Number of dairy cows	4.85	units/hh	linked to raw data from the baseline survey
B_{0T}	Maximum methane producing capacity for manure produced by dairy cows	0.13	m3 CH4/kg	https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch10_Livestock.p
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter per dairy cows	4.104	kg/day	linked to sheet VS
BGTA 31: $MS_{su,y}$	Share manure treated in biodigester	87%		CPII first monitoring survey reported in VPA01-DD CPII
10%	Physical leakage factor	10%	-	methodology default
$PE_{AWMS,y}$	Project scenario emissions continued baseline and biodigester	150.74	gCH4/day	calculated
BGTA 30: $N_{LT,y}$	Number of other cattle	0.46	units/hh	linked to raw data from the baseline survey
B_{0T}	Maximum methane producing capacity for manure produced by animal LT	0.13	m3 CH4/kg	https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch10_Livestock.pdf
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter	2.6416	kg/day	linked to sheet VS
BGTA 31: $MS_{su,y}$	Share manure treated in biodigester	56.7%		CPII first monitoring survey reported in VPA01-DD CPII
10%	Physical leakage factor	10%	-	methodology default
$PE_{AWMS,y}$	Project scenario emissions continued baseline and biodigester	6.01	gCH4/day	calculated
BGTA 30: $N_{LT,y}$	Number of market swine	0.12	units/hh	linked to raw data from the baseline survey
B_{0T}	Maximum methane producing capacity for manure produced by animal LT	0.29	m3 CH4/kg	https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch10_Livestock.pdf
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter	0.3102	kg/day	linked to sheet VS
BGTA 31: $MS_{su,y}$	Share manure treated in biodigester	25%		CPII first monitoring survey reported in VPA01-DD CPII
10%	Physical leakage factor	10%	-	methodology default
$PE_{AWMS,y}$	Project scenario emissions continued baseline and biodigester	0.18	gCH4/day	calculated
BGTA 30: $N_{LT,y}$	Number of breeding swine	0.15	units/hh	linked to raw data from the baseline survey
B_{0T}	Maximum methane producing capacity for manure produced by animal LT	0.29	m3 CH4/kg	https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch10_Livestock.pdf
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter	0.366	kg/day	linked to sheet VS
BGTA 31: $MS_{su,y}$	Share manure treated in biodigester	62%		CPII first monitoring survey reported in VPA01-DD CPII
10%	Physical leakage factor	10%	-	methodology default
$PE_{AWMS,y}$	Project scenario emissions continued baseline and biodigester	0.65	gCH4/day	calculated
BGTA 30: $N_{LT,y}$	Number of sheep	1.13	units/hh	linked to raw data from the baseline survey
B_{0T}	Maximum methane producing capacity for manure produced by animal LT	0.13	m3 CH4/kg	https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch10_Livestock.pdf
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter	0.2573	kg/day	linked to sheet VS
BGTA 31: $MS_{su,y}$	Share manure treated in biodigester	0%		CPII first monitoring survey reported in VPA01-DD CPII
10%	Physical leakage factor	10%	-	methodology default
$PE_{AWMS,y}$	Project scenario emissions continued baseline and biodigester	0.00	gCH4/day	calculated
BGTA 30: $N_{LT,y}$	Number of goat	0.74	units/hh	linked to raw data from the baseline survey
B_{0T}	Maximum methane producing capacity for manure produced by animal LT	0.13	m3 CH4/kg	https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch10_Livestock.pdf
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter	0.2496	kg/day	linked to sheet VS
BGTA 31: $MS_{su,y}$	Share manure treated in biodigester	4%		CPII first monitoring survey reported in VPA01-DD CPII
10%	Physical leakage factor	10%	-	methodology default
$PE_{AWMS,y}$	Project scenario emissions continued baseline and biodigester	0.07	gCH4/day	calculated
BGTA 30: $N_{LT,y}$	Number of poultry	38.32	units/hh	linked to raw data from the baseline survey
B_{0T}	Maximum methane producing capacity for manure produced by animal LT	0.24	m3 CH4/kg	https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch10_Livestock.pdf
BGTA 10a,VS_T	Daily volatile solid excreted for livestock category T in g dry matter	0.0104	kg/day	linked to sheet VS
BGTA 31: $MS_{su,y}$	Share manure treated in biodigester	6%		CPII first monitoring survey reported in VPA01-DD CPII
10%	Physical leakage factor	10%	-	methodology default
$PE_{AWMS,y}$	Project scenario emissions continued baseline and biodigester	0.37	gCH4/day	calculated
$PE_{PL,y}$	Project emissions from physical leakage in year y	1.615	tCO2e / yr /hh	calculated with equation 14 in the methodology

[21] See VPA06 CPII SDG baseline sheet PE cell C2:G58

The summation of these emissions by animals type as shown in the table, and multiplying this with the GWP of methane and correction for uncertainties yields the project emissions from manure management.

b. Fuel switch

Baseline fuel use in the baseline is calculated with equation 4 of this report, and equation 5 and 6 for the specific CO2 and non-CO2 emissions. The baseline emissions results are depicted below.

The total amount of fuel in the population is calculated by calculating the weighted average wood and charcoal consumption, thus by taking into account the relative fraction of each fuel use scenario and the amount consumed.

Table 9: **Baseline fuel consumption**[22]

[22] See sheet BE in file VPA06 CPII SDG database cell C55:G89

B1	B1: Firewood used to meet (more than 50%) of my cooking needs	76%	-	Fist monitoring survey CPII - fixed for this CP
B2	B2: Charcoal used to meet (more than 50%) of my cooking needs	8%	-	Fist monitoring survey CPII - fixed for this CP
B3	B4:Other fuels	16%	-	Fist monitoring survey CPII - fixed for this CP

BFTwoood result	The quantity of wood consumed	3.417	ton/year	ABPL BFT firewood result sheet cel I63
	The quantity of charcoal consumed	0.009	ton/year	ABPL BFT firewood result sheet cell M63
	The quantity of LPG consumed	0.009	ton/year	ABPL BFT firewood result sheet cell U63

BFTcharcoal result	The quantity of wood consumed	0.625	ton/year	ABPL BFT Charcoal result sheet cell M62
	The quantity of charcoal consumed	0.734	ton/year	ABPL BFT Charcoal result sheet cell M62
	The quantity of LPG consumed	0.014	ton/year	ABPL BFT Charcoal result sheet cell M62

BFTLPG result	The quantity of wood consumed	0.187	ton/year	ABPL BFT LPG result sheet cell I62
	The quantity of charcoal consumed	0.032	ton/year	ABPL BFT LPG result sheet cell M62
	The quantity of LPG consumed	0.237	ton/year	ABPL BFT LPG result sheet cell U62

Pb,i,y	The quantity of wood consumed	2.670	ton/year	Calculation
NCV	Net calorific value of the non-renewable biomass that is substituted	0.0156	TJ/tonne	IPCC default
EF_{CO2}	CO_2 emission factor of wood	112	tCO_2/TJ	BGTA13 default
EF_{nonCO2}	Non CO2 emission factor of wood	9.46	tCO_2/TJ	BGTA 14 default

Pb,i,y	The quantity of charcoal consumed	0.073	ton/year	Calculation
NCV	Net calorific value of the non-renewable biomass that is substituted	0.0295	TJ/tonne	IPCC default
EF_{CO2}	CO2 emission factor of charcoal	165	tCO2/TJ	BGTA13 default
EF_{nonCO2}	Non-CO2 emission factor of charcoal	44.83	tCO2/TJ	BGTA 14 default

Pb,i,y	The quantity of LPG consumed	0.045	ton/year	Calculation
NCV	Net calorific value of LPG fuel subsituted	0.0473	TJ/tonne	IPCC default
EF_{CO2}	CO2 emisson factor of subsituted fuel	63.1	tCO_2/TJ	IPCC default
EF_{nonCO2}	Non CO2 emission factor	0.1665	tCO2/TJ	Calculation

$SEb,y,CO2$	Specific CO2 emissions for a baseline b technology in year y	5.158	tCO2 e/ yr /hh	calculation
$SEb,y,non-CO2$	Specific non-CO2 emissions for a baseline b technology in year y	0.491	tCO2e/yr/hh	calculation
f_{NRB}	Fraction of non-renewable biomass	74.4%		fNRB survey
$BE_{TA,y}$	Baseline emissions for total project activity in year y	**4.363**	tCO_2 e/ yr /hh	calculation

The project emissions, calculated with equations 12 and 13 and 14 for the CO2 and non-CO2 emissions respectively of this report. The PFT results from the last monitoring period were used. The project emission calculation is shown here below:

Table 10: Project fuel emissions[23]

	The quantity of wood consumed	0.5132	ton/year	10Jan23 VPA06 MPIV survey SDG_ER sheet PFT9030 cell F60
NCV	Net calorific value of the non-renewable biomass that is substituted	0.0156	TJ/tonne	IPCC default
	CO_2 emission factor of wood	112	tCO_2/TJ	BGTA13 default
2	Non CO2 emission factor of wood	9.46	tCO_2/TJ	BGTA 14 default

	The quantity of charcoal consumed	0.0124	ton/year	10Jan23 VPA06 MPIV survey SDG_ER sheet PFT9030 cell G60
NCV	Net calorific value of the non-renewable biomass that is substituted	0.0295	TJ/tonne	IPCC default
	CO2 emission factor of charcoal	165	tCO2/TJ	BGTA13 default
2	Non-CO2 emission factor of charcoal	44.83	tCO2/TJ	BGTA 14 default

	The quantity of LPG consumed	0.0001	ton/year	10Jan23 VPA06 MPIV survey SDG_ER sheet PFT9030 cell H60
NCV	Net calorific value of LPG fuel subsituted	0.0473	TJ/tonne	IPCC default
	CO2 emisson factor of subsituted fuel	63.1	tCO_2e/TJ	IPCC default
2	Non CO2 emission factor	0.1665	tCO2e/TJ	Calculated based on IPCC defaults

$SEp,y,CO2$	Specific CO2 emissions for a project technology in year y	0.957	tCO2e / yr /hh	Calculation
$SEp,y,non-CO2$	Specific non-CO2 emissions for a baseline b technology in year y	0.092	tCO2e / yr /hh	Calculation
	Fraction of non-renewable biomass	74%		fNRB survey
	Project emissions for total project activity in year	**0.804**	tCO_{2e} / yr /hh	Calculation

Finally, the emission reductions are calculated with equation 15 in this report, which is the sum of the calculated BE minus the PE in this section multiply by the number of

[23] See sheet PE_LE in VPA06 CPII SDG database cell C61:G79

number of units in operation for the length of the monitoring period. Section B6.4 presents the ERs for the 7 years in this CP.

