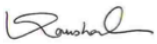
Verification and certification report form for CDM project activities

(Version 01.0)

VERICATION AND CERTIFICATION REPORT	
Title of the project activity	Kolar Biogas Project
Reference number of the project activity	4058
Version number of the verification and certification report	01.1
Completion date of the verification and certification report	26/05/2016
Monitoring period number and duration of this monitoring period	2nd Monitoring Period 01/01/2014 – 31/12/2014 (including both days)
Version number of monitoring report to which this report applies	02.1
Crediting period of the project activity corresponding to this monitoring period	01/04/2012 – 31/03/2022 (Fixed)
Project participant(s)	M/s SKG Sangha Foundation myclimate - The Climate Protection Partnership
Host Party	India
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Sectoral Scope 1, Energy industries (renewable-/non-renewable sources) Sectoral Scope 15 Agriculture AMS.I.C – "Thermal energy for the user with or without electricity" ver. 18 AMS.I.E – "Switch from Non-Renewable Biomass for Thermal Applications by the User" ver.3 AMS.III.R – "Methane recovery in agricultural activities at household/small farm level" ver.1
Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD	31,944 tCO_2e
Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period	30,643 tCO_2e
Name of DOE	KBS Certification Services Pvt. Ltd.
Name, position and signature of the	

approver of the verification and certification report	 Kaushal Goyal Managing Director

SECTION A. Executive summary

KBS has been commissioned by "Foundation myclimate - The Climate Protection Partnership" to perform an independent verification of its registered CDM project "Kolar Biogas Project", UNFCCC Ref# 4058 for the reported GHG emission reductions for the given monitoring period 01/01/2014 – 31/12/2014 (both dates included). The CDM projects must undergo independent third party verification and certification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

Purpose:
The purpose of this verification exercise is, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the revised approved PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) 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 revised approved PDD, including the monitoring plan and the corresponding validation opinion(s);
(b) Previous verification reports, deviation requests, requests for revision of monitoring plan;
(c) Monitoring report for the monitoring period under verification including CER calculations sheets and all supporting documents;
(d) The applied monitoring methodology;
(e) The applied standardized baseline (if applicable);
(f) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;
(g) All information and references relevant to the project activity's resulting in emission reductions

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

KBS has, based on the recommendations in the latest version of CDM Validation and Verification Standard, 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:
The project activity is the installation of biogas plants (digesters) of 2 m^3 or 3 m^3 capacity each for single households having minimum of 2/3 cattle and place to build biogas digester in 5 taluks (Srinivaspur, Kolar, Mulbagal, Malur, and Bangarapet.) in Kolar District in Karnataka State. The biogas units will be fed by cattle dung generated from the households. The biogas stoves will replace the traditional fire wood stoves used for cooking and heating purposes. Thereby, it avoids the related CO_2 emission from the use of non-renewable biomass.

In the baseline situation, the cattle dung was dumped in the traditional open compost pit which results in decay and leading to methane emissions. Since in the project situation, the dung generated from cattle is used in bio-digester and the methane generated from the digester is burnt in cooking stove, the project also results in avoidance of methane emission. The PP planned to install biogas units in 9,380 households in which 5,264 units were commissioned at the end of this monitoring period i.e., 31/12/2014.

Methodology:
KBS 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 monitoring report of the project activity is made publicly available at UNFCCC website as per CDM procedures. A desk review of the project documentation is undertaken, which is followed by an onsite visit 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 version 9 of CDM VVS, to capture the

assessment of applicable CDM requirements viz., version 9 of CDM Project Standard, revised approved PDD, applied methodology/ies, applied standardized baseline 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, if any. The verification protocol is an internal document, and is available on request. Following are the major milestones for the verification under consideration.

Verification contract	01/12/2015
Publication of MR	04/01/2016
On site verification	02/02/2016 & 03/02/2016
Draft Verification Report	01/03/2016
Final Verification Report	26/05/2016

Conclusion:
From the verification assessment, it is confirmed that the project activity has been implemented and operated as per the revised approved PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place. All the monitoring systems & procedures and monitoring report confirms the requirements of the approved monitoring plan and the approved monitoring methodology. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 30,643 tCO_2e emission reductions during period 01/01/2014 – 31/12/2014.

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 review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	IR	Narendra Kumar	R	Central Office	x	x	x	x
2.	Technical Expert	IR	Kanal	M P	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 DOE or outsourced entity)
1.	Technical reviewer	IR	Kandari	Sanjay	Central office
2	Manager Technical & Certification	IR	Sharma	Chetan Swaroop	Central Office
3.	Approver	IR	Goyal	Kaushal	Central Office

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.	Transfer of data from sampling survey sheet to excel ER spreadsheet	Low	Possible human error during transfer of data to ER spreadsheets and	Thorough cross-check required on the transfer of data to the ER spreadsheet

			MR	and MR.
2	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.

C.2. Consideration of materiality in conducting the verification

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The prescribed thresholds for materiality, as per §361 of VVS V9.

Prescribed range of ERs/annum	500,000+	300,000+ to 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 5% as project activity is small scale project activity.

	MR Version (Draft)	**MR Version (Final)**
Emission reductions/annum	27,666 tCO_2e	30,643 tCO_2e
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**
$N_{operating}$	Complete data check	No error identified	NA	No Impact	Yes
H_{stove}	Acceptance sampling	No error identified	NA	No Impact	Yes
$F_{kerosene, project}$	Acceptance sampling	No error identified	NA	No Impact	Yes
$B_{biomass, project}$	Acceptance sampling	No error identified	NA	No Impact	Yes
$B_{biomass, non-project}$	Acceptance sampling	No error identified	NA	No Impact	Yes
$N_{(T)}$	Acceptance sampling	No error identified	NA	No Impact	Yes
$B_{manure,generated}$	Acceptance sampling	No error identified	NA	No Impact	Yes
$B_{manure,fed}$	Acceptance sampling	No error identified	NA	No Impact	Yes
Application of sludge	Acceptance sampling	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 review

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A desk review is undertaken, 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;
- 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

