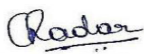


**Verification and certification report form for
GS project activities**

(Version 04.0)

BASIC INFORMATION

Title and GS reference number of the project activity	Micro Scale Biogas CDM Project of CROSS (GS1199)
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the verification and certification report	2.0
Completion date of the verification and certification report	12/12/2025
Monitoring period number and duration of this monitoring period	Monitoring Period no: 05 Duration: 01/01/2023 to 30/06/2025 (Inclusive of both days)
Version number of the monitoring report to which this report applies	02
Crediting period of the project activity corresponding to this monitoring period	01/01/2021 – 31/12/2025
Project participants	M/s Community Reconstruction of Social Service (CROSS)
Host Party	India
Applied methodologies and standardized baselines	AMSI.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 11/5/
Mandatory sectoral scopes	Sectoral Scope 1
Conditional sectoral scopes, if applicable	Sectoral Scope 13
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	38,062 tCO ₂ /year
Certified amount of GHG emission reductions or GHG removals for this monitoring period	20,960 tCO ₂ e/year
Name of the VVB	4K Earth Science Private Limited
Name, position and signature of the approver of the verification and certification report	Chandrakala R  Managing Director

SECTION A. Executive summary

4K Earth Science Private Limited (4KES) has been commissioned by “M/s Community Reconstruction of Social Service (CROSS)” to perform an independent verification of its registered GS VER project “Micro Scale Biogas CDM Project of CROSS”, GS Ref # GS1199 for the reported GHG emission reductions for the given monitoring period 01/01/2023 to 30/06/2025 (both dates included). The GS VER projects must undergo independent third-party verification and certification of emission reductions as the basis for issuance of Verified Emission Reductions (VERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the registered PDD and that all physical features (technology, project equipment, and monitoring) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The actual monitoring systems & procedures and monitoring report conforms with the requirements of the approved monitoring plan and the approved monitoring methodology;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.

Scope:

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on review of monitoring report, supporting information and

- (a) The registered GS PDD.
- (b) The approved methodology mentioned in the GS PDD.
- (c) The registered monitoring plans.
- (d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board/09/.
- (e) CDM Validation and Verification Standard (VVS)/09/.
- (f) GS4GG Validation and Verification Standard (VVS)/09/.
- (g) All information and references relevant to the project activity's resulting in emission reductions.
- (h) Information related to monitoring of SD parameters.

The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures/9/ and related rules and guidance.

4KES has based on the recommendations in the latest version of CDM Validation and Verification Standard/9/, employed a rule-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

Description of project:

This is a GS4GG CDM Project Transitioned to GS Ver Project, Without Deregistering from CDM. The Monitoring Report Is Submitted to the Gold Standard for Issuance of GS VERs. The Monitoring Report will not be Submitted Again to CDM for Issuance of CERs for this Monitoring Period and PD has provided the double counting declaration/15/ which is found to be acceptable.

The purpose of the project activity is to set up 5,000 biogas plants (digesters) of 2m³ capacity each for single households in Chittoor district where the NGO, CROSS is working, and in this way replace Non-Renewable Biomass with biogas for cooking and heating water. In the baseline, traditional inefficient wood stoves were being used, leading to release of Greenhouse Gas emissions. By replacing the traditional inefficient wood stoves by biogas, there is reduction of GHGs thereby contributing to addressing climate change and sustainable development goals of the country.

In baseline situation, households used traditional fire wood stove which is inefficient. In the project situation the biogas stoves are used for cooking and hence completely avoiding the usage of traditional stoves which results in savings in non-renewable biomass. Thereby, it avoids the related CO₂ emission from the avoidance of non-renewable biomass in cooking. In the baseline, the animal dung was dumped into open pit in which the methane is produced due to anaerobic condition and released into atmosphere. Hence, the project also avoids methane emission by capturing biogas from the digestion of dung and burning it in biogas stove. The project activity is construction of 5,000 biogas plants in the project area. Of these, 3095 units were built till 2019. The installed biogas units are 3095 households in which 2863 units were functioning at the end of this monitoring period i.e., 01/01/2023 to 30/06/2025.

Methodology:

4KES follows a rule-based verification approach, wherein, as a first step, the contract review is undertaken as per latest version of CDM Accreditation Standard. Subsequently, after the contract is signed, the Gold Standard Verification work plan of the project activity is made available at Gold Standard registry in accordance with Gold Standard rules.

A desk review of the project documentation is undertaken, which is followed by an onsite visit and interviews by the members of verification team in accordance with the latest version of CDM AS. The verification protocol is filled by the verification team that is based on standard auditing practices and latest version of CDM VVS/9/, to capture the assessment of applicable CDM & GS requirements viz., latest version of GS Project Standard/9/, applicable GS toolkit, registered GS-PDD applied methodology/ies and/or tools and recent decisions. The verification protocol provides transparent means to record the observations and compliances by the verification team members and the nonconformities (CARs/CLs), if any. The verification protocol is an internal document, and is available on request. After successful closure of findings (CARs/CLs), the draft verification report is prepared which went through Independent technical review as per 4KES internal procedures and the TR comments were given for any gaps in audit findings. After closure of the TR comments, final verification report is prepared then followed by final approval for the decision made. The approved verification report is given to PP which shall be submitted for request for issuance.

Following are the major milestones for the verification under consideration.

Verification contract	02/07/2025
On site verification	06/09/2025 and 07/09/2025
Draft Verification Report	09/10/2025
Final Verification Report	12/12/2025

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 VVB or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader and Technical/ Local Expert (1.1 & 13.2) (GS Approved Auditor)	IR	Kandari	Sanjay	4KES - Central office	X	X	X	X
2.	Team Leader (Under Observation) (GS Approved Auditor)	IR	S	Sriram	4KES - Central office	X	X	X	X
3.	Verifier (GS Approved Auditor)	IR	B R	Ragul	4KES - Central office	X	-	-	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 VVB or outsourced entity)
1.	Technical Reviewer (TA 1.1 & 13.2)	IR	S	Stalin	4KES - Central office

2	Approver	IR	R	Chandrakala	4KES - Central office
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SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Wrong data collection/ misinterpretation of household situation	Low	It's not complicated monitoring process. Appropriate trainings are conducted for the monitoring personnel.	By means of site visit check of actual situation to sample number of households.
2	Transfer of data from sampling survey sheet to ER sheet	Low	Possible human error during transfer of data to ER sheet	Thorough cross-check required on the transfer of data from survey sheets to the ER sheet
3	Error in ER calculations	High	The sample size was large, hence increasing the chances of error in ER calculation	The ER calculations were checked for accuracy.

C.2. Consideration of materiality in conducting the verification

The prescribed thresholds for materiality, as per §326 of CDM VVS for PA,

Prescribed range of ERs/annum	>500,000	300,000-500,000	<300,000	SSC PAs	MSC PAs
Prescribed Threshold	0.5%	1.0%	2.0%	5.0%	10.0%

The identified/selected materiality threshold for the project activity under current monitoring period is 1.0% as project activity is large scale project activity with the emission reduction less than 5.0%.

	MR Version (Draft)	MR Version (Final)
Emission reductions/annum	20,960 tCO ₂	20,960 tCO ₂
Identified Threshold	5.0%	5.0%

The impact of errors observed during verification for each monitoring parameter on the emission reduction calculation is provided below:

Parameter	Verification approach	Error identified	Corrected	Extrapolated error for population size (Qty and %)	Within Threshold
Fractional non-renewability	Checking with latest available reports and data	No error identified	NA	No Impact	Yes
Biogas Units Constructed	Complete data check	No error identified	NA	No Impact	Yes

Number of biogas plants operating	Complete data check	No error identified	NA	No Impact	Yes
Confirmation that nonrenewable biomass has been substituted	Acceptance sampling	No error identified	NA	No Impact	Yes
Non-usage of biogas plants	Complete data check	No error identified	NA	No Impact	Yes
Physical leakage of the bio-digester	Checking the IPCC/4/ value	No error identified	NA	No Impact	Yes
Percentage of biodigester in use in year y	Checking the survey results	No error identified	NA	No Impact	Yes

No error on the values of the monitoring parameters is found. The change in the emission reduction between draft and final MR is due to the correction in the ER calculation. Please refer the CARs & CLs raised in the Appendix 4.

SECTION D. Means of verification

D.1. Desk/document review

The verification is performed primarily as a desk review of the documents submitted at various stages of assessments. The review is performed by assessment team using verification protocols (checklists). The assessment team cross-checked the information provided in the MR and information from sources other than those used, if available, and also conducts independent background investigations. 4KES conducted a desk review, involving but not limited to,

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

The list of documents reviewed is included in the section 'Appendix 3' of this report.

D.2. On-site inspection

Site visit was conducted by the VVB for this Verification of GS project on. Details of interviewees, topics covered and additional information presented in the below section "D.3 Interviews"

Duration of on-site inspection: 06/09/2025 and 07/09/2025				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening Meeting, Office Inspection, Verification of monitoring records, interviews and database inspection	CROSS Office	06/09/2025	Sanjay Kandari (Team Leader and Technical/ Local Expert (1.1 & 13.2) (GS Approved Auditor))
2	Interview with monitoring team	CROSS Office	06/09/2025 and 07/09/2025	
3	Visit to sample beneficiary households	Beneficiary households,	06/09/2025 and 07/09/2025	Sriram S ((Team Leader (Under Observation) (GS Approved Auditor))

D.3. Interviews

No.	Interviewee			Date	Subject
	Last name	First name	Organization		
1.	P	Bhupathi	CROSS	06/09/2025	- General aspects of the project - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - Procedural aspects of the Monitoring - Maintenance - Data analysis - ER Calculations - MR editorial issues
2	P	Paven Kumar	CROSS	06/09/2025	
3	P	Ganapathi	CROSS	06/09/2025	
4.	T	Chaitanya	CROSS	07/09/2025	
5	K	Ramadan ran	CROSS	07/09/2025	
6	V	Jaya Sudha	CROSS	07/09/2025	
7	Padmanabha	Sudha	FCN	06/09/2025 and 07/09/2025	

Beneficiary Details with Unit ID							
S.no	Name	Location	Unique ID	Gender	Village location	Date	Subject
1	I.Devi	Chittoor District, Andhra Pradesh State	5670	Female	Velkur	06/09/2025	- Verification of monitored data - Awareness about ownership of CERs - Working condition of digester unit - SD parameters verification - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management
2	K.Sureesha		3458	Female	Velkur	06/09/2025	
3	Vasantamma		1335	Female	Garampalli	06/09/2025	
4	K.Jyothi		4083	Female	V. Bandarlapalli	06/09/2025	
5	G.Chandrakala		4064	Female	Vejjupalli	06/09/2025	
6	K.Munilakshmi		076	Female	Vejjupalli	06/09/2025	
7	G.Saraswathi		4060	Female	Vejjupalli	06/09/2025	
8	G.Vasantha		809	Female	Vejjupalli	06/09/2025	
9	P.Eswari		814	Female	Vejjupalli	06/09/2025	
10	A.Vijayalakshmi		5795	Female	Mukkalathur	06/09/2025	
11	R.Kanaka		3611	Female	Rasimareddy palli	06/09/2025	
12	M.Thavamani		5578	Female	Venkatapuram	06/09/2025	
13	M.Jhansi Rani		5723	Female	Venkatapuram	06/09/2025	
14	J.Aruna		5588	Female	Venkatapuram	06/09/2025	
15	G.Parvatham		6017	Female	Thugundram	07/09/2025	
16	M.Jayalakshmi		6345	Female	Samsireddyalli	07/09/2025	
17	D.Valarmathi		5105		Keelagaram	07/09/2025	

GS-VCR-FORM

18	G Thulasamma		4330	Female	Medavada	07/09/2025	- Data uncertainty and residual risks - Procedural aspects of the Monitoring
19	B.Kumari		3042	Female	Mangunta Colony	07/09/2025	
20	K.Narashamma		5005	Female	Chinnathangal	07/09/2025	
21	K.Bindhu		6114	Female	Bodapur	07/09/2025	
22	P.Meena		6430	Female	G.T.Kandriga	07/09/2025	

The 22 collected samples are from Chittoor District, Andhra Pradesh state and fall within the project area, as verified by the database and geographical coordinates. These samples accurately represent the biogas units installed in Chittoor District, Andhra Pradesh state. During the site visit, the verification team interviewed the biogas users randomly. Apart from acceptance sample survey explained below section, the other questions asked by the verification team and the summary of reply received from the stakeholders are given below:

Questions asked by verification team	Summary of Response by Stakeholders/end users
Since when you are using the biogas system?	Verification team received varied responses from each household based on the implementation date
Is the biogas system in operating condition now?	All the households visited reported operational condition.
Are there any repairs done for the biogas system?	Few households confirmed that their biogas systems are repaired in the past.
Have you signed end user agreement with Community Reconstruction of Social Service (CROSS) through which the GS CER rights are transferred to Community Reconstruction of Social Service (CROSS)?	All households confirmed that they have signed end user agreement with Community Reconstruction of Social Service (CROSS).
Did you participate any training conducted by Community Reconstruction of Social Service (CROSS)?	All households confirmed that the CROSS staff trained them on functioning of the biogas unit and on the slurry management during implementation and follow-up visits
How the digester slurry is disposed?	Most of the households confirmed that the digester slurry is used as fertilizer for agriculture as trained by the Community Reconstruction of Social Service (CROSS) staff. Few households even confirmed that the use of chemical fertilizer is reduced due to the application of bio digester slurry.
If any issue with the biogas system or any grievances, to whom you will report to resolve the issue/ grievances?	All households confirmed that either they report to Community Reconstruction of Social Service (CROSS) staff. They also confirmed they have the mobile number of the Community Reconstruction of Social Service (CROSS) Staff.
How useful is the biogas system?	All households confirmed cooking in the biogas smokeless compared to old traditional wood stove. They also confirmed cooking in the biogas system is safer and operation of the system is easy. The households also mentioned that considerable amount of time saved due to the use of biogas system from fuel wood collection, cooking and cleaning utensils.
Is there any reduction in indoor smoke & eye problem?	All households confirmed reduction in indoor smoke & eye problem
Do you use any other fuel other than biogas?	All households confirmed that only biogas system is used primarily for cooking. But few households reported they use LPG which they got through Ujjwala scheme, but rarely as after the cylinder given by government.

	Few households also reported they use fuel wood some times when the cook outdoors or some specific items.
You have any concerns with the biogas system/project?	No households reported any concerns over the project.

D.4. Sampling approach

VVB Sampling approach:

During the on-site verification a sampling approach has been used by the verification team to verify the reported values for the monitored parameters as listed in section D.2 of the MR which are determined through sample survey by PP.

For the determination of DOE's acceptance sample size, verification team assumed the following factors:

- Acceptable quality level (AQL) or the Level of Assurance- 1.0% (i.e. the proportion of discrepancies between the project participants' sample records and the DOE sample that are acceptable up to 1.0% limit)
- Unacceptable Quality Level (UQL) – 20% (i.e., the proportion of discrepancies between the project participants' sample records and DOE sample records that are unacceptable above 20% limit)
- Producer risk -5% (i.e., there is 5% chance that the DOE will wrongly reject the project participants' records of acceptable quality)
- Consumer risk -5% (i.e., there is 5% chance that the DOE will wrongly accept the project participants' records of records of unacceptable quality)

Verification team has determined acceptance sample size for all the sample survey parameters based on the standard "Sampling and surveys for CDM project activities and programmes of activities" version 9/9/. From the above assumed factors, the verification team determined the minimum sample size (n) as 22 and acceptance number (c) as 1. The same is intimated to PP prior to the site visit. The actual number of sample size where the acceptance survey was done given below:

Parameters	Total Population	PP's sample size	Acceptance sample size	Acceptance Number	Sampling method used
Confirmation that non-renewable biomass of has been substituted	3095	50	22	1	simple random sampling

During site visit, verification team visited the selected sample households and interviewed the biogas plant user to check the data reported by PP. The result of the survey is given below:

Parameters	DOE Sample size	No of PP's record beyond unacceptable level	Accepted / Rejected
Confirmation that non-renewable biomass of has been substituted	22	0	Accepted

Verification team finds no error in the PP's survey records. Hence verification team accepts all the data determined through sample survey by PP. However, it shall be noted that the parameter is not used for

emission reduction calculation but used to just confirm that the non-renewable biomass has been substituted due to the use of project devices.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	1	-	-
Compliance of the project implementation and operation with the registered PDD	-	-	-
Post-registration changes	-	-	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	1	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Stakeholder Inputs & Legal Dispute	-	-	-
Others (Key project Information, ER sheet, SDG impact tool)	3	3	-
Total	5	3	-

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The project is registered under GS4GG, and PP used GS monitoring report template, version 1.1. All the sections of the form were filled as per the GS4GG guidelines and gave all the relevant details.
Findings	No findings
Conclusion	Monitoring report was found to be completed and using the valid version i.e., version 1.1 of the GS MR, hence the monitoring report is complying with the monitoring report form.

E.2. Remaining forward action requests from validation and/or previous verifications

This is the 2nd crediting period of 5th verification of the project activity. Verification team checked previous validation report/10/ and found that no FAR has been raised.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	The purpose of the project activity is to implement household size biogas plants in the state of Andhra Pradesh, India. The biogas units are constructed for the project beneficiaries in Andhra Pradesh, India. CROSS works for the betterment of economically backward section of the district. The project activity is construction of 5,000 biogas plants in the project area. Of these, 3095 units were built till 2019. The project involves construction and commissioning of household level biogas units, their maintenance and monitoring the emission reductions generated. The biogas will substitute firewood and/or other fuels, which are used for daily cooking needs by the local population. In the longer term, the project will help to decrease the deforestation rate in the project area. Most of the households use inefficient cooking stoves with incomplete combustion, which leads to indoor emissions that pose severe health risks to the women and children, who are
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continuously exposed to the smoke during cooking. Project activity aims to implement 5,000 biogas units under this project and sizes of 2m³ and 3 m³.

As verified from site visit, PP has provided a unique identification number (Unit ID) for each biogas unit constructed which is also written on the digester. The project database includes all the details about digester like Name of the beneficiary, address, Unit ID, functioning date etc. Hence, the double counting of digester unit is avoided. Also, all the beneficiaries have signed end user agreements with PP through which they agree to transfer the VER rights to PP. This is confirmed from verification of sample end user agreements /6/ and interview with beneficiaries. Hence, double counting of emission reduction is avoided. Verification team further validated double counting of emission reduction by checking the double counting declaration/15/ which is provided by PP

Avoidance of double counting or double claiming with other mitigation actions - The devices under this project will not be included in any other project, as each project device is assigned a unique identification number. Therefore, there is no risk of double counting of project devices with any other project. Additionally, this project is not registered under any other mechanism and will not apply to any other mechanism in the future. The same is confirmed through a declaration from the Project Developer.

The Verification Team conducted a thorough review of the project area across other registries (CDM, GCC, GS, and VERRA) and confirmed that there is no overlap in geographic boundaries with other projects, and no related concerns were identified. Each biogas unit is tagged with a unique identification number, which was verified during the on-site visit. Interviews with beneficiaries confirmed that three-stone cookstoves were used prior to receiving the biogas unit.

To substantiate the assessment of negligible double-counting risk, the Verification Team reviewed the evidence submitted by the Project Participant, including signed double-counting declarations provided by the Project Developer, as referenced in Section C of the Monitoring Report. The Verification Team further confirmed that the biogas plants constructed under the project are not included under any other voluntary or compliance standards.

In the event that any risk of double counting arises, CROSS commits to retiring eligible units equal to the quantity of Gold Standard VERs.

The verification team determined the conformity of the actual project activity and its operation with the validated project design document. Verification team has, by means of a desk review and an on-site visit, assessed that all physical features of the GS project activity proposed in the revised & approved PDD/3/.

The verification team has checked the information in the monitoring report and compared against the approved PDD.

During the onsite inspection, the verification team has checked the project locations, implementation, technology applied, project equipment, and monitoring system against the information in the approved PDD. Interviews with operational personnel and households and random samplings have been carried out.

The biogas units under the project have been operational in the Andhra Pradesh project areas since 2013. To ensure accurate tracking and management, separate project databases have been maintained for a state, detailing the number of units built, abandoned, and currently in use. These databases, accessible in the provided project documentation, offer a transparent record of the project's progress.

By the end of 2019, a total of 3095 biogas units had been built across both states since the project's inception. Of these, 3095 units were installed in Andhra Pradesh. However, some units were abandoned due to various reasons, such as non-usage, technical issues, or lack of maintenance.

Community Reconstruction of Social Service (CROSS) is a Non-Governmental Organization (NGO) working in Chittoor district of Andhra Pradesh, India. CROSS works for the betterment of economically backward section of the district. The project activity is construction of 5,000 biogas plants in the project area. Of these, 3095 units were built till 2019. The project involves construction and commissioning of household level biogas units, their maintenance and monitoring the emission reductions generated. The construction of biogas plants was done in a phased manner. The details of the units commissioned are as follows.

Taluk	2013	2014	2015	2016	2017	2018	2019	Total
G.D.Nellore	31	157	329	73	163	52	7	812
Karvetinagaram	30	61	136	11	46	6	2	292
Nagalapuram				118	25	26	8	177
Nagari				38	99	12	5	154
Narayanavanam				29	127	12		168
Nindra				27	181	29	2	239
Pichatur				96	78	24	6	204
Puttur				62	98	32		192
Ramachandrapuram				22	49	7		78
S.R.Puram	1	48	141	59	95	33	1	378
Vadamalapeta				6	41	3	9	59
Vedurukuppam		29	171	40	78	16	8	342
Grand Total	62	295	777	581	1080	252	48	3095

The ER calculation sheet provides details on the 2863 number of functioning units per month in a state involved in the project activity. The verification team has reviewed the data and confirmed that the reported numbers of functional and non-functional units are accurate and appropriate.

During the onsite assessment, the VVB conducted an acceptance sampling process to evaluate the functionality of the units. Throughout this process, the VVB did not identify any non-functional units among the selected samples. A total of 22 units were assessed, and all were found to be in proper working condition, meeting the required operational standards. This indicates that the sampled units are functioning as expected, with no observed defects or performance issues during the assessment.

Findings

No findings

Conclusion

The verification team has reviewed the project database/11/, monitoring database, monitoring survey data/11/, and end user agreements/6/. The verification team has observed at the site that all physical locations of the biogas units on sample basis and found that the details are correctly matching with the monitoring report and monitoring records maintained by PP. The type of the biogas provided and the locations are consistent with the approved PDD/3/. Thus, the verification team has concluded that the project activity was implemented and operated as per approved PDD. The verification team, based on the site visit and document review, was able to conclude that the project activity has been commissioned and implemented as per the approved PDD/3/ and that all physical features of the project are in place.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents¹

No temporary deviation from registered monitoring plan or monitoring methodology is sought for this monitoring period.

E.4.2. Corrections

No correction in the PDD is sought since registration of the project activity

E.4.3. Changes to the start date of the crediting period

There are no changes to the start date of the crediting period in this monitoring.

E.4.4. Inclusion of a monitoring plan

Monitoring plan was already included in the approved PDD. Hence, not applicable.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

No permanent change in monitoring plan is applied during this monitoring period. The applied methodology remains the same for the registered document.

E.4.6. Changes to the project design

Not applicable

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	The verification team checked compliance of project monitoring plan with the applied methodology (AMS I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 11/5/ and including applicable tools.
Findings	No Findings
Conclusion	All parameters stated in the monitoring plan and the applied methodology has been fulfilled in the current monitoring report. All baseline emission parameters have been verified and found satisfactory. The discussion regarding each parameter has been elaborated in the further sections of this report. The monitoring plan as mentioned in the registered PDD is in accordance with the applied methodology. In the opinion of the verification team the monitoring report complies with the requirement of the registered PDD and applied methodologies in the context of the project activity.

E.6. Compliance of monitoring activities with the registered monitoring plan**E.6.1. Data and parameters fixed ex ante or at renewal of crediting period**

Means of verification	The verification team has checked the ex-ante parameters and data stated in Section D.1 of MR and compared with section B.6.2 of the registered PDD whether all parameters fixed ex-ante for the crediting period have been applied correctly.		
	Ex-ante Parameter	Value	Consistent with the revised PDD/3/

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).

	kW _{th} /digester	1.69	Yes
	$BC_{BL,HH,y}$	3.71	Yes
	$f_{NRB,y}$	0.89	Yes
	NCV _{biomass}	0.0156	Yes
	EF _{projected_fossilfuel}	64.4	Yes
	Determination of Leakage	0.19	Yes
Findings	CL ID 04 is raised and closed successfully		
Conclusion	The values of ex ante fixed parameters have been verified from the revised PDD/3/. Same has been crosschecked with the source mentioned in the PDD and found to be consistent. The verification team confirms that the values used/applied are correct and justified. Also, the ex-ante values have been correctly applied in the calculation of emission reductions.		

E.6.2. Data and parameters monitored

Means of verification	The verification team has determined whether the approved monitoring plan has been properly implemented and followed by the CME that the monitoring has been carried out in accordance with the approved monitoring plan; and determined whether all parameters including project emission parameters, baseline emission parameters and leakage parameters used for emission reduction calculation stated in the registered monitoring plan are monitored or used appropriately as per the registered PDD. During the verification all monitoring parameters listed in Section D.2 of MR were compared with section B.7.1 of the registered PDD have been verified with regard to the: (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy, and applied QA/QC measures. The monitored values are assessed as follows: Date of commissioning of biogas units: This parameter is monitored as and when a digester is commissioned/started producing gas and the same is entered into the monitoring database. The reported data is cross checked with the online monitoring solution/14/ maintained by CROSS during the onsite visit. The value reported in the monitoring report (ie, 3095) is found to be correct. N_{HH} (Number of households in the project activity in year y) PP has monitored the construction processes of biogas unit on a day-to-day basis and database maintained from its initiation to completion dates for each of the biogas unit. Thus, the start date of each of the unit installed is fixed for each of the unit. In case of replacement of any unit due to demolition will be recorded and the loss days accounted for. This could be for the same user or new user in which case the baseline is the users were using fuel wood. A new end user agreement will be signed with them and recorded. 3095 total biogas units were installed in the project activity as per PDD this parameter is monitored annually. However, project database is updated by the field team as when new biogas units are installed. Verification team has crosschecked the databases and ER sheet and is found consistent. Hence the values applied are correct. Number of biogas plants operating (Number of plants operating in year (t)): PP will repair the plants as and when an issue is found by staff or reported by end user. So, PP continuously monitors the non-working days when the unit is not operational. The emission reduction will be adjusted based on the non-operational days. Hence, the number of biogas plants operating is monitored as 92.50% of 3095 units. The values (2863 units) were cross-verified with Log book records, digitized monitoring database during onsite audit by the verification team. List of
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	non-operational units are also verified and confirmed that there are 232 units were not in operational at the end monitoring period. Hence, the value reported for this parameter is correct Confirmation that non-renewable biomass has been substituted (Confirmation that non-renewable biomass has been substituted): This parameter was monitored through simple random sample survey. PP has conducted survey in 50 households respectively which are selected randomly/15/. As verified from the survey result/11/, all the sample households confirm that the bio digester usage substitute non-renewable biomass used in the baseline situation. All the survey sheets/11/ are verified and found that the data mentioned in the excel sheet is correct. During the onsite audit, the verification team also checked with PP regarding how the daily monitoring taken place. PP confirmed that the operational status of the biogas system was monitored. During the onsite audit verification team has done acceptance sampling survey where verification team conducted survey with 22 households (randomly selected from PP's sample population). All the data collected are consistent with PP's record/17/. No error found. Hence, the verification team confirms that the non- renewable biomass of By has been substituted by the project activity. It shall also be noted that the parameter is not used for emission reduction as the non-usage of biogas stoves are monitored 100% as mentioned in the above parameter and deducted from emission reduction. $BC_{PJ,HH,y}$ (Average annual consumption of woody biomass per household in the pre-project devices during the project activity) The days not used from the daily monitoring report for each of the unit done at the village level and data maintained on the digitized monitoring database /11/ and when biogas units are not functional, the beneficiaries report to the village level women volunteer, who in turn reports to the Case Worker of the project for the repair of the unit. A log book is maintained for the reason of non-function and days under repair. The data is entered into the monitoring solution for each of the unit. The appropriate fuelwood use for non-operational days of biogas units is accounted. The two-pronged approach to determine the data/parameter results in emission reduction calculations that are based on real time data and have less uncertainty. During the onsite audit verification team has done acceptance sampling survey where verification team conducted the survey with 22 households (randomly selected from PP's sample population). All the data collected are consistent with PP's record/15/. No error found. It shall also be noted that the parameter is not used for emission reduction.
Findings	CL ID 04 is raised and closed successfully.
Conclusion	The VVB team confirm that, the monitoring has been carried out in accordance with the approved PDD/3/ and VVS /09/ The monitoring system is in compliance with the information flow for the parameters as mentioned in monitoring plan in registered PDD/3/. The monitored data for the parameters has been verified by checking the procedure for information flow and found to be complete and consistent.

E.6.2.1. Implementation of sampling plan

Means of verification	The verification team checked whether the PPs have applied a sampling approach to determine the monitored parameters. For the parameters determined through sampling, the verification team checked the sampling approach followed for each monitoring parameters to confirm the sampling plan mentioned in the registered PDD and applied methodology. (i) Confirmation that non-renewable biomass has been substituted (ii) Average annual consumption of woody biomass per household in the pre-project devices during the project activity, used in parallel. (iv) SDG Parameters other than SDG 13 The verification team checked the sampling approach followed for each monitoring parameters to confirm the sampling plan mentioned in the registered PDD. Confirmation that non-renewable biomass has been substituted Since the
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parameter 'Confirmation that non-renewable biomass has been substituted' is the proportion parameter PP has estimated the sample size based on 90/10 confidence / precision level is calculated as per the below formula:

$$n = \frac{1.96^2 NV}{(N - 1) \times 0.1^2 + 1.96^2 V}$$

Where:

$$V = \left(\frac{SD}{mean} \right)^2$$

n	Sample size
N	Total number of households
Mean	Expected mean
SD	Expected standard deviation
1.96	Represents the 95% confidence required
0.1	Represents the 10% relative precision

Since the survey is conducted in the households where biogas units are in operational, the expected proportion of the parameter for "Confirmation that non-renewable biomass has been substituted" for each the stratum is 1. Hence, the sample size required is estimated to be 0. Hence, PP has calculated the sample size based on the proportion of bio digesters in operation:

Year	Sample size (based on expected proportion of HH NRB substituted)	Actual sample size considered for survey/11/	Is sample size adequate?
2024	0	50	Yes
2025	0	50	Yes

Checking Reliability

The standard error of mean is calculated as

$$\sqrt{(1 - f) \frac{s^2}{n}},$$

where

f is the sampling fraction – the proportion of the population that is sampled, s² is the sample variance (s is the sample standard deviation).

Precision associated with mean is t-value x standard error of the mean. t value is derived in Microsoft Excel using the TINV function. =TINV (0.10, (sample minus 1))

The ratio of precision to the mean gives the relative precision, which needs to be within 10%.

Based on pilot study, 42 households need to sampled for BCPL,HH,y and zero for confirmation that non-renewable biomass has been substituted. A total of 100 households were sampled as follows in 2024 and 2025

Average annual hours of operation of a system:

Since the parameter 'Average annual hours of operation of a system' is the mean parameter, PP has estimated the sample size based on 90/10 confidence / precision level is calculated as per the below formula:

$$n = \frac{1.96^2 NV}{(N - 1) \times 0.1^2 + 1.96^2 V}$$

$$V = \left(\frac{SD}{mean} \right)^2$$

As per the mean and standard deviation derived from the previous monitoring period survey result, the sample size is estimated.

Year	Estimated sample rate @80% survey/1/	Actual sample size considered	Is sample size adequate?
2024	42	50	Yes
2025	42	50	Yes

For both the parameter, the sample size calculated based on 90/10 confidence /precision level. The sample size calculation provided in the ER calculation sheet/2/ is verified and found to be correct. The chosen minimum sample size seems to be acceptable and conservative. Moreover, PP has considered more sample than required.

Verification team checked the PP's survey results. The achieved precision is mention below:

Survey Year	Confirmation Average annual Is achieved that non- hours of precision is </= renewable operation of a 10 % biomass of by system has been substituted	Actual sample size considered	Is sample size adequate?
2024	0%	1.71%	Yes
2025	0%	1.03%	Yes

Since all the sampled households confirms substitution of non-renewable biomass in all the surveys, the achieved precision level is 0% which a within the required precision level of 10%. For the parameter 'Average annual hours of operation of a system' also the achieved precision levels are within 10%. Hence, the verification team confirms that the sample sizes considered by PP are adequate.

Verification team has conducted acceptance sampling to verify the parameter monitored through sampling. The verification team calculated the minimum sample size (n) as 22 and acceptance number (c) as 1. Verification team has conducted telephonic survey in randomly in 22 numbers of households (selected from the PP's sample population) and verified the PP's survey data. No error is found in PP's sample data. All the data are found to be within acceptable quality level. Hence, the data collected by PP though sample survey is acceptable.

PP's sample data. All the data are found to be within acceptable quality level. Hence, the data collected by PP though sample survey is acceptable

Findings

CAR 01 was raised and closed

Conclusion

Verification team concludes the following:

	- The sample size considered for all the parameters (which are monitored through sampling basis) are found to be appropriate - The precision level achieved from the monitored data also confirms that the sample size considered for the monitoring is sufficient. - The sampling plan is implemented correctly in accordance with the registered PDD.
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E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Not applicable as no monitoring equipment is involved.
Findings	NA
Conclusion	NA

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The verification team has checked whether calculations of baseline GHG emissions calculation have been carried out in accordance with the formulae and methods described in the registered monitoring plan. In detail the following has been verified: <u>Transparency:</u> It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. <u>Parameter consistency:</u> It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. <u>Correctness:</u> It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. <u>Completeness:</u> It has been checked whether all calculations are complete and without omissions As per the methodology the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. Baseline emissions are calculated as: $BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil_fuel}$ According to Para 29, B_y is determined by following option (a) as follows: Calculated as the product of the number of households using cookstoves distributed under the project activity multiplied by the estimate of average annual consumption of woody biomass per household that is displaced by the project activity: $B_y = N_{HH,y} \times (BC_{BL,HH} - BC_{PJ,HH,y})$ PP has submitted the emission reduction calculation in the excel sheet/2/. The calculation in the excel sheet is checked whether the calculation is in accordance with the formula given in the PDD/3/ and the selected methodology/6/
Findings	No Findings
Conclusion	The verification team confirms the following: The calculations of baseline emission have been carried out in accordance with the equations and methods described in the registered monitoring plan and applied methodology.

	- The emission factor applied is an ex-ante value valid for the fixed crediting period. - Any assumptions used in emission or removal calculations have been justified. - Appropriate emission factor and other reference values have been correctly applied. It can be confirmed that the baseline calculation is overall correct. - The ER calculation sheet provided is clear, transparent and the calculations provided in the sheet are reproducible. Hence, the total baseline reduction reported in the monitoring report for the monitoring period is verified to be correct and the summary is given below:				
	Vintage Year	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions	Emission Reductions
	2023 (1/1/2023 to 31/12/2023)	8,458	-	422	8,036
	2024 (1/1/2024 to 31/12/2024)	9,055	-	453	8,602
	2025 (1/1/2025 to 30/06/2025)	4,550	-	228	4,322
	Total	22,063	-	1,103	20,960

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	Not applicable as the emission reduction is directly calculated. No project emission is calculated. This is as per the registered PDD & selected methodology.
Findings	No findings raised.
Conclusion	NA

E.8.3. Calculation of leakage GHG emissions

Means of verification	The determination of leakage is 0.19 for household fuelwood use of 3.71 t/HH/Yr. Based on the fuelwood use determined ex-post ($BC_{BL,HH,y} - BC_{PL,HH,y}$) leakage will be determined by net to gross adjustment factor of 0.95 to account for leakage.										
Findings	No findings raised.										
Conclusion	The VVB confirms that a default adjustment factor of 0.95 has been applied to the emission reductions for this monitoring period which is acceptable considering the provision in the latest version of the methodology (AMS I.E). Following the application of this factor, the leakage emissions for the monitoring period have been calculated. <table border="1"> <thead> <tr> <th>Vintage</th><th>$\sum LE_{b,y}$ (tCO₂e)</th></tr> </thead> <tbody> <tr> <td>2023</td><td>422</td></tr> <tr> <td>2024</td><td>453</td></tr> <tr> <td>2025</td><td>228</td></tr> <tr> <td>Total</td><td>1,103</td></tr> </tbody> </table>	Vintage	$\sum LE_{b,y}$ (tCO ₂ e)	2023	422	2024	453	2025	228	Total	1,103
Vintage	$\sum LE_{b,y}$ (tCO ₂ e)										
2023	422										
2024	453										
2025	228										
Total	1,103										

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	Section E.4 of MR demonstrated the summary of GHG emission reductions for the monitoring period and calculated according to the applied methodologies as follows: $ER_y = \sum BE_{b,y} - \sum PE_{p,y} - \sum LE_{p,y}$ Where ER_y Emission reduction for total project activity in year y (tCO₂e/yr) BE_{p,y} Baseline emissions for baseline scenario b in year y (tCO₂e/yr) PE_{b,y} Project emissions for project scenario p in year y (tCO₂e/yr) LE_{p,y} Leakage for project scenario p in year y (tCO₂e/yr) PP has submitted the calculation in the excel sheet/2/. The emission reduction calculation in the excel sheet is checked whether the calculation is in accordance with the formula given in the revised PDD/3/ and the selected methodologies/5/.																									
Findings	No Findings																									
Conclusion	The verification team confirms the following: • The emission reduction is calculated as per the approved PDD and the applied methodology • The emission reduction value reported in the PDD is verified to be correct. • The summary of emission reduction for Chittoor District, Andhra Pradesh state has been given below: <table><tr><th>Vintage Year</th><th>Baseline GHG emissions or baseline net GHG removals (t CO₂e)</th><th>Project GHG emissions or actual net GHG removals (t CO₂e)</th><th>Leakage GHG emissions</th><th>Emission Reductions</th></tr><tr><td>2023 (1/1/2023 to 31/12/2023)</td><td>8,458</td><td>-</td><td>422</td><td>8,036</td></tr><tr><td>2024 (1/1/2024 to 31/12/2024)</td><td>9,055</td><td>-</td><td>453</td><td>8,602</td></tr><tr><td>2025 (1/1/2025 to 30/06/2025)</td><td>4,550</td><td>-</td><td>228</td><td>4,322</td></tr><tr><td>Total</td><td>22,063</td><td>-</td><td>1,103</td><td>20,960</td></tr></table>	Vintage Year	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions	Emission Reductions	2023 (1/1/2023 to 31/12/2023)	8,458	-	422	8,036	2024 (1/1/2024 to 31/12/2024)	9,055	-	453	8,602	2025 (1/1/2025 to 30/06/2025)	4,550	-	228	4,322	Total	22,063	-	1,103	20,960
Vintage Year	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions	Emission Reductions																						
2023 (1/1/2023 to 31/12/2023)	8,458	-	422	8,036																						
2024 (1/1/2024 to 31/12/2024)	9,055	-	453	8,602																						
2025 (1/1/2025 to 30/06/2025)	4,550	-	228	4,322																						
Total	22,063	-	1,103	20,960																						

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The verification team has checked whether the MR includes a comparison of actual values of the monitoring period with the estimations in the approved PDD/3/. Section E.5 of the MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the approved PDD <table border="1"> <tr> <td>Emission reduction estimated as per the revised PDD/3/</td><td>Actual emission reduction achieved as per Monitoring report/1/</td></tr> <tr> <td>38,062 t CO₂e</td><td>20,960 t CO₂e</td></tr> </table>	Emission reduction estimated as per the revised PDD/3/	Actual emission reduction achieved as per Monitoring report/1/	38,062 t CO ₂ e	20,960 t CO ₂ e
Emission reduction estimated as per the revised PDD/3/	Actual emission reduction achieved as per Monitoring report/1/				
38,062 t CO ₂ e	20,960 t CO ₂ e				
Findings					
Conclusion	The estimated emission reductions as per the PDD and the actual emission reductions achieved during the monitoring period are correctly reported in Section E.5 of the MR. The verification team confirms that the actual emission reductions are higher than the estimated values. This is primarily because the actual wood consumption observed during the monitoring period was lower than the value assumed in the PDD, resulting in higher actual emission reductions.				

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	The estimated emission reductions as per the PDD and the actual emission reductions achieved during the monitoring period are correctly reported in Section E.5 of the MR and the actual emission reductions are higher than the estimated values. The reason for increase in emission reduction which is provided by PP in the section E.5.1 of the MR is found to be acceptable and appropriate.
Findings	CAR ID 03 is raised and closed successfully
Conclusion	The estimated emission reductions as per the PDD and the actual emission reductions achieved during the monitoring period are correctly reported in Section E.5 of the MR. The verification team confirms that the actual emission reductions are higher than the estimated values. This is primarily because the actual wood consumption observed during the monitoring period was lower than the value assumed in the PDD, resulting in higher actual emission reductions.

E.9. Assessment of reported sustainable development co-benefits

Relevant SDG	SDG 3: Good Health and Well Being		
Parameter description	Continued improved indoor air condition and reduced respiratory problems especially for women and children.		
Source	Based on experience by the communities for reduction in health problems through sample survey.		
Monitored Value	100% of the surveyed families		
Means of verification	The improvement in indoor air condition compared to baseline based on community perspective and Reduction in incidence of health problems i.e., eye irritation, respiratory problems, burns and wounds etc., due to better indoor air quality have been monitored through annual sample survey/11/. The sample survey sheets are verified and found that the data reported in MR is correct. It is also cross-verified through interview with end user during the onsite audit.		
Findings	No findings		
Conclusion	The parameter is monitored appropriately, in accordance with the registered monitoring plan. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. All the monitored parameter values reported in the MR are found to be correct.		
	Baseline Estimate	Project Estimate	Net Benefit
	i. Use of traditional cookstove causing indoor smoke and health hazards. (100% of HHs having clear indoor air)	i. Reduction in indoor air pollution (100% of HHs)	100% of the surveyed families reported reduction in smoke and health problems during 2024, while 98% reported reduction in 2025 survey.

Relevant SDG	SDG 5: Reduction in drudgery of cooking – Save time		
Parameter description	i. Reduction in Hours for collection of woody biomass and cooking ii. Women in monitoring of the project activity iii. Income generation activities promoted due to the time saved for women		
Source	i and iii. Sample survey ii. Database of CROSS		
Monitored Value	i. Reduction in time by 66.92% for collection of woody biomasses and 59.72% for cooking ii. 21 Number of Women in monitoring of the project activity iii. Income generation activities such as agriculture related work and small businesses promoted due to the time saved for women		
Means of verification	All the sample survey sheets/11/ are checked and found that the value provided in the excel sheet is consistent with the sample survey sheets. Also, verification team		

	conducted acceptance sample survey and confirmed that the values determined by PP through sample survey is correct. In the baseline scenario, Women spent approximately 18.6 hrs/yr in fetching, processing and storing fuelwood for cooking and 6.247 hours per day for cooking on traditional stoves, which is now reduced and hence the saved time is used for other activities by women. Hence as per the survey results there has been reduction of fuel wood collection time 5.18 hours/yr for collection of woody biomasses and 2.391 hrs per day for cooking. Hence, the value reported in MR is correct Number of women involved in monitoring are crosschecked from the ledger/21/ of the CROSS and the reported value is found to be correct. Also, the sample survey sheets/11/ are checked and found that the most of the households reported they involved in income generated activities such as Work on own Land, daily wage, more time to relax and watch television and spend time with children, tailoring, petty shop etc due to the time saved. This is also confirmed during the acceptance sample survey during onsite audit.		
Findings	No findings		
Conclusion	The parameter is monitored appropriately, in accordance with the registered monitoring plan. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. All the monitored parameter values reported in the MR are found to be correct.		
	Baseline value	Project Value Net Benefit	Net Benefit
	i. Women spent approximately 18.6 hrs/yr in fetching, processing and storing fuelwood for cooking and 6.247 hours per day for cooking on traditional stoves ii. No women are involved in monitoring iii. No income generation activities	i. Women spend 5.18 hours/yr for collection of woody biomass and 2.391 hrs per day for cooking ii. 21 women in monitoring of the project activity iii. Income generation activities such as agriculture related work and small businesses promoted due to the time saved for women	i. During 2024 and 2025, Reduction in time by 66.92% for collection of woody biomass and 59.72% for cooking ii. 20 Number of Women in monitoring of the project activity iii. Income generation activities such as agriculture related work and small businesses promoted due to the time saved for women

Relevant SDG	SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all
Parameter description	i. Number of biogas units constructed for the rural communities thereby reducing the use of fuelwood. ii. Number of biogas units repaired and maintained for continuous use of biogas units making them operational
Source	Based on data from online monitoring solution
Monitored Value	i. 3095 biogas units constructed ii. 92.50% (2863) biogas units operational
Means of verification	The value has been derived from the project database in the online monitoring solution/11/. As per the project database, 3095 households were provided the biogas units in which 2863 digesters (92.50%) were in operational condition at the end of the monitoring period.
Findings	No finding raised.

Conclusion	The parameter is monitored appropriately, in accordance with the registered monitoring plan. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. All the monitored parameter values reported in the MR are found to be correct.		
	Baseline value	Project Value Net Benefit	Net Benefit
	No Biogas Units	i. 3095 biogas units constructed ii. 93.5% (2863) biogas units operational	i. 3095 biogas units constructed ii. 93.5% (2863) biogas units operational

Relevant SDG	SDG 17: Partnerships for the Goals		
Parameter description	Domestic/international carbon funding to construct and maintain biogas units		
Monitored Value	Rs. 61.922 million carbon funding so far for the project activity. Rs 5.570 million during this monitoring period (100% Carbon Funding to construct, repair, maintain and monitor the project)		
Source	Audited statement for the project		
Means of verification	These details are taken from the PP's audited statement. Verification team checked the audited statement/22/ and found that a total of Rs. 61.922 million carbon investment received till date (and Rs. 5.570 million received during the monitoring period) for construction, repair and maintenance to the project till end of monitoring period		
Findings	No finding		
Conclusion	The parameter is monitored appropriately, in accordance with the registered monitoring plan. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. All the monitored parameter values reported in the MR are found to be correct.		
	Baseline value	Project Value Net Benefit	Net Benefit
	No funding in the baseline scenario	Rs. 61.922 million carbon funding so far for the project activity. Rs 5.570 million during this monitoring period (100% Carbon Funding to construct, repair, maintain and monitor the project)	Rs. 61.922 million carbon funding so far for the project activity. Rs 5.570 million during this monitoring period (100% Carbon Funding to construct, repair, maintain and monitor the project)

Relevant SDG	SDG 8: Decent Work and Economic Growth		
Parameter description	Number of permanent and temporary jobs created due to the project activity		
Monitored Value	Financial transactions		

Source	These details are taken from the PP's employment records, Project related 21 temporary and 7 permanent jobs created for men and women. Verification team checked the General Ledger of CROSS/21/ and Bank receipt of salary payments/23/ and found that the employment details reported in the MR is correct		
Means of verification	These details are taken from the PP's employment records. Verification team checked the General Ledger of CROSS/24/ and Bank receipt of salary payments/20/ and found that the employment details reported in the MR is correct.		
Findings	No finding		
Conclusion	The parameter is monitored appropriately, in accordance with the registered monitoring plan. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. All the monitored parameter values reported in the MR are found to be correct;		
	Baseline value	Project Value Net Benefit	Net Benefit
	No project related jobs created	Project related 21 temporary and 7 permanent jobs created for men and women	Project related 21 temporary and 7 permanent jobs created for men and women

E.10. Stakeholder Inputs & Legal Dispute

Means of verification	All the inputs from stakeholders are related to repair and maintenance of biogas digester. PP attended all the cases and resolved the same. There are no other grievances reported by Stakeholders during the current or previous monitoring period. Verification team checked the repairs and replacement records and confirmed that all the cases are resolved by either repairing stove or replacement of the stove. Verification team checked with PP whether any legal consent or dispute arise during the monitoring period and PP also confirmed that there are no such legal contests or dispute that has arisen with the project during the monitoring period
Findings	No finding
Conclusion	The verification team confirms the following: - The only grievances received from biogas users are related to repairs & maintenance of stoves. All the cases received during the monitoring period are attended and resolved during the monitoring period itself. - No other grievances received during the current or previous monitoring period - No legal consent or dispute raised during the monitoring period.

SECTION F. Internal quality control

The draft verification report prepared by team leader is reviewed by an independent technical reviewer (having competence of relevant technical area himself/herself or through an independent technical area expert) to confirm the internal procedures established by 4KES are duly followed and the verification report/opinion is reached in an objective manner and complies with the applicable Gold Standard & CDM requirements.

The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team. The independent technical reviewer(s) may approve or reject the draft verification report. The findings may be identified even at this stage, which needs to be satisfactorily resolved, before submit final report to Client/Gold Standard. The final approval decision is taken by the Head of the DOE/Director.

The final decision is authorized by the Director, 4KES, once the report is finalized by the Head of the DOE/DOE Manager.

SECTION G. Verification opinion

The verification team confirms that the the evidence is of sufficient quantity, appropriate quality and reliable. The reported values, notation, units and sources in the monitoring report for all the monitoring parameters have been cross checked with the emission reduction sheet and monitoring report. During the course of verification and on-site visit, the data submitted by PP was cross verified with the values mentioned in the emission reduction sheet/2/ and monitoring report/1/. The procedure for data monitoring, recording, transfer and compilation was also verified and found in compliance with the monitoring plan as mentioned in the approved revised PDD/3/.

Evidences (Documents/interview/site visit) referred for verification of individual monitoring parameter and fixed parameters are defined in section E.6 above. It is confirmed by the assessment team that the reported emission reductions have been conservatively calculated. A list of referred documents for verification is also included in Appendix 3 of this report.

Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 20,960 tCO₂ emission reductions during period 01/01/2023 to 30/06/2025.

SECTION H. Certification statement

4K Earth Science Private Limited has been contracted by 'M/s Community Reconstruction of Social Service (CROSS)' to undertake independent verification and certification for the greenhouse gas (GHG) emission reductions reported and the contribution to sustainable development indicators from the GS Project activity "Micro Scale Biogas CDM Project of CROSS" and CDM Ref# 8784 & GS Ref# GS1199 for the monitoring period 01/01/2023 to 30/06/2025 (including both dates) in the GS Monitoring Report Version 01 (first version) dated 05/08/2025. The verification is based on the revised CDM PDD, GS PDD and the GS monitoring report for this project. Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the Gold Standard Board.

The management of the 'M/s Community Reconstruction of Social Service (CROSS)' is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions & monitoring of SDG parameters on the basis set out within the project Final GS Monitoring Report Version 02 dated 24/09/2025. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the 'M/s Community Reconstruction of Social Service (CROSS)'. The development and maintenance of records and reporting procedures are in accordance with the GS Monitoring Report Version 03 dated 05/12/2025.

In our opinion the GHG emissions reductions reported for the project activity are fairly stated in the GS Monitoring Report (final) Version 03, dated 05/12/2025. 4KES based on outcome of verification activities, certifies in writing that, during the monitoring period 01/01/2023 to 30/06/2025 (including both days), the registered CDM GS PA "Micro Scale Biogas CDM Project of CROSS" in the registered GS CDM PA achieved the verified amount of 20,960 tCO₂e reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the PA.

The Verified and certified impacts during the monitoring period 01/01/2023 to 30/06/2025 (including both dates) is stated below:

Monitoring Period	SDG	Parameter	Certified Net Impacts
01/01/2023 to 30/06/2025	SDG 13	Emission Reduction (tCO ₂ e)	20,960 tCO ₂
	SDG 3	Continued improved indoor air condition and reduced respiratory problems especially for women and children	100% reduction in indoor air pollution during 2024 and 98% in 2025.
	SDG 5	Reduction in drudgery of cooking – Save time	i. During 2024 and 2025, Reduction in time by

GS-VCR-FORM

			66.92% for collection of woody biomass and 59.72% for cooking ii.21 Number of Women in monitoring of the project activity iii. Income generation activities such as agriculture related work and small businesses promoted due to the time saved for women
	SDG 7	i. Construction and maintenance of biogas units for rural communities. ii. Maintenance of constructed biogas units and elimination of use of firewood.	i. 3095 biogas units constructed ii. 93.50% (2863) biogas units operational
	SDG 8	Number of jobs created	Project related 20 temporary and 7 permanent jobs created for men and women
	SDG 17	Access to domestic or international carbon funding to implement clean technologies	Rs. 61.922 million carbon funding so far for the project activity. Rs 5.570 million during this monitoring period (100% Carbon Funding to construct, repair, maintain and monitor the project)

Appendix 1. Abbreviations

Abbreviations	Full texts
4KES	4K Earth Science Pvt. Ltd
BE	Baseline Emissions
CROSS	Community Reconstruction of Social Service
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CH ₄	Methane
CL	Clarification Request
CO ₂ e	Carbon dioxide equivalent
EF	Emission Factor
ERs	Emission Reductions
FAR	Forward Action Request
FCN	Fair Climate Network
GHGs	Greenhouse Gas(es)
GS	Gold Standard
GVC	Gram Vikas Committees
GVK	Gram Vikas Kosh
GWP	Global Warming Potential
HH	Household
ISO	International Organization of Standardization
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LE	Leakage Emissions
MR	Monitoring Report
MP	Monitoring Plan
NCV	Net Calorific Value
NGO	Non-Governmental Organisation
PE	Project Emissions
PDD	Project Design Document
PS	Project Standard
PCIA	Partnership for Clean Indoor Air
PCP	Project Cycle Procedure
SD	Sustainable Development
SDG	Sustainable Development Goal
SHG	Self Help Group
QA/QC	Quality Assurance/Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VER	Verified Emission Reduction
VVB	Validation and Verification Body
VVS	Validation & Verification Standard
WBT	Water Boiling Test

Appendix 2. Competence of team members and technical reviewers

<u>Certificate of Competence</u>							
Name	☒ Mr. ☐ Ms.	Sanjay Kandari					
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GCC/GHG Projects.						
Appointed to work as:							
	Validator/ Verifier	Team Leader	Trainee	Technical Expert	Technical Reviewer	Financial Expert	Approver
Appointed	Yes	Yes	No	Yes	Yes	No	No
Appointed Date	23-06-2025						
Authorized to work as Technical Expert for:							
Authorized Technical Area	Sectoral Scope		TA Code		Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)		1.1		Thermal energy generation		
	Energy industries (renewable - / non-renewable sources)		1.2		Renewables		
	Energy distribution		2.1		Energy distribution		
	Energy demand		3.1		Energy demand		
	Waste handling and disposal		13.1		Solid waste and wastewater		
	Waste handling and disposal		13.2		Manure		
Authorized to work as Local Expert for:							
Country/Countries	India						
Compliance check by:				Swati S Acharya			

<u>Certificate of Competence</u>							
Name	☒ Mr. ☐ Ms.	Ragul B R					
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GCC/GHG Projects.						
Appointed to work as:							
	Validator/ Verifier	Team Leader	Trainee	Technical Expert	Technical Reviewer	Financial Expert	Approver
Appointed	Yes	No	No	Yes	No	No	No
Appointed Date	23-06-2025						
Authorized to work as Technical Expert for:							
Authorized Technical Area	Sectoral Scope		TA Code		Technical Area within the scope		
	Transportation		7.1		Transport		
Authorized to work as Local Expert for:							
Country/Countries	-						
Compliance check by:				Swati S Acharya			

Certificate of Competence

Name	☒ Mr. ☐ Ms.	Sriram S					
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GCC/GHG Projects.						
Appointed to work as:							
	Validator/ Verifier	Team Leader	Trainee	Technical Expert	Technical Reviewer	Financial Expert	Approver
Appointed	Yes	No	No	No	No	No	No
Appointed Date	23-06-2025						
Authorized to work as Technical Expert for:							
Authorized Technical Area	Sectoral Scope		TA Code		Technical Area within the scope		
	-		-		-		
Authorized to work as Local Expert for:							
Country/Countries	India						
Compliance check by:				Swati S Acharya			

Certificate of Competence

Name	☒ Mr. ☐ Ms.	Chetan Swaroop Sharma					
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GCC/GHG Projects.						
Appointed to work as:							
	Validator/ Verifier	Team Leader	Trainee	Technical Expert	Technical Reviewer	Financial Expert	Approver
Appointed	Yes	Yes	No	Yes	Yes	No	Yes
Appointed Date	23-06-2025						
Authorized to work as Technical Expert for:							
Authorized Technical Area	Sectoral Scope		TA Code		Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)		1.1		Thermal energy generation		
	Energy industries (renewable - / non-renewable sources)		1.2		Renewables		
	Energy distribution		2.1		Energy distribution		
	Energy demand		3.1		Energy demand		
	Waste handling and disposal		13.1		Solid waste and wastewater		
	Waste handling and disposal		13.2		Manure		
Authorized to work as Local Expert for:							
Country/Countries	India, Mauritius, Vietnam, Senegal and Thailand						
Compliance check by:				Swati S Acharya			

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	CROSS	Monitoring Report	Version 01, dated 05/08/2025	CROSS
	CROSS	Monitoring Report	Version 02, dated 13/10/2025	CROSS
	CROSS	Monitoring Report (Final Version)	Version 03, dated 05/12/2025	CROSS
2	CROSS	VER Calculation Sheet	Version 01	CROSS
	CROSS	VER Calculation Sheet	Version 04 corresponding to MR version 4	CROSS
3	CROSS	Approved PDD	Version 2.1, dated 06/12/ 2012	CROSS
4	IPCC	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	Web link	publicly available
5	GS	AMS I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 11.	Version 11	publicly available
6	CROSS	End User Agreements	-	CROSS
7	CROSS	Training Records - On-site women maintenance training - On-site beneficiaries training - On-site masons training for construction of biodigester - Supervisors training	-	CROSS
8	FSI	Kyoto Protocol (1997)	http://unfccc.int/k%20yoto_protocol/ite%20ms/2830.php	Publicly available
9	UNFCCC	CDM Modalities and Procedures an CDM Validation and Verification Standard Standard: Sampling and surveys for CDM project activities and programme of activities GS4GG Validation and Verification standard (Version 2.0) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board	Version 09	publicly available
10	4KES	Validation Report	-	publicly available
11	CROSS	Monitoring survey	-	CROSS

12	CROSS	Project Database	-	CROSS
13	CDM	CDM TOOL30 "Calculation of the fraction of non-renewable biomass,	version 04.0	publicly available
14	CROSS	fNRB_ calculation sheet	-	CROSS
15	CROSS	Double counting Declaration	-	CROSS
16	CROSS	Biogas basic record set: - Biogas application form - End user agreement for VER ownership - Completion certificate - Online monitoring solution	-	CROSS
17	CROSS	Training Records: - Training conducted for end user - Training conducted for staffs - Training conducted for Village	-	CROSS
18	CROSS	Village level plant breakdown log sheets maintained by village level volunteers		CROSS
19	CROSS	Grievance records		CROSS
20	CROSS	Bank receipts of salary paid to employees		CROSS
21	CROSS	General Ledger		CROSS
22	CROSS	Audited Statement of CROSS		CROSS
23	GS4GG	monitoring report template, version 1.1	-	Publicly available

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

Table 1. FAR from Validation

No Forward Action Request raised during the Validation

Table 2. CL from this Verification

CL ID	01	Section no.	documents	Date:	10/09/2025
Description of CL					
PP is required to submit the following documents:					
1. The PDD which this MR is applicable to. 2. Annual Report. 3. Kindly submit the double counting deceleration. 4. End user agreement. 5. Previous performance review document.					
Project participant response					Date:

Please find the above-mentioned documents:	
1. The PDD which this MR is applicable to 2. The annual report 3. The double counting declaration 4. Sample end user agreements 5. Previous performance review document	
Documentation provided by project participant	
As stated above.	
DOE assessment	Date: 7/10/2025
The PP has submitted all the above documents. The VVB has reviewed and verified the PDD and found it to be appropriate. Therefore, CL 01 is closed	

CL ID	02	Section no.	ER sheet	Date: 10/09/2025
Description of CL				
The PP is to clarify the process followed for identifying biogas unit breakdowns and repairs during this monitoring period, the time taken for their resolution, and the records where these details have been maintained. Additionally, a separate sheet distinguishing operational and non-operational units should be included in the ER sheet.				
Project participant response				Date:
The village level volunteers visit the households periodically to check on the usage of the units. Also, in case of any repairs or maintenance, the end users call the case workers or the village level volunteers. The date of breakdown and the date of repair is noted down. Emission reductions are not estimated for these days, when the system is not working. Those units that are not operational at all are not included for emission reduction calculations. The breakdown log of the units with the dates of problem, the problem and the date of repair, if repaired is provided for the monitoring period.				
Documentation provided by project participant				
NA				
DOE assessment				Date: 7/10/2025
PP has provided the clarification which is found to be acceptable, Hence CL ID 02 is closed				

CL ID	03	Section no.	D.2.of MR	Date: 10/09/2025
Description of CL				
The PP needs to clarify whether any biogas units were demolished during this monitoring period.				
Project participant response				Date:
Based on the database, during this monitoring period, 7 units were not claimed emission reduction due to them being demolished. The breakdown log is submitted with details of breakdown for all the units during the monitoring period				
Documentation provided by project participant				
Breakdown log of all the biogas units from the online monitoring solution.				
DOE assessment				Date: 7/10/2025
PP has provided the Breakdown log which is found to be acceptable, Hence CL ID 03 is closed				

CL ID	04	Section no.	D.2.	Date: 10/09/2025
Description of CL				
The PP needs to clarify how the parameter $BC_{PJ,HH,y}$ has been calculated.				
Project participant response				Date:
The value is calculated at HH level for two components – i. days not used and for the days used, the parallel use of traditional cookstoves. i) For the days not used per HH - fuelwood use/day x number of days not used and ii) for the days used, the parallel use of fuelwood on traditional cookstove x number of days used. There was an error in the calculations of $BC_{PJ,HH,y}$. The value is rectified, based on which accordingly, the emission reductions is reduced.				
Documentation provided by project participant				
Revised ER calculations sheet				
DOE assessment				Date: 7/10/2025
The PP has submitted the revised ER. The VVB has reviewed and verified the PDD and found it to be appropriate. Therefore, CL 04 is closed				

CL ID	05	Section no.	ER sheet	Date: 10/09/2025
Description of CL				
The PP is requested to clarify what the numbers mentioned in Column A of the "Biogas Users" sheet in the ER sheet represent.				
Project participant response				Date:
<i>The Column A is deleted now as it is the Unit ID, which already exists under Column "Unit ID".</i>				
Documentation provided by project participant				
<i>Revised Calculations sheet</i>				
DOE assessment				Date: 7/10/2025
The PP has submitted the revised ER. The VVB has reviewed and verified the PDD and found it to be appropriate. Therefore, CL 05 is closed				

Table 3. CAR from this verification

CAR ID	01	Section no.		Date: 10/09/2025
Description of CAR				
PP needs to submit the proof for all the SDGs.				
Project participant response				Date:
<i>The proof of all SDGs is submitted</i>				
Documentation provided by project participant				
DOE assessment				Date: 7/10/2025
The PP has submitted all the SDGs proof. The VVB has reviewed and verified the PDD and found it to be appropriate. Therefore, CAR 01 is closed				

CAR ID	02	Section no.	ER sheet	Date: 10/09/2025
Description of CAR				
Make ensure all the dates which were mentioned in the MR and ER sheet is as per the GS requirements ie DD/MM/YYYY				
Project participant response				Date:
<i>The dates are revised in the Monitoring Report and the ER Calculations sheet to DD/MM/YYYY</i>				
Documentation provided by project participant				
<i>Revised Monitoring Report and ER Calculations Sheet</i>				
DOE assessment				Date: 7/10/2025
The PP has submitted Revised Monitoring Report and ER Calculations Sheet. The VVB has reviewed and verified the PDD and found it to be appropriate. Therefore, CAR 02 is closed				

CAR ID	03	Section no.	E.4	Date: 10/09/2025
Description of CAR				
In this section, Project estimate is mentioned as 'O' in both MR and ER. Check and revise				
Project participant response				Date:
<i>Project emissions is not applicable as it is not a biomass project. According to the methodology, project emissions are applicable only for biomass projects. In section E.4., the leakage assessment is included under project estimate, which is 1,105 tCO₂. In ER Sheet, as leakage is shown separately, project emissions is zero.</i>				
Documentation provided by project participant				
-				
DOE assessment				Date: 7/10/2025
PP has provided the clarification which is found to be acceptable, Hence CAR ID 03 is closed				

Table 4. FAR from this verification

FAR ID	xx	Section no.	Date: DD/MM/YYYY
Description of FAR			
NA			
Project participant response			Date: DD/MM/YYYY
Documentation provided by project participant			
DOE assessment			Date: DD/MM/YYYY

Document information

Version	Date	Description
04.0	6 April 2021	Revision to: Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
03.0	31 May 2019	Revision to: - Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN); - Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		