Other SDGs – example calculations are tabulated below – all values are sourced from parameters monitored. All data here is sourced from the sheet SDG impact tool in file VPA06 CPII SDG database. **For readability, only the cells are referenced.**

SDG	Contribution	Ex-ante estimate
1	GSDM-I1.1.1 Average household savings i.e., decrease in expenditure on basic service such cooking, lighting, drinking	This SDG is calculated with equation SDG1 The household savings are 26.32 Ksh per day and is calculated by subtracting maintenance cost from savings incurred from fuel substitution. This is then multiplied with the number of technology days included. Cell H81, for annual figures see B.6.4
2	GSDM-I2.4.2 Number of farmers adopted the practice by the project	This SDG is calculated with equation SDG2 100% of the farmers use bio-slurry, that times the number of plants in operation yield the annual result. Cell L78, for annual figures see B.6.4
	GSDM-I2.4.3: Area under sustainable agriculture	The outcome of GSDM-I.2.4.2 multiplied with the percentage of land on which bio-slurry is applied and land ownership gives the average per farmer (which is according to the baseline survey referenced in VPA01-DD: 1.42 ha). Cell P78, for annual figures see B.6.4
3	GSDM-I.3.9.1: Reduced indoor air pollution	This SDG is calculated with equation SDG3 The percentage of households observing a reduction in PM2.5 and CO is 93%. That multiplied by the number of units in operation gives the total result. Cell T79, for annual figures see B.6.4

4	GSDM-I.4.4.1 Number of employees provided skill development training	This is based on the number of masons trained, which is 113 at the end of CPI / start of this CP Cell X79, for annual figures see B.6.4
5	GSDM-I.5.4.1: Average time saving associated with cooking time and fuel collection	This SDG is calculated with equation SDG5 The total time savings of biodigester in operation is 1.94 hours/day/hh (1 hour and 56 minutes). That time the number of plants in operation gives the annual result. Cell AB79, for annual figures see B.6.4
7	GSDM-I7.1.1: Number of beneficiaries: individuals and households	This SDG is calculated with equation SDG7 The total number household with access to energy are biodigesters installed * average household size (cell AF77) For annual figures see B.6.4
8	GSDM-I.8.5.1 total number of jobs	This is a cumulative number of masons provided biodigester- jobs created, and this is 464 for year 1 in CPII, see cell AK59 The count is based on the total number of digesters constructed, regardless of operationality. For annual figures see B.6.4
9	GSDM-I.9.3.1 Total number of companies supported for their integration into value chains and markets	This is the cumulative number of companies that gained access to the biogas value chain, which is 243 in year 1 of CPII, see AO59 The count is based on the total number of digesters constructed, regardless of operationality. For annual figures see B.6.4
12	GSDM-I.12.5.2: Improved waste management services	This SDG is calculated with equation SDG2 This is obtained by multiplying the number of biodigester in operation with the feeding rate,

		manure and water (138.37 kg/day, cell AR80) and then annualized. For annual figures see B6.4
15	GSDM-I15.1.1 Total non-renewable wood fuel saved	This SDG is calculated with equation SDG15 This is based on equation 4 and 12 in this report and multiplied with the number of technology days included, see AV59 for year 1. For annual figures see B.6.4

B.6.4. Summary of ex ante estimates of each SDG outcome

GSDM-I13.2.1: Reduction in GHGs emissions

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	35,885	8,633	27,252
2025	52,132	12,542	39,590
2026	61,759	14,858	46,901
2027	73,506	17,684	55,822
2028	87,396	21,026	66,370
2029	97,588	23,478	74,110
2030	104,816	25,217	79,599
1/1/2031 to 13/03/2031	20,335	4,892	15,443

Total	**533,417**	**128,330**	**405,087**
Total number of crediting years	7		
Annual average over the crediting period	57,870		

GSDM-I1.1.1 Average household savings i.e., decrease in expenditure on basic service such cooking, lighting, drinking

The results in Ksh are tabulated below. The value will also be presented in USD in the monitoring report based on the prevailing forex exchange rate.

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	34,282,667	34,282,667
2025	0	49,804,689	49,804,689
2026	0	59,001,947	59,001,947
2027	0	70,224,267	70,224,267
2028	0	83,493,839	83,493,839
2029	0	93,231,285	93,231,285
2030	0	100,135,822	100,135,822
1/1/2031 to 13/03/2031	0	19,427,209	19,427,209
Total	**-**	**509,601,725**	**509,601,725**

Total number of crediting years	7		
Annual average over the crediting period	72,800,246		

GSDM-I2.4.2 Number of farmers adopted the practice by the project

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	4481	4,481
2025	0	5217	5,217
2026	0	6184	6,184
2027	0	7361	7,361
2028	0	8727	8,727
2029	0	9753	9,753
2030	0	10461	10,461
1/1/2031 to 13/03/2031	0	10275	10,275
Total	**-**	**10,275**	**10,275**
Total number of crediting years	7		
Annual average over the crediting period	7,807		

GSDM-I2.4.3: Area under sustainable agriculture

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	6,378	6,378
2025	0	7,424	7,424
2026	0	8,800	8,800
2027	0	10,476	10,476
2028	0	12,420	12,420
2029	0	13,880	13,880
2030	0	14,888	14,888
1/1/2031 to 13/03/2031	0	14,622	14,622
Total number of crediting years	-	14,622	14,622
Annual average over the crediting period	11,111		
Total number of crediting years	**7**		

GSDM-I3.9.1 Number of households that observed reduction in PM2.5 & carbon monoxide (CO) concentration reductions

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	4166	4,166

2025	0	4850	4,850
2026	0	5749	5,749
2027	0	6844	6,844
2028	0	8113	8,113
2029	0	9067	9,067
2030	0	9726	9,726
1/1/2031 to 13/03/2031	0	9552	9,552
Total	**-**	**9,552**	**9,552**
Total number of crediting years	7		
Annual average over the crediting period	7,258		

GSDM-I.4.4.1 Number of employees provided skill development training

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	122	122
2025	0	158	158
2026	0	203	203

2027	0	278	278
2028	0	378	378
2029	0	478	478
2030	0	578	578
1/1/2031 to 13/03/2031	0	578	578
Total	**-**	**578**	**578**
Total number of crediting years	7		
Annual average over the crediting period	346		

GSDM-I.5.4.1: Average time saving associated with cooking time and fuel collection

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	2,525,058	2,525,058
2025	0	3,668,318	3,668,318
2026	0	4,345,734	4,345,734
2027	0	5,172,303	5,172,303
2028	0	6,149,661	6,149,661

2029	0	6,866,864	6,866,864
2030	0	7,375,411	7,375,411
1/1/2031 to 13/03/2031	0	1,430,893	1,430,893
Total	**0**	**37,534,241**	**37,534,241**
Total number of crediting years	7		
Annual average over the crediting period	5,362,034		

GSDM-I7.1.1: Number of beneficiaries: individuals

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	21,457	21,457
2025	0	24,977	24,977
2026	0	29,607	29,607
2027	0	35,244	35,244
2028	0	41,784	41,784
2029	0	46,697	46,697
2030	0	50,086	50,086
1/1/2031 to 13/03/2031	1	49,194	49,193

Total	**-**	**49,194**	**49,193**
Total number of crediting years	7		
Annual average over the crediting period	37,381		

GSDM-I7.1.1: Number of beneficiaries: households

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	o	4,481	4,481
2025	o	5,217	5,217
2026	o	6,184	6,184
2027	o	7,361	7,361
2028	o	8,727	8,727
2029	o	9,753	9,753
2030	o	10,461	10,461
1/1/2031 to 13/03/2031	o	10,275	10,275
Total		**10,275**	**10,275**
Total number of crediting years	7		
Annual average over the crediting period	7,807		

GSDM-I.8.5.1 total number of jobs

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	449	449
2025	0	536	536
2026	0	652	652
2027	0	797	797
2028	0	971	971
2029	0	1116	1,116
2030	0	1232	1,232
1/1/2031 to 13/03/2031	0	1247	1,247
Total	**-**	**1,247**	**1,247**
Total number of crediting years	7		
Annual average over the crediting period	875		

GSDM-I.9.3.1 Total number of companies supported for their integration into value chains and markets

Year	Baseline estimate	Project estimate	Net benefit

14/03/24 to 31/12/2024	0	236	236
2025	0	281	281
2026	0	342	342
2027	0	418	418
2028	0	510	510
2029	0	586	586
2030	0	647	647
1/1/2031 to 13/03/2031	0	655	655
Total	**-**	**655**	**655**
Total number of crediting years	7		
Annual average over the crediting period	439		

GSDM-I.12.5.2: Improved waste management services

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	0	180,233	180,233
2025	0	261,837	261,837
2026	0	310,189	310,189

2027	0	369,188	369,188
2028	0	438,949	438,949
2029	0	490,142	490,142
2030	0	526,441	526,441
1/1/2031 to 13/03/2031	0	102,134	102,134
Total	**-**	**2,679,112**	**2,679,112**
Total number of crediting years	7		
Annual average over the crediting period	382,730		

GSDM-I15.1.1 Total non-renewable wood fuel saved

Year	Baseline estimate	Project estimate	Net benefit
14/03/24 to 31/12/2024	9,401	1,785	7,616
2025	10,567	2,007	8,560
2026	12,420	2,358	10,061
2027	14,751	2,801	11,950
2028	17,515	3,326	14,189
2029	20,104	3,818	16,286

2030	21,976	4,173	17,803
1/1/2031 to 13/03/2031	22,519	4,276	18,243
Total	**129,253**	**24,545**	**104,708**
Total number of crediting years	7		
Annual average over the crediting period	14,958		

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

SDG 13

Data / Parameter	BGTA 24: Avoidance of double counting or double claiming among project technology end users
Unit	NA
Description	Evidence of avoidance of double counting or double claiming with project technology end users
Source of data	Warranty certificates / sales contracts alerting end-users to the waiving of their carbon rights signed by end users
Value(s) applied	100% of the users have received a warranty card at commissioning of their digester
Measurement methods and procedures	N/A
Monitoring frequency	Monitored whenever project technology is sold or otherwise disseminated.
QA/QC procedures	Unique identification of users in the database
Purpose of data	Calculation of project scenario

Additional comment	All

Data / Parameter	BGTA 25: $U_{p,y}$
Unit	Percentage
Description	Average usage rate in project scenario p during year y
Source of data	VPA06 CPII SDG database sheet SDG_outcome, cell F9
Value(s) applied	Ex-ante: 80.4% for year 1 forecasted
Measurement methods and procedures	Monitoring of operationality of the biogas systems, including the operationality of both the biogas digester and biogas cookstove, through (a) Census of users or survey of the users at randomly selected sample sites; (b) Based on on-going rental/lease payments or a recurring maintenance fee by users; (c) Measurement campaigns using biogas flow meters. For all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) or 95/10 (for biennial monitoring) confidence/precision levels. The project can claim up to 90% in cases where the operationality is determined based on user reported questionnaire survey i.e., using option (a) above to account for uncertainties. Maximum up to 100% usage rate can be claimed using option (b) and (c). For the case of measurement campaigns using biogas flow meters, it may be undertaken at randomly selected sample sites. The selected samples should take into account possible stratification of the population according to the capacity, biogas digester types and region where the digesters are installed

<table>
<tr><td></td><td>(e.g., 6 cubic metre or 8 cubic metre capacity, fixed dome or floating dome type, regions where seasons influence average ambient temperature). The stratification of the population could be exempted in cases the project demonstrates that the approach applied for measuring the used biogas, results in conservative values for biogas used.
The continuous use monitoring campaign shall be conducted for a minimum of 100 households for at least 30 days.
The operational rate of each system is determined by dividing the number of days in operation by the length of the campaign. An operational day is a day in which biogas is consumed.</td></tr>
<tr><td>Monitoring frequency</td><td><table><tr><td>Method</td><td>Frequency</td></tr><tr><td>Census of users or survey of the users at randomly selected sample sites</td><td>Annual</td></tr><tr><td>Based on on-going rental/lease payments or a recurring maintenance fee by users;</td><td>Continuous measurement</td></tr><tr><td>Measurement campaigns using biogas flow meters</td><td>Annual</td></tr></table></td></tr>
<tr><td>QA/QC procedures</td><td>Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring)</td></tr>
<tr><td>Purpose of data</td><td>Calculation of project scenario</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

Data / Parameter	BGTA 26: $N_{LT,y}$
Unit	Number

Description	Annual average number of animals of type *LT* in year *y*
Source of data	Ex-ante from: number of swine produced CPII VPA01-DD parameter 26, the other values from VPA06 CPII ER SDG database sheet BE Cell E9, 15, 21, 33, 39, 45
Value(s) applied	Number of dairy cows 4.85 Number of other cattle 0.46 Swine finishing 0.71 Number of breeding swine 0.15 Number of sheep 1.13 Number of goat 0.74 Number of poultry 38.32
Measurement methods and procedures	This parameter reflects the annual number of animals produced. Parameter BGTA 30 reflects the annual average.
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project and baseline scenario
Additional comment	N/A

Data / Parameter	BGTA27: TAM_{LT}
Unit	kg/animal
Description	Typical animal mass for livestock LT at the project site.
Source of data	IPCC default TAM values as provided in Table 10A.5 as well as in the Annexes of Chapter 10 of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National

	Greenhouse Gas Inventories shall be selected accordingly.
Value(s) applied	<table><tr><td>Dairy cow</td><td>270</td></tr><tr><td>Cattle</td><td>208</td></tr><tr><td>Fattening pig</td><td>33</td></tr><tr><td>Breeding pig</td><td>61</td></tr><tr><td>Goat</td><td>24</td></tr><tr><td>Sheep</td><td>31</td></tr><tr><td>Poultry</td><td>0.8</td></tr></table>
Measurement methods and procedures	When IPCC values of VS are adjusted for site specific animal weight as per para 3.5.4 | or 3.5.7 | and *Eq. 3* or *Eq. 6* sampling procedures can be used to estimate this variable as per the Section 4.4 |General requirements for sampling of the applied methodology
Monitoring frequency	Annual
QA/QC procedures	Proper implementation of the methodology
Purpose of data	Calculation of project scenario
Additional comment	N/A

Data / Parameter	BGTA 28: nd_y
Unit	Days
Description	Number of days the treatment plant was operational in year *y*.
Source of data	Monitoring survey
Value(s) applied	N/A, varies on the length of the MP.
Measurement methods and procedures	Survey methods
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	N/A

Data / Parameter	BGTA 29:$N_{da,y}$
Unit	days
Description	Number of days animal is alive in the farm in the year y
Source of data	Ex-ante taken from VPA01-DD CPII
Value(s) applied	See data/parameter BGTA 25, this applies to animals raised in cycles.

Dairy cow	N/A static population
Cattle	N/A static population
Fattening pig	120
Breeding pig	N/A static population
Goat	N/A static population
Sheep	N/A static population
Poultry	N/A static population

Measurement methods and procedures	Monitoring survey
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	N/A

Data / Parameter	BGTA 30: $N_{p,y}$
Unit	[-]
Description	Annual average number of animals of type LT in year y
Source of data	VPA06 CPII SDG database sheet BE Cell E9, 15, 21, 27, 33, 39, 45
Value(s) applied	

Number of dairy cows	4.85
Number of other cattle	0.46
Swine finishing	0.12
Number of breeding swine	0.15
Number of sheep	1.13
Number of goat	0.74
Number of poultry	38.32

Measurement methods and procedures	AWMS Method 1 is applied in this VPA The annual average is determined by: - for animals with generally a static population: Asking the farmer how many on average he owns during a particular MP - for animals raised in cycles are fattening pigs. Asked will be how many rounds per year, the average length of a round (see BGTA 29), and number of animal per round to calculate the annual average.
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project and baseline scenario
Additional comment	N/A

Data / Parameter	BGTA 31: $MS\%_{i,y}$
Unit	%
Description	Fraction of manure handled in project animal manure management system i
Source of data	VPA06 CPII SDG database sheet PE_LE Cell E12, 18, 24, 30, 36, 42, 48 taken from VPA01-DD CPII
Value(s) applied	

Ex-ante, to be updated annually	Percentage
Dairy cow	87
Cattle	56.7
Fattening pig	25
Breeding pig	62
Sheep	0
Goat	4
Poultry	6

Measurement methods and procedures	Monitoring survey
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	N/A

Data / Parameter	BGTA32: Proper soil application
Unit	-
Description	Refers to the proper soil application which not resulting in methane emissions of the digestate
Source of data	VPA01-DD CPII
Value(s) applied	0
Measurement methods and procedures	The use of bio-slurry will be monitored and in case bio-slurry is not used, it will be assessed if this leads to methane emissions
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of the project scenario
Additional comment	Other systems are used that do not lead to emissions, such as using it as insecticide, animal feed etc.

b. Parameters related to Thermal application

Data / Parameter	BGTA 38: $N_{b,p,y}$
Unit	days
Description	Number of project technology-days included in the project database for each project scenario in year y
Source of data	VPA06 CPII ER SDG database sheet SDG 13 and Np cell F18
Value(s) applied	2,095,884 for year 1, ex-ante
Measurement methods and procedures	Calculated from the Project database as the sum of the number of installed project technology units times the calendar days during the year y that they were used at the end user locations. The methodological default of 2 weeks is used for the period from commissioning and start date
Monitoring frequency	Continuously, collected annually
QA/QC procedures	Cross check the results of the usage survey with the contents of the project database to confirm whether the project technology units surveyed are present at end user locations as expected, or not. If there is discrepancy, this must be explained or corrected.
Purpose of data	Calculation of project outcome
Additional comment	Conversion of methodology default of 2 weeks is by the following: in cumulative number of units installed in month 'y' are units installed in month 'y-1' + units installed in month 'y/2'. This is conservative as the average length of a month is more than 14 days Applicable to SDG 1,5,12 and 15 as well

Data / Parameter	BGTA 39: $LE_{p,y}$
Unit	tCO_2e per year
Description	Leakage in project scenario p during year y

Source of data	See parameter BGTA 43
Value(s) applied	0 (ex-ante)
Measurement methods and procedures	Survey method
Monitoring frequency	Every two years, or default discount value of 0.95 applied to emission reductions.
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project outcome
Additional comment	Monitoring parameters required for calculating leakage emissions shall be included in the monitoring plan in the PDD as required to monitor and quantify the sources of leakage determined by following section 3.7 |Leakage emissions.

Data / Parameter	BGTA 42: $P_{p,i,y}$
Unit	tonnes/household/year
Description	Quantity of fuel that is consumed in project scenario p during year y.
Source of data	VPA06 CPI MRV v1.5 PFT
Value(s) applied	Fuelwood: 0.5132 Charcoal: 0.0124 LPG: 0.0001
Measurement methods and procedures	Kitchen performance test
Monitoring frequency	Updated every two years, or more frequently. The KPT values are valid for two years and may be applied for before or after period.

QA/QC procedures	Compliance with the general requirements for sampling (Section 4.4 |), general requirements for QA/QC (Section 4.5 |) and Annex 2: COMPLEMENTARY GUIDELINES FOR KITCHEN PERFORMANCE TESTING. Of the applied methodology
Purpose of data	Calculation of project outcome
Additional comment	Updated every two years, or more frequently. The KPT values are valid for two years and may be applied for before or after period.

Data / Parameter	BGTA 43: Leakage assessment
Unit	tonnes/household/year
Description	Quantity of fuel that is consumed in project scenario p during year y attributed to leakage
Source of data	VPA01-DD MPI CPII
Value(s) applied	0
Measurement methods and procedures	

#	Source to evaluate	Assessment	Ex-ante assessment based on VPA01 CPII MP results
	The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or with a higher intensity than would have occurred in the absence of the project.	The biogas household will be asked what happened with their baseline technology and if this was used outside the project boundary displacing a lower emitting technology	All households either use it, demolished it, or keep it as back up stove.
	Members of the population who do not participate in the	This is not a risk. The project will save wood and therefore	N/A no hh gave their stove away

	project, and previously used lower emitting energy sources, instead use the non-renewable biomass or fossil fuels saved under the project activity.	reduce the pressure on the forest. Fossils fuels are a minor sour of energy in the project.	
	The project significantly reduces the NRB fraction within an area where other GHG mitigation project activities account for NRB fraction in their baseline scenario.	Biogas households are scattered throughout the country and not concentred. This is therefore not an issue	
	The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of space heating or by retaining some use of inefficient technology.	Households will be asked, do you use more fuels for space heating since you have installed a biogas plant. If so, how much?	The amount of fuel has decreased as per MPI results (cell E128 of the referenced sheet)
	By virtue of promotion and marketing of a new technology, the project stimulates substitution with this technology by households who commonly used a technology with relatively lower	This is the project activity. No assessment is required.	

	emissions.
Monitoring frequency	Updated every two years, or more frequently.
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project outcome
Additional comment	-

SDG 1

Data / Parameter	GSDM-I1.1.1: SDG1
Unit	Gross savings (local currency/day)
Description	Reduction in expenditure on cooking fuels in the project scenario compared to the baseline
Source of data	Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA) VPA06_CPII ER SDG sheet SDG impact tool cell H79
Value(s) applied	26.37 Ksh
Measurement methods and procedures	Survey – households will be asked how much they saved on cooking fuels, boiling water and lighting compared to the situation before having a biodigester
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project outcome
Additional comment	-

Data / Parameter	GSDM-I1.1.1: OM
Unit	Operation and maintenance expenses biodigester (local currency/day)
Description	Costs associated with operating and maintaining the biodigester
Source of data	Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA) VPA06_CPII ER SDG sheet SDG impact tool cell H80
Value(s) applied	0.05 Ksh
Measurement methods and procedures	Survey – households will be asked how much they spent on operating and maintaining their biodigester
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project outcome
Additional comment	-

Data / Parameter	GSDM-I1.1.1: Forex
Unit	Ksh/USD
Description	Forex exchange rate
Source of data	www.xe.com
Value(s) applied	0.00064 on 8/8/2023
Measurement methods and procedures	the website Xe.com will be used for the exchange rate
Monitoring frequency	Annual

QA/QC procedures	Include the day of the exchange rate for traceability
Purpose of data	Calculation of project outcome
Additional comment	-

SDG 2

Data / Parameter	GSDM-I2.2.3: $BIOu$
Unit	Bio-slurry usage rate
Description	% farmers using bio-slurry as fertilizer
Source of data	Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA)
Value(s) applied	100% ex-ante
Measurement methods and procedures	Survey method – households will be asked how much land is in cultivation and the proportion on which bio-slurry is applied as main fertilizer
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	-

Data / Parameter	GSDM-I2.2.3: Fa
Unit	hectare/hh
Description	Land area on which bio-slurry is applied
Source of data	Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA)

Value(s) applied	1.42
Measurement methods and procedures	Survey method – households will be asked how much land is in cultivation and the proportion on which bio-slurry is applied as main fertilizer
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	-

SDG 3

Data / Parameter	GSDM-I3.3.9: HAP_r
Unit	%
Description	Fraction of families mentioned reduction in household air pollution
Source of data	Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA)
Value(s) applied	Ex ante: 93%
Measurement methods and procedures	Survey method, households will be asked if a reduction in household air pollution is observed
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	-

SDG 4

Data / Parameter	GSDM-I4.4.1: Quality education
Unit	Number
Description	Refers to the number of masons, companies and other's who received training services of any type via project during the reporting period.
Source of data	VPA01-DD CPII (undergoing design renewal review together with this VPA) See VPA06_CPII ER SDG sheet SDG impact tool cell X59
Value(s) applied	Ex-ante: 122 for the first year
Measurement methods and procedures	Training reports
Monitoring frequency	Annual
QA/QC procedures	Recording of training and participant lists
Purpose of data	Calculation of project scenario
Additional comment	50% of trainings is attributed to VPA01 and the remainder to VPA06

SDG 5

Data / Parameter	GSDM-I5.4.1: Ts
Unit	Hour/day
Description	Time savings (hours per day)
Source of data	Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA)
Value(s) applied	Ex-ante: 1.94
Measurement methods and procedures	Sample surveys in representative households. The main cook will be asked how much time she saved on

	collecting wood, starting and tendering the fire and cleaning of pots attributed to the biodigester.
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	2 hh mentioned time has increased out of 79 respondents. 1 due to increase in number of animals and 1 attributed to feeding versus usage of LPG. The latter is related to the biodigester. See the analysis in sheet SDG outcome cell B93:E96

Data / Parameter	GSDM-I5.4.1: Usage of time saved
Unit	Usage of time saved
Description	In order to understand whether clean and/or efficient cookstove or fuel is contributing to more gender-equitable development, it is important to know how users are spending their saved time and whether the act of saving time on fuel collection actually contributes to their well-being and empowerment, or if that time is just replaced with another household chore."
Source of data	SMS Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA)
Value(s) applied	Ex-ante:

usage of time	% experienced
Productive time use	54%
Leisure	4%
Family activities	15%

	education activities: 3% Social activities: 24%
Measurement methods and procedures	Sample surveys in representative households
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	-

SDG 7

Data / Parameter	GSDM-I7.1.1: HHs
Unit	Household size
Description	Average household size
Source of data	Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA)
Value(s) applied	Ex-ante: 4.788
Measurement methods and procedures	Sample surveys in representative households
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	-

SDG 12

Data / Parameter	GSDM-I.12.5.2: $F_{(p,b)}$
Unit	kg feeding/day
Description	Biodigester feeding rate with manure and water
Source of data	Ex-ante: taken from VPA01-DD CPII (undergoing design renewal review together with this VPA)
Value(s) applied	Ex-ante: 138.37
Measurement methods and procedures	Sample surveys in representative households
Monitoring frequency	Annual
QA/QC procedures	Compliance with the general requirements for sampling and for all cases where sampling is applied, the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be used for determining the sample size to achieve 90/10 (for annual monitoring) confidence/precision levels.
Purpose of data	Calculation of project scenario
Additional comment	-

B.7.2. Sampling plan

The sampling plan is the following for the SDG monitoring survey (SMS) and the baseline survey.

	Requirement during monitoring	**Baseline survey conversion**
Survey name	SDG monitoring survey (SMS)	Baseline survey
Representativeness	The project survey requires in person interviews with a robust sample of end users without project technologies that are representative of end users targeted in the project activity.	A baseline survey was executed in November 2021 for the development of this VPA—DD. Project households were randomly selected and based on this selection equivalent households with the potential for biogas, defined of

		having at least 2 cattle or 5 pigs, were selected near the project households.
Sampling frame	Project database	Nearest households from a randomly selected biogas household
Sample Sizing	> 100 (as the population is larger than 1000)	> 100 (actual n=130)
Cross-VPA sampling	Cross-VPA sampling is not allowed across groups larger than 10 VPAs. The requirements described here apply both when sampling is applied to a single VPA and to permissible cross-VPA sampling	The survey is representative for Kenya VPA01 and VPA06
Sampling method	A statistically valid sample can be used to determine parameter values, as per the relevant requirements for sampling in the latest version of the CDM Standard for sampling and surveys for CDM project activities and programme of activities. 90% confidence interval and a 10% margin of error requirement shall be achieved for the sampled parameters unless mentioned otherwise in the methodology. The parameter of interest on the basis of which the compliance with the 90/10 sampling compliance will be assessed is the usage rate	The sampling frame of the existing biodigester users was used. This ensured that the survey took place in the localities where the actual implementation takes place.
Data to be collected	See parameters to be monitored	See section B.7.1 and indicator **BGTA 6:** for baseline scenario survey results.

Table 11: Kitchen performance test

	Requirement during monitoring	**Baseline survey conversion[24]**
KPT	PFT	BFT (verified values[25])
Sample size	> 30	B1: >30 (actual 53)
		B2: >30 (actual 46)
		B3: > 30 (actual 34)
Purpose	The baseline and project performance field tests (BFT and PFT) measure real, observed technology performance in the field. When Option 1 (based on avoided quantity of fuel consumption) is applied, a field test is carried out both for baseline[26] and project scenarios, either by an independent sample (different subjects for baseline and project scenarios).	
Target group	Households with a biodigester	Equivalent households without a baseline. Criteria used in order of importance and deviation permissible were: 1. The HH size of BFT HH is a maximum deviation of +/- 2 people compared to the project HH size. 2. The Number of meals should match-not the deviation on this one, if Project HH cooked 3 meals, then BFT HH should be cooking 3 meals per day. 3. The minimum number of animals should be met, by the BFT HH (>20 kg manure per day) 4. The Stove in use in the BFT HH should be equivalent with the baseline stove of the project hh

[24] Implemented in July and august 2023, result taken from 3 spreadsheets (ABPL BFT [fuel] results sheets, where [fuel] is either B1:firewood, B2: charcoal or B3:LPG)
[25] Verified as per VPA01 CPII DD
[26] The default value for baseline scenario could be applied following the guidance for parameter **Error! Reference source not found.**

Sampling strategy	Simple random sampling	Simple random sampling based of biodigester households and selecting the nearest equivalent baseline household for the BFT. This ensures that the BFT takes place in areas with biodigesters
Statistical analysis	90/30 rule. When the sample sizes are large enough to satisfy the "90/30 rule," i.e., the endpoints of the 90% confidence interval lie within +/- 30% of the estimated mean GHG emission or fuel consumption, overall emission reductions can be calculated on the basis of the estimated MEAN annual emission reduction per unit or MEAN fuel annual savings per unit. Outliers will be excluded using the Grubb's Test[27].	As with the project scenario[28]. B1 90%/9% B2: 90%/15% B3: 90%/21% And therefore, the mean is used No outliers were detected

Project database including a total sales or dissemination record

A complete sale record is kept in the project database Salesforce. Salesforce include, at minimum the following information

1. Date of installation and commissioning
2. Geographic area of sale
3. Model/type of project technology sold

[27] For more information on the Grubbs' test, please refer to: https://www.itl.nist.gov/div898/handbook/eda/section3/eda35h1.htm *check of the significance of the results, please refer to an online tool available on: http://www.graphpad.com/quickcalcs/Grubbs1.cfm.*

[28] Cell AG39 in all the files sheet BFT sample [fuel] no editing. [fuel] is either firewood, charcoal or LPG

4. Quantity of project technologies sold
5. Name and telephone number (if available), and address and/or GPS coordinates:

Mode of use: domestic, institutional commercial, other.

B.7.3. Other elements of monitoring plan

>>

Quality assurance/Quality control

The CME will provide the necessary training to the VPA implementers, and the parties involved in the monitoring to ensure that the data recorded is complete and accurate. Training will include going through all the data that needs to be collected and how to do this, and to adequately filling out the questionnaire. The VPA Implementer will prepare data collection protocols to be given to the research assistants to guide them during the data collection exercise. The qualifications and experience of personnel involved in monitoring should be as follows:

- Knowledge of local language(s)
- Prior experience in household surveys, with experience in fuel surveys is an advantage.
- At least one team member with a good understanding of statistics and statistical software
- Knowledge of technical aspects of operating a biogas digester
- Ability to identify different manure management techniques.
- Prior involvement in surveys (baseline or monitoring) for other carbon projects is advantageous,

Response rates will be maximized by contacting all randomly selected biogas digester users beforehand to arrange a practical site visit date and sampling over the minimum required number to compensate for any non-responses in case sufficient telephone numbers of users are available. In special cases where participants refuse to participate in the monitoring, the reason shall be documented. The surveyor will explain that monitoring is part of the requirements of the programme and try to arrange an alternative date for a site visit or carry out monitoring with another member of the household.

All data monitored and required for verification and issuance will be kept for at least five years after the end of the crediting period or the last issuance of VERs for the project activity, whichever is later[29].

Analysis: All the sales data and the survey data will be captured in a computerized database. The analysis will include a calculation of the proportion of biogas system in use and of the emission reductions according to the methodology applied.

1. **Implementation plan**

The VPA implementer is responsible for entering user data into the Project Database, and for ensuring that the information in the Sales Agreements is complete and correct. The total number of Sales Agreements will reveal the quantity of biogas systems sold at the end of a Monitoring Period. The Project Database will record the start and end dates of each selling year *y* for each biogas system and calculate the emission reductions attributable to each Monitoring Period. Appropriate record keeping procedures will be implemented to ensure that each Monitoring Period dataset can be transparently attributed to its corresponding VPA, preventing any occurrences of double counting.

2. **Monitoring Responsibilities**

The VPA Implementer is responsible for all the monitoring activities carried out within their respective VPA, including data collection, data analysis and writing the Monitoring Report unless otherwise agreed to with the CME. It is possible for instance to outsource data collection and monitoring reporting to other qualified parties.

[29] In fact, all collected data is digital, and available in the impact registry for all monitoring periods

SECTION C. DURATION AND CREDITING PERIOD

C.1. Duration of project

C.1.1. Start date of VPA

>>23/10/2015

C.1.2. Expected operational lifetime of VPA

>> 21 years

C.2. Crediting period of project

C.2.1. Start date of crediting period

>>

The first crediting period started on 14/03/2017

The second credit period started on 14/03/2024

C.2.2. Total length of crediting period

>> 7 years, twice renewable

SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

D.1. Safeguarding Principles that will be monitored

A completed Safeguarding Principles Assessment is in Appendix 1, ongoing monitoring is summarised below.

No risks were identified of which mitigation measures are added to the monitoring plan.

D.2. Assessment that project complies with GS4GG Gender Sensitive requirements

Question 1 - Explain how the project reflects the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy?	The project doesn't involve the activity related to slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. The project enhances the women's access and entitlement of benefits. And since the women will be direct user of the Biogas stoves, it will benefit women by reducing their exposure to the indoor air pollution thereby improving their health. The project will not restrict the women rights or access to resources but promotes the women rights to have access to clean energy and environment. In addition, the replacement of firewood after the installation of Biogas will reduce workload of women for the collection of firewood. The workload of women to collect wood is reduced, cooking is faster, and less cleaning is required as pots are not blackened by soot. Reduced workload results in time saving that the women can use for other productive activities. The project also improved convenience as biogas ignites directly and there is no need to tender the fire continuously. The project doesn't involve any activity risking sexual harassment, or any forms of violence against women. On the contrary, it reduces the risk of sexual harassment or violence when women collect firewood in the baseline scenario

	But the project promotes to have access to clean energy and environment to the women. Benefits from the project is expected to create entrepreneurial opportunities for both men and women without any discrimination. Training and capacity building is equitably provided to both men and women without discrimination
Question 2 - Explain how the project aligns with existing country policies, strategies and best practices	The project is in line with Kenya's Energy Act of 2019[30] in which biogas is identified as key source of sustainable energy to households. In accordance with the Ministry of Energy's Gender Policy [31] the biogas program responds to the needs of the poor in the rural and urban areas in female headed households. In addition, the policy has identified biogas projects to facilitate easier access of energy by vulnerable groups and the marginalized. The project focuses on improving livelihoods, health and capacities of women, poor and the excluded so that they can have access to different energy source. The PD, as per the National Policy on Gender and Development[32] has mentioned that it will ensure women participate in and benefit equitably from investments in various natural resources development initiative. This is done by enhancing their voice so that they can recognize their rights and influence decisions affecting.

[30] http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/2019/EnergyAct__No.1of2019.PDF
[31] http://energy.go.ke/wp-content/uploads/2019/10/Gender-Policy-in-Energy.pdf
[32] http://psyg.go.ke/wp-content/uploads/2019/12/NATIONAL-POLICY-ON-GENDER-AND-DEVELOPMENT.pdf

	them. So in every stakeholder consultation of the project, it has to be ensured the women's participation and their comments are addressed
Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?	No
Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	No, no particular gender challenges are expected

SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the 2 step GS4GG Consultation for monitoring purposes. Please refer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

E.1. Summary of stakeholder mitigation measures

The VPA organized the LSC at original registration as per PoA-DD requirements. The GS4GG Principles & Requirements, Stakeholder Consultation Requirements, and the Community Services activity Requirements do not mandate an LSC at CP renewal.

E.2. Final continuous input / grievance mechanism

METHOD	INCLUDE ALL DETAILS OF CHOSEN METHOD (S) SO THAT THEY MAY BE UNDERSTOOD AND, WHERE RELEVANT, USED BY READERS.
Continuous Input / Grievance Expression Process Book (mandatory)	Fully automated process on salesforce, where all customer comments are captured using TaroWorks in real time, and is available and actively used. This includes details of the comments received, from who, who is responsible for following up and whether the issue is addressed or not.
GS Contact (mandatory)	help@goldstandard.org
Telephone access	Stakeholders will be able to call to provide input on the project's performance at any time. The numbers available to call include: Landline:+254 020 218 0608 /218 0648 Mobile phone: 0719 635 516; 0723 903 957
Internet/email access	Stakeholders will be able to provide continuous input/feedback via the following email address: Email: info@kbp.co.ke or info@goldstandard.org; Website: http://kenyabiogas.com

SECTION F. Eligibility and inclusion criteria for VPAs inclusion

>>

NO.	ELIGIBILITY CRITERION	DESCRIPTION/ REQUIRED CONDITION	DESCRIPTION OF THE VPA IN RELATION TO THE CRITERIA, MEANS OF VERIFICATION AND SUPPORTING EVIDENCE FOR INCLUSION
(i)	The geographical boundary of the VPA including any time-induced boundary consistent with the geographical boundary set in the PoA	All biogas systems included in the VPA will demonstrate they fall within the geographical boundary of the PoA through: – Recording the address/location of the system in Salesforce or equivalent software – Warranty or household sales agreement	Project database with address and location details
(ii)	Conditions to avoid double counting of GHG emission reductions or net anthropogenic GHG removals, such as unique identifications of product and end-user locations	Double counting is avoided by unique biodigester identification as per methodology procedure indicator BGTA 1 and 2	Project database with unique codes for unambiguous identification of household
(iii)	Conditions to confirm that V/CPAs are neither registered as project activities with other offset Schemes, included in other registered PoAs, nor the project activities that have been deregistered;	The required condition is that the biodigester is only registered under this project	To be demonstrated in BGTA 2 of VPA section Section B.6.2
(iv)	Specification of the technology/measure such as the level and type of service, as well as performance specification based on, inter alia, testing/certification;	Demonstration that the plant is installed according to specifications by conducting a commission check	database with the data of commissioning shall be used for this demonstration

(v)	Conditions to check the start dates of VPA through documentary evidence	The start date is defined as the first digester commissioned in a VPA	Warranty certificate or sales contract of the first plant installed shall be provided
(vi)	Conditions to ensure compliance with the applicability of the applied methodologies, the applied standardised baselines and the other applied methodological regulatory document	The VPA shall provide a discussion on the applicability of the applied methodology	To be described in VPA-DD section B.2
(vii)	Conditions to ensure that VPA meet the requirements for demonstration of additionality	As per CDM tool 21 Demonstration of additionality of small-scale project activities. Version 13.1	To be demonstrated in VPA-DD section B.5
(viii)	Conditions to ensure no diversion of official development assistance;	VPAs will demonstrate that any Official Development Assistance received for the VPA has not occurred on the condition that the resulting credits are transferred to the donor country	A signed ODA no diversion letter is to be uploaded
(ix)	Target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/offgrid)	The VPA will demonstrate which target group(s) is/are to be targeted by the VPA and the distribution mechanism.	Implementation documents
(x)	Conditions related to sampling requirements for the PoA	The conditions as stipulated in the applied methodologies	To be described in VPA monitoring plan
(xi)	Conditions to ensure that VPAs that will be included meet the small-scale thresholds and remain within those thresholds throughout the crediting period	The VPA Implementer will ensure that each VPA remains below the small-scale limits. For activities falling under Type I, each VPA in aggregate will remain below 15 MW (45MWth) per year. For activities falling under Type III, each VPA will achieve below 60,000 tCO_{2e} in emission reductions annually.	To be described in VPA-DD section A.4

(xii)	Conditions to confirm that technologies in V/CPAs are eligible	Demonstration that only biodigesters are included up to 100 m^3	To be evidence in the database through the recording of plant sizes
(xiii)	Conditions to be met by each VPA regarding SDG outcomes assessment	From 13 March 2022, the SDG Impact Tools are a mandatory part of the project development cycle. This tool has been adopted	SDG impact tool document

APPENDIX 1 - SAFEGUARDING PRINCIPLES ASSESSMENT

SOCIAL SAFEGUARDING PRINCIPLES		
Reference requirement	Question	Response
ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.		
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project developer, its representatives and the Project disrespect internationally proclaimed human rights?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Is the project involved or complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Have local communities or individuals raised human rights concerns regarding the project (e.g., during the stakeholder engagement process, grievance processes, public statements)?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Is there a risk that rights-holders (e.g., Project-affected stakeholders) do not have the capacity to claim their rights?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does this project undermine national or regional measures for the realisation of the right to development?	☐ YES ☒ NO
If the answer to any of the questions above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.		
Please add text here…		
Would the project potentially involve or lead to:		
ERROR! REFERENCE SOURCE NOT FOUND.	adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalised groups?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE	inequitable or discriminatory impacts on affected populations, particularly people living in poverty or	☐ YES ☐ POTENTIALLY

NOT FOUND.	marginalised or excluded individuals or groups, including persons with disabilities?	☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	restrictions in availability, quality of and/or access to resources or basic services, in particular to marginalised individuals or groups, including persons with disabilities?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	exacerbation of conflicts among and/or the risk of violence to project-affected communities and individuals?	☐ YES ☐ POTENTIALLY ☒ NO

Briefly describe below how the project incorporates a human rights-based approach.

This project upholds a human rights-based approach by prioritizing the dignity, cultural heritage, and individuality of indigenous people. Participation is strictly voluntary, safeguarding personal freedom and autonomy. The project maintains a clear stance against any involvement in human rights violations, demonstrating a commitment to respecting internationally recognized human rights. Additionally, Kenya's ratification of key UN human rights conventions, like the International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil and Political Rights, underscores the host country's dedication to upholding human rights principles.

ERROR! REFERENCE SOURCE NOT FOUND.**ERROR! REFERENCE SOURCE NOT FOUND.**

ERROR! REFERENCE SOURCE NOT FOUND.	Have women's groups/leaders raised gender equality concerns regarding the project, (e.g., during the stakeholder engagement process, grievance processes, public statements)?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project undermine the principles of non-discrimination, equal treatment, and equal pay for equal work?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project prevent men and women from having equal opportunities to participate in identified tasks and activities, whether through paid work, volunteer work, or community contributions, as appropriate?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project limit the participation of women or men based on pregnancy, maternity/paternity leave, or marital status?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Is information about project objectives being communicated in a way that is inappropriate for the local context and not tailored to the methods of understanding of both women and men, which could hinder their participation?	☐ YES ☒ NO

ERROR! REFERENCE SOURCE NOT FOUND.	Has the project assessed gender risks without referencing the country's gender strategy or equivalent national commitment?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Has expert stakeholder(s) been involved, and has their input been requested for the project design on gender equality and women's empowerment?	☐ YES ☒ NO

If the answer to any of the questions above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.

Please add text here….

Would the project potentially involve or lead to:		
ERROR! REFERENCE SOURCE NOT FOUND.	adverse impacts on gender equality and/or the situation of women and girls?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	exacerbation of risks of gender-based violence? For example, through the influx of workers to a community, changes in community and household power dynamics, increased exposure to unsafe public places and/or transport, etc.	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	reproducing discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	limitations on women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well-being.	☐ YES ☐ POTENTIALLY ☒ NO

Briefly describe below how the project is addressing any identified risk to gender equality and women's empowerment.

The project primarily addresses the risk of sexual harassment or violence that women may face when collecting firewood in the baseline scenario. By providing biogas as an alternative energy source, the project reduces the need for women to venture out to collect firewood, thereby mitigating the risk of them encountering such threats. Furthermore, the project actively promotes gender equality and women's empowerment by ensuring equitable access to training and capacity-building programs. The project's focus on improving the livelihoods,

health, and capacities of women, along with its efforts to enhance their voice and influence in decision-making processes, further contributes to addressing gender-related risks and promoting women's empowerment.
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ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve potential risks to the health and safety of affected communities during its life cycle?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve any potential risks to the workers' safety and health?	☐ YES ☒ NO

If the answer to any of the questions above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.
All answers are no
Would the project potentially involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	construction and/or infrastructure development (e.g., roads, buildings, dams)?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	air pollution, noise, vibration, traffic, injuries, physical hazards, poor surface water quality due to runoff, erosion, sanitation?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	harm or losses due to failure of structural elements of the project (e.g., collapse of buildings or infrastructure)?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	risks of water-borne or other vector-borne diseases (e.g., temporary breeding habitats), communicable and noncommunicable diseases, nutritional disorders, mental health?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g., explosives, fuel and other chemicals during construction and operation)?	☐ YES ☐ POTENTIALLY ☒ NO

ERROR! REFERENCE SOURCE NOT FOUND.	adverse impacts on ecosystems and ecosystem services relevant to communities' health (e.g., food, surface water purification, natural buffers from flooding)?	☐ YES ☐ POTENTIALLY ☒ NO

Briefly describe below how the project is addressing any identified risk related to community health and safety.

The project primarily addresses the risk of community exposure to health risks by ensuring the hygienic disposal of animal waste in biodigesters. The proper management of waste helps in mitigating nuisances such as odor and water pollution, which can pose health risks to the community. The project also emphasizes the safety of workers involved in the construction and maintenance of biodigesters by providing training on the use of safety equipment like helmets, gloves, and goggles.

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ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve altering, damaging, or removing sites, objects, or structures of significant cultural heritage?	☐ YES ☒ NO

If the answer to question above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.

N/A

Would the project potentially involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	activities adjacent to or within a cultural heritage site?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	significant excavations, demolitions, movement of earth, flooding or other environmental changes?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	alterations to landscapes and natural features with cultural significance?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE	adverse impacts to sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations,	☐ YES ☐ POTENTIALLY

NOT FOUND.	practices)? (Note: projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	utilisation of tangible and/or intangible forms (e.g., practices, traditional knowledge) of Cultural Heritage for commercial or other purposes?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES" or "POTENTIALLY" - are the communities made aware of their right under the law, scope and nature of proposed development and its potential consequences?	☐ YES ☒ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES" - does the project provide equitable sharing of benefits from commercialisation of such knowledge, innovation, or practice, consistent with their customs and traditions?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES" - are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES", has project design been changed, modified, updated considering opinions and recommendations of an Expert Stakeholder?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve any risks related to involuntary relocation of people?	☐ YES ☒ NO

If the answer to question above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.

N/A

Would the project potentially involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	risk of forced evictions or involuntary relocation of people?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	temporary or permanent and full or partial physical displacement (including people without legally recognisable claims to land)?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	economic displacement (e.g., loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES" or "POTENTIALLY", - has the project developed Resettlement Action Plan or Livelihood Action Plan in consultation and agreement with affected individual, group or community? - has the project integrated Resettlement Action Plan or Livelihood Action Plan into the Project design?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES" - are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES", have project design been changed, modified, updated considering opinions and recommendations of an Expert Stakeholder?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve any risks related to identifying and managing legitimate tenure rights that may be affected by the project?	☐ YES ☒ NO

If the answer to question above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.

N/A

Would the project potentially involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	impacts on or changes to land tenure arrangements and/or community-based property rights/customary rights to land, territories and/or resources?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	uncertainties with regards to land tenure, access rights, usage rights or land ownership? Examples include, but are not limited to water access rights, community-based property rights and customary rights.	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Changes in legal arrangements, if yes, are the changes done in line with relevant laws and regulations?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Changes in legal arrangements, if yes, are these changes agree with free, prior and informed consent of the involved stakeholders?	☐ YES ☒ NO ☐ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Does some other entity (other than the project developer) hold uncontested land title for the entire Project Boundary?	☐ YES ☒ NO ☐ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	☐ YES ☒ NO ☐ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES", have project design been changed, modified, updated considering opinions and recommendations of an Expert Stakeholder?	☐ YES ☒ NO ☐ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Have project developer in consultation with stakeholders established a functioning mechanism to receive, process, resolve, communicate and record grievances?	☐ YES ☒ NO ☐ NA
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.		
Please add text here….		

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.		
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve Indigenous People within the Project area of influence who may be affected directly or indirectly by the Project?	☐ YES ☒ NO

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.		
Please add text here….		
Would the project potentially involve or lead to:		
ERROR! REFERENCE SOURCE NOT FOUND.	affect areas where indigenous peoples are present (including project area of influence)	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	affect areas, land and territory claimed by indigenous peoples?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	impacts (positive or negative) to the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to above questions is ''YES'' or "POTENTIALLY", - Is it determined that the proposed project may affect the rights, lands, resources, or territories of indigenous people? - Has an "Indigenous People Plan" (IPP) or "Indigenous People Plan Framework" been elaborated and included in the project documentation? - Was the plan developed in accordance with the effective and meaningful participation of indigenous peoples and in accordance with UNDP Guidelines?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	risk of forcibly removing indigenous people from their lands and territories?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	utilisation and/or commercial development of natural resources on lands and territories claimed by indigenous peoples? Consider, and where appropriate ensure, consistency with the answers under Principle 4.1 above	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "YES" or "POTENTIALLY" - Did the project obtain free, prior and informed consent from indigenous people before taking their cultural, intellectual, religious, and/or spiritual property?	☐ YES ☒ NO ☐ NA

ERROR! REFERENCE SOURCE NOT FOUND.	- Does the project ensure that the indigenous people receive an equitable sharing of benefits resulting from the use of their traditional knowledge and practices? ? - Does the project ensure that the sharing of benefits resulting from the use of indigenous peoples' traditional knowledge and practices is culturally appropriate and inclusive? - Does the project ensure that the provision of equitable sharing of benefits does not impede land rights or equal access to basic services including health services, clean water, energy, education, safe and decent working conditions, and housing?	
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project lack appropriate feedback and grievance channels for Indigenous Peoples and their representatives?	☐ YES ☒ NO ☐ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Has a grievance mechanism not been established at the beginning of programme or project implementation with due consideration given to customary dispute settlement mechanisms among the Indigenous Peoples concerned and will it remain operational throughout the project cycle?	☐ YES ☒ NO ☐ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	☐ YES ☒ NO ☐ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is “YES”, have project design been changed, modified, updated considering opinions and recommendations of an Expert Stakeholder?	☐ YES ☒ NO ☐ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve, or is it complicit in, contributing to or reinforcing corruption or corrupt projects?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE	Does the project have a risk of encouraging bribery, kickbacks, or other unethical behavior?	☐ YES ☒ NO

NOT FOUND.		

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

ECONOMIC SAFEGUARDING PRINCIPLES

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ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve, facilitate, or condone forced labor, or pose a potential risk of forced labor?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project violate any labor or health and safety laws, international obligations, or ILO conventions?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project violate the principles of equal opportunity and fair treatment in its employment decisions?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project violate national laws, if available regarding non-discrimination in employment?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND. ERROR! REFERENCE SOURCE NOT FOUND.	Does the project allow child labor?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE	Does the project have insufficient processes and measures in place to ensure the safety and health of project workers?	☐ YES ☒ NO

NOT FOUND. ERROR! REFERENCE SOURCE NOT FOUND.		
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have insufficient measures to safeguard and support vulnerable project workers, such as women, people with disabilities, migrant workers, and young workers, and to prevent any kind of harassment, abuse, bullying, or exploitation, including gender-based violence (GBV)?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have no grievance mechanism available for workers to voice workplace concerns? Is information about this mechanism not provided to workers at the time of recruitment, or is it not easily accessible?	☐ YES ☒ NO
If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.		
N/A		
Would the project potentially involve or lead to: (NOTE: APPLIES TO BOTH PROJECT AND CONTRACTOR WORKERS)		
ERROR! REFERENCE SOURCE NOT FOUND.	use of forced labour?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	working conditions that do not meet national labour laws and international commitments?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	working conditions that may deny freedom of association and collective bargaining?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	absence of documented working agreements with all individual workers *if such agreements do not exist, or do not address working conditions and terms of employment, the project developer shall provide reasonable working conditions and terms of employment.*	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	use of migrant workers? *if engaged, the developer shall ensure that they are engaged substantially equivalent terms and conditions to non-migrant workers carrying out similar work.*	☐ YES ☐ POTENTIALLY ☒ NO

ERROR! REFERENCE SOURCE NOT FOUND.	having no arrangements for basic services[33] for workers? *the project developer shall put in place and implement policies on the quality and management of the accommodation and provision of basic services in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation arrangements should not restrict workers' freedom of movement or of association*	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	any form of discrimination or harassment based on factors unrelated to job requirements, such as gender, race, nationality, ethnicity, social or indigenous origin, religion or belief, disability, age, or sexual orientation?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	any form of discrimination in any aspect of employment, such as recruitment, compensation, working conditions, training, job assignment, promotion, termination, or discipline?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	harassment, intimidation, and/or exploitation, especially in regard to women?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	discriminatory working conditions and/or lack of equal opportunity where national law provides provision to address non-discrimination in employment?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	use of child labour? (including third-party engaged workers)	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	inadequate and verifiable mechanisms for age verification?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	no processes and measures in place for the safety and health of project workers?	☐ YES ☒ NO

[33] Basic services requirements refer to minimum space, supply of water, adequate sewage and garbage disposal system, appropriate protection against heat, cold, damp, noise, fire, and disease-carrying animals, adequate sanitary and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting, and in some cases basic medical services.

ERROR! REFERENCE SOURCE NOT FOUND.	No provision of safety and health training provisions, including on the proper use and maintenance of personal protective equipment conducted by competent persons and the maintenance of training records?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	No provision to record and document accidents, diseases, incidents, and any resulting injuries, illnesses, or deaths?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	occupational health and safety risks due to physical, chemical, biological and psychosocial hazards (including violence and harassment) throughout the project life-cycle?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	No measures to protect vulnerable project workers from harassment, exploitation, and gender-based violence (GBV)? This includes women, people with disabilities, migrant workers, and young workers.	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	No grievance mechanism available for workers to voice workplace concerns.	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	No measures for due diligence and the establishment of policies and procedures to manage and monitor the performance of third-party employees in the project?	☐ YES ☒ NO
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.		
N/A		

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Is there a risk of project failure during implementation or after project certification due to a lack of financial resources?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have potential negative impacts or pose a risk to the local economy?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Are there any potential risks or negative impacts this project may have on vulnerable or marginalised social groups, despite the benefits it may bring?	☐ YES ☒ NO
If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.		

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	economic impacts (negative/detrimental) to the local economy?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	negative economic consequences during and after project implementation, e.g., for vulnerable and marginalised social groups in targeted communities?	☐ YES ☐ POTENTIALLY ☒ NO

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.
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ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have a risk of increasing greenhouse gas emissions over the Baseline Scenario?	☐ YES ☒ NO

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	increase greenhouse gas emissions over the Baseline Scenario?	☐ YES ☐ POTENTIALLY ☒ NO

If the answer is "yes" or "potentially" to the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project pose a risk to the availability and reliability of energy supply to other users?	☐ YES ☒ NO

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	negative impact on the availability and reliability of energy supply to other users?	☐ YES ☐ POTENTIALLY ☒ NO

If the answer is "yes" or "potentially" to the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.**ERROR! REFERENCE SOURCE NOT FOUND.**

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ERROR! REFERENCE SOURCE NOT FOUND.	Does the project increase water usage to a level that will not allow for the maintenance of environmental flows?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project result in the discharge of wastewater that does not meet the required standard for beneficial reuse and could therefore negatively impact the environmental flow?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have the potential risk to exceed the rate of recharge for the groundwater source?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve any processes or activities that could contaminate the groundwater and render it unsuitable for use?	☐ YES ☒ NO

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	affect the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Wastewater discharge of quality that does not meet the required standard for beneficial reuse?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	significant extraction, diversion of ground water? For example, construction of dams, reservoirs, river basin developments, groundwater extraction	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have a risk of negatively impacting the catchment and has it been assessed and addressed?	☐ YES ☒ NO

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND. -	negatively impact on the catchment area? *If yes, Erosion prevention measures, including soil and slope protection measures, must be implemented before project commencement. These measures should involve natural terracing, infiltration strips, permanent ground*	☐ YES ☐ POTENTIALLY ☒ NO

ERROR! REFERENCE SOURCE NOT FOUND.	*cover, hedge and tree rows, and effective slope length assessment. Regular reassessment of these measures is necessary.*	
ERROR! REFERENCE SOURCE NOT FOUND.	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

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ERROR! REFERENCE SOURCE NOT FOUND. - **ERROR! REFERENCE SOURCE NOT FOUND.**	Is there any risk of soil resource degradation or loss of ecosystem services provided by soils in the project? *If yes, the project shall maintain healthy soils by minimising negative impacts on soil health, productivity, structure, and water retention. Steps to minimise soil degradation include crop rotation, composting, using N-fixing plants, and reducing tillage and ecologically harmful substances.*	☐ YES ☒ NO

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	production, harvesting, and/or management of living natural resources by small-scale landholders and/or local communities?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	if answer to above question “yes” or “potentially”, does project adopt appropriate and culturally sensitive sustainable resource management practices?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.
N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.		
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have any risks associated with natural or man-made hazards that could result from land use changes due to the project?	☐ YES ☒ NO
If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.		
N/A		
Would the project involve or lead to:		
ERROR! REFERENCE SOURCE NOT FOUND.	any potential risks that require emergency preparedness and response planning?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	if answer to above question “yes” or “potentially”, did the project developer disclose appropriate information about emergency preparedness and response to affected communities?	☐ YES ☒ NO ☐ NA
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.		
N/A		

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.		
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve the transfer, handling, and use of genetically modified organisms/living modified organisms that may result in adverse effects on biological diversity?	☐ YES ☒ NO
If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.		
N/A		
Would the project involve or lead to:		

ERROR! REFERENCE SOURCE NOT FOUND.	the transfer, handling and use of genetically modified organisms/living modified organisms (GMOs/LMOs) that result from modern biotechnology	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to above question is "yes" has a risk assessment by a competent Expert stakeholder been carried out in accordance with Annex iii of the Cartagena protocol on biosafety to the convention on biological diversity?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to above question is "yes" has any risks identified in the risk assessment?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Forestry (for example Afforestation/Reforestation) involving GMO planting? *Note - Forestry projects (for example Afforestation/ Reforestation) involving GMO planting are not eligible for Certification under Gold Standard for the Global Goals.*	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have a risk of releasing pollutants to air, water, and land in routine, non-routine, or accidental circumstances?	☐ YES ☒ NO

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	any potential risk of pollutant release that cannot be avoided?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to above question is "Yes" or "potentially", has the project identified all potential pollution sources that may degrade the quality of soil, air, surface, and groundwater in the project area?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE	If answer to above question is "Yes" or "potentially", do the pollution prevention and control technologies and practices	☐ YES

SOURCE NOT FOUND.	applied during the project life cycle align with national regulations or international best practices?	☒ NO ☐ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to above question is "Yes", is there a monitoring plan to ensure that mitigation measures are implemented, and resources are protected?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve the generation of waste materials (both hazardous and non-hazardous)?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve risk of release of hazardous materials resulting from their production, transportation, handling, storage, or use?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve the use of any chemicals or materials subject to international bans or phase-outs?	☐ YES ☒ NO

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	the generation and management of waste materials?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	treatment, destruction, or disposal of waste material?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE	If answer to above question is "Yes", does the project involve an environmentally friendly method that includes	☐ YES ☐ NO

NOT FOUND.	appropriate control of emissions and residues resulting from the handling and processing of waste material?	☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	risk of release of hazardous materials resulting from their production, transportation, handling, storage, or use?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to above question is "yes", does project has measures in place to address health risks?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Involve manufacture, trade, and use of chemicals and hazardous materials subject to international bans or phase-outs due to their high toxicity to living organisms, environmental persistence, potential for bioaccumulation, or potential for depletion of the ozone layer	☐ YES ☐ POTENTIALLY ☒ NO

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve the use of chemical pesticides?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve purchase, store, manufacture, trade or use products that fall in Classes IA (extremely hazardous) and IB (highly hazardous)	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project use fertilisers, and if so, are measures being taken to minimise their use and nutrient losses to the environment?	☐ YES ☒ NO

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE	chemical pesticides use for pest management?	☐ YES ☐ POTENTIALLY ☒ NO

NOT FOUND.		
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "yes" or "potentially", does project has documented Chemical Pesticides Policy in place?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	purchase, store, use, manufacture, or trade in Class II (moderately hazardous) pesticides?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to question above is "yes" or "potentially", does project has appropriate controls on manufacture, procurement, or distribution and/or use of these chemicals?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have a risk of unsustainable forest management, including timber harvesting?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project pose a risk of depleting biodiversity and ecosystem functionality in areas where improved forest management is undertaken?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project risk not meeting requirements for environment-friendly, socially beneficial, and economically viable plantations using native species whenever possible?	☐ YES ☒ NO

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve the risk of negatively influencing access to and availability of food for people affected?	☐ YES ☒ NO

If the answer to the question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.
N/A

Would the project involve or lead to:		
ERROR! REFERENCE SOURCE NOT FOUND.	modification of the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	☐ YES ☐ POTENTIALLY ☒ NO

If the answer is "yes" or "potentially" to the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.
N/A

ERROR! REFERENCE SOURCE NOT FOUND. ERROR! REFERENCE SOURCE NOT FOUND.		
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve any risks to animal welfare? Animal welfare shall be ensured by providing access to water and food, appropriate environment, humane treatment, and staff training. Evidence of mistreatment will be treated as an immediate non-conformity.	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve any potential risk of excessive or inadequate use of veterinary medicines?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project involve the risk of administering synthetic growth promoters, including hormones?	☐ YES ☒ NO

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.
N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	animal husbandry or harvesting of fish populations or other aquatic species?[34]	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	limiting access for animals to basic needs like drinking water, adequate food, daylight, appropriate shelter etc.?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	inadequate measures to isolate sick animals and control the spread of disease, especially zoonotic diseases?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	inadequate low-stress methods, equipment, and facilities that facilitate calm animal movement.	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	inadequate measures to ensure that animals are exposed to the least stress possible during transportation and slaughtering?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	inappropriate spacing per animal and stocking rates per land unit?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	inadequate measures to address the specific needs of aquatic animals?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND. ERROR! REFERENCE	primary production of living natural resources such as animal husbandry, aquaculture, and fisheries? If the answer is yes, implement industry-standard sustainable management practices in line with to one or more relevant and credible standards and utilise available technologies.	☐ YES ☐ NO ☒ NA

[34] 'Involve' means if the project mechanism and/or impact(s) are achieved via changing animal husbandry practices in some way.

SOURCE NOT FOUND.		

If the answer is "yes" or "potentially" to any of the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project have the risk of negatively impacting HCV areas and/or critical habitats?	☐ YES ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	Does the project in the project area or area of downstream impacts have risks to the following: native tree patches, individual native trees, freshwater resources (including rivers, lakes, swamps, temporary water bodies, and wells), habitats of rare, threatened, and endangered species, and biodiversity-enhancing areas?	☐ YES ☒ NO

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	identified habitats as HCV areas and or Critical habitats?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to above question is "yes", does the project have any risks that could negatively impact the catchment, project success, and surrounding HCV and ecological assets, as well as any measurable adverse impacts on the criteria or biodiversity values for which the critical habitat was designated, and on the ecological processes supporting that biodiversity?	☐ YES ☐ NO ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If answer to above question is "yes", is a robust, appropriately designed, and long-term Habitats and Biodiversity Action Plan absent which will make the project unable to achieve net gains of those biodiversity values for which the critical habitat was designated?	☐ YES ☐ NO ☒ N/A
ERROR! REFERENCE SOURCE	Does the project area or area of downstream impacts have native tree patches, individual native trees, freshwater resources (including rivers, lakes, swamps, temporary water bodies, and wells), habitats of rare, threatened, and endangered species, and biodiversity-enhancing areas?	☐ YES ☐ POTENTIALLY ☒ NO

NOT FOUND.		
ERROR! REFERENCE SOURCE NOT FOUND.	If the answer to the above question is "yes", will the project have any adverse effects on these areas?	☐ YES ☐ No ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	If the answer to above question is "yes", does the project has opportunities to minimise unwarranted conversion or degradation of the habitat and to enhance the habitat as part of its development?	☐ YES ☐ No ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Is the project applying Land Use & Forest Activity Requirements and managing a minimum 10% of the project area to protect or enhance the biological diversity of native ecosystems following HCV approach as per the given requirements?	☐ YES ☐ No ☒ NA
ERROR! REFERENCE SOURCE NOT FOUND.	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does the project lead to the reduction or negative impact on any recognised Endangered, Vulnerable or Critically Endangered species?	☐ YES ☒ NO

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	distortion of habitats of endangered species?	☐ YES ☐ POTENTIALLY ☒ NA

ERROR! REFERENCE SOURCE NOT FOUND.	If answer to the above question is "yes", does the project plan to protect and enhance them?	☐ YES ☐ POTENTIALLY ☐ NO ☒ N/A
ERROR! REFERENCE SOURCE NOT FOUND.	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	☐ YES ☐ NO ☒ NA

If the answer is "yes" or "potentially" to any of the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

ERROR! REFERENCE SOURCE NOT FOUND.ERROR! REFERENCE SOURCE NOT FOUND.

ERROR! REFERENCE SOURCE NOT FOUND.	Does project introduce any alien species (not currently established in the country or region of the project) into new environments?	☐ YES ☒ NO

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

N/A

Would the project involve or lead to:

ERROR! REFERENCE SOURCE NOT FOUND.	risk of introducing any alien species with a high risk of invasive behaviour regardless of whether such introductions are permitted under the existing regulatory framework?	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	risk of potential accidental or unintended introductions including the transportation of substrates and vectors (such as soil, ballast, and plant materials) that may harbour alien species.	☐ YES ☐ POTENTIALLY ☒ NO
ERROR! REFERENCE SOURCE NOT FOUND.	risk of spreading alien species into areas in which they have not already been established?	☐ YES ☐ POTENTIALLY ☒ NO

If the answer is "yes" or "potentially" to any of the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

N/A

APPENDIX 2- CONTACT INFORMATION OF VPA IMPLEMENTER

Organization name	Kenya Biogas Programme
Registration number with relevant authority	CLG-JLF58B
Street/P.O. Box	P.O. Box 79875-00202 Nairobi
Building	ACS Plaza
City	Nairobi
State/Region	Nairobi, Kenya
Postcode	00202
Country	Kenya
Telephone	+254 791496964
E-mail	Not applicable
Website	https://kenyabiogas.com
Contact person	Kevin Kinusu
Title	Programme Coordinator
Salutation	Mr.
Last name	Kinusu
Middle name	
First name	Kevin
Department	
Mobile	+254 725 685 864
Direct tel.	+254 789 451 729
Personal e-mail	kkinusu@kbp.co.ke

APPENDIX 3- LUF ADDITIONAL INFORMATION

N/A

APPENDIX 4 - DESIGN CHANGES

A4.1. Details of proposed or actual design change

>>

A4.2. Describe the Impacts of Design Change on the following

a. Additionality

>>

b. Applicability of methodology and other methodological regulatory documents with which the project activity has been certified

>>

c. Compliance with the monitoring plan of the applied methodology

>>

d. Level of accuracy and completeness in the monitoring of the project activity compared with the requirements contained in the registered monitoring plan

>>

e. ***Scale of the project activity***

>>

f. Stakeholder consultation

>>

g. Sustainable development criteria

>>

h. Safeguarding Assessment

>>

i. Compliance with applicable legislation

>>

Revision History

Version	Date	Remarks
2.3	Dd/mm/yyyy	Editorial changes in line with V2.1 of the Safeguarding Principles and Requirements
2.2	21 June 2023	Editorial changes in line with V2.0 of the Safeguarding Principles and Requirements
2.1	14 April 2023	Integrated the design change memo as annex of the document.
2.0	4 May 2022	
1.1	7 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Inclusion criteria table added Gender sensitive requirements added Prior consideration (1 yr rule) and Ongoing Financial Need added Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on Stakeholder Consultation information required Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption