Verification and certification report form for Gold Standard project activities

BASIC INFORMATION	
Title and GS reference number of the project activity	African Biogas Carbon Programme (ABC) – Uganda – VPA003 (GS4236)
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the verification and certification report	03
Completion date of the verification and certification report	21/11/2022
Monitoring period number and duration of this monitoring period	05 01/05/2021 – 18/04/2022 (including both the dates)
Version number of the monitoring report to which this report applies	1.5
Crediting period of the project activity corresponding to this monitoring period	19/04/2015 to 18/04/2022 (Inclusive both dates)
Project representative(s)	HIVOS
Host Party	Uganda
Applied methodologies and standardized baselines	Technologies and Practices to Displace Decentralized Energy Consumption (version 1.0)
Mandatory sectoral scopes	13
Conditional sectoral scopes, if applicable	-
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	12,126 tCO_2e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	24,489 tCO_2e
SDG Impacts:	1. SDG 2: Zero hunger 2. SDG 3: Good health and wellbeing 3. SDG 5: Gender Equality 4. SDG 7: Affordable and Clean Energy 5. SDG 8: Decent work and Economic Growth 6. SDG 13: Climate Action
Name and UNFCCC reference number of the DOE	E-0052: Carbon Check (India) Private Ltd.

Name, position and signature of the approver of the verification and certification report	 Vikash Kumar Singh, Compliance Officer

SECTION A. Executive summary

Carbon Check (India) Private Ltd. (CCIPL) is performing the fifth periodic verification of the GS project "African Biogas carbon Programme (ABC) – Uganda - VPA003" (GS project ID: GS 4236) for the period 01/05/2021 – 18/04/2022 (inclusive of both the dates). The VPA will stimulate the installation of domestic biogas systems of $4m^3$, $6m^3$, $9m^3$, $12m^3$, $13m^3$ and $15m^3$ capacities (other sizes may be included under the VPA). This VPA is retroactively included in the ABC PoA which includes the biogas systems that have been installed since 2009.

According to the PDD /B03/ & MR /01-f/, the project activity " African Biogas Carbon Programme (ABC): Uganda - VPA003 " is part of the African Biogas Carbon PoA and is the third VPA that is implemented in Uganda. 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.

This report summarises the findings of the verification of the project, performed on the basis of Gold standard for Global Goals (GS4GG), as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the Gold Standard. Verification is required for all registered GS project activities intending to confirm their achieved emission reductions and proceed with request for issuance of VERs. This report contains the findings and resolutions from the verification and a certification statement for the verified emission reductions.

Verification is the periodic independent review and ex-post determination of both quantitative and qualitative information by a Validation & Verification body (VVB), of the monitored reductions in GHG emissions that have occurred as a result of the registered GS project activity/ Programme of activity during a defined monitoring period.

Certification is the written assurance by a validation & verification body (VVB) that, during a specific period, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the "African Biogas Carbon Programme (ABC) – Uganda - VPA003" in the host country "Uganda" for the period 01/05/2021 – 18/04/2022 (including both the days).

The purpose of verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan, monitoring data used to confirm the reductions in anthropogenic emissions by sources, is sufficient, definitive, and presented in a concise and transparent manner. CCIPL's objective is to perform a thorough, independent assessment of the registered project activity.

In particular, the monitoring plan, monitoring report and the project's compliance with relevant GS and Host Party criteria are verified in order to confirm that the component project/s has/have been implemented in accordance with the previously registered project design and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the registered PDD and the approved monitoring methodology.

Scope:

The scope of the verification is:

- To verify the project implementation and operation with respect to the registered PDD
- To verify the implemented monitoring plan with the registered PDD and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

Verification process:

The verification comprises a review of the monitoring report /01-f/ over the monitoring period from 01/05/2021 – 18/04/2022 and based on the registered PDD as part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology, and all related evidence provided by project participants.

On-site interviews and inspections are also performed as part of the verification process.

Conclusion:

The verification team assigned by the validation & verification body (VVB) concludes that the monitoring report /01-f/, meet all relevant requirements of the Gold Standard as per the requirements of GS4GG. The verification has been conducted in-line with the GS4GG requirements. /B02/

The project activity was correctly implemented according to the selected monitoring methodology, monitoring plan and the registered PDD /B03/. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. The following table provides the resulted emission reduction from the project as verified through the document review and on-site interviews by the verification team.

Vintage	**ER (tCO_2e)**
01/05/2021 – 31/12/2021	16,189
01/01/2022 – 18/04/2022	8,300
Total for the monitoring period	**24,489**

CCIPL as a Validation & verification body (VVB) is therefore pleased to issue a positive verification opinion expressed in the attached Certification statement

SECTION B. Verification team, technical reviewer, and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader / Verifier	IR	Chaudhary	Aparna	CCIPL	X	X	X	X
2.	Technical Expert	IR	Anand	Amit	CCIPL	X			X
3.	Trainee Assessor	IR	K V	Kiran	CCIPL	X	X	X	X
4.	Local Expert	ER	Okumu	Willis	CCIPL		X		

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Seshan	Ranganathan	CCIPL
2.	Approver	IR	Singh	Vikash	CCIPL

Amit Anand: Qualified lead assessor and internal technical reviewer for offset projects validations and verifications under CDM, VCS and Gold Standard (GS) and actively been involved in the validation and verification or internal technical review of more than 200 offset projects. He is qualified as technical expert for TA 1.2, 3.1, 8.1, 13.1 and 14.1 under CDM Sectoral Scope categorization. He has a professional experience of more than 12 years in various capacities with organizations like MITCON, TUV Rheinland, Deloitte and MGM International in the development and validation/verification of carbon offset projects under different market-based mechanism. He was also involved in validation and verification the following Gold Standard Projects: GS 1078, GS 976, GS 850, and GS 916 PoA (GS 1231 (VPA 01) GS 1029 (VPA 02), GS 1030(VPA 03), GS 1031(VPA 04).

Aparna Choudhary: Qualified Team Leader, Assessor and technical expert for offset projects validation and verification under CDM, VCS and Gold Standard (GS), GCC. She is qualified as a technical expert for TA 1.2 and 3.1 She was involved in more than 50 projects under CDM, VCS and Gold Standard (GS) and GCC.

Kiran K V: A trainee assessor with experience of working in more than 10 projects in sectoral scopes 1.2 and 3.1. Has taken part in training programs conducted by GS and other standards. Holds a postgraduate degree in Environmental science and Resource Management and a certificate of Lead Verifier and Validator training for ISO 14064-1 & ISO 14064-2.

Ranganathan Seshan: holds a Bachelor's Degree in Chemical Engineering and has an overall working experience of around thirty nine years with twenty four years' experience in Chemical process industry (fertilizer & petrochemical manufacturing) covering production, technical services including energy audits and efficiency studies, waste heat -recovery, efficiency studies of boilers ,power plants, safety audits and pollution control activities including waste water treatment, project management, corporate planning, sales, logistics in fertilizer & petrochemical industry. The experience also includes 5 years in process design & engineering for chemical process industry. He is qualified validator, verifier and technical reviewer and has fifteen years' experience working with leading certification bodies. He is involved in the validation/verification of over 200 projects in various roles.

SECTION C. Means of verification

C.1. Desk/document review

The verification was performed primarily based on the review of the Monitoring report /01-f/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan and monitoring methodology. Documents reviewed or referenced during the verification are listed in Appendix 3.

C.2. On-site inspection

Onsite physical audit has been performed on the dates 29/07/2022 to 01/08/2022. The Team leader has conducted the on-site inspection and in particular the acceptance sampling.

Furthermore, VVB has considered the Site Visit and Remote Audit Requirements and Procedures, version 1.0/B06/ for conducting the onsite visit. In accordance with the requirements provided in the §3.1.1(b) of the Site Visit and Remote Audit Requirements and Procedures, version 1.0/B06/.

C.3. Interviews

No.	29/07/2022				Team member
	Last name	First name	Affiliation	Topic	
/01/	Malagala	Emmanuel	KAESCO	Project implementation, monitoring plan, grievances	Aparna Choudhary, Kiran K V & Willis Okumu
/02/	Ninsiima	Viola	BSUL (M&E officer)		
/03/	Muthoni	Salome	ABPL		
/04/	Okello	Anthony Walter	BSUL (Quality manager)		
/05/	Muvule	Michel	BSUL (Programme director)		
/06/	Buysman	Eric	Consultant	Project design, Monitoring plan. GHG ER calculation	
/07/	Ndemere	Arineitwe Joseph	CIRCODU	Baseline and Monitoring survey.	
/08/	Atuyamba	Alexander	CIRCODU		
/09/	Waweyo	Patrick	CIRCODU		

List of Households interviewed by DOE

Sl. no	Plant code	Name of interviewee	Date	Sample category	Audit team member
/01/	UG-CEN-1704-06951	Emmanuel, Kabalega	30/07/2022 – 01/08/2022	Survey A & B	Aparna Choudhary, Kiran K V, and Willis Okumu
/02/	UG-CEN-1102-4466	Jennifer Musiime	30/07/2022 – 01/08/2022	Survey A & B	Aparna Choudhary, Kiran K V, Job Muiriki
/03/	UG-CEN-1202-1316	Mary Nakitende	30/07/2022 – 01/08/2022	Survey A & B	Aparna Choudhary, Kiran K V, Job Muiriki
/04/	BSU1/04443	Nanteza,Ssemuddu Regina	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V, Job Muiriki
/05/	UG-EAS-1102-444	Muyindike john	30/07/2022 – 01/08/2022	Survey A & B	Aparna Choudhary, Kiran K V, Job Muiriki
/06/	BSU/018446	Ssali,Peter	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V, Job Muiriki
/07/	BSU/021328	Mwabutsya Baare	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V, Job Muiriki
/08/	BSU/3938	Katumba Christopher	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V,

					Job Muiriki
/09/	BSU/018450	Ssenoga Fredrick Daniel	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V, Job Muiriki
/10/	BSU/06867	Luwebmbo John Chairman	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V, Job Muiriki
/11/	UG-CEN-1005-3921	Kasozi Joseph	30/07/2022 – 01/08/2022	Survey A & B	Aparna Choudhary, Kiran K V, Job Muiriki
/12/	BSU/013403	Kito Grace	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V, Job Muiriki
/13/	BSU/06388	Ddambya, Patrick	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V, Job Muiriki
/14/	UG-CEN-1906-06386	Hajji, Sebizizi	30/07/2022 – 01/08/2022	Survey A & B	Aparna Choudhary, Kiran K V, Job Muiriki
/15/	UG-CEN-1304-3964	Geofrey Mbazira	30/07/2022 – 01/08/2022	PFT	Aparna Choudhary, Kiran K V, Job Muiriki
/16/	UG-CEN-1904-07722	Nabakooza, Eva	30/07/2022 – 01/08/2022	Survey A & B	Aparna Choudhary, Kiran K V, Job Muiriki

C.4. Sampling approach

As the target population is homogeneous, PP has proposed simple random sampling plan using 90/30 as confidence/precision. This is in line with the applied methodology /B01/. The sample size for each parameter is determined following guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB86, Annex 4) /B04/.

In line with paragraph 28 of the Sampling Standard, the verification team has applied acceptance sampling approach through on-site interviews on the monitoring survey as part of verification. The project participant had applied sampling approach to the monitoring survey /02/, conducted by the representatives of project participant. The verification team has chosen acceptance sampling in accordance with paragraph 28 of the sampling standard /B04/.

Applying paragraph 39(c) of the sampling standard, version 09/B04/, a sample size of 08 households was chosen (with no discrepant records). A sample size of 08 was determined for both user/usage survey and PFT, based on an AQL of 0.5% and UQL of 20%; producer risk of 5% and consumer risk of 20% in determining the DOE's sample size Acceptance number (c) thus determined for the sample is 0. However, DOE interviewed 08 samples from the baseline survey done by project participants.