Duration of on-site inspection: 02/02/2016 to 03/02/2016				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Opening Meeting, Office Inspection, Verification of monitoring records, interviews and database inspection	SKG Sangha office	02/02/2016 & 03/02/2016	R Narendra Kumar & M P Kanal
2	Visit to sample number of households	Beneficiary households	02/02/2016 & 03/02/2016	R Narendra Kumar & M P Kanal

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	K	Kiran Kumar	Secretary – M/s SKG Sangha	02/02/2016 & 03/02/2016	- General aspects of the project - Changes since validation / previous verification - Remaining issues from validation/ previous verification - 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 - Data Analysis - Issues in the MR - ER calculation	R Narendra Kumar, MP Kanal
2	-	Manjula	Bangavadi Village	02/02/2016	- Verification of data collected through survey - Awareness about ownership of CERs - Working condition of bio-digester unit - SD parameters verification	
3	-	Netravathi		02/02/2016		
4	-	Sushilamma		02/02/2016		
7	-	Kavitha	Thernahalli Village	02/02/2016		
8	-	Munivenkatappa		02/02/2016		
9	-	Upendra Kumar		02/02/2016		
10	-	Girijamma		02/02/2016		
11	-	Thriveni	Madanahalli	03/02/2016		
12	-	Sunandamma		03/02/2016		
13	-	Parvathamma		03/02/2016		
14	-	Lakshmamma	Yaluvalli	03/02/2016		
15	-	Gunamma		03/02/2016		
16	K.R.	Savithri		03/02/2016		
17	-	Roopa		03/02/2016		
18	-	Anasuyamma	Velagalaburre	03/02/2016		
19	-	Jyothemma		03/02/2016		
20	-	Pushpa		03/02/2016		
21	-	Rathanamma		03/02/2016		
5	-	Sharadamma	Girijanapete Village	02/02/2016		
6	-	Sunandamma		02/02/2016		
22	-	Sujatha	Paravanahalli	03/02/2016		
23	-	Neelamma		03/02/2016		
24	-	Gowramma		03/02/2016		
25	-	Vimalakshi		03/02/2016		
26	-	Munirathnamma	Kamanuru	03/02/2016		
27	-	Indramma		03/02/2016		
28	-	Shwetha		03/02/2016		

D.4. Sampling approach

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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. Verification team has determined acceptance sample size for all the sample survey parameters based on the table 1 of standard "Sampling and surveys for CDM project activities and programmes of activities" version 5. Considering AQL - 1%, UQL - 20%, producer risk – 10% & consumer risk – 10%, the verification team determined the minimum sample size (n) as 18 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
H_{stove}	5264	325	20	1	Simple random sample
$F_{kerosene, project}$	5264	325	20	1	Simple random sample
$B_{biomass, project}$	5264	325	20	1	Simple random sample
$B_{biomass, non-project}$	infinite	126	20	1	Simple random sample
$N_{(T)}$	5264	325	20	1	Simple random sample
$B_{manure,generated}$	5264	325	20	1	Simple random sample
$B_{manure,fed}$	5264	325	20	1	Simple random sample
Application of sludge	5264	325	20	1	Simple random sample

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:

Parameter	DOE sample size	Number of CME's records beyond unacceptable level	Accepted/Rejected
H_{stove}	20	0	Accepted
$F_{kerosene, project}$	20	0	Accepted
$B_{biomass, project}$	20	0	Accepted
$B_{biomass, non-project}$	20	0	Accepted
$N_{(T)}$	20	0	Accepted
$B_{manure,generated}$	20	0	Accepted
$B_{manure,fed}$	20	0	Accepted
Application of sludge	20	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.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	-	-
Compliance of the project implementation with the registered PDD	-	3	-
Post-registration changes	-	1	-
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	-	-	-
Compliance of monitoring activities with the registered monitoring plan	2	-	-

Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	3	1	-
Total	5	5	-

SECTION E. Verification findings

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

Means of verification	Verification team checked the monitoring report with latest version of MR available in the UNFCCC website (i.e., version 5.1)/9/ and "Instructions for filling out the monitoring report form" mentioned as attachment to Monitoring report form (version 05.1).
Findings	No CAR/CL is raised
Conclusion	Verification team confirms that final monitoring report is completed using the latest valid version of the applicable monitoring report form/9/.

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

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The verification team has reviewed the validation report and observed that there the following forward Action Request (FAR) was raised during validation.

1. *"Actual implementation schedule needs to be confirmed during the implementation*
2. *As per PDD, version 03, 70:30 ratio has been considered for installation of 2 m^3 units and 3 m^3. Estimated emission reduction has been calculated based on the proposed ratio of 2 m^3 units and 3 m^3 units installed. Since the ratio influence the emission reduction, the same needs to be checked during verification."*

PP was asked to justify the same for this monitoring period under FAR-01. As per the response from PP the following is confirmed:

The monitoring report mentions the actual number of units installed. Though the actual implementation is not in line with the schedule mentioned in the PDD, the emission reduction is calculated based on the actual number of units installed. Hence, the verification team found the same to be acceptable.

Thought the actual ratio of of 2 m^3 units and 3 m^3 is not consistent with the ratio considered in the registered PDD, the emission reduction is calculated based on the actual ratio of 2 & 3 m^3 units installed. Hence, the verification team found the same to be acceptable.

The FAR raised in the validation report is closed for this verification.

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

Means of verification	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 proposed CDM project activity proposed in the validated PDD/3/ are in place, and that the project participants have operated the CDM project activity as per the validated PDD/3/ . The verification team has checked the information in the monitoring report and compared against the revised 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.
Findings	CAR-01, CAR-02 & CAR-03 are raised
Conclusion	The project involves implementation of 2 m^3 and 3 m^3 Deen Bandhu type Bio-digester in the Srinivaspur, Kolar, Mulbagal, Malur, and Bangarapet taluks of Kolar district. The first unit was commissioned on 07/03/2012. At the end of the

	monitoring period (ie, 31/12/2014) 5264 units have been installed in which 1024 units are 2 m^3 size units and 4240 units are 3 m^3. The verification team has reviewed the biogas application form, completion certificates/4/ and end user agreements/4/. The verification team has observed at the site that all physical locations of the bio-digesters 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 digester installed and the locations are consistent with the PDD. Thus the verification team has concluded that the project activity was implemented and operated as per revised 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 validated PDD/3/ and that all physical features of the project are in place

E.4. Post-registration changes

A Post registration change was already approved by EB (ie, PRC-4058-001, dated 01/10/2015)/5/. No PRC was requested during this monitoring period. CAR-04 was raised and closed successfully.

E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

No temporary deviation is envisaged for this monitoring period.

E.4.2. Corrections

The approved post registration change PRC-4058-001, dated 01/10/2015/5/ includes corrections in the PDD. No other correction is sought during this monitoring period.

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

The start date of the crediting period is changed from 24/11/2011 to 01/04/2012/5/ which is already validated and approved by EB on 01/10/2015 (PRC Ref No: PRC-4058-001).

E.4.4. Inclusion of a monitoring plan to a registered project activity

Not applicable as the monitoring plan is included in the registered PDD itself.

E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

The approved post registration change PRC-4058-001, dated 01/10/2015 includes/5/ change in registered monitoring plan in the PDD/3/. No change in monitoring plan is sought during this monitoring period.

E.4.6. Changes to the project design of a registered project activity

The approved post registration change PRC-4058-001, dated 01/10/2015 includes change in project design/5/. No change in project design is sought during this monitoring period.

E.4.7. Types of changes specific to afforestation and reforestation project activities

Not applicable as it is not AR project.

E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

Means of verification	The verification team checked compliance of project monitoring plan with the applied methodologies (AMS I.C, version 18, AMS I.E, version 03, AMS III.R, version 01)/6/ and including applicable tools.
Findings	No CAR/CL is raised
Conclusion	All parameters stated in the monitoring plan and the applied methodology has been fulfilled in the current monitoring report. All baseline emission parameters has 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 revised approved PDD is in accordance with the applied methodology. In the opinion of the verification team the monitoring report complies with the requirement of the revised approved PDD/3/ and applied methodologies (AMS I.C,

	version 18, AMS I.E, version 03, AMS III.R, version 01)/6/ in the context of the project activity. Thus, it conforms to the requirement of §386 of VVS V9/12/.

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 revised approved PDD whether all parameters fixed ex-ante for the crediting period have been applied correctly.

Ex-ante Parameter	Value	Consistent with the PDD/3/ & the source mentioned in it
$\rho_{kerosene}$	0.817 kg/l	Yes
$NCV_{kerosene}$	43.8 TJ/Gg	Yes
$EF_{kerosene}$	71,900 Kg CO_2/TJ	Yes
$F_{kerosene, baseline}$	24.12 L/yr	Yes
f_{NRB}	0.78	Yes
$B_{Biomass, Baseline}$	4.74 t/yr	Yes
GWP CH_4	25	Yes
$VS_{(T)}$	3.8 for dairy cow, 3.1 for buffalo, 1.4 for other cattle - kg dry matter / (head * day)	Yes
$B_{o(T)}$	0.15 for dairy cattle, 0.1 for buffalo and other cattle - m3 CH4/kg VS	Yes
MCF_{liquid} $MCF_{liquid\ with\ crust}$ MCF_{solid}	80% 50% 5%	Yes
MS_{liquid} $MS_{liquid\ with\ crust}$ MS_{solid}	0.32 0.20 0.16	CL-05 was raised and closed. Now the value are consistent with PDD

Findings

CL-05 is raised

Conclusion

The values of ex ante fixed parameters have been verified from the revised approved 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 registered monitoring plan has been properly implemented and followed by the PP that the monitoring has been carried out in accordance with the registered 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 revised approved PDD.

During the verification all monitoring parameters listed in Section D.2 of MR were compared with section B.7.1 of the revised approved 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:

$N_{operating}$: The parameter 'number of units installed and operating' is monitored continuously (and recorded monthly). As and when the plant is commissioned the same is entered into the records of SKG Sangha. If any malfunction is found by staffs of the SKG Sangha through regular check up or through complains by households, the same will be taken into records and the repair date also will be

	recorded/18/. The non-usage days will be deducted from the total monitoring period days for the calculation of emission reduction. Hence, the actual number of units installed is considered as $N_{operating}$. Only if the plants are abandoned or not used by household permanently then the same will be deducted from the total number of units installed for the estimation of $N_{operating.}$ The verification team checked the records/14/ and found that the total number of operating units during this monitoring period is 5264. Verification team also verified all the documents ie, application, end user agreement, completion certificate & payment receipt for 27 number of samples and found that all the details provided for the respective households in the excel sheet/2/ are matching. Hence, the value considered in the MR is correct. H_{stove}: **'**Annual hours of operation of an average system (hours of burner functioning)' is measured through sample basis by the respective household member. During the monitoring period, PP selected 235 household on sample basis and they were given a monitoring sheet to record hours of operation of biogas continuously for a week of time. All the 235 records/15/ are verified by the verification team and found that the details provided in the monitoring sheet. Verification team also checked the same during site visit by surveying 27 household randomly selected among 235 numbers and found that all the data are correct. No error is found. Hence the value considered for $\mathbf{H_{stove}}$ (ie, 3.54 hr/day) is correct. $F_{kerosene,\ project}$: The 'Annual amount of kerosene consumed by household after installation of biogas unit' is monitored through annual sample survey. PP has conducted sample survey in 325 numbers of household. Verification team checked all 325 survey sheet of PP/15/. Also verification team interviewed 27 households in it randomly and confirmed that the value provided by PP is correct. No error is found in the PPs data. Hence the value considered by PP (i.e., 0 litre/year) is found to be correct. $\mathbf{B_{biomass,\ project}}$**:** **'**Annual quantity of biomass consumed by household after installation of biogas unit' is monitored through annual sample survey done by PP. PP has conducted sample survey in 325 numbers of household/15/. Verification team checked all 325 survey sheet of PP. Also verification team surveyed 27 households in it randomly and confirmed that the value provided by PP is correct. No error is found in the PP's data. Hence the value considered by PP (i.e., 0 tonnes/year) is found to be correct. $\mathbf{B_{biomass,\ non\text{-}project}}$**:** **'**Consumption of fuel wood for cooking in households not participating in the project activities' is monitored through annual sample survey. PP has conducted sample survey in 126 numbers of non-project household in the project area. Verification team checked all 126 survey sheet of PP/16/. Also verification team surveyed 27 households in it randomly and confirmed that the value provided by PP is correct. No error is found in the PP's data. Hence the value considered by PP (ie, 8.3 kg/day) is found to be correct. ' $\mathbf{N_{(T)}}$**:** **'**Annual average animal population in a household (number of heads of dairy cow, buffalo and other cattle)' is monitored through annual sample survey. PP has conducted sample survey in 325 numbers of household. Verification team checked all 325 survey sheet of PP/15/. Also verification team surveyed 27 households in it randomly and confirmed that the value provided by PP is correct. No error is found in the PP's data. Hence the average value considered by PP (ie, 2.59 dairy cows/HH, 0.51 buffalos/HH & 0.23 other cattle/HH) is found to be correct. $\mathbf{B_{manure,generated}}$**:** **'**Average amount of animal manure generated per household per year' is monitored thorough annual sample survey. PP has conducted sample survey in 325 numbers of household. Verification team checked all 325 survey sheet of PP/15/. Also verification team surveyed 27 households in it randomly and confirmed that the value provided by PP is correct. No error is found in the PP's data. Hence the average value considered by PP (ie, 56.52 kg/day or 20.63 tonnes/year) is found to be correct.

	$B_{manure,fed}$: 'Average amount of animal manure fed into biogas digester per year' is monitored thorough annual sample survey. PP has conducted sample survey in 325 numbers of household. Verification team checked all 325 survey sheet of PP/15/. Also verification team surveyed 27 households in it randomly and confirmed that the value provided by PP is correct. No error is found in the PP's data. Hence the average value considered by PP (ie, 51.56 kg/day or 18.82 tonnes/year) is found to be correct. **Application of sludge: '**Proper application of the sludge from the biogas unit' is monitored thorough annual sample survey. PP has conducted sample survey in 325 numbers of household. Verification team checked all 325 survey sheet of PP/15/. Also verification team surveyed 27 households in it randomly and confirmed that the value provided by PP is correct. No error is found in the PP's data. PP has also conducted training programme for households in sludge treatment and application. The same is verified from the training records/17/ maintained by SKG Sangha. From the above assessment, the verification team concludes that the bio-digester sludge is applied properly by the households which do not lead to anaerobic treatment.
Findings	CL-01 is raised
Conclusion	Corresponding to the §389 of VVS V9[/12/], the team confirm that the monitoring has been carried out in accordance with the approved PDD[/3/]. The monitoring system is in compliance with the information flow for the parameters as mentioned in monitoring plan in approved 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.6.3. Implementation of sampling plan

Means of verification	The verification team checked whether the PPs have applied a sampling approach to determine the monitored values. 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 revised approved PDD. The comparison of sample size required

Parameter	Sample size required as per PDD/3/	Actual sample size considered for survey/1/	Is sample size is sufficient?
$B_{biomass,\ non\text{-}project}$	50	126	Yes
H_{stove}	264 (ie, 5% of total units)	325	Yes
$F_{kerosene,\ project}$			
$B_{biomass,\ project}$			
$N_{(T)}$			
$B_{manure,generated}$			
$B_{manure,fed}$			
Application of sludge			

The verification team also checked the precision level from the survey data and confirmed that precision level achieved for all parameter is within the limit of 10%. Hence, the sample size considered for all the parameters are found to be OK.

Findings	No CAR/CL is raised
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. • PP's sample population was selected in all the taluks proportionally based on the number units installed in the respective taluk.

	• The sampling plan is implemented correctly in accordance with the revised approved PDD • Though acceptance sampling, the verification team confirmed that the all the data collected by PP through sample survey are correct. No error found.

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Not applicable as no monitoring equipments 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: Transparency: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. Parameter consistency: 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. Correctness: 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. Completeness: It has been checked whether all calculations are complete and without omissions The baseline emissions are calculated for the three components – (i) displacement of kerosene, (ii) displacement of non-renewable biomass and (iii) the capture and destruction of methane from animal manure. The equations applied for the determination of baseline GHG emissions is consistent with the revised approved PDD and methodology: The baseline emission from kerosene avoidance is calculated using the formula: $$BE_{kerosene} = F_{kerosene} * N * \rho_{kerosene} * NCV_{kerosene} * EF_{kerosene} * 10^{-9}$$ The baseline emission from avoidance of non-renewable biomass is calculated using the formula: $$BE_{NRB} = B_{biomass} * N * f_{NRB} * NCV_{biomass} * EF_{kerosene} * 10^{-3}$$ Baseline emission from manure management is calculated using the formula: $$BE_{manure} = \sum_{(T)} (EF_T * N_T) * N * GWP\_CH_4/1000$$ Where the EFt is calculated as below: $$EF_{(T)} = VS_{(T)} * 365 * B_{o(T)} * 0.67\ kg/m^3 * (\frac{MCF_{liquid}}{100} * MS_{liquid} + \frac{MCF_{liquid\ with\ crust}}{100} * MS_{liquid\ with\ crust} + \frac{MCF_{solid}}{100} * MS_{solid}$$ The PDD values of MS_{manure} (MS_{liquid}, $MS_{liquid\ with\ crust}$, MS_{solid}) are estimated based on Fraction of livestock category T's manure handled using manure management system S in climate region k in baseline (management systems considered are liquid/slurry management system, liquid/slurry with natural crust cover system and solid storage) and percentage of animal confinement per day monitored through baseline survey. However as per PDD/3/, the actual confinement time of animal should be considered for the emission reduction calculation. In line with that, PP has estimated animal confinement time through monitoring sample survey which is estimated to be 21.26 hrs/day (ie, 88.6%) against the baseline estimated value of 17.38 hrs/day (ie, 72.4%). So, the final baseline emission from animal manure management is adjusted with the factor of 1.22 (calculated from 21.26/17.28). The verification team checked the calculation and found to be correct.

	From the calculated baseline emission from above formula, the baseline emission per day is calculated. The project emission per day is multiplied with the actual number of operating days (average operating days of all biogas units during the monitoring period) to estimate the actual baseline emission. Since the baseline emission is adjusted with actual number of operating days, the verification team found this to be appropriate. PP has submitted the calculation in the excel sheet/2/. The baseline calculation in the excel sheet is checked whether the calculation is in accordance with the formula given in the approved PDD/3/ and the selected methodologies/6/.
Findings	CL-03 & CL-04 are raised
Conclusion	The verification team confirms the following: • The calculations of baseline GHG emissions 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 baseline emission reported in the monitoring report for the monitoring period (ie, 34,104 tCO_2e) is verified to be correct

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

Means of verification	The verification team has checked whether calculations of project 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: Transparency: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. Parameter consistency: 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. Correctness: 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. Completeness: It has been checked whether all calculations are complete and without omissions The project emissions are calculated for the three components – (i) kerosene usage, (ii) non-renewable biomass usage and (iii) physical leakage of methane from digester. The equations applied for the determination of baseline GHG emissions is consistent with the revised approved PDD and methodology: Project emission from kerosene usage is calculated using the formula: $PE_{kerosene} = F_{kerosene,\ project} * \rho_{kerosene} * NCV_{kerosene} * EF_{kerosene} * 10^{-9}$ Project emission from NRB usage is calculated using the formula: $PE_{y,NRB} = B_{biomass\ project} * f_{NRB,y} * NCV_{biomass} * EF_{kerosene}$ Project emission from physical leakage of methane from digester is calculated using the formula: $PE = LF_{AD} * (GWP\_CH_4 * D_{CH4} * B_{o(T)} * VS_{(T)})/1000$ As per the monitored values, there is no kerosene or biomass is consumed in the project situation. Hence project emission due to kerosene and biomass consumption is calculated as zero. Only physical leakage is calculated as project emission. From the calculated project emission from above formula, the project emission per day is calculated. The project emission per day is multiplied with the actual number

	of operating days (average operating days of all biogas units during the monitoring period) to estimate the actual baseline emission. Since the project emission is adjusted with actual number of operating days, the verification team found this to be appropriate. PP has submitted the calculation in the excel sheet/2/. The project emission calculation in the excel sheet is checked whether the calculation is in accordance with the formula given in the approved PDD/3/ and the selected methodologies/6/.
Findings	CL-02 & CAR-05 are raised
Conclusion	The verification team confirms the following: • The calculations of project GHG emissions 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 project emission calculation is overall correct. • The ER calculation sheet provided is clear, transparent and the calculations provided in the sheet are reproducible. • Hence, the project emission reported in the monitoring report for the monitoring period (ie, 3,461 tCO_2e) is verified to be correct

E.8.3. Calculation of leakage GHG emissions

Means of verification	During the verification it has been checked whether leakage emissions have to be considered and in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. According to the approved PDD, leakage relating to non-renewable biomass as per AMS -I.E will be assessed from ex-post surveys of users and areas from where biomass is sourced. $LEy = (B_{biomass,non\text{-}project} - B_{biomass,y}) \times f_{NRB,y} \times NCV_{biomass} \times EF_{kerosene}$ As verified from the monitoring data, the biomass consumed in the non-project households is lower than the baseline fuel consumption. Also verification team checked with non-project households and confirmed that the no household used renewable energy before the project start which is now changed to non-renewable biomass. Hence the leakage is considered as zero. For applied methodologies AMS I-C, AMS I-E and AMS-III.R,/6/ if the energy generating equipment is transferred from another activity or if existing equipment is transferred to another activity, leakage is to be considered. The project does not involve any movable equipment and hence all the bio-digesters are built newly. Hence there is no equipment transfer happed in the project activity.
Findings	No CAR/CL is raised
Conclusion	No leakage has to be considered during this MP, as from the 126 non-project HHs surveyed/16/ to assess to the quantity of biomass consumed in the baseline survey and during the project, the consumption of firewood from cooking and for water heating in the non-project households is lower than in the baseline, and thus there is no leakage due to project activity.

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

Means of verification	Section E.4 of MR demonstrate the summary of GHG emission reductions for the monitoring period and calculated according to the applied methodologies as follows: $ER_y = BE_y - PE_y - L_y$ =34,104-3,461-0 =30,643 tCO_2e The ER calculation sheet and monitoring report is verified to check the calculation.
Findings	No CAR/CL is raised
Conclusion	The verification team confirms the following:

	• The emission reduction value reported (ie, 30,643 tCO_2e) is verified to be correct. • The summary table in the MR has been filled correctly and the values are in line with the related emissions reduction spreadsheet. • Since the full monitoring period starts after 31/12/2012, the complete emission reductions are correctly reported under the respective column in the MR.

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 revised 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 revised approved PDD Emission reduction estimated as per the revised approved PDD/3/ | Actual emission reduction achieved as per Monitoring report/1/ 31,944 t CO_2e | 30,643 t CO_2e Hence, the actual emission reduction achieved during the monitoring period is 4% less than the estimation in the PDD.
Findings	No CAR/CL is raised
Conclusion	The estimated emission reduction as per revised approved PDD and the actual emission reduction achieved for the monitoring period are correctly reported in the section E.5 of MR. The actual achieved emission reduction is 4% less than the PDD estimation. Hence no justification is required.

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

Means of verification	The verification team has determined the CER achieved during this monitoring period with the estimated value and reason for increase if any.
Findings	No CAR/CL is raised
Conclusion	The actual achieved emission reduction is 4% less than the PDD estimation. Hence no justification is required.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The verification team has determined the CER achieved during first commitment period and second commitment period
Findings	No CAR/CL is raised
Conclusion	Since the complete monitoring period falls after the first commitment period, the complete emission reductions are correctly reported under the respective column in the MR.

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 KBS are duly followed and the verification report/opinion is reached in an objective manner and complies with the applicable CDM requirements.

The independent technical reviewer may approve or reject the draft verification report. The findings may be identified even at this stage, which needs to be satisfactorily resolved, before the request for issuance is submitted to UNFCCC. The final decision is taken by the Manager Technical and Certification. The technical reviewer and Manager (Technical & Certification) can be same person.

The final decision is authorized by Managing Director, KBS once the report is approved by the Manager (Technical & Certification).

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 30,643 tCO_2e emission reductions during period 01/01/2014 – 31/12/2014.

SECTION H. Certification statement

KBS Certification Services Pvt. Ltd. has been contracted by 'Foundation myclimate – The Climate Protection Partnership' to undertake independent verification and certification for the greenhouse gas (GHG) emission reductions reported from the CDM Project activity "Kolar Biogas Project" and UNFCCC Reference Number 4058 for the monitoring period 01/01/2014 – 31/12/2014 (including both dates) in the Monitoring Report Version 01 (first version) dated 01/12/2015.

The verification is based on the approved revised PDD and the 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 CDM Executive Board.

The management of the 'M/s SKG Sangha' and 'Foundation myclimate – The Climate Protection Partnership' are responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Final Monitoring Report Version 02.1 dated 23/05/2016. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the 'M/s SKG Sangha' and 'Foundation myclimate – The Climate Protection Partnership'. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 02.1 dated 23/05/2016.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the monitoring period 01/01/2014 – 31/12/2014 (including both dates) based on the reported emission reductions in the Final Monitoring Report Version 02.1 dated 23/05/2016 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.
KBS confirms the following;

Reporting period: 01/01/2014 – 31/12/2014 (including both dates)

Verified and certified emission in the above reporting period:

	Amount	Unit
Baseline emissions (BE)	34,104	tCO2e
Project emissions (PE)	3,461	tCO2e
Leakage emissions (LE)	0	tCO2e
Certified emission reductions (CERs)	30,643	tCO2e

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CERs	Certified Emission Reductions
CH4	Methane
CL	Clarification Request
CO2e	Carbon dioxide equivalent
COP	Conference of Parties
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ERs	Emission Reductions
FAR	Forward Action Request
GHGs	Greenhouse Gas(es)
GWP	Global Warming Potential
HH	Household
ISO	International Organization of Standardization
IPCC	Intergovernmental Panel on Climate Change
KBS	KBS Certification Services Pvt. Ltd.
KP	Kyoto Protocol
LE	Leakage Emissions
MR	Monitoring Report
MP	Monitoring Plan
PE	Project Emissions
PDD	Project Design Document
PS	Project Standard
PCP	Project Cycle Procedure
PPA	Power Purchase Agreement
QA/QC	Quality Assurance/Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation & Verification Standard

Appendix 2. Competence of team members and technical reviewers

Personnel Name:		**Narendra Kumar**	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert	☒
Area(s) of Technical Expertise			
Sectoral Scope		**Technical Area**	
Energy Industries (renewable/non-renewable sources)		TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	

Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources
Energy Demand	TA 3.1: Energy Demand
Approved by (Manager C& T)	Akhilesh Joshi
Approval date:	16/01/2016

Personnel Name:		**M P Kanal**	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope	**Technical Area**		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Energy Demand	TA 3.1: Energy Demand		
Waste handling and disposal	TA 13.1. Solid waste and wastewater		
Agriculture	TA 15.1. Agriculture		
Approved by (Manager C & T)	Gagandeep Kakkar		
Approval date:	03/11/2015		

Personnel Name:		**Sanjay Kandari**	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope	**Technical Area**		
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal TA 13.2 Manure		
Approved by (Manager C & T)	Gagandeep Kakkar		
Approval date:	03/11/2015		

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	SKG Sangha	Monitoring Report,	Version 01, dated 01/12/2015	SKG Sangha
	SKG Sangha	Monitoring Report	Version 02, dated	SKG Sangha

			09/03/2016	
	SKG Sangha	Monitoring Report	Version 02.1, dated 23/05/2016	SKG Sangha
2	SKG Sangha	ER Calculation Sheet	Version 01, dated 01/12/2015	SKG Sangha
	SKG Sangha	ER Calculation Sheet	Version 02, dated 09/03/2016	SKG Sangha
	SKG Sangha	ER Calculation Sheet	Version 02.1, dated 23/05/2016	SKG Sangha
3	SKG Sangha	Approved PDD	Version 14, 18/06/2015	Publically available
4	SGS	Validation Report	Dated 28/06/2015	Publically available
5	UNFCCC	PRC document page in UNFCCC	Web link	Publically available
	TUV Nord	PRC Validation Report,	Dated 15/07/2015	
6	UNFCCC	CDM Methodologies: AMS.I.C – "Thermal energy for the user with or without electricity"	Version 18	Publically available
	UNFCCC	AMS.I.E – "Switch from Non-Renewable Biomass for Thermal Applications by the User"	Version 03	Publically available
	UNFCCC	AMS.III.R – "Methane recovery in agricultural activities at household/small farm level"	Version 01	Publically available
7	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	Publically available
8	UNFCCC	Kyoto Protocol (1997)	Web link	Publically available
9	UNFCCC	Monitoring Report Form (CDM-MRFORM), Version 05.1	Version 05.1	Publically available
10	UNFCCC	CDM Project Standard	Version 9.0	Publically available
11	UNFCCC	Standard: Sampling and surveys for CDM project activities and programme of activities	Version 05	Publically available
	UNFCCC	Guidelines for sampling and surveys for CDM project activities and programme of activities	Version 04	Publically available
12	UNFCCC	CDM Validation and Verification Standard	Version 09	Publically available
13	UNFCCC	Glossary "CDM terms"	Version 08	Publically available
14	SKG Sangha	Biogas basic record set: - Biogas application form - End user agreement for CER ownership - Completion certificate - Payment receipt	For the digesters installed during 01/01/2014 – 31/12/2014	SKG Sangha
15	SKG Sangha	Sample Survey monitoring sheets for this monitoring period	Conducted for the year 2014	PP
16	SKG Sangha	Non-project household survey sheets for this monitoring period	Conducted for the year 2014	PP
17	SKG Sangha	Training Records: Training conducted for user/beneficiary	Conducted during 01/01/2014 – 31/12/2014	PP

		Training conducted for Mason conducted for staffs involved in monitoring and maintenance		
18	SKG Sangha	Plant repair cards	Covering the monitoring period 01/01/2014 – 31/12/2014	PP
19	SKG Sangha	Monthly monitoring report by monitoring staff	Covering the monitoring period 01/01/2014 – 31/12/2014	PP
20	SKG Sangha	Operating hours data monitored by the selected beneficiaries	Monitored for the year 2014	PP

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

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	01	**Section no.**	E.2	**Date:** 01/03/2016
Description of FAR				
As per the validation report dated 28/06/2011, the following FAR (FAR# 19) has been raised: 1. Actual implementation schedule needs to be confirmed during the implementation 2. As per PDD, version 03, 70:30 ratio has been considered for installation of 2 m^3 units and 3 m^3. Estimated emission reduction has been calculated based on the proposed ratio of 2 m^3 units and 3 m^3 units installed. Since the ratio influence the emission reduction, the same needs to be checked during verification. Please clarify how the above is justified for this monitoring period.				
Project participant response				**Date:** 08/03/2016
1. The installation of biodigesters has taken place slower than originally anticipated. Thus the implementation of the total number of units will take some more time than scheduled in the PDD but the implementation is on track and the schedule can be confirmed. *2. The demand after 2m3 units is higher than expected which results in a current installation ratio of 80% 2m3 units and 20% 3m3 units But the ratio of 70:30 can be confirmed for the future. The ER Calculations considers the actual unit size ratio in its calculation. This is also one of the reasons why the ER s achieved during this monitoring period is smaller than originally expected in the PDD.*				
Documentation provided by project participant				
NIL				
DOE assessment				**Date:** 04/04/2016
1. The monitoring report reports the actual number of units installed. Though the actual implementation is not in line with the schedule mentioned in the PDD, the emission reduction is calculated based on the actual number of units installed. Hence, acceptable. 2. Thought the actual ratio of of 2 m^3 units and 3 m^3 is not consistent with the ratio considered in the revised approved PDD, the emission reduction is calculated based on the actual ratio of 2 & 3 m^3 units installed. Hence, acceptable. Finding is closed				

Table 2. CL from this verification

CL ID	01	**Section no.**	E.6.2	**Date:** 01/03/2016
Description of CL				

MR-Section D2:

1. The QA/QC procedures provided in the PDD is not followed for all respective monitoring parameters. Clarify

2. As per the methodology, it should be justified that the NRB is not diverted to household that previously used renewable energy sources. Clarify how this is justified.

3. As per monitoring survey, 0.87 kg of dung is pre-treated in composting pit. However, this is not considered in the calculation of parameter 'Average amount of animal manure fed into biogas digester per year'. Clarify

Project participant response | **Date:** 08/03/2016

1. QA/QC procedures as provided in the PDD are now reflected in the MR
2. Kolar is biomass deficit district. Total biomass availability to the demand is about 20% please refer PDD for more details. The non-project households biomass use survey has been conducted for this purpose to know whether the use of NRB saved by project activity has been used by the non-project households. If the non-project households biomass use is increased then the amount of increase to the baseline use will be treated as leakage. But in the non-project households survey conducted for this monitoring period shows that the biomass use by the non-project households use is lower than the baseline consumption. Hence no leakage. Data collected about the type of biomass used by households clearly shows that the renewable type of biomass use has been increased from the baseline use. It correlates that the biomass scarcity has been increased since the year of baseline survey.
3. 0.87kg of dung pre-treated in composting pit are now reflected in ER calculation of parameter " Average amount of animal manure fed into biogas digester.

Documentation provided by project participant

Revised Monitoring Report
Revised ER calculation sheet

DOE assessment | **Date:** 04/04/2016

1. The QA/QC procedures o the monitoring parameters are revised in the MR which is consistent with PDD.
2. The explanation is accepted. Verification team also confirmed during site visit that the saved NRB is not diverted to any households that used renewable energy before project as no non-project household used renewable energy before the project start. Hence OK
3. The dung pre treated in composting pit is now considered in the calculation of average amount of dung fed into the digester.

Finding is closed

CL ID	02	**Section no.**	E.8.2	**Date:** 01/03/2016

Description of CL

MR-Section E.2:

As per the PDD, the project emission due to use of traditional stove (ie, emission from use of NRB and Kerosene) in case of non-operation of bio-digester will be included. Clarify how it is accounted for this monitoring period.

Project participant response | **Date:** 08/03/2016

There are two ways of knowing the use of biomass for cooking needs in the project households. One through the survey in project households and the other is the monthly reports sent by the local supervisors. Monitoring survey captures the data from sampled households biomass use for different purposes. If the project households used biomass for cooking then it will be treated as leakage. If any plant is non-functioning for some time then the household will use other source of energy for cooking needs. This information will be derived from monthly reports of the local supervisors. In this monitoring period there were 33 such cases out of 5264 HH used firewood for cooking during the repair of their respective units. All these units put together used 2.5 tons of fuel wood for cooking. As this amount is negligible this has not been considered as leakage.
Some of the households used biogas for heating water. Wood saved by this use also has not been considered for ER calculation as a conservative measure.
An average household used biogas stove for 0.0646 hours/day for heating water purpose. This is equal to 24h/year/hh or 40 kg of fire wood. There were 5264 households in this monitoring period. These households saved 5264 x 40 = 124 tons of wood. The savings are 50 times higher than the use of the 2.5 tons of fuelwood during non-functioning of unit.

Documentation provided by project participant

-

DOE assessment | **Date:** 04/04/3016

The explanation provided by PP is acceptable. Hence OK Finding is closed

CL ID	03	**Section no.**	E.8.1	**Date:** 01/03/2016
Description of CL				
ER Sheet-Monitoring Survey: Some of the monitoring survey was done in the year of 2012. Clarify how the data is appropriate for this monitoring period which covers dates from 01/01/2014 to 31/12/2015.				
Project participant response				**Date:** 08/03/2016
Survey has been conducted during the monitoring period. Data of few of the surveyed households was wrongly entered in the date of survey column in the monitoring sheet. Instead of 2014 it was wrongly typed as 2012. It has been corrected.				
Documentation provided by project participant				
Revised ER sheet				
DOE assessment				**Date:** 04/04/2016
The necessary corrections are made in the survey sheet. The filled survey questionnaire for the same is verified and found that it was done during the days between 01/01/2014 and 31/12/2015. Hence they typo in the sheet is corrected appropriately. Finding is closed				

CL ID	04	**Section no.**	E.8.1	**Date:** 01/03/2016
Description of CL				
ER Sheet-Monitoring Survey: 1. As per the status of bio-digester provided, few plants are not functioning. However no biomass or kerosene consumption is considered for cooking for those plants. Clarify. 2. Also for one plant, it is mentioned door is locked as family shifted from the place. Still the survey results are given. Clarify				
Project participant response				**Date:** 08/03/2016
1. All the plants were functioning. In the monitoring survey Excel sheet in the comments column there was a mistake in typing. Only the first portion of comment “plant is not functioning well” was typed and the reaming portion “because of overfeeding – overfeeding cleared” was not typed. Now the mistake has been corrected by typing the full comment. 2. Data has been collected by contacting the family over phone and verified through his brothers family living in the same village. The monthly reports from the field level supervisors mentioned this case. The family shifted to other town in the month of August 2014. Since then the unit is not in use. ERs for this plant has been calculated only for the period the unit functioned.				
Documentation provided by project participant				
1. Relevant scan copies of the monitoring sheets 2. Relevant scan copy of the supervisor monthly report				
DOE assessment				**Date:** 04/04/2016
1. Since the plant was already repaired, the status is now also includes “*overfeeding cleared*”. The monitoring sheet is now verified and confirmed that the plants are under working condition. Hence OK 2. Explanation is acceptable as the plant was used during the monitoring period. Finding is closed.				

CL ID	05	**Section no.**	E.6.1	**Date:** 01/03/2016
Description of CL				
ER Sheet-AMS III R: The values considered for the MS_liquid, MS_liquid_crust and MS_solid are not consistent with the values provided in the PDD.				
Project participant response				**Date:** 08/03/2016

The values of "MS_liquid, MS_liquid_crust and MS_solid" have been wrongly included as fixed ex- ante in the PDD. Values for Fraction of livestock category T's manure handled using manure management system S in climate region k (fraction of livestock manure handled using liquid/slurry manure management system, fraction of livestock manure handled using liquid/slurry with natural crust cover and fraction of livestock manure handled using solid storage manure management system) has been fixed by the baseline. % of total excrement fermenting in above conditions was calculated based on time the animals spend in confinement. Hence % of animal confinement per day is used to calculate manure handled in manure management system. Baseline fixed value will be multiplied with the % of time the animals spend in confinement derived from monitoring surveys. Then the product will be used to calculate the ERs. This is the reason why the values of "MS_liquid, MS_liquid_crust and MS_solid" for the second monitoring period are not consistent with the PDD. However to be consistent with the PDD, the same values of MS_liquid, MS_liquid_crust & MS_solid considered in the PDD is considered for the section D.1 to be consistent with the PDD and the final baseline emission value is multiplied with the adjustment factor of 1.22 which is the ration of project confinement time and baseline confinement time estimated from project sample survey and baseline sample survey respectively.
Documentation provided by project participant
Revised MR *Revised ER Sheet*
DOE assessment **Date:** 04/04/2016
The MS values fixed in the PDD is retained in the monitoring report to be consistent with the PDD. However, PP has estimated animal confinement time through monitoring sample survey which is estimated to be 21.26 hrs/day (ie, 88.6%) against the baseline estimated value of 17.38 hrs/day (ie, 72.4%). So, the final baseline emission from animal manure management is adjusted with the factor of 1.22 (calculated from 21.26/17.28). The verification team checked the calculation in the ER sheet and found to be correct. Finding is closed

Table 3. CAR from this verification

CAR ID	01	**Section no.**	E.3	**Date:** 01/03/2016
Description of CAR				
MR-Section A.1 The following details are missing: - Explanation on how the emission reduction is achieved in the project activity - Commissioning date of first digester - Total GHG Emission achieved in the monitoring period				
Project participant response				**Date:** 08/03/2016
- The missing data has been included in MR. - The Commissioning date of first digester was on 07-03-2012 - The total GHG emission achieved has been included in MR				
Documentation provided by project participant				
Revised MR *Scan copy of the document signed by the beneficiary*				
DOE assessment				**Date:** 04/04/2016
The missing details are now included in the section A.1 of MR. Finding is closed				

CAR ID	02	**Section no.**	E.3	**Date:** 01/03/2016
Description of CAR				
Section A.5 of MR: One of the project developer name is mentioned as "Foundation myclimate – The Planet Protection Partnership" which is not consistent with the front page of MR as well as UNFCCC project webpage.				
Project participant response				**Date:** 08/03/2016
The name of project developer has been corrected to "Foundation myclimate - The Climate Protection Partnership" and is now stringent.				
Documentation provided by project participant				

Revised MR
DOE assessment **Date:** 04/04/2016
The PP name is corrected to “Foundation myclimate – The Climate Protection Partnership” which is consistent with the front page of MR & UNFCCC project webpage. CAR-02 is closed

CAR ID	03	**Section no.**	E.3	**Date:** 01/03/2016
Description of CAR				
MR-Section B.1: The description provided under this section is not in line with the requirement of section 13.3 of project standard. version 9				
Project participant response				**Date:** 08/03/2016
The description provided under section B is now in line with the requirement of section 13.3 of project standard. version 9				
Documentation provided by project participant				
Revised MR				
DOE assessment				**Date:** 04/04/2016
The description is now revised and found that it is in line with requirement of section 13.3 of project standard, version 9. Finding is closed				

CAR ID	04	**Section no.**	E.4	**Date:** 01/03/2016
Description of CAR				
MR-Section B.2: As per the UNFCCC project page, a PRC was approved by EB on 01/10/2015. However, the same is not reflected in this section.				
Project participant response				**Date:** 08/03/2016
The PRC is now mentioned in the MR Section B.				
Documentation provided by project participant				
Revised MR				
DOE assessment				**Date:** 04/04/2016
The PRC details are now included in the section B.2 of MR. Finding is closed.				

CAR ID	05	**Section no.**	E.8.2	**Date:** 01/03/2016
Description of CAR				
MR-Section E.2: The equation considered for the project emission from physical leakage is not consistent with the equation mentioned in the PDD (check the equation 9 in the PDD)				
Project participant response				**Date:** 08/03/2016
The formula is corrected.				
Documentation provided by project participant				
Revised MR				
DOE assessment				**Date:** 04/04/2016
The formula for the physical leakage emission is corrected in MR which is verified to be consistent with the equation 9 of PDD. Finding 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

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Document information

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