The information provided in the monitoring survey /02/, has been cross checked during the Onsite visit. As a part of acceptance sampling, the Verification team could confirm the monitoring survey data /02/ with no discrepant records. Thus, PP's set of records has been accepted in line with § 33 of the sampling standard, version 09 /B04/.

The details of the sample interviewed are listed in section C.3 (under the list of interviewed persons). No discrepancy was found in any of the 08 samples surveyed for user/usage survey and PFT each and thus c=0, i.e., no discrepant records were observed. Thus, PP's set of records has been accepted in line with §33 of the sampling standard (version 09.0) /B04/. For the impact parameters, questionnaire was prepared and was used during the survey by the PP. During the on-site interviews, the verification team cross-checked these sample documents, and no discrepancies were found in the impact parameters as well. Furthermore, the training & competency of the personnel, who conducted such test were checked. They were also interviewed to ensure that the process, method used, and their competency to confirm such standardised test were appropriately applied. The sampling technique to draw such samples were found adequate and the sample collectors were found competent to perform such task.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

The VVB has raised 16 clarifications (CLs) and 05 corrective action requests (CARs) and 01 Forward Action Request (FAR) and closed successfully

SECTION D. Verification findings

D.1. Remaining forward action requests from validation and/or previous verifications

FAR ID	01	**Section no.**	B.1.1	**Date:** 24/08/2022
Description of CL				
Refer CL D-1, there are 79 households have been temporarily removed from the database. *The VPA Implementer is to follow up on these households for reporting in the next monitoring period.*				
Project participant response				**Date:** 04/09/22
Section G.1 is updated and now includes the outcome for FAR01				
Documentation provided by project participant				
MR v1.1 *FAR01 MPIV 79 cases status*				
DOE assessment				**Date:** 14/09/2022
On the basis of the review of the revised MR v.1.1 and the excel sheet "*FAR01 MPIV 79 cases status"* provided by the PP, the verification team observed that the no. of Households permanently removed is given as 6 in the excel sheet while it is given as 3 in the MR. PP is requested to clarify this discrepancy.				
Project participant response				**Date:** 23/09/2022
The VPA implementer has reviewed the sheet, and added one more column (column k), according to their assessment, of all 79 plants, 2 have been included in the database (status operation), all other plants are excluded. Out of the 79-2 =77 plant excluded, 6 are permanently removed from the database, and the remainder (77-6 = 71) temporarily excluded. Those plants will be reincluded once the plant is operational. The MR is updated accordingly, see MR v1.2				
DOE Assessment				**Date:** 01/10/2022
It has been observed that the PP has mentioned in the revised MR "Of all 79 plants, 2 have been included in the database (status operation), all other plants are excluded. ". However, based on the review of the excel sheet "FAR01 MPIV 79 cases status", the following observations are seen. 1. Out of the 6 plants which is claimed to be permanently dropped, one plant having ID BSU1/05192 is found to be included in the database. PP is requested to remove it from the database. 2. Out of the plants which are shown temporary excluded from the database, some plants are found to be included in the database. PP is requested to provide a clarification for the same 3. Furthermore, PP is requested to provide an evidence to all the grievances which are claimed to be closed. Thus, the finding is open.				

Project participant response	Date: 25/10/2022
PD responses 14 Oct. 1. BSU1/05192 is now excluded from the database. The list with 79 plants was updated, and only 3 out of 79 are now included, see MR section G.1 2. As above 3. The VVB has made verification calls. Based on the calls it was discovered that 4 plants were erroneously included in the database. These are the plants of 1) Mutesi Jaliya 2) Ssempala Patrick 3) Kikune Saudah 4) Mbogo Rukidi These 4 plants were removed from the database. Based on Q 1,2 and 3, the ER spreadsheet, the database and the MR was updated.	
DOE Assessment	**Date:** 27/10/2022
1. The verification team confirms that the plant ID BSU/05192 has been excluded from the database. 2. Verification team confirms that all the all the above-mentioned plants which are claimed to be excluded from the database are removed from the database. 3.Verification team has conducted telephonic interview with the HH which are considered as closed in the grievances. Out of the 8 grievances which were claimed to be closed are found to be open. These HH has been removed from the database which is confirmed upon the review of the revised database provided by the PP. A FAR has been raised in this verification report Thus, the finding is closed	

For all other findings raised during this verification, refer to the appendix 4 below.

D.2. Compliance of the project implementation and operation with the registered project design document

Means of verification	Document Review, Interview
Findings	CL14, CL15 has been raised and closed successfully
Conclusion	Verification team confirms that the latest available version of the monitoring report template has been used and the MR is in compliance with the monitoring report form and related monitoring report template guide. As verified from on-site interview and third-party survey report /06/, the audit team confirm the project implementation and operation complies with the project design document /B03-a/. The starting date of operation is 11/11/2009 (commissioning of first biogas plant) which is confirmed from the registered PDD /B03-a/ and validation report /B03-d/. This VPA was retroactively included in the ABC PoA and includes biogas systems of which the construction started since 2009. The project boundary in the registered PDD /B03-a/ is in line with the actual project boundary. CCIPL confirms that the project biogas systems are operational through on-site visits and interviews with end users. Each biogas system has a unique identification number that was provided in the end user agreement and are correct according to the project database. Each biogas plant is also physically marked with its unique identification number. Along with the serial number, the biogas technology, end username, address, commissioning date etc. had also been noted which were found to be consistent on ground. It is noted that no changes have been observed or identified, that may impact the additionality. No addition of component nor extension of technology, no addition nor removal of project sites, no change of values of the actual operational parameter relevant to determination of emission reductions which are within the control of the PP; no change has been observed or identified that may impact the scale of the project activity or applicability of baseline and monitoring methodology Technologies and Practices to Displace Decentralized Energy Consumption (version 1.0)/B01/. Verification team based on review of MR /01-f/ and provided evidence confirms that the households/end users relinquish their right of carbon credits. Furthermore,

	the Biogas systems implemented under the project is uniquely identified, thus avoiding any potential double counting. As verified through document review and on-site interviews, the project implementation and operation, all physical features of the project comply with the project design document /B03-a/. Verification team has checked the information in the monitoring report /01-f/ and compared it against the registered PDD /B03-a/ and found to be consistent. Verification team confirms that: a) The project activity is implemented as per registered PDD/B03-a/. b) The actual operation of the proposed CDM project activity is in line with the registered/revised PDD /B03-a/. c) It has reviewed the registered PDD /B03-a/ including the monitoring plan, the applied monitoring methodology and found that the final MR/01-f/ for this monitoring period is in line with all the above-mentioned documents. Verification team of CCIPL based on review of records and on-site interviews confirms that a robust and effective grievance addressal mechanism is in place. In summary, the monitoring period is reasonable, and the operation of the project activity is in accordance with the registered/revised PDD /B03-a/.

D.3. Post-registration changes

D.3.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[1]

Not applicable

D.3.2. Corrections

Not applicable

D.3.3. Changes to the start date of the crediting period

Not applicable

D.3.4. Inclusion of a monitoring plan

Not applicable

D.3.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

The PoA has undergone transition to GS4GG on 23/07/2019, which is made available through the transition annex/B03-c/. All The monitoring parameters remains the same but are now expressed in terms of SDG's. In comparison to the earlier monitoring parameter, additional parameters are included.

1. SDG 5: Achieve gender equality and empower all women and girls with the following indicators
    a. Time saving of female member in charge of cooking
    b. Usage of saved time.

2. GS10: Technology transfer and technological self-reliance which is now SDG 8.5

D.3.6. Changes to the project design

Not applicable

[1] Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

D.3.7. Changes specific to afforestation and reforestation project activities

Not applicable

D.4. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	Document Review, Interview
Findings	CAR05, CL02 has been raised and closed successfully
Conclusion	The verification team has checked the actual monitoring plan against the registered monitoring plan and monitoring methodology and applicable tools. Furthermore, the verification team has checked monitoring system by means of comparison with the information given in the monitoring plan and monitoring methodology. The monitoring plan is completely in accordance with the approved methodology /B01/ applied by the registered PDD/B03-a/.

D.5. Compliance of monitoring activities with the registered monitoring plan

D.5.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	Document Review, Interview
Findings	CL04, CL05 has been raised and closed successfully.
Conclusion	Verification team confirms that the data and parameters fixed ex ante are in compliance with the registered PDD /B03-a/ and monitoring plan. Please refer to the Annex 1 for assessment of each parameter.

D.5.2. Data and parameters monitored

Means of verification	Document Review, Interview
Findings	CAR01, CAR02, CAR03, CL07, CL09, CL10, CL11, CL12 has been raised and closed successfully.
Conclusion	The verification team confirms that the data and parameters monitored are in compliance with the registered PDD /B03-a/ and the monitoring plan. It is confirmed that the verification team assessed the data / information flow from the point of monitoring to emission reduction calculation and found no gap in the same. Please refer to the Annex 2 for assessment of each parameter

D.5.3. Implementation of sampling plan

Means of verification	Document Review, Interview
Findings	No findings
Conclusion	According to the standard for sampling and survey /B04-a/ and related guidelines /B04-b/ the sampling plan was determined at the time of project registration and applied during the monitoring. Sampling method: Simple random sampling method is adopted as the target population is homogeneous. The sample size is determined by the requirement to achieve 90/30 precision, in line with the methodology for annual survey. Sampling approaches may follow the Guideline “Sampling and surveys for CDM project activities and programme of activities” for calculation of sample size. A multistep sampling approach has been implemented which includes user survey (Survey A), Usage survey (Survey B) and PFT (Survey C). The total biodigesters in use has been stratified into 12 age groups. The project representative has sampled 35 household per age group which is more than minimum number of samples (30) required as per methodology. A total of 437 samples has been selected for the usage survey. A sample of 210 Households were chosen for the usage survey against the minimum requirement of 100 samples as per methodology. The verification team confirms that the sample size selected is more than required as per the methodology for user survey, usage survey and PFT.

D.6. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Document Review, Interview
Findings	No findings
Conclusion	N/A since there is no monitoring equipment which require calibration as per the monitoring plan. The monitoring consists of reviewing the documents and on-site interviews.

D.7. Assessment of data and calculation of emission reductions or net removals

D.7.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	CAR04 has been raised and closed successfully
Conclusion	**Baseline emissions from fuel use:** The amount of baseline scenarios was defined in the VPA-DD through a baseline survey. The ratio of each scenario is monitored, see the equation below:

$$BE_{b,CO2,y} = (\sum_b BB_{b,fuel} * NCV_{fuel} * EF_{bfuel}) + (BB_{b,bio} * NCV_{bio} * EF_{b,bio} * f_{NRB})$$

Where:

$BE_{b,CO2,y}$ = Cumulative baseline CO_2 emissions from the use non-renewable biomass and fossil fuels during year *y*

$BB_{b,fuel}$ = The quantity of fossil fuel consumed in the baseline scenario *b*, in tonnes/year (0.00)

NCV_{fuel} = Net calorific value of fossil fuel, in TJ/tonne (0.0473)

$EF_{b,fuel}$ = CO_2 emission factor of fossil fuel in baseline scenario *b*, in tonnes/TJ (63.1)

$BB_{b,bio}$ = The quantity of biomass consumed in the baseline scenario *b*, in tonnes/year

Baseline scenario	Quantity of biomass used (tonnes/hh/yr)	Ratio
$BB_{b1,bio}$	3.527	77.7%
$BB_{b2,bio}$	7.042	14.6%
$BB_{b3,bio}$	10.034	6.3%
$BB_{b4,LPG}$	0.00	1.5%

NCV_{bio} = Net calorific value of biomass, in TJ/tonne (0.015)

$EF_{b,bio}$ = CO_2 emission factor of biomass in baseline scenario *b*, in tonnes/TJ (112)

f_{NRB} = Fraction of non-renewable biomass, in percentage (82.0)

Therefore,

$BE_{b,CO2,y}$ = 6.059 CO_2/year/hh

Accounting for baseline emissions from manure handling: The baseline emissions from the handling of animal waste is determined with IPCC Tier 2. The baseline emissions per household shall be calculated as follows:

$$BE_{b,CH4,h,y} = \frac{(VS_T * 365) * (B_{0,T} * 0.67 kg/m^3 * MCF_{x,k} * MS_{T,x,k} * GWP_{CH_4} * N_{T,h})}{1000}$$

Where:

$BE_{b,CH4,h,y}$ = Baseline emissions from manure handling during the year *y* in tCO2e for manure handling method h

VS_T = Daily volatile solid excreted for livestock category T in kg dry matter per animal per day (See the table below for values)

$B_{0,T}$ = Maximum methane producing capacity for manure produced by livestock category T in m^3 CH_4 (see the table below for values)

$MCF_{x,k}$ = Methane conversion factors for the animal waste handling system in the baseline situation by climate zone *k*, (15.48%)

$MS_{T,x,k}$ = Fraction of livestock category T's manure handled using manure management system *x* in climate region *k* (determined through survey method ex-post) (see table below for values)

GWP_{CH4} = Global Warming Potential of methane (28)

$N_{T,h}$ Number of livestock category T in premise *h* (see the table below for values

	VS_T (kg/head/day)	BO_T ($m^3/CH_4/Kg$)	$MS_{T,S,k}$ (%)	$N_{T,h}$ (Number/hh)
Diary Cows	1.90	0.13	82.47	7.42
Other cattle	1.50	0.10	68.13	3.21
Market swine	0.30	0.29	25.76	1.14
Breeding swine	0.30	0.29	50.00	1.56
Goats	0.35	0.13	0.00	4.75
Sheep	0.32	0.13	0.00	1/15
Poultry	0.02	0.24	8.47	28.59

Therefore,

$BE_{b,CH4,h,y}$ =3.127tCO₂/year/hh

The total calculated baseline emissions = calculated baseline emission * usage rate * total no of HH = 45,169 tCO₂e

The verification team based on the assessment of the calculation provided in the ER sheet /02-b/ and MR confirms that all the all the calculations are true and the same has been verified through the on-site survey assessment and therefore all the values are deemed to be accepted.

D.7.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	Document Review, Interview
Findings	CL06, CL08, CL13, CL16 has been raised and closed successfully
Conclusion	As per Technologies and Practices to Displace Decentralized Energy Consumption (version 1.0), the project emissions are calculated as: **Project emission due to the continued use of fossil fuel and non-renewable biomass** Is calculated as $$PE_{p,CO2,y} = \sum(BB_{p,fuel} * NCV_{fuel} * EF_{p,fuel}) + (BB_{p,bio} * NCV_{bio} * EF_{p,bio} * f_{NRB})$$

Where:

$PE_{p,CO2,y}$ = Cumulative project CO_2 emissions from the use non-renewable biomass and fossil fuels during year y

$BB_{p,fuel}$ = The quantity of fossil fuel consumed in the project scenario *p*, in tonnes/year (0.00)
NCV_{fuel} = Net calorific value of fossil fuel, in TJ/tonne (0.0473)
$EF_{p,fuel}$ = CO_2 emission factor of fossil fuel in project scenario *p*, in tonnes/TJ (63.1)
$BB_{p,bio}$ = The quantity of biomass consumed in the project scenario p, in tonnes/year (2.822)
NCV_{bio} = Net calorific value of biomass, in TJ/tonne (0.015)
$EFp_{,bio}$ = CO_2 emission factor of biomass in project scenario *p*, in tonnes/TJ (112)
f_{NRB} = Fraction of non-renewable biomass, in percentage (82)

Therefore,
$PE_{p,CO2,y}$ = 3.970 t CO_2/hh/year

Project emission from methane emission due to manure handling
Project emissions of the methane avoidance component include both the physical leakage of biogas from the bio digester and the incomplete combustion of biogas. These shall be accounted for in accordance with equation (17) of the applicable methodology:

$$PE_{p,CH4,y} = GWP_{CH4} * \sum (N_{T,h,y} * EF_{awms,T}) * PL_y + \sum (N_{T,h,y} * EF_{awms,T}) * (1 - \eta_{new\ stove})(1 - PL_y)$$

Where:
$PE_{p,CH4,y}$ = Project emissions from manure handling during the year y in tCO_2e

GWP_{CH4} = Global Warming Potential of methane (28)
$N_{T,h}$ = Number of livestock category T in premise h (see the table below for values)

$EF_{awms,\ T}$ = Emission factor for the defined livestock population category T

Pl_y = Physical leakage of the biodigester (through measurement or application of 10% default)
$\eta_{new\ stove}$ = Combustion efficiency of the used type of biogas stove (55%)

In the above equation, $EF_{awms,\ T}$ is further defined as:

$$EF_{awms,h} = \frac{(VS_T * 365) * (B_{0,T} * 0.67 kg/m^3 * MCF_{x,k} * MS_{T,x,k})}{1000}$$

Where
$EF_{awms(T)}$ = CH_4 emission factor for livestock category *T*, (tCH4per animal per year)

$EF_{awms,\ Dairy\ cow}$	0.0077
$EF_{awms,\ Goat}$	0.0000
$EF_{awms,\ other\ cattle}$	0.0039
$EF_{wwms,\ Sheep}$	0.0008
$EF_{awms,\ market\ swine}$	0.0000
$EF_{awms,\ breeding\ swine}$	0.0016
$EF_{awms,\ Poultry}$	0.0000

$VS_{(T)}$ = Daily volatile solid excreted for livestock category *T*, (kg dry matter per animal per

day) (see the table below for values)

365 = Basis for calculating annual VS production, (days per year)

$Bo_{(T)}$ = Maximum methane production capacity for manure produced by livestock category *T*, (m3CH4 per kg of VS excreted) (see the table below for values)

$MCF_{(BL,k)}$ = Methane conversion factors for the animal waste handling system in the baseline situation by climate zone k, (15.48%)

$MS_{(T,S,k)}$ = Fraction of livestock category *T*'s manure treated in the animal waste management system, in climate region *k* (dimensionless) (see the table below for values)

	VS_T (kg/head/day)	BO_T ($m^3/CH_4/Kg$)	$MS_{T,S,k}$ (%)	$N_{T,h}$ (Number/hh)
Diary Cows	1.90	0.13	82.47	7.42
Other cattle	1.50	0.10	68.13	3.21
Market swine	0.30	0.29	25.76	1.14
Breeding swine	0.30	0.29	50.00	1.56
Goats	0.35	0.13	0.00	4.75
Sheep	0.32	0.13	0.00	1/15
Poultry	0.02	0.24	8.47	28.59

Therefore,

$PE_{p,CH4,y}$ = 0.236tCO_2/year/hh

Project emission from bio slurry

The following steps are followed to calculate the project emissions from bio slurry (Accounted for ER calculation if total emission from bio-slurry exceeds 1% or project emissions)

Step 1: estimation of the total amount of VS entering the biodigester

To estimate the total amount of Volatile Solids (VS) that enters the biogas digester, for each animal, the VS excretion in kg/day is multiplied with the average number of animals owned by households with a biodigester. This results in a total amount of VS excreted per animal per day. Next, these totals are multiplied with the share of bio-slurry fed into the biodigester for each animal, resulting in the total VS entering the biodigester per day. The sum of VS entering the biodigester from all animals combined is **15.28 kgVS.day-1.**

Step 2: assessment of remaining VS content of bio-slurry

The second step is the assessment of remaining VS content. A 55% efficiency is assumed for the digesters implemented through this project; the remaining VS content of bio-slurry is therefore 45% of total VS introduced to the digester. The figure is calculated by subtracting the percentage of VS that is destroyed in the biodigester from the total VS entering the biodigester. The resulting total VS in bio-slurry is:

15.28 kgVS.day-1 x 45% **= 6.87 kgVS.day-1.**

Step 3: Assessment of the methane potential of bio-slurry

To assess the methane potential of bio-slurry under the project scenario, for each animal the maximum methane producing capacity of the manure is multiplied by the remaining CH_4 production capacity of liquid digestate ($F_{ww,CH4}$) (EB 96 Annex 7). The resulting figure is multiplied with the total VS entering the biodigester per animal and proportionally weighted, resulting in an average methane potential per digester of **0.025 m3CH_4/KgVS per day**.

Step 4: calculation of bio-slurry emissions

$PE_{p1\ bio\text{-}slurry}$ = (total VS in biodigesters * 365) * $B_{o,dig}$ * ΣDMS * MCF *(D_{CH4} /1000) * GWP_{CH4}

Where:

$PE_{p1\ bio\text{-}slurry}$ =Project emissions from bio-slurry

	Total VS in bio-slurry = 6.87 kg/day/hh $Bo_{,dig}$ =Maximum methane production capacity for the biodigester (0.025) $m^3CH_4/kgVS$) DMS = Bio-slurry management practice, as a fraction MCF = Methane conversion factor (5.58%) D_{CH4} = Density of methane conversion factor (0.00067 t/m^3) GWP_{CH4} = Global Warming Potential of methane (28) **$PE_{p1\ bio\text{-}slurry}$ = 0.00007 tCO_2/hh/year** (Excluded as this is less than 1% of total emission) Total Project Emissions: $PE = PE_{p1,CO2,y} + PE_{p1,CH4,y} + PE_{p1,bio-slurry}$ $= 0.236 + 3.970 + 0\ \ tCO_2/year/hh$ **PE = 4.206 tCO_2/year/hh Or 20,680 tCO_2e** The verification team based on the assessment of the calculation provided in the ER sheet /02-b/ and MR confirms that all the all the calculations are true and the same has been verified through the on-site survey assessment and therefore all the values are deemed to be accepted.

Applied directly	60.53%
Sundrying (drylot)	12.61%
Composting	3.03%
Slurry	4.18%
Uncovered lagoon (black watery mass.)	5.91%
solid storage	7.05%
Other (discarded +other)	6.70%

D.7.3. Calculation of leakage GHG emissions

Means of verification	Document Review, Interview
Findings	No findings
Conclusion	Leakage emissions The methodology states that the following potential sources of leakage are to be considered: 1. The displaced baseline cook stoves- are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project. 2. The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources. 3. The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario. 4. The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology. 5. By virtue of promotion and marketing of a new technology with high efficiency, the project stimulates substitution within users who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline. As per the methodology "*Leakage risks deemed very low can be ignored as long as the case for their insignificance is substantiated*."

	Section 6.4.3.3 of the VPA-DD/B03-a/ provides an overview of potential sources of leakage, including their applicability and justification for excluding the sources of leakage and there it was determined that the leakage risk was negligible and that additional monitoring, therefore, is not required. The verification team based on the assessment of the on-site survey confirms that there is no potential leakage risk involved during the current monitoring period. The same has been verified during the last two monitoring period and therefore the leakage emission can be ignored.

D.7.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	Document Review, Interview
Findings	No findings
Conclusion	Emission Reductions: The emission reductions in this monitoring period are: $ER_y = BE_y - PE_y - LE_y$ Where, ER_y is the total emission reductions of the project activity during the year y in tCO_2e; BE_y is the baseline emissions for the project activity during the year y in tCO_2e PE_y is the emissions for the project activity during the year y in tCO_2e. LE_y is the leakage emissions for the project activity during the year y in tCO_2e. As explained in section D.7.1 above, the resulted Baseline emissions (BE_y) for the monitoring period is 45,169 tCO_2e. Similarly, as explained in section D.7.2 and section D.7.3 project emission is 20,680 for the monitoring period. Hence, resulted emission reduction for the monitoring period is 24,489 tCO_2e.

D.7.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	Document Review, Interview
Findings	No findings
Conclusion	The ex-ante estimate value of the emission reductions for the monitoring period as per the registered PDD /B03-a/ is 12,126 tCO_2e and the actual emission reductions achieved for the monitoring period is 24,489 tCO_2e.

SDG		Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
13		12,126 tCO_2e	24,489 tCO_2e
8		Not Estimated	225,733
7	GS-08	12,002	8,326
	GS-12	Not estimated	30
5		Not estimated	91%
3		Not estimated	97%

	2	Not estimated	93.3%

The emission reduction calculations provided in the spreadsheet /02/ have been verified to be correct and in line with the registered PDD /B03/.

D.7.6. Remarks on difference from estimated value in registered PDD

Means of verification	Document Review, Interview
Findings	No findings
Conclusion	The ex-ante estimate value of the emission reductions for the monitoring period as per the registered PDD /B03/ is 12,126 tCO_2e and the actual emission reductions achieved for the monitoring period is 24,489 tCO_2e. For SDG 13, the actual emission reduction is higher than the estimated value and the monitoring report /01-f/ provides reason for increase in the actual emission reduction and the same was confirmed by the verification team through the survey and by reviewing the actual implementation status of the project. For other SDG parameters, PP has provided justification in the Monitoring report and assessment of the same is provided below: • There are no ex-ante values available of SDG 2,3, 5, 7 (impact GS-12 Technology transfer and technological self-reliance) and thus no remarks can be provided on a potential increase from estimate value in approved PDD, and thus acceptable to the VVB. • SDG 7: The actual value exceeds the estimated value, which is deemed appropriate and thus acceptable to the VVB. • SDG 13: The actual value exceeds the estimated value, which is deemed appropriate on the basis of the verification of the actual implementation of the project activity and thus acceptable to the VVB.

SECTION E. Internal quality control

The verification report passed a technical review before being submitted to the Gold Standard. The technical review is performed by a technical reviewer qualified in accordance with CCIPL's qualification scheme for CDM validation and verification.

SECTION F. Verification/Certification opinion

Carbon Check (India) Private Ltd. (CCIPL) has performed the 5th periodic verification of the registered GS Project Activity "African Biogas Carbon Programme (ABC) – Uganda - VPA003".

The verification team assigned by the VVB concludes that the project activity as described in the PDD /B03-a/ and the Monitoring report /01-f/, meets all relevant requirements of the Gold Standard. The verification has been conducted in-line with the GS4GG requirements project activities.

Verification methodology and process

The Verification team confirms the contractual relationship signed /12/ between the VVB, Carbon Check (India) Private Ltd. and the Project Participant. The team assigned to the verification meets the CCIPL's internal procedures including the UNFCCC/GS requirements for the team composition and competence. The verification team has conducted a thorough contract review as per UNFCCC and CCIPL's procedures and requirements.

The verification has been performed as per the requirements described in the GS4GG and constitutes the review and completion of the following steps:

- Reviewing the PDD /B03-a/, including the monitoring plan and the corresponding validation report /B03-a/.
- Desk review of the MR /01-f/ and other relevant documents including documents related to the project activities in emission reductions.

- Review of the applied monitoring methodology Technologies and Practices to Displace Decentralized Energy Consumption (version 1.0) /B01/.
- On-site inspection (29/07/2022- and 01/08/2022)
- Resolution of CARs and CLs raised during verification
- Issuance of Verification Report

The project activity was correctly implemented according to selected monitoring methodology, monitoring plan and the registered PDD. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the document review and remote interviews, the verification team confirms that the project activity has resulted in the 24,489 tCO_2e emission reductions during the reported monitoring period.

This statement covers verification period from 01/05/2021 – 18/04/2022(including both the dates).

The VVB has raised 16 clarifications and 05 corrective action requests and 01 Foreword action request and closed successfully

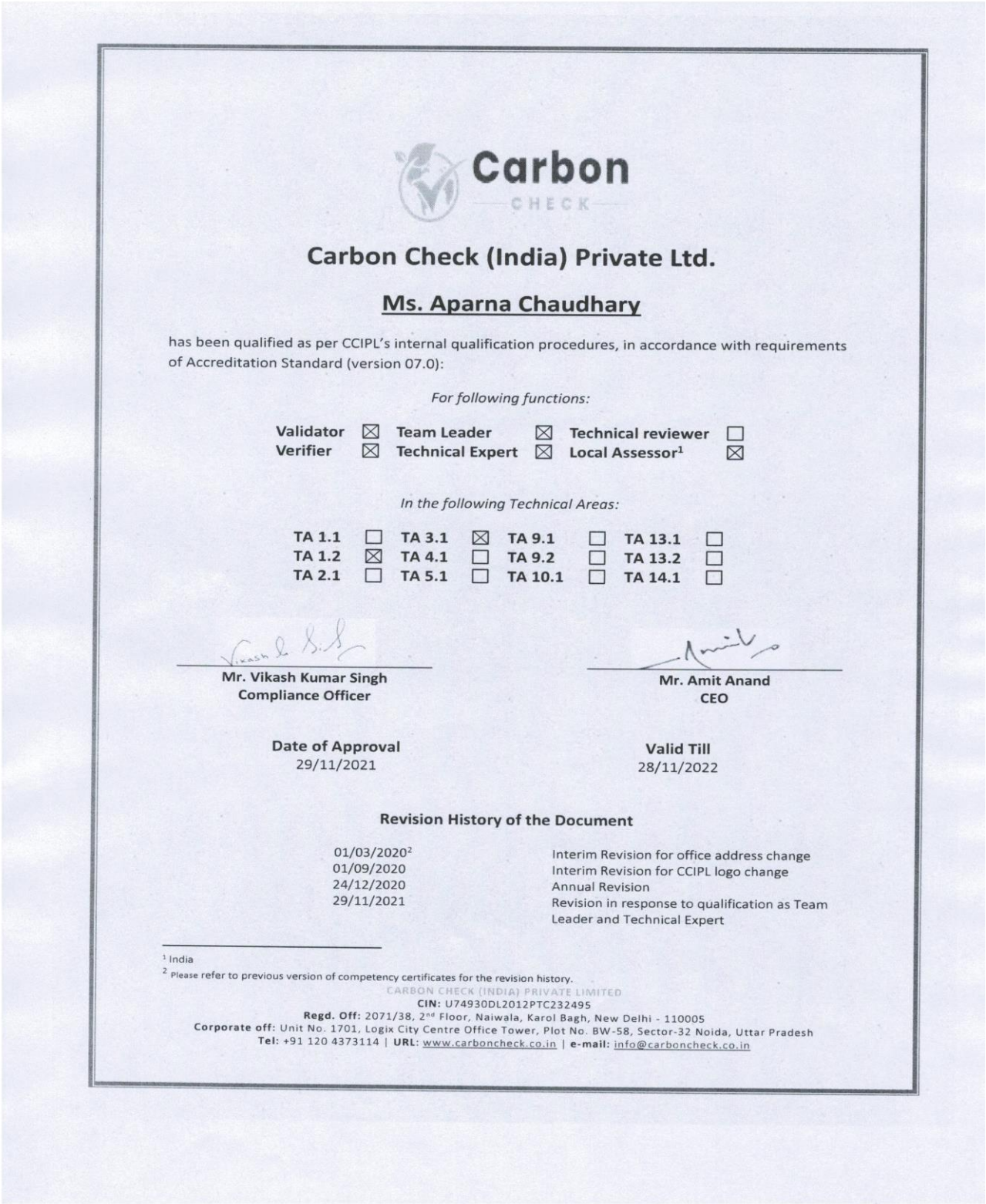
The VVB considers necessary to give reasonable assurance that reported GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology and the monitoring plan contained in the registered PDD are fairly stated.

The VVB, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 24,489 tCO_2e equivalent and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records.

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CA	Corrective Action/ Clarification Action
CER	Certified Emission Reduction
CAR	Corrective Action Request
CCIPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CH_4	Methane
CL	Clarification Request
CO_2	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalent
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
FA	Final Approval
FAR	Forward Action Request
FVR	Final Validation Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LE	Leakage Emissions
MP	Monitoring Period
MR	Monitoring Report
MWh	Mega Watt Hour
OSV	On Site Visit
PE	Project Emissions
PP(s)	Project Participant(s)
PRC	Post registration change
QC/QA	Quality Control/ Quality Assurance
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
VVB	Validation & verification body

Appendix 2. Competence of team members and technical reviewers



Carbon CHECK

Carbon Check (India) Private Ltd.

Ms. Aparna Chaudhary

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator	☒	Team Leader	☒	Technical reviewer	☐
Verifier	☒	Technical Expert	☒	Local Assessor[1]	☒

In the following Technical Areas:

TA 1.1	☐	TA 3.1	☒	TA 9.1	☐	TA 13.1	☐
TA 1.2	☒	TA 4.1	☐	TA 9.2	☐	TA 13.2	☐
TA 2.1	☐	TA 5.1	☐	TA 10.1	☐	TA 14.1	☐

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

Date of Approval
29/11/2021

Valid Till
28/11/2022

Revision History of the Document

01/03/2020[2]	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
29/11/2021	Revision in response to qualification as Team Leader and Technical Expert

[1] India

[2] Please refer to previous version of competency certificates for the revision history.

CARBON CHECK (INDIA) PRIVATE LIMITED
CIN: U74930DL2012PTC232495
Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh
Tel: +91 120 4373114 | **URL:** www.carboncheck.co.in | **e-mail:** info@carboncheck.co.in

Carbon CHECK

Carbon Check (India) Private Ltd.

Amit Anand

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator	☒	**Team Leader**	☒	**Technical reviewer**	☒
Verifier	☒	**Technical Expert**	☒	**Local Assessor**[1]	☒

In the following Technical Areas:

TA 1.1	☒	**TA 4.1**	☐	**TA 9.1**	☐	**TA 13.1**	☒
TA 1.2	☒	**TA 5.1**	☐	**TA 9.2**	☐	**TA 13.2**	☐
TA 3.1	☒	**TA 5.2**	☐	**TA 10.1**	☐	**TA 14.1**	☒

Vikash K. Singh

Mr. Vikash Kumar Singh
Compliance Officer

Date of Approval	**Valid Till**
24/12/2021	23/12/2022

Revision History of the Document

01/03/2020[2]	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
24/12/2021	Annual Revision

[1] India and South Africa

[2] Please refer to previous version of competency certificates for the revision history.

CARBON CHECK (INDIA) PRIVATE LIMITED
CIN: U74930DL2012PTC232495
Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh
Tel: +91 120 4373114 | **URL:** www.carboncheck.co.in | **e-mail:** info@carboncheck.co.in

Carbon CHECK

Carbon Check (India) Private Ltd.

Mr. S. Ranganathan

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator	☒	Team Leader	☒	Technical reviewer	☒
Verifier	☒	Technical Expert	☒	Local Assessor[1]	☒

In the following Technical Areas:

TA 1.1	☒	TA 4.1	☐	TA 9.1	☐	TA 13.1	☒
TA 1.2	☒	TA 5.1	☒	TA 9.2	☐	TA 13.2	☐
TA 3.1	☒	TA 5.2	☐	TA 10.1	☐	TA 14.1	☐

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

Date of Approval
20/09/2022

Valid Till
23/12/2022

Revision History of the Document

01/03/2020[2]	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
24/12/2021	Annual Revision
20/09/2022	Initial Joining

[1] India

[2] Please refer to previous version of competency certificates for the revision history.

CARBON CHECK (INDIA) PRIVATE LIMITED
CIN: U74930DL2012PTC232495
Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh
Tel: +91 120 4373114 | **URL:** www.carboncheck.co.in | **e-mail:** info@carboncheck.co.in

Appendix 3. Documents reviewed or referenced

S. No.	Document
/01/	Monitoring report a) Version 01 (initial) b) Version 1.1 c) Version 1.2 d) Version 1.3 e) Version 1.4 f) Version 1.5 (final)
/02/	Emission reduction calculation spread sheet / Monitoring survey a) 01-a b) 01-d
/03/	Project database a) Version 1.0 b) Version 1.1
/04/	PFT samples
/05/	Survey questionnaires
/06/	Usage rate requirement evidence a) Verification check evidence b) random number generator evidence for verification checks
/07/	Training report a) Masons training report b) enumerators training report
/08/	3rd party survey report
/09/	Evidence for random number generator for monitoring survey.
/10/	Grievances evidence a) Grievances on previous MP b) Grievances on current MP
/11/	Biogas plant technical details
/12/	Contract between VVB and project participant

Background Documents

Ref no.	Reference Document
/B01/	Technologies and Practices to Displace Decentralized Energy Consumption (version 1.0)
/B02/	Community Services Activity Requirements (version 1.1) under GS4GG https://globalgoals.goldstandard.org/200-gs4gg-community-services-activity-requirements/ Principles and requirements v.1.2 under GS4GG
/B03/	Registered DD a) VPA DD, Version 3.1 dated 02/05/2017 b) POA DD c) Transition annex d) validation report
/B04/	a) CDM Sampling Standard, version 09.0 b) Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0. c) CDM validation and verification standard for project activities, version 04.0
/B05/	IPCC 2006, volume 2, chapter 1
/B06/	Site Visit and Remote Audit Requirements and Procedures, version 1.0

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. FARs from this verification

FAR ID	01	Section no.	B.1.1	Date: 25/10/2022
Description of FAR				
1.On the basis of the FAR raised in the MPIV, the status of 79 plants has been followed up in the current MP. It has been observed that out of 79 grievances, 3 has been closed which is confirmed on the basis of the telephonic interviews made to the HH. The remaining 76 units has been removed from the database. Project implementer is to follow up on these households during the next monitoring period. 2.It has been observed that 196 grievances are pending in the current monitoring period. Project implementer is to follow up on these household during the next monitoring period.				
PP response				**Date:**
Documentation provided by the CME				
DOE assessment				**Date:**

Table 2. CARs from this verification

CAR ID	01	Section no.	D.2	Date: 24/08/2022
Description of CAR				
It has been observed that the reference to the excel sheet for the values of the parameter MSp,s,k and MS t,s,k provided in section D.2 of the MR is found to be incorrect. PP is requested to provide the correct reference.				
Project participant response				**Date: 04/09/22**
The references are now corrected				
Documentation provided by project participant				
MR v1.1				
DOE assessment				**Date: 14/09/2022**
It has been observed by the verification team that the reference to the excel sheet for the parameter MSpsk and MStsk has been revised in the updated MR v.1.1 and has been made consistent with the excel sheet. Thus, the finding is closed.				

CAR ID	02	Section no.	D.2	Date: 24/08/2022
Description of CAR				
In section D.2, under the parameter BBp1, bio. The value of the parameter is not consistent with the reference provided. (2.882 Tonnes/year to be found in the reference). PP is requested to correct the same				
Project participant response				**Date: 04/09/22**
this is correct, the typo is changed to the reference value				
Documentation provided by project participant				
DOE assessment				**Date: 14/09/2022**
on the basis of the review of the revised MR, v 1.4. The value of BBp1,bio has been observed to be made consistent with reference provided. Thus, the finding is closed.				

CAR ID	03	Section no.	D.3	Date: 24/08/2022
Description of CAR				
PP is requested to correct the type error in the value provided for the parameter "Number of biogas plants installed" under section D.3 of the MR				

Project participant response	Date: 04/09/22
The references are now corrected	
Documentation provided by project participant	
MR V1.1	
DOE assessment	**Date: 14/09/2022**
It has been observed that the PP has provided the value for the parameter “Number of biogas plants installed” as “8.399”, which is found to be represented incorrectly. PP is requested to provide the value in appropriate representation.	
Project participant response	**Date: 23/10/2022**
this minor issue has been resolved in MR v1.2	
DOE Assessment	**Date 01/10/2022**
The PP has corrected the typo mistake and the value has been represented correctly. Thus, the finding is closed	

CAR ID	04	Section no.	E.1	Date: 24/08/2022
Description of CAR				
In the section E.1, The value adopted for the calculation of each parameter is requested to be provided for all the calculation. It was found that the value is not provided for baseline emissions from manure handling, project emission due to methane emissions from manure handling.				
Project participant response				**Date: 04/09/22**
section E.1 only calculates the baseline emissions, not the project emissions. The baseline emissions from AWMS are calculated, and are 3.127 tCO_2/hh/year. Project emissions are calculated in section E.2 as per template guide.				
Documentation provided by project participant				
DOE assessment				**Date: 14/09/2022**
In the section E.1 and E.2, the calculations has been provided for baseline and project emissions. However, the value of each parameter mentioned In the calculation is not provided in the section for some of the calculation. For eg: For the calculation of baseline emissions from fuel use, the value of the parameter involved is provided in the table 7. Similarly, PP is requested to provide the value of all the parameters involved in the calculation of baseline and project emission in section E.1 and E.2				
Project participant response				**Date: 23/09/2022**
The MR is now updated as per instruction, see MR v1.5 During the update, it was discovered that the bio-slurry calculation was correct. Changed in the excel are: sheet bio-slurry cell B63 is linked with E43 instead of B43, as the calculations only include the amount of VS not destroyed, thus remaining in the bio-slurry. As a consequence, the emissions from bio-slurry are lower. The MR has been updated. There is on change in the VER claim as bio-slurry were and remain insignificant and are therefore ignored. Moreover, the unit depicted in cell E62 of the value in cell E63 was incorrect and is now corrected.				
DOE Assessment				**Date: 01/10/2022**
It has been observed that the PP has provided all the values involved in the calculation of baseline and project emissions in the section E.1 and E.2 of the updated MR and the values has been cross checked with the excel sheet and confirms to be consistent. The changes in the calculation of Bio slurry emissions are also cross checked and is found to be correct. The value is less than 1% of total emission and therefore is considered insignificant. Thus, the finding is closed				

CAR ID	05	Section no.	N/A	Date: 24/08/2022
Description of CAR				

As per the FAR raised during the GS performance review of previous monitoring period and referring to the updated usage rate requirements dated 27/10/2020, "Registered Projects and PoA/VPAs involving household biogas digesters, with monitoring periods after 26/10/2021, must demonstrate compliance with Usage Requirements v.2.0.

PP is requested to use and demonstrate compliance with the usage requirement version v 2.0 as per the FAR raised for the current monitoring period.

Project participant response	**Date: 04/09/22**

The revised VPA003-DD v3.2 has been provided for which an VVB opinion is requested by the SC.

In addition, compliance is demonstrated in section B4 in which analysis is provided on how the usage guidelines are implemented.
The conclusion of the verification calls was: Generally, from the 10% sample= 44 households, survey and verification results agree and if there is a variance, it is insignificant or a satisfactory explanation is provided e.g. in the attached cells BN20/BO20 (explanation), BN22/BP22(explanation) (Outcome verification final Sample of 87 (1) Ver 5 May (1)). Note that the list contains numbering until 87, which is the total sampling including spare households. Calling continued until 44 successful calls were completed.

Documentation provided by project participant

VPA003-DD 3.2 (provided previously)
Random number usage verification (to demonstrate random selection)
File Outcome verification final Sample of 87 (1) Ver 5 May (1)

A link to salesforce for the verification of the pictures will be shared tomorrow on the 5th of September by email.

DOE assessment	**Date: 14/09/2022**

The verification team has reviewed the salesforce database as per the guidance provided by the PP through mail and confirms that the photographic evidences of the project technology is given in the database.

PP has mentioned that "Compliance is demonstrated in section B.4 " is the PP response section above, however this reference is unclear to the verification team. PP is requested to clarify as no demonstration has been provided in section B4

It has been observed that in the section D.4 of the MR, the PP has demonstrated the compliance to the usage requirement v.2.0, however PP is requested to response to the following.

1. PP is requested to provide a detailed assessment of the verification checks under the implementation column.
2. PP is requested to clarify how the random number generated is connected to the unique identification of the HH.

Project participant response	**Date: 23/09/2022**

1. This is now updated in section D.4, see MR v1.2
2. The procedure is
    a. Make a list of hh visited by the survey consultant and give all hh a serial number starting with 1.
    b. Run the random generator to randomize the total number of hh visited, the evidence is shared (the word document)
    c. Copy sequency randomly generated number to the excel (evidence is shared)
    d. Survey the randomly selected hh from the sequence number starting with 1 and call those hh until the desired sample size is reached.
    e. Thus hh 1 could have a number allocated randomly of 40, it means that hh 1 is now hh 40 in the list, and first 39 other hh's are called.

DOE Assessment	**Date: 01/10/2022**

On the basis of the review of the revised MR, the verification team confirms that

1. The detailed assessment of the verification check has been provided in the section D.4 of the MR.
2. The PP has conducted the verification checks on the basis of the random sampling which is confirmed on the basis of the review of the file "Outcome verification final Sample of 87" and the random sample numbers generated as provided in the file "Random Numbers usage verification".

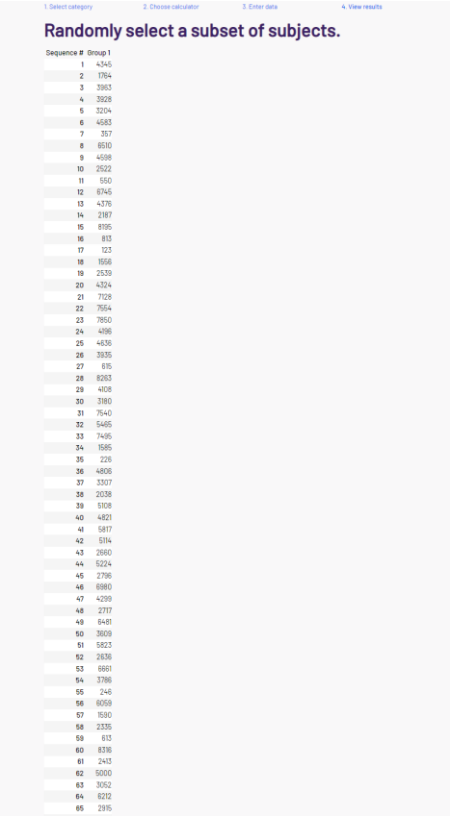
Thus, the finding is closed.

CL ID	01	Section no.	Key project page	Date: 24/08/2022
Description of CL				
On the basis of the review of the previous monitoring report and verification report obtained from the GS4GG impact registry, the verification team has observed that the previous monitoring period no is 4 having a start date of 01/05/2020 to 30/04/2021. Therefore PP is requested to clarify the Monitoring Period no mentioned as 4 in the key project page of the current monitoring report.				
Project participant response				**Date : 04/09/2022**
This was a typo, this is now updated to 5 in MR version 1.1				
Documentation provided by project participant				
DOE assessment				**Date: 14/09/2022**
The verification team confirms that the monitoring period no has been revised in the revised MR v.1.1 and the current monitoring period no (5) has been correctly mentioned in the key project page of the MR. *Thus, the finding is closed.*				

Table 3. CL from this verification

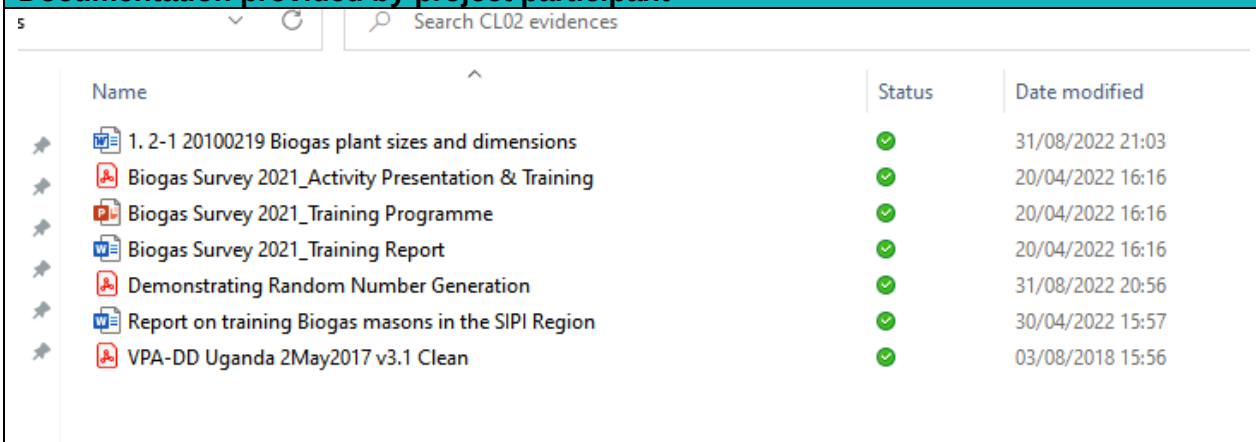
CL ID	02	Section no.	N/A	Date: 24/08/2022
Description of CL				
PP is requested to provide the following documents *1. Technical specifications of the biodigesters as given in table 03 of the MR.* *2. manufactures specification (for the assessment of values given under the parameter nbiogas,stove)* *3. Training records of masons (for the assessment of parameter GS-12)* *4. Training records of CIRCODU enumerators.* *5. evidence for the random sample generation.*				
Project participant response				**Date: 04/09/22**

1. See file 1. 2-1 20100219 Biogas plant sizes and dimensions in the response package
2. the reference is the VPA003-DD, the VPA003-DD which was validated by the VVB is shared as evidence
3. This evidence was shared with the VVB before (see folder evidence in the first package). However it is shared again, see in the reply package CL02 evidences
4. Training records are now shared, see the files starting with Biogas user survey 2021..
5. Graphpad.com is utilized for the PFT. The evidence was already included in the BSUL PFT sample list and copied here. See also that file from cell E307:Q379



On the survey A and B, see the file Demonstrating Random Number Generation in the response package

Documentation provided by project participant



DOE assessment	**Date: 14/09/2022**

The verification team has confirmed that the PP has provided a complete list of evidence/ required documents for the assessment of the implementation of the project activity.

However, the following requires further clarification.

1. It has been observed by the verification team that the PP has provided the technical specifications of the biodigesters in table 3 of the MR up to 13m^3. In the footnote of the same page, it has been mentioned that “larger digesters than 13m^3 are also installed” and “The performance of these digesters is proportional to the increase in digester volume”.
   PP is requested to provide a clarification that the performance of these digesters are proportional to the increase in digester volume and also to provide the technical specification of biodigesters with larger volume which are provided in the database that is used in the project activity.
2. On page no 4 of the supporting document, the number of trainees mentioned under 4 tables totals 23 while in the MR and the supporting document the number of trainees is mentioned as 30, moreover, the designation of 7 attendees is not provided in table 4 of the supporting document. Thus, PP is requested to clarify the discrepancy and requested to provide the attendance register of the trainees/training contract of the training programme.
3. The PP has provided the evidence for the random sampling of PFT as well as for Survey A and B, but it is not clear to the verification team how the Households have been chosen based on the numbers generated through the random sample generator. PP is requested to clarify the same.

Moreover, in section D.4, page number 34 of the MR, it has been observed that PP has referred to the “Inception report of the consultant, chapters 2 and 3”. PP is requested to provide the mentioned document.

Project participant response	**Date: 23/09/2022**

PP replies

1. HRT= V/Q, HRT is the residence time of manure in a digester, which is a fixed value. The loading rate Q is therefore directly proportional to V, the volume. This is basic environmental science. In the FVR of the last verification page 3 and 4 the technical details of the other sizes can be found. Since this was raised before by the VVB, additional justification is not required. The FVR MP4 is included as evidence
2. That is incorrect, the total is 30, please check again, here it is calculated.
    a. Training site 1: 7
    b. Training site 2: 8
    c. Training site 3: 8
    d. Training site 4: 7

Training Site 1		
	Name	**Designation**
1	Epok Maxwell	Supervisor
2	Chabo Robert	Trainee
3	Wetaka Micheal	Trainee
4	Chemutai Enos	Trainee
5	Wodada Bosco	Trainee
6	Namuozo Mary	Trainee
7	Chetoris Moses	Trainee
8	Mwanga Simon	Trainee
9		

Training Site 2		
	Name	**Designation**
1	Ateka Moses	Supervisor
2	Mahungu Amos	Trainee
3	Musobo Hassen	Trainee
4	Wodada Milton	Trainee
5	Cheptoyek Benson	Trainee
6	Nandipia Titus	Trainee
7	Cherotich Idaya	Trainee
8	Chesanga Stephen	Trainee
9	SofekwoNelson	Trainee

Training Site 3		
	Name	**Designation**
1	Mukwalu Andrew	Supervisor
2	Wolimbwa Martin	Trainee
3	Chebet Ali	Trainee
4	Wofuta Moses	Trainee
5	Chesang Ismail	Trainee
6	Kibet Isaac	Trainee
7	Sebila Abubaker	Trainee
8	Chelimo Jentrice	Trainee
9	Chemayok Andrew Yeko	Trainee

Training Site 4		
	Name	**Designation**
1	Malagala Emmanuel	Supervisoe
2	Sirikye Willson	
3	Nakoko Akisoferi	
4	Yeko David	
5	Sande David	
6	Kametei Aggerey	
7	Chemayek Andrew	
8	Limo Alfred	
9		

    e.
3. Included is the BUS report, in chapter 2, the background of the sampling can be found. Note that this is also described in the MR
   On the PFT, a random sample of hh is selected (evidence is shared), the numbers from the random sample are surveyed. I.e. if number 233 was selected, then hh with the number 233 from the database is selected, if hh 2000, then hh 2000 would be survey etc.

DOE Assessment	**Date: 01/10/2022**

1. The verification team has observed that the PP has provided the clarification required for the proper understanding of the technical specification of biodigesters having volume higher than 13m^3 which are not provided in the MR. The same has been verified upon the review of the *Domestic biogas plants Sizes and dimensions* report provided by the PP.

2. It has been observed that the PP has provided the necessary clarifications regarding the number of trainees attended the masons training programme and is deemed to be acceptable to the verification team.

3. The verification team based on the review of the BSUL PFT sample list, PFT - 90-30 Test_checks and the response provided by the PP, confirms that the PFT was conducted as per the random sampling and the proper evidence is provided by the PP.

Thus, the finding is closed

CL ID	03	Section no.	D.1	Date: 24/08/2022
Description of CL				
On the basis of the review of the project database file provided by the PP, the verification team has observed that apart from Taroworks, another app "Magpi" has been used for the collection of data, while the app is not mentioned in the MR, PP is requested to clarify the involvement of magpi and why it has not been metioned in he MR.				
Project participant response				**Date: 04/09/22**
Magpi was the application BSUL used briefly before changing to TaroWorks. It was used briefly because it did not give the expected results hence the change to TaroWorks. The data collected through Magpi was however imported into Salesforce for consolidation purposes and Tarowrks is used from 2014 onwards				
Documentation provided by project participant				
DOE assessment				**Date: 14/09/2022**
The PP has provided the justification regarding the involvement of the application "Magpi" and the data collected through magpi has been fed into the database until 2014 which has been confirmed by the verification team u review of the database Thus, the finding is closed				

CL ID	04	Section no.	D.1	Date: 24/08/2022
Description of CL				
t has been observed by the verification team that the source and value of the ex-ante parameter MCF x,k provided in the section D.1 of the MR is inconsistent with the VPA-DD. PP is requested to clarify the inconsistency				
Project participant response				**Date: 04/09/22**
See page 22 of the first Verification report in which the same comment was provided. The same response to that comment remain valid and were approved by the VVB. The verification report is included in the response package folder CL5 and CL4 evidence				
Documentation provided by project participant				
VER_REP_ABC_Uganda_VPA003				
DOE assessment				**Date: 14/09/2022**
The verification team confirms that the value and source provided for the ex-ante parameter - MCFx,k is consistent with the monitoring period 1 (19/04/2015 - 31/08/2017) MR v.2 dated 23/05/2018 and the same has been reviewed by the verification team. Thus, the finding is closed.				

CL ID	05	Section no.	D.1	Date: 24/08/2022
Description of CL				
It has been observed that the values provided for the parameter EF awms,t in the section D.1 of the MR is not consistent with the POA DD and VPA DD, though there is only single source mentioned in VPA DD and PoA DD and MR. PP is requested to clarify the inconsistency				
Project participant response				**Date: 04/09/22**
As above, see the evidence, the first verification report, provided in the folder CL5 and CL4 evidence page 23 on AWMS.t				
Documentation provided by project participant				
VER_REP_ABC_Uganda_VPA003				
DOE assessment				**Date: 14/09/2022**

It has been observed that the PP has mentioned in the response that the value for EFawms,t has been sourced from the first verification report. However, upon review of the same, it has been observed that the value of market swine is inconsistent between the current monitoring report and the first verification report.
Moreover, PP is requested to revise the value's source and add the information regarding the revised value from the VPA DD in the additional comment section.

Project participant response	**Date: 23/09/2022**
This is now updated using the VVB assessment of the changes made in the first monitoring report, see MPI FVR and the updated MR v1.1	
DOE Assessment	**Date: 01/10/2022**
The PP has revised the value of the Market swine has been made consistent with the source. Also, necessary justification has been provided in the Additional comment. Thus, the finding is closed.	

CL ID	**06**	**Section no.**	**ER sheet**	**Date: 24/08/2022**
Description of CL				
On the basis of the review of the Excel sheet "19Apr22 VPA003 MPIV survey_SDG_ER v1.0", the verification team has observed that the total number of respondents for the parameter SDG 3 is only 32. Moreover, as indicated in the sheet "Survey A", under column EW, most of the response is indicated as NA. PP is requested to clarify why only 32 responses out of 210 sampled has been considered for the evaluation. *Moreover the 97% value in which the user reported perceived health improvement is considered based on the 32 samples responded, not the 210 samples considered.*				
Project participant response				**Date: 04/09/22**
This question is only applicable to respondents responsible for cooking. Asking this question to members not responsible for cooking makes the question not applicable (NA). A significant number of respondents did not cook, and therefore did not experience the benefits on this SDG. The members who did benefit, were not interviewed, i.e. because not available due to work or other duties				
Documentation provided by project participant				
-				
DOE assessment				**Date: 14/09/2022**
It has been observed that the PP has considered 100 samples for the monitoring of the parameter SDG 3 on the basis of the requirement of the methodology. However only 32 respondents interviewed were responsible for the cooking and therefore other respondents are considered not applicable which is confirmed on the basis of the review of the excel sheet "*VPA003 MPIV survey_SDG_ER v1.0"* Thus, the finding is closed				

CL ID	**07**	**Section no.**	**D.2**	**Date: 24/08/2022**
Description of CL				
PP is requested to provide the relevance of the additional comment made under the parameter GS-1: Air quality in section D.2 of the MR				
Project participant response				**Date: 04/09/22**
This is relevant to demonstrate that the worsening eye condition was not caused by biogas, but by a pre-existing condition. Some wording changed in the additional comment				
Documentation provided by project participant				
-				
DOE assessment				**Date: 14/09/2022**
The PP has revised the statement provided against the additional comments and the statement is clear to the verification team and is found to be relevant. Thus, the finding is closed.				

CL ID	08	Section no.	ER Sheet	Date: 24/08/2022
Description of CL				
On the basis of the review of the Excel file "19Apr22 VPA003 MPIV survey_SDG_ER v1.0", sheet "Analysis A", the verification team has observed that in the cell C53, the no of HH responded to "Yes,more time available than before having biogas" is found to be 108 and the total no of HH considered under various categories of the usage of saved time given in cell C68 is found to be 153 in which the values for the parameter "usage of saved time" is accounted for. PP is requested to clarify this inconsistency.				
Project participant response				**Date: 04/09/22**
This is not inconsistent. If a certain amount of time is saved, it can be used for multiple activities (i.e, household chores and farming). Thus the sum of the activities is often larger than the sum of households reporting time savings.				
Documentation provided by project participant				
-				
DOE assessment				**Date: 14/09/2022**
The verification team has reviewed the excel sheet provided by the PP and confirms that the response provided by the hh for usage of saved time is categorised into different activities which totals to a count of 153 which is different from actual number of respondents. The usage of saved time has been sourced from these categories and therefore the justification provided by the PP is deemed to be acceptable. Thus, the finding is closed.				

CL ID	09	Section no.	D.2	Date: 24/08/2022
Description of CL				
PP is requested to revise the measurement methods and procedures under the parameter "usage of saved time" given in section D.2 of the MR as the statement given is found to be inconsistent with the PoA VPA transition annex v.1.6				
Project participant response				**Date: 04/09/22**
This is now made consistent				
Documentation provided by project participant				
MR v1.1				
DOE assessment				**Date: 14/09/2022**
The verification team confirms that the PP has revised the MR and the statement provided against "measurement method and procedure" for the parameter "Usage of saved time" has been made consistent with the transition annex v.1.6. Thus, the finding is closed.				

CL ID	10	Section no.	D.2	Date: 24/08/2022
Description of CL				
PP is requested to provide the measurement methods and procedure under the parameter "GS-8 access to affordable and clean energy services" under the section D.2 of the MR as given in the POA-VPA transition annex v.1.6				
Project participant response				**Date: 04/09/22**
This is now made consistent				
Documentation provided by project participant				
MR v1.1				
DOE assessment				**Date: 14/09/2022**
The verification team confirms that the PP has revised the MR and the statement provided against "measurement method and procedure" for the parameter "GS-8 access to affordable and clean energy services" has been made consistent with the transition annex v.1.6. Thus, the finding is closed.				

CL ID	11	Section no.	D.2	Date: 24/08/2022

Description of CL	
It has been observed by the verification team that the PP has mentioned the purpose of date under NT,h and BBb,ratio in the section D.2 of the MR as "calculation of project emission" which is found to be inconsistent with the VPA DD v.3.1. PP is requested to provide a clarification on the same.	
Project participant response	**Date: 04/09/22**
The parameter *NT,h is consistent with the transition annex and the purpose of data of parameter BBb,ratio is revised to baseline emissions consistent with the transition annex.* Parameter N,t,h however is not consistent with the VPA003-DD, but in this case the transition Annex supersedes the VPA003-DD and therefore consistency with the transition annex was maintained.	
Documentation provided by project participant	
MR v1.1	
DOE assessment	**Date: 14/09/2022**
It has been observed that the MR has been revised keeping the statement against “purpose of data” consistent with the transition annex and VPA DD for the parameter BBratio. However for the parameter Nt,h. the data provided in the MR is consistent with the transition annex and not the VPA DD. Therefore, it is deemed acceptable to the verification team. Thus, the finding is closed.	

CL ID	12	Section no.	D.3	Date: 24/08/2022
Description of CL				
PP is requested to clarify the inconsistency in the value provided for the parameter Up1,y in the section D.2 with the value given in section D.3				
Project participant response				**Date: 04/09/22**
The value in section D.3 is updated and is now consistent with D.2 (and the excel sheets)				
Documentation provided by project participant				
MR v.1.1				
DOE assessment				**Date: 14/09/2022**
The verification team on the basis of the review of the revised MR, confirms that the value of UP1,y has been made consistent throughout the MR, which is also consistent with the ER sheet provided. Thus, the finding is closed				

CL ID	13	Section no.	E.2	Date: 24/08/2022
Description of CL				
In the section E.2, under the “step 1: estimation of the total amount of VS entering the biodigester”and “step 2: assessment of remaining VS content of bio-slurry” for the calculation of project emissions due to bio-slurry, the value provided for both the calculation (12.22 KgVS/day and 5.50 KgVS/day) is not found to matching with the reference cell G36, and E43 respectively in sheet Bio slurry, VPA03 MPIV survey_SDG_ER v1.1. PP is requested to correct the discrepancy. *Moreover, in the same section, PP has provided the calculation of bioslurry emission as* *PEp1 bio-slurry = (5.5*number of days in 2020 with GWP methane of 28 * 0.026 * 6.7% *(0.67/1000)* *While the monitoring period is from May 2021 to April 2022, PP is requested to clarify the relevance of days in 2020 in the calculation.*				
Project participant response				**Date: 04/09/22**

The relevance is discussed in the MR, ex-ante kenya values were used in the VPA-DD, and this was revised later with a baseline survey during MPI. The section in the template asks to explain differences with values from the VPA-DD. The text is copied here below from the MR The ex-ante value in the VPA-DD is calculated based on the VPA03 baseline data, VPA03 estimates from the VPA03-DD BFT and PFT and the MCF from a survey of similar smallholder farmers in Kenya in 2014 and the projected number of units for this MP. The MCF however, which was 3.59% in the Kenyan smallholder survey was revised ex-post to 15.48% in VPA03 MPI – this is the main difference between the ex-post and ex-ante calculations With other words, for the baseline, ex-ante Kenya values were used, and later revised using Ugandan values ex-post using country applicable values.
Documentation provided by project participant

DOE assessment	**Date: 14/09/2022**
The verification team has reviewed the VPA DD and previous verification report and confirms that the use of Kenya in the statements in the section E.5.1 is used for referring to the value of MCF used in the VPA DD and the same value has been revised to the country specific value in the MP1 and has been used in the calculation of project emission from bio slurry. The justification provided by the PP is deemed to be acceptable. Thus, the finding is closed.	

CL ID	**14**	**Section no.**	**E.5.1**	**Date: 24/08/2022**
Description of CL				
In the section E.5.1, PP has mentioned Kenya in the statement provided. PP is requested to clarify the relevance as the VPA03 is prepared for Uganda.				
Project participant response				**Date: 04/09/22**
the values were not updated from the last MR, all the values are not updated and the reference to 2020 is removed				
Documentation provided by project participant				

DOE assessment	**Date: 14/09/2022**
It has been observed that PP has revised the value of the above-mentioned parameters and is found to be consistent with the ER sheet references. The calculation of PEpi, bio-slurry has also been revised and the value and the calculation is found to be consistent with the ER sheet. The statement has been revised. Thus, the finding is closed.	

CL ID	**15**	**Section no.**	**D.1**	**Date: 24/08/2022**
Description of CL				
In the section D.1 of MR. under the parameter EFb,bio it has been mentioned that "IPCC (2006); May be updated according to any future changes by the IPCC. CO_2 and non-CO_2 emissions factors for charcoal may be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal production ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent EF for wood." *PP is required to mention in MR that there is no change in value consequent to revised assessment report of IPCC published in 2016/2019* *For other parameter where the source of parameter is considered as "2006 IPCC Guidelines for National Greenhouse Gas Inventories", PP is requested to confirm and mention the revisions to IPCC report has not affected the values.*				
Project participant response				**Date: 04/09/22**
That is not applicable. The methodology requires us to use 2006 values only and also parameters are fixed for this CP.				

Documentation provided by project participant	
DOE assessment	**Date: 14/09/2022**
On the basis of the review of the methodology (Section II, subsection 8), and previous monitoring and verification report which was published after the latest IPCC report, the verification team has observed that the justification provided by the PP is deemed to be acceptable. Thus, the finding is closed.	

CL ID	16	Section no.	ER sheet	Date: 24/08/2022
Description of CL				
For the calculation of parameter Up1,y, in the sheet the VPA03 MPV survey_SDG_ER, sheet Analysis B, cell H23, the value in the cell E13 is not considered. PP is requested to clarify				
Project participant response				**Date: 04/09/22**
That is a mistake. This is now included and since the usage rate change slightly, the ER related values in the MR were also updated.				
Documentation provided by project participant				
DOE assessment				**Date: 14/09/2022**
Based on the review of the revised Er sheet VPA03 MPIV survey_SDG_ER v1.2. the verification team confirms that the all the cells involved in the calculation of Up1,y has been considered and the revised value has been updated in the revised MR v 1.4. Thus, the finding is closed.				

Annex 1: Assessment of data and parameters fixed ex-ante at the time of validation

Relevant SDG Indicator	SDG 13, Climate action
Parameter	$f_{NRB,y}$
Data unit	Percentage
Default values used	82%
Purpose of data	Estimation of Baseline and project emission
Source of verification of the source	Calculated

Relevant SDG Indicator	SDG 13, Climate action
Parameter	$EF_{b, bio}$
Data unit	tCO_2/TJ
Default values used	112
Purpose of data	Calculation of the baseline scenario
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate action
Parameter	$EF_{p, bio}$
Data unit	tCO_2/TJ
Default values used	112
Purpose of data	Calculation of the project scenario
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate action
Parameter	$EF_{p, fuel}$
Data unit	tCO_2/TJ
Default values used	Kerosene = 71.9 LPG = 63.1
Purpose of data	Calculation of baseline emissions
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate action
Parameter	NCV_{bio}
Data unit	TJ/tonne
Default values used	0.015
Purpose of data	Calculation of Baseline emissions
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate action
Parameter	$EF_{b, fuel}$
Data unit	tCO_2/TJ
Default values used	Kerosene = 71.9 LPG = 63.1
Purpose of data	Calculation of the baseline scenario
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate action
Parameter	NCV_{fuel}
Data unit	TJ/tonne
Default values used	Kerosene = 0.0438 LPG = 0.0473
Purpose of data	Calculation of the baseline scenario
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate Action
Parameter	VS_T
Data unit	kg/head/day
Default values used	Dairy cows = 1.90 Other cattle = 1.50 Market Swine = 0.30 Breeding swine = 0.30 Goats = 0.35 Sheep = 0.32 Poultry = 0.02
Purpose of data	Calculation of the baseline scenario
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate Action
Parameter	BO_T
Data unit	m^3CH_4/kg
Default values used	Dairy cows = 0.13 Other cattle = 0.10 Market swine = 0.29 Breeding swine = 0.29 Goats = 0.13 Sheep = 0.13 Poultry = 0.24
Purpose of data	Calculation of the baseline scenario
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate Action
Parameter	$\eta_{biogas\ stove}$
Data unit	%
Default values used	Manufacturer / Model no/ name / No of burners / Thermal efficiency Puxin / JZZ2-A13 / 2 / >57% Wusi / JZZ.2-A1 / 2 / 56.8% Xunda / JZZ2-99 / 2 / >58% Xunda / JZZ1-6128 / 1 / >58% SNV / Lotus III (Cambodia) / 1 / 55%
Purpose of data	Calculation of the project scenario
Source of verification of the source	Manufacturers specification taken from VPA03-DD

Relevant SDG Indicator	SDG 13, Climate Action
Parameter	$MCF_{x,k}$

Data unit	%
Default values used	15.48
Purpose of data	Calculation of the baseline emissions
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate Action
Parameter	$EF_{awms,T}$
Data unit	m^3CH_4/kg
Default values used	**Animal T** / **m^3CH_4/kg** Dairy Cow / 0.0015 Goat / 0.0000 Other cattle / 0.0001 Sheep / 0.0000 Market Swine / 0.0000 Poultry / 0.0000 Breeding Swine / 0.0026
Purpose of data	Calculation of project emissions
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Relevant SDG Indicator	SDG 13, Climate Action
Parameter	PL
Data unit	%
Default values used	Estimated using a 10% default rate of total methane production.
Purpose of data	Calculation of project emissions
Source of verification of the source	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Annex 2: Assessment of data and parameters monitored

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 2 Indicator 2.4.1 "Proportion of agricultural area under productive and sustainable agriculture
Data / Parameter: **(as in monitoring plan of PDD):**	GS-3 Soil Condition
Unit	%
Measuring frequency/Time Interval:	Annual
Reported value	93.3
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis A, D43
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place

of emission reductions and are necessary QA/QC processes in place?	
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 3 Indicator 3.9.1: Mortality rate attributed to household and ambient air pollution
Data / Parameter: **(as in monitoring plan of PDD):**	GS-1 Air Quality
Unit	%
Measuring frequency/Time Interval:	Annual
Reported value	97% of the user report perceived health improvement 0% report no change 3% report deterioration in health
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis A, cell D47:D49
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 5 Achieve gender equality and empower all women and girls
Data / Parameter: **(as in monitoring plan of PDD):**	Timesaving
Unit	%
Measuring frequency/Time Interval:	Annual
Reported value	<table><tr><td>Yes, more time available than before having biogas</td><td>91</td></tr><tr><td>No, just the same as before (between before and after having biogas)</td><td>6</td></tr><tr><td>Not relevant</td><td>3</td></tr></table>
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis A, cell

	D53:D57
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 5 Achieve gender equality and empower all women and girls
Data / Parameter: **(as in monitoring plan of PDD):**	Usage of saved time
Unit	%
Measuring frequency/Time Interval:	Annual
Reported value	<table><tr><td>Income generating including farming</td><td>39.9</td></tr><tr><td>Education</td><td>7.8</td></tr><tr><td>Leisure (chat,</td><td>45.8</td></tr><tr><td>Other</td><td>6.5</td></tr></table>
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis A, H60:H63
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 7 7.1.2: Proportion of population with primary reliance on clean fuels and technology

Data / Parameter: **(as in monitoring plan of PDD):**	GS-08 Access to affordable and clean energy services
Unit	Number
Measuring frequency/Time Interval:	Annual
Reported value	8,326
Verified Source of Data	VPA003 MPV database and SDG8, sheet SDG8, cell C11
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 7 7.1.2: Proportion of population with primary reliance on clean fuels and technology
Data / Parameter: **(as in monitoring plan of PDD):**	GS-12 Technology transfer and technological self-reliance
Unit	Number of masons and biogas enterprise staff attending training programmes
Measuring frequency/Time Interval:	Annual
Reported value	30
Verified Source of Data	Training records (report on training biogas masons in SIPI region)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**

Relevant SDG Indicator	SDG 8 8.5 By 2030, achieve full and productive employment and decent work for all women and men,
Data / Parameter: **(as in monitoring plan of PDD):**	GS-10 Technology transfer and tetaken for 7&*chnological self-reliance
Unit	Man-days
Measuring frequency/Time Interval:	Annual
Reported value	225,733
Verified Source of Data	VPA003 MPV database and SDG8, sheet SDG8, cell F11
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 “Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production”.
Data / Parameter: **(as in monitoring plan of PDD):**	Up1,y
Unit	Fraction
Measuring frequency/Time Interval:	Annual
Reported value	60.31%
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis B, cell G16
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring	NA

plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	Np1,y
Unit	Number
Measuring frequency/Time Interval:	Annual
Reported value	1,401,531
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis B, cell C44
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	Op1,y
Unit	Number
Measuring frequency/Time Interval:	Annual
Reported value	168.33
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis B, cell C43
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes

Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	LEp1,y
Unit	tCO_2e/year
Measuring frequency/Time Interval:	The leakage will be monitored biennially using survey methods to satisfy the requirements put forth by the methodology 'Technologies and practices to displace decentralized thermal energy consumption' (11/04/2011)'. As per the methodology "*Leakage risks deemed very low can be ignored as long as the case for their insignificance is substantiated*.". There are no potential leakage risk which has been confirmed during the first and second monitoring period and the same has been verified by the verification team during the onsite visit in this monitoring period.
Reported value	0
Verified Source of Data	GS MPII issuance review
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

<table>
<tr><th>Monitoring Parameter Requirement</th><th>Assessment/ Observation by the DOE</th></tr>
<tr><td>Relevant SDG Indicator</td><td>SDG 13
Indicator 13.2.1 “Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production”.</td></tr>
<tr><td>Data / Parameter:
(as in monitoring plan of PDD):</td><td>$N_{T,h}$</td></tr>
<tr><td>Unit</td><td>Number</td></tr>
<tr><td>Measuring frequency/Time Interval:</td><td>Annual</td></tr>
<tr><td>Reported value</td><td><table>
<tr><th>Number of animals</th><th>#/hh</th></tr>
<tr><td>Number of dairy cattle</td><td>7.42</td></tr>
<tr><td>Number of other cattle</td><td>3.21</td></tr>
<tr><td>Number of pigs (for market)</td><td>1.14</td></tr>
<tr><td>Number of pigs (for breeding)</td><td>1.56</td></tr>
<tr><td>Number of poultry</td><td>28.59</td></tr>
<tr><td>Number of sheep</td><td>1.15</td></tr>
<tr><td>Number of goats</td><td>4.75</td></tr>
</table></td></tr>
<tr><td>Verified Source of Data</td><td>VPA003 MPV survey_SDG_ER, sheet Analysis A, cell C7:C13</td></tr>
<tr><td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes</td></tr>
<tr><td>Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:</td><td>NA</td></tr>
<tr><td>Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</td><td>Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place</td></tr>
<tr><td>In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?</td><td>NA</td></tr>
</table>

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 “Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production”.
Data / Parameter: (as in monitoring plan of PDD):	BB_{bratio}
Unit	%
Measuring frequency/Time Interval:	Annual

Reported value	<table><tr><th>Baseline Scenario</th><th>Percentage</th></tr><tr><td>B1: Firewood used to meet (more than 50%) of my cooking needs</td><td>77.7%</td></tr><tr><td>B2: Charcoal used to meet (more than 50%) of my cooking needs</td><td>14.6%</td></tr><tr><td>B3: Firewood & charcoal used to meet (more than 50%) of my cooking</td><td>6.3%</td></tr><tr><td>B4:Other fuels</td><td>1.5%</td></tr></table>
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis A, cell D16:D19
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 “Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production”.
Data / Parameter: **(as in monitoring plan of PDD):**	$BB_{b1,ratio}$
Unit	Tonnes/year
Measuring frequency/Time Interval:	Not applicable: Option B BFT conducted once upfront and parameter fixed throughout the crediting period.
Reported value	3.527
Verified Source of Data	MRI
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes ,The verification team reviewed the first verification report and confirm that the value is consistent and as mentioned in the PDD, the value is fixed throughout the crediting period.
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place

QA/QC processes in place?	
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	$BB_{b2,bio}$
Unit	Tonnes/year
Measuring frequency/Time Interval:	Not applicable: Option B BFT conducted once upfront and parameter fixed throughout the crediting period.
Reported value	7.042
Verified Source of Data	MRI
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	$BB_{b3,bio}$
Unit	Tonnes/year
Measuring frequency/Time Interval:	Not applicable: Option B BFT conducted once upfront and parameter fixed throughout the crediting period.
Reported value	10.034

Verified Source of Data	MRI
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	$BB_{b1,2,3,fuel}$
Unit	Tonnes/year
Measuring frequency/Time Interval:	Not applicable: Option B BFT conducted once upfront and parameter fixed throughout the crediting period.
Reported value	0
Verified Source of Data	MRI
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an

	integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	$BB_{p1,bio}$
Unit	Tonnes/year
Measuring frequency/Time Interval:	Project Performance Field Test (PFT) will be updated once every two years
Reported value	2.882
Verified Source of Data	PFT - 90-30 Test_checks, cell G74
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the PFT has been conducted on the following period MPIII: February-March MPV: February-March. The verification team verified during the one site visit that the PFT was conducted during the current monitoring period.
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	$BB_{p1,fuel}$
Unit	Tonnes/year
Measuring frequency/Time Interval:	Projected amount of fossil fuels used in the project scenario p
Reported value	0
Verified Source of Data	PFT - 90-30 Test_checks, cell J71
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place

In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: **(as in monitoring plan of PDD):**	$MS_{P,S,K}$
Unit	%
Measuring frequency/Time Interval:	Annual
Reported value	<table><tr><th>Animal T</th><th>Average amount</th></tr><tr><td>Dairy Cow</td><td>17.53</td></tr><tr><td>Cattle</td><td>31.88</td></tr><tr><td>Market Swine</td><td>74.24</td></tr><tr><td>Breeding Swine</td><td>50.00</td></tr><tr><td>Poultry</td><td>91.53</td></tr><tr><td>Sheep</td><td>100.00</td></tr><tr><td>Goat</td><td>100.00</td></tr></table>
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis A, cell B33: C39
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster

<table>
<tr><td></td><td>climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production”.</td></tr>
<tr><td>Data / Parameter:
(as in monitoring plan of PDD):</td><td>$MS_{T,S,K}$</td></tr>
<tr><td>Unit</td><td>%</td></tr>
<tr><td>Measuring frequency/Time Interval:</td><td>Annual</td></tr>
<tr><td>Reported value</td><td><table><tr><th>Animal T</th><th>Average amount</th></tr><tr><td>Dairy Cow</td><td>82.47</td></tr><tr><td>Cattle</td><td>68.13</td></tr><tr><td>Market Swine</td><td>25.76</td></tr><tr><td>Breeding Swine</td><td>50.00</td></tr><tr><td>Poultry</td><td>8.47</td></tr><tr><td>Sheep</td><td>0.00</td></tr><tr><td>Goat</td><td>0.00</td></tr></table></td></tr>
<tr><td>Verified Source of Data</td><td>VPA003 MPV survey_SDG_ER, sheet Analysis A, cell C30:C36</td></tr>
<tr><td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes</td></tr>
<tr><td>Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:</td><td>NA</td></tr>
<tr><td>Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</td><td>Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place</td></tr>
<tr><td>In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?</td><td>NA</td></tr>
</table>

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 “Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production”.
Data / Parameter: (as in monitoring plan of PDD):	GWP_{CH4}
Unit	Unit
Measuring frequency/Time Interval:	Annual
Reported value	25 on and before 31/12/2020 28 on and after 01/01/2021
Verified Source of Data	GS rule update: https://globalgoals.goldstandard.org/standards/RU-2020-PR-V1.2-GWP-values.pdf
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring	NA

equipment, its specification and calibration as per the requirements of registered PDD:	
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: (as in monitoring plan of PDD):	Bio
Unit	
Measuring frequency/Time Interval:	Annual
Reported value	<table><tr><th>How do you apply bio-slurry</th><th>% of farmers</th></tr><tr><td>Use directly for various purposes</td><td>61%</td></tr><tr><td>Store it first</td><td>34%</td></tr><tr><td>I don't use it / discarded</td><td>5%</td></tr></table>
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet bio-slurry, cell B15:D18
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the DOE**
Relevant SDG Indicator	SDG 13 Indicator 13.2.1 "Number of countries that have communicated the establishment or operationalization of an

	integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production".
Data / Parameter: (as in monitoring plan of PDD):	Nop1,y
Unit	Number
Measuring frequency/Time Interval:	Annual
Reported value	8,326
Verified Source of Data	VPA003 MPV survey_SDG_ER, sheet Analysis B, cell H14
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Assessment of details of monitoring equipment, its specification and calibration as per the requirements of registered PDD:	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA