



Monitoring report form
(Version 05.1)

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT

Title of the project activity	Kolar Biogas Project
UNFCCC reference number of the project activity	4058
Version number of the monitoring report	01
Completion date of the monitoring report	18/02/2016
Monitoring period number and duration of this monitoring period	3 rd Monitoring period 01/01/2015 – 31/12/2015 (including both day)
Project participant(s)	SKG Sangha Foundation myclimate – The Climate Protection Partnership
Host Party	India
Sectoral scope(s)	Sectorial Scope 1, Energy industries (renewable-/non-renewable sources) Sectorial Scope 15 Agriculture
Selected methodology(ies)	Sectorial Scope 1, Energy industries (renewable-/non-renewable sources) Sectorial 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
Selected standardized baseline(s)	N.A.
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	46,930

Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	N.A.	33,468

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The project provides biogas units to 9,380 households in rural areas of Kolar District in Karnataka State in India. The project reduces the amount of fuel wood and kerosene used for cooking and heating water and replaces inefficient traditional cooking stoves with cleaner biogas stoves. The project also reduces methane emissions from cattle manure and contributes strongly to the sustainable development of the rural households involved in the project. Measures taken for GHG emission reductions are:

- (1) to replace fuel wood and kerosene for cooking with biogas
- (2) to avoid methane emissions from cattle manure

Brief description of the installed technology and equipment:

In each household, a Deen Bandhu Biogas plant model together with a biogas-based cooking stove unit will be installed. The biogas units are constructed of bricks, sand, cement, pipes, pipe fittings, metal clips, wire and gas burners. Each bioreactor is a mesophilic fixed dome. The capacity of the bio-digesters is either 2m³ or 3m³ of biogas per day. The biogas unit size for a particular household is chosen based on the number and type of cattle owned by the household and the number of people in the household. Cattle dung and wastewater is fed into the biodigester daily. Cattle dung and kitchen wastewater is added to a mixing tank above ground which has an inlet pipe to a digester chamber which is below ground. The dung and wastewater slurry remains in the chamber for approximately 40 days and breaks down anaerobically producing biogas. This biogas builds up above the slurry and remains in the chamber until it is released through the gas outlet pipe at the top of the dome when the gas burner in the household is turned on.



Figure 1: DeenBandhu Biogas plant model under construction.

Relevant dates for the project activity:

The starting date of bio-digester construction is: 01/04/2012. Since then, bio-digesters have been constructed continuously.

Registration date of the project activity: 24/11/2011

1st CDM Monitoring Period: 01/04/2012 – 31/12/2013

2ND CDM Monitoring Period: 01/01/2014 – 31/12/2014

3rd CDM Monitoring Period: 01/01/2015 – 31/12/2015

Up to 31/12/2015 6403 bio-digesters have been started functioning.

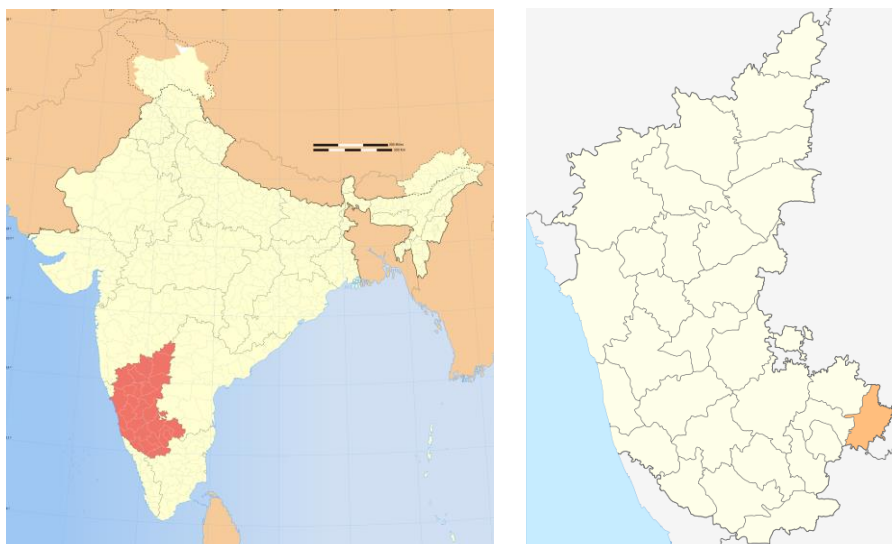
A.2. Location of project activity

The project is located in the rural areas of Kolar District, which is a district located in south-east of Karnataka State. Karnataka State is located in the south West of India. Kolar district has an area of 4,011 km² and is divided in five Taluks – Srinivasapur, Kolar, Mulbagal, Malur, and Bangarapet.

The geographical coordinates of the Kolar District are:

North Latitudes: 77° 49' 26" and 78° 33' 13"

East Latitudes: 12° 44' 45" and 13° 26' 28"



Figures 2: Location of Karnataka State in India and location of Kolar district within Karnataka State of India.

The geographical coordinates of the taluk centres are given below:

Centre	Latitude ° N	Longitude, ° E
Kolar Taluk	13°08'12.04''	78°08'20.44''
Bangarapet Taluk	12°59'04.97''	78°10'42.40''
Malur Taluk	12°59'20.71''	77°55'42.12''
Mulbagal Taluk	13°09'39.22''	78°23'19.11''
Srinivasapur Taluk	13°20'19.13''	78°12'38.15''

A.3. Parties and project participant(s)

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
India (Host)	Private entity: SKG Sangha	No
Switzerland	Private entity: Foundation myclimate – The Climate Protection Partnership	No

A.4. Reference of applied methodology and standardized baseline

Component 1, Thermal energy generation:

AMS.I.C – “Thermal energy for the user with or without electricity” ver. 18
<http://cdm.unfccc.int/methodologies/DB/6EL4AG49US2S1DNH55Y4S7GDQFA2JF>

“Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion” ver.2
<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf>

“Tool to calculate baseline, project and/or leakage emissions from electricity consumption” ver.1
<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf>

“Tool for the demonstration and assessment of additionality” ver. 05.2

<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf>

AMS.I.E – “Switch from Non-Renewable Biomass for Thermal Applications by the User” ver.3
<http://cdm.unfccc.int/methodologies/DB/WHTQUFLWCVNB9CIUZC198A712WGQR4>

Component 2. Methane-emissions-avoidance:

AMS.III.R – “Methane recovery in agricultural activities at household/small farm level” ver. 1
<https://cdm.unfccc.int/methodologies/DB/JQHRMGL23TWZ081T6G7G1RZ63GM1BZ>

A.5. Crediting period of project activity

The project has a fixed crediting period.

The crediting Period starts from 01/04/2012 - 31/03/2022

A.6. Contact information of responsible persons/entities

SKG Sangha

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SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

The construction of Bio-digester has started on 01/04/2012.

Until the end of 3rd monitoring period 6403 units have been functioning under the project activity.

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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B.2.2. Corrections

N.A.

B.2.3. Changes to start date of crediting period

N.A.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

N.A.

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

N.A.

B.2.6. Changes to project design of registered project activity

N.A.

B.2.7. Types of changes specific to afforestation or reforestation project activity

N.A.

SECTION C. Description of monitoring system

SKG Sangha has developed a system of installing and maintaining the biogas units. The operational and monitoring plan builds on this experience. Monitoring is done in a hierarchical manner with a large number at the village level reporting to and supervised by a small team at each taluk in turn reporting to the project coordinator and his team at the main office.

The scheme below shows the distribution of monitoring tasks and responsibilities between different levels of project implementation: the project level (the main SKG Sangha office: project coordinator with a team), the taluk level (supervisor with a team) and the village level (motivator).

In each village cluster where SKG Sangha starts installing biodigesters, a local person is selected to be the motivator. The motivators are trained in how to:

- supervise project implementation in the village;
- maintain and repair the biogas units;
- monitor the functionality of biogas units;
- keep records; and
- report to Taluk level

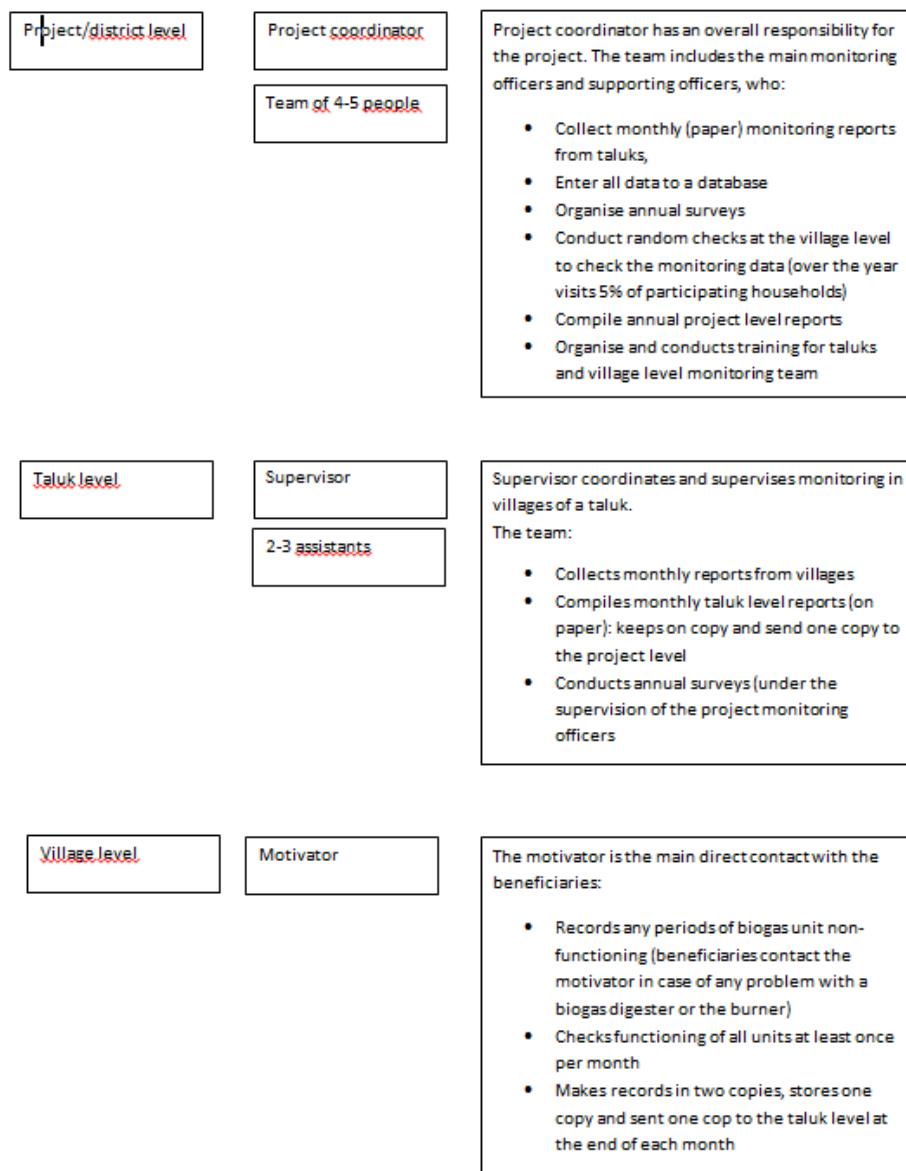
A number of separate training sessions are also run for the households who have biodigesters installed to ensure that beneficiaries use their units correctly. All users receive training from SKG Sangha for the use of the digester as soon as it is installed. The motivator participates in the training sessions to ensure all beneficiaries are familiar with the main contact in the village. The beneficiaries are instructed to report any faults or problems with the units to the motivator.

During installation the household signed three pieces of paper to confirm that the masonry work, the pipe fitting work and the overall biodigester has been installed satisfactorily. A technician from SKG Sangha checked the unit once it has been installed to ensure the biogas unit has been installed correctly and this information was then recorded and logged in SKG Sangha's records as well as in paper monitoring journals of the relevant motivator. The records also include information on the size of each unit – whether it is a 3 m³ unit or a 2 m³ unit. During project implementation, SKG Sangha made records of every biogas unit installed, and calculation of real emission reductions may be adjusted according to the actual ratio of 2 m³ and 3 m³ biogas units if the ratio turns out to be slightly different than is currently planned. Each biodigester is given a unique identification marking to indicate:

- who sponsored the biodigester;
- who built the biodigester;

- which year the biodigester was built in; and
- which number biodigester it is for that village for that year.

Monitoring scheme



Monitoring of biogas unit functionality

Once the unit is installed and checked by the technician, the motivator marks the start of unit operation. Beneficiaries are instructed to report any faults or problems with a biodigester or a burner to the motivator. Normally any problems with the biogas units will be resolved the same day as the original complaint. The motivator will record any periods (in days) when the unit was not operating. Households also have a separate pre-paid post form that they can send directly to SKG Sangha to inform SKG Sangha of any problems in the event that they experience any problems with their village representative. The fact that households make an in-kind contribution to the construction of biogas units also makes them more interested in making proper use of these units. Besides recording problems, the motivator will check all project units in the village at least once per month to record whether they are functioning properly. The records will be made

by hand writing, on two copies of a monitoring journal. At the end of each month one copy will be delivered to the taluk level monitoring team, and one copy remains with the motivator.

The taluk level monitoring team collects monitoring journals from the villages in their taluk, and compiles monthly taluk-level reports, which include:

- Number of units that started operations before the monitoring period (i.e. before the beginning of the relevant monitoring month), separately for 2 m³ and 3 m³ sizes;
- Detailed records of units installed during the monitoring month, including the location, the beneficiary, the size of the biodigester, and the date of start of operations;
- Sum of non-operational days of a 2 m³ unit and a 3 m³ unit (i.e. if there were 10 units of 2 m³ size that were not operational for 1 day, the record is that a 2 m³ unit was not operational for 10 days).

The monthly reports are made in two copies, one of which is delivered to the project level (main SKG Sangha office), and another one remains at the taluk level.

The project level monitoring team collects the monthly reports. Throughout the year it makes random visits to villages to check whether the data recorded by the motivator is correct.

The project level monitoring team enters all data into the central project database, which includes:

- Records of every unit installed, including the location, the beneficiary, the size of the biodigester, the date of start of operations, and the end of operations in case the unit broke down
- Records of non-operational days, separately for 2 m³ and 3 m³ sizes, for every village (corrected after the random visits if needed)

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	ρ_{kerosene}
Unit:	kg/l (kilogrammes per litre)
Description:	Density of kerosene
Source of data:	http://www.simetric.co.uk/si_liquids.htm
Value(s) applied:	0.817
Choice of data or measurement methods and procedures	Default value
Purpose of data:	Baseline Kerosene Emission Calculation
Additional comment:	N.A.

Data / Parameter:	NCV_{kerosene}
Unit:	TJ/Gg (terajoules per gigagram)
Description:	Net calorific value of kerosene
Source of data:	Table 1.2 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1.
Value(s) applied:	43.8
Choice of data or measurement methods and procedures	Default value
Purpose of data:	Baseline Kerosene Emission Calculation
Additional comment:	

Data / Parameter:	EF_{kerosene}
Unit:	Kg CO ₂ /TJ (kilogrammes of CO ₂ per terajoule)
Description:	Net calorific value of kerosene
Source of data:	Table 2.5 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 2.
Value(s) applied:	71,900
Choice of data or measurement methods and procedures	Default value
Purpose of data:	Baseline Kerosene Emission Calculation
Additional comment:	Default emissions factor for stationary combustion in the residential category suggested by IPCC. This value is used for calculating BE _{kerosene} . For BE _{NRB} , the default value specified in AMS I.E, 71,500 kg CO ₂ /TJ, is used. For Project Emissions based on AMS.I.C, as per defined tool the upper value of 73,700 kg CO ₂ /TJ for kerosene is used.

Data / Parameter:	F_{kerosene, baseline}
Unit:	L (liters)/year
Description:	Annual amount of kerosene used for cooking and starting fires in an average household
Source of data:	Baseline Survey
Value(s) applied:	24.12
Choice of data or measurement methods and procedures	Survey
Purpose of data:	Calculation of Baseline
Additional comment:	

Data / Parameter:	f_{NRB}
Unit:	Dimensionless
Description:	Fraction of biomass used in the absence of project activity that can be established as non-renewable biomass using survey methods
Source of data:	"Inventorying, Mapping and Monitoring of Bioresources Using GIS and Remote Sensing" study (Ramachandra and Rao 2005)
Value(s) applied:	0.78
Choice of data or measurement methods and procedures	Default value
Purpose of data:	Baseline Fuel wood Emission Calculation
Additional comment:	N.A.

Data / Parameter:	B_{Biomass, Baseline}
Unit:	Tonnes/year
Description:	Quantity of biomass that is substituted or replaced in an average household
Source of data:	Baseline survey
Value(s) applied:	4.74

Choice of data or measurement methods and procedures	Baseline Survey
Purpose of data:	Calculation of Baseline emissions
Additional comment:	

Data / Parameter:	GWP CH₄
Unit:	t CO ₂ / t CH ₄ (tonnes of CO ₂ per tonne of CH ₄)
Description:	Global warming potential for methane
Source of data:	IPCC Guidelines for National Greenhouse Gas Inventories,
Value(s) applied):	25
Choice of data or measurement methods and procedures	Default value
Purpose of data:	Baseline Methane Avoidance Calculation
Additional comment:	Default value suggested by IPCC

Data / Parameter:	VS_(T)
Unit:	kg (kilogrammes) dry matter / (head * day)
Description:	Daily volatile solid excreted for livestock category T
Source of data:	Tables 10A-4 to 10A-6 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 4, Chapter 10), Biogas Technology by B.T. Nijaguna (see reference 5 in Annex 5), Table 2.12 p29.
Value(s) applied):	3.8 for dairy cow, 3.1 for buffalo, 1.4 for other cattle
Choice of data or measurement methods and procedures	Default value
Purpose of data:	Baseline Methane Avoidance Calculation
Additional comment:	Default value suggested by IPCC

Data / Parameter:	B_{o(T)}
Unit:	m ³ CH ₄ /kg VS
Description:	Maximum methane producing capacity for manure produced by livestock category T
Source of data:	India specific value taken for dairy cows from Biogas Technology by B.T. Nijaguna (Nijaguna, B.T, Biogas Technology (New Age International (P) Ltd, 4835/24 Ansari Road, Daryaganj, New Delhi 110 002, 2002). As nationally published values are not available for other cattle, IPCC default values are used for buffalo and other cattle. Tables 10A-4 to 10A-6 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied):	0.15 for dairy cattle, 0.1 for buffalo and other cattle
Choice of data or measurement methods and procedures	Default value

Purpose of data:	Baseline Methane Avoidance Calculation
Additional comment:	India specific value taken for dairy cows from Biogas Technology by B.T. Nijaguna. As nationally published values are not available for buffalo and other cattle, IPCC default values are used for buffalo and other cattle. Tables 10A-4 to 10A-6 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 10.

Data / Parameter:	MCF_{manure} (MCF_{liquid}, MCF_{liquid with crust} and MCF_{solid})
Unit:	% (percentage)
Description:	Methane correction factor for cattle manure for each manure management system S by climate region k
Source of data:	Table 10.17 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 10.
Value(s) applied:	80 for liquid/slurry manure management system (MCF _{liquid}), 50 for liquid/slurry manure management system with natural crust cover (MCF _{liquid with crust}), 5 for solid storage manure management system (MCF _{solid}).
Choice of data or measurement methods and procedures	Default value
Purpose of data:	Baseline Methane Avoidance Calculation
Additional comment:	Values corresponding to average annual temperature of 29.6 °C are taken for MCF _{liquid} and MCF _{liquid with crust} . Temperature data was taken from the Indian Meteorological Department, Government of India.

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter)

Data / Parameter:	N_{operating}
Unit:	Dimensionless
Description:	Number of systems (biogas units) operating
Measured/ Calculated / Default:	Calculated
Source of data:	SKG Sangha
Value(s) of monitored parameter:	6403
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Continuously
Calculation method (if applicable):	N.A.
QA/QC procedures:	The level of uncertainty of recording this parameter is low. The methodology requires recording the number of systems operating annually. In this case, the recording was done monthly, and any periods of non-functioning were recorded. Beneficiaries are not likely not to report faults, as any non-functioning means non availability of clean and simple cooking. Normally beneficiaries want to resolve any problems as soon as they appear. Nevertheless, monitoring team from the project level did random checks to check whether the data recorded by the motivator is correct.
Purpose of data:	Baseline and Project Emission Calculation
Additional comment:	-

Data / Parameter:	H_{stove}
Unit:	H (hours)/year
Description:	Annual hours of operation of an average system (hours of burner functioning)
Measured/ Calculated / Default:	Calculated
Source of data:	Monitoring survey
Value(s) of monitored parameter:	1187 h/y
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	Beneficiaries made records for a week writing down each day hours when a burner is functioning. They wrote down the time of starting cooking and finishing cooking, and noted whether one or two burners were used. Average use was 3.25 h/d, thus $3.25 \times 365 = 1187$ h/y.
QA/QC procedures:	-
Purpose of data:	The parameter is not used for ER calculation. The parameter is used for checking whether the biodigester produced enough biogas to substitute previous use of non-renewable biomass and kerosene.
Additional comment:	The survey result shows that the digester produces enough biogas to substitute the previous energy needs.

Data / Parameter:	F_{kerosene, project}
Unit:	l (litres)/year
Description:	Annual amount of kerosene consumed by household after installation of biogas unit
Measured/ Calculated / Default:	Calculated
Source of data:	Monitoring Survey
Value(s) of monitored parameter:	0
Monitoring equipment:	Monitoring questionnaire
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	N.A.
QA/QC procedures:	N.A.
Purpose of data:	Project Emissions Calculation
Additional comment:	The monitoring surveys have shown that no kerosene is consumed for cooking by households after installation of biogas units. Thus, no project emissions related to use of kerosene have to be considered in the emission reduction calculations.

Data / Parameter:	B_{biomass, project}
Unit:	T (Tonnes) /year
Description:	Annual quantity of biomass consumed by household after installation of biogas unit

Measured/ Calculated / Default:	Calculated
Source of data:	Monitoring Survey
Value(s) of monitored parameter:	0
Monitoring equipment:	questionnaire
Measuring/ Reading/ Recording frequency:	annually
Calculation method (if applicable):	N.A.
QA/QC procedures:	-
Purpose of data:	Project Emission calculations
Additional comment:	The monitoring surveys have shown that no biomass is consumed for cooking by households after installation of biogas units. Thus, no project emissions related to use of biomass have to be considered in the emission reduction calculations.

Data / Parameter:	B _{biomass, non-project}		
Unit:	Kgs/day		
Description:	Consumption of fuel wood for cooking in households not participating in the project activities.		
Measured/ Calculated / Default:	Calculated		
Source of data:	Monitoring Survey		
Value(s) of monitored parameter:	12.0		
Monitoring equipment:	Monitoring Survey in households not participating in the project activity.		
Measuring/ Reading/ Recording frequency:	Survey of 175 non-project households that use fuel wood. The surveys are carried out once per monitoring period by the taluk level monitoring team.		
Calculation method (if applicable):	N.A.		
QA/QC procedures:	Monitoring team from the project level does random checks to check whether the data recorded by the taluk level team is reasonable and correct.		
Purpose of data:	Calculation of fuel wood leakage		
Additional comment:	The non-project households are surveyed to make sure that there is no increase in fuel wood consumption in non-project households due to higher fuel wood availability based on project activity.		
	Following fuel wood consumption was measured in the baseline and in the non-project households.		
	Item	Baseline	Non-Project
	Fire wood use for cooking in Kg/day	12.9	8.12
	Fire wood use for water heating	8.6	4.6
	Total fire wood use	21.5	12.72
	It is clear that that 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.		

Data / Parameter:	N_(T)
Unit:	Dimensionless (number)
Description:	Annual average animal population in a household (number of heads of dairy cow, buffalo and other cattle).
Measured/ Calculated / Default:	Calculated
Source of data:	Monitoring Survey
Value(s) of monitored parameter:	2.55 for dairy cows 0.35 for buffalos 0.20 for other cattle
Monitoring equipment:	Monitoring Questionnaire
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	N.A.
QA/QC procedures:	-
Purpose of data:	Baseline Methane Avoidance Calculations
Additional comment:	-

Data / Parameter:	B_{manure,generated}
Unit:	T (Tonnes)
Description:	Average amount of animal manure generated per household per year.
Measured/ Calculated / Default:	Measured
Source of data:	Monitoring Survey
Value(s) of monitored parameter:	20.35
Monitoring equipment:	Questionnaire
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Total Dung form shed produced (kgs/day) times days per year: $55.75 * 365/1000 = 20.35$
QA/QC procedures:	One day accumulation of dung in the confined shed area in selective households was measured. In other households the basket in which HH collects the dung is measured.
Purpose of data:	To know the efficiency of the biogas unit
Additional comment:	-

Data / Parameter:	B_{manure,fed}
Unit:	T (Tonnes)/year
Description:	Average amount of animal manure fed into biogas digester per year.
Measured/ Calculated / Default:	Measured
Source of data:	Monitoring Survey

Value(s) of monitored parameter:	20.19
Monitoring equipment:	Questionnaire
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Out of 55.75 kg generated in the shed 55.32 kg will be fed to the biogas plant and the remaining 0.43 kg per day will be dumped in the compost pits. $55.32 * 365/1000 = 20.19$ tons/y will be fed to biogas plant.
QA/QC procedures:	One day accumulation of dung in the confined shed area in selective households was measured. In other households the basket in which HH collects the dung is measured.
Purpose of data:	To know the efficiency of the biogas unit
Additional comment:	-

Data / Parameter:	MS_{manure} (MS_{liquid}, MS_{liquid with crust}, MS_{solid})
Unit:	Dimensionless
Description:	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)
Measured/ Calculated / Default:	Calculated
Source of data:	Baseline and Monitoring Survey
Value(s) of monitored parameter:	0.40 for liquid/slurry manure management system (MS _{liquid}), 0.24 for liquid/slurry with crust cover manure management system (MS _{liquid with crust}), 0.20 for solid storage manure management system (MS _{solid})
Monitoring equipment:	Questionnaire
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	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 S. 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. Emission reductions per animal per year have been calculated based on the default values provide by the IPCC.
QA/QC procedures:	One day accumulation of dung in the confined shed area in selective households was measured. In other households the basket in which HH collects the dung is measured.
Purpose of data:	Baseline Emission Reduction Calculation

Additional comment:	<p>Values corresponding to average annual temperature of 29.6 °C are taken for MCF_{liquid} and MCF_{liquid} with crust. Temperature data was taken from the Indian Meteorological Department, Government of India.</p> <p>The total excrement of the animals is not fermenting in baseline manure management system. The amount of dung generated during the animal confinement time is entering the traditional compost pits and some amount of dung excreted while animals were grazing in fields also enters the compost pits. As it is difficult to measure the total excrement per day by different types of animals the animals confinement time per day has been taken to calculate the emissions. If the animals are staying at confinement for 12 hours in a day 50% of the emissions emitted by animals was taken into account. Animal confinement per day value will be surveyed every year through monitoring survey to calculate ERs. In this monitoring period animal confinement time is 89.25% of a day. Emissions by animals will be multiplied with this 89.25% to get the real ERs. As explained in calculation method the time of animal confinement is important. The value fixed in the baseline cannot represent the present value as the practices and methods of animals management will vary during the course of 10 year period. To capture the real value, the animal confinement time will be monitored every year and will be used for ER calculations. This is more accurate. Thus the Parameter of MS_{manure} is listed under D.2. Data and parameters to be monitored, even though it was mentioned as parameter fixed ex-ante in the PDD.</p>
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Data / Parameter:	Application of sludge
Unit:	Percentage tons/year
Description:	Percentage of Households applying slurry to agricultural lands Average tons of Slurry applied to agricultural lands per Household
Measured/ Calculated / Default:	Measured
Source of data:	Monitoring Survey
Value(s) of monitored parameter:	58% 3.8 tons/year
Monitoring equipment:	Questionnaire
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	-
QA/QC procedures:	Monitoring team from the project level randomly checked the data collected and found to be reasonable.
Purpose of data:	The data is not used for calculation of emission reductions but to check if the produced slurry is applied to the agricultural lands
Additional comment:	SKG Sangha has conducted number of training programmes with the beneficiaries and trained them on application of sludge. The monitored results can be found in the ER spread sheet under the monitoring survey excel page under the column BD.

D.3. Implementation of sampling plan

Description of implemented sampling design

Taluk level monitoring teams will carry out annual surveys of a sample of beneficiaries to determine the following parameters and information

- Annual hours of operation of a unit (operation of a burner)
- Annual amount of kerosene used
- Annual amount of fuel wood used
- Animal population per household (for each type of cattle)
- Amount of manure generated on the farm
- Amount of animal manure fed into the system
- Proper soil application of the final sludge

276 households have been surveyed

Sample size:

According to the data collected during the 2nd monitoring period the maximum sample size for any of the sampling parameter was 125. Hence a sample size of 250 has been taken to collect the data for this 3rd monitoring period and 276 households were surveyed to cover all 2 & 3 size samples. .

Drawing of sample: sample size has been decided as 250. There are 5 taluks in Kolar district. Project units have been installed in all the 5 taluks. Basing on the number of units installed in that particular taluk the sample size has been decided on pro rata basis. There were 6403 units meant for this verification period (number of plants that were installed and functioning until 31/12/2015). Out of these 6403 units there were 1416 plants with 3 cubic meter capacity and 4987 plants of 2 cubic meter size.

Precision: All the parameters were calculated with 95% confidence and 5% deviation. The surveyed data has been fed to the Excel sheet. Using Microsoft Excel formulas total and average value has been drawn for all the parameters which are having numeric values. Later in the same way standard deviation and square root for the number of households was calculated. Using the statistical methodology the net value has been derived. The standard deviation has been divided with the square root of HH surveyed and the resultant has been multiplied with 1.96 (the number for the 95% confidence level) later the product has been deducted from the average value to get the net value.

The following table will provide the information about the sample deduction:

	Sampling plan														
	Projection							Planned total sample size							250
SL	Taluk	Installed until 2014			Anticipated in 2015		Total		To be surveyed			Actual surveyed			
		2	3	Total	2	3	2	3	2	3	Total	2	3	Total	
1	BPT	1496	326	1822	150	100	1646	426	63	16	80	69	19	88	
2	KLR	518	168	686	130	120	648	288	25	11	36	30	17	47	
3	MLR	387	94	481	40	35	427	129	16	5	21	17	6	23	
4	MLB	1318	326	1644	150	100	1468	426	56	16	73	55	18	73	
5	SVP	521	110	631	225	200	746	310	29	12	41	32	13	45	
	Totals	4240	1024	5264	695	555	4935	1579	189	61	250	203	73	276	
							6514								
	Actually done														
SL	Taluk	Installed until 2014			Installed in 2015		Total		To be surveyed			Actual surveyed			
		2	3	Total	2	3	2	3	2	3	Total	2	3	Total	
1	BPT	1496	326	1822	169	64	1665	390	65	15	80	69	19	88	
2	KLR	518	168	686	155	62	673	230	26	9	35	30	17	47	
3	MLR	387	94	481	48	7	435	101	17	4	21	17	6	23	
4	MLB	1318	326	1644	142	97	1460	423	57	17	74	55	18	73	
5	SVP	521	110	631	233	162	754	272	29	11	40	32	13	45	
	Totals	4240	1024	5264	747	392	4987	1416	195	55	250	203	73	276	
						1139	Total	6403							

As per plan above villages where the plants have been installed were selected randomly covering most of the area of the taluk. Once the village has been selected randomly, all the plants in that village have been monitored. To monitor the required number of 2/3 size plants more villages has been added to the monitoring list. Total 276 plants have been surveyed to achieve the required numbers.

The survey has been conducted from October to December 2015.

Surveys of non-project households

Taluk level monitoring teams has surveyed 175 non-project households in the project area to determine the amount of biomass uses for various purposes, the sources of biomass and trends in sourcing the biomass

According to the number of units installed in that particular taluk the sample of non-project households was taken. Randomly households were visited by the monitoring team with pre-printed survey sheets and data has been collected.

The non-project households were surveyed to make sure that there is no increase in fuel wood consumption of non-project households due to higher fuel wood availability because of the project activity.

Following fuel wood consumption was measured in the baseline and in the non-project households. The collected data has been fed to Excel sheet and net values have been arrived at 95% confidence level.

Item	Baseline HH	Non-Project HH	Units	Source
Fire wood use for cooking	12.9	8.12	Kg/d	Baseline and monitoring surveys
Fire wood use for water heating	8.6	4.6	Kg/d	Baseline and monitoring surveys
Total fire wood use	21.5	12.72	Kg/d	Calculated

It is clear that that 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.

Demonstration on whether the required confidence/precision has been met

To achieve 90% confidence and at 10% margin of error number of non-project households to be surveyed is 58. Even though it has been projected in the PDD to take up survey in 100 households, 175 households have been surveyed to achieve more accuracy

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

For component 1: Kerosene component

Description: The project activity generates thermal heat through bio-digesters in rural households in the Kolar district. That heat would have been otherwise generated by burning kerosene and fuel wood for cooking purposes.

Baseline emissions from burning kerosene (BE_{kerosene} in tCO_2e) are determined based on the amount of kerosene that has been displaced, its density, net calorific value and the emissions factor for stationary combustion of kerosene in the residential category according to AMS-I.C “Thermal energy for user with or without electricity”, version 18. Only the kerosene used for cooking and staring fire was taken into account for the baseline calculations.

$BE_{\text{kerosene}} = F_{\text{kerosene}} * N * \rho_{\text{kerosene}} * NCV_{\text{kerosene}} * EF_{\text{kerosene}} * 10^{-9}$ (1)	
BE_{kerosene}	Baseline emissions from burning of kerosene for household cooking needs (t CO_2e /year)
F_{kerosene}	Annual amount of kerosene used for cooking in an average household participating in the Kolar District Biogas Project (l/year)
N	Number of devices (biogasifiers)
ρ_{kerosene}	Kerosene density (kg/l)
NCV_{kerosene}	Net calorific value of kerosene (TJ/Gg)
EF_{kerosene}	Emissions factor of kerosene (kg CO_2 /TJ)

Calculation applying the actual values:

Parameter	Value	Unit	Source
F_{kerosene}	24.12	L/year	Baseline Survey
N	6403	Number of bio-digesters	Taluk level reports
ρ_{kerosene}	0.817	Kg/l	IPCC
NCV_{kerosene}	43.8	TJ/Gg	IPCC 2006 T.1.2
EF_{kerosene}	71,900	kg CO_2 /TJ	IPCC 2006 T.2.5

Therefore:

$$BE_{\text{kerosene}} = 24.12 \text{ l} * 6403 * 0.817 \text{ kg/l} * 43.8 \text{ TJ/t} * 71,900 \text{ kg } CO_2/\text{TJ} * 10^{-9} = 397 \text{ t } CO_2e/\text{y}$$

$$BE \text{ for 1 unit per day: } 397/6403/365 = 0.0017 \text{ t } CO_2e/\text{y}$$

Total Baseline Emissions from use of Kerosene for the third monitoring period = $0.00017 * 6403 * 329.5$
(average functioning days) = **358 t CO_2e**

For component 2: Non-renewable biomass component

Description: The project activity generates thermal heat through bio-digesters in rural households in the Kolar district. That heat would have been otherwise generated by burning fuelwood and kerosene for cooking purposes.

Baseline emissions from burning non-renewable biomass (BE_{NRB} in tCO_2e) are calculated based on the use of the biomass (fuel wood) that is replaced, the fraction of the biomass that is non-renewable, and the emissions factor of kerosene as a projected alternative fuel (according to AMS-I.E “Switch from non-renewable biomass for thermal applications by the user”) The following formula is for one device (biogasifier):

$BE_{\text{NRB}} = B_{\text{biomass}} * N * f_{\text{NRB}} * NCV_{\text{biomass}} * EF_{\text{kerosene}} * 10^{-3}$ (2)	
BE_{NRB}	Baseline emissions from the combustion of non-renewable part of the fuel wood used for cooking in households (t CO_2e /year)
B_{biomass}	Quantity of biomass per household that is substituted or replaced in an average household (t/year)
N	Number of households
f_{NRB}	Fraction of biomass used in the absence of project activity that can be established as non-renewable biomass using survey methods
NCV_{biomass}	Net calorific value of the non-renewable biomass that is substituted (TJ/tonne). Default value of 0.015 TJ/tonne specified in AMS I.E. is used.
EF_{kerosene}	Emissions factor for kerosene combustion in households as kerosene is the most reasonable projected fossil fuel in the absence of project activity (kg CO_2 /TJ). Default value for kerosene of 71.500 kg CO_2 /TJ as per AMS. I.E is used..

Calculation applying the actual values:

The following values are used:

Parameter	Value	Unit	Source
$B_{biomass}$	4.74	T/year	Baseline Survey
N	6403	Units	Taluk level reports
f_{NRB}	0.78	%	Study by Ramachandra and Rao 2005
$NCV_{biomass}$	0.015	TJ/t	IPCC 2006 T.1.2
$EF_{kerosene}$	71,500	kg CO ₂ /TJ	AMS I.E.

Therefore:

$$BE = 4.74 \text{ t} * 6403 * 0.78 * 0.015 \text{ TJ/t} * 71,500 \text{ kg CO}_2/\text{TJ} * 10^{-3} = 25,405 \text{ t /CO}_2\text{e/y}$$

$$BE \text{ for 1 unit per day: } 25,405/6403/365 = 0.0109 \text{ t /CO}_2\text{e/y}$$

Total Baseline Emissions from use of wood fuel for the third monitoring period = $0.0109 * 6403 * 329.5$
(average functioning days) = **22,934 t/CO₂e**

For component 3: Cattle manure component

The project activity avoids the methane emissions from cattle manure that would have otherwise been left to decay under clearly anaerobic conditions in pits. The manure is used instead in controlled combustion for biogas generation.

Baseline emissions (BE_{manure} in tCO₂e) are determined according AMS-III.R “Methane recovery in agricultural activities at the household/small farm level”, version 1.

This methodology does not provide an equation. Instead it states that emission reductions should be calculated using the Tier 2 approach from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories). Emission factors for manure of different cattle categories (dairy cows, buffalo and other cattle) are calculated based on nationally published (where available) and IPCC default values (where nationally published values are not available) for volatile solid excreted by each animal category, maximum methane producing capacity for manure of each animal category, methane correction factors for liquid/slurry, liquid/slurry with natural crust cover and solid storage manure management systems in a warm climate with average temperature of 29.7°C and fractions of total manure handled in these manure management systems.

The proposed project will involve N households and will avoid methane emissions which has to be converted into CO₂e with the global potential warming for methane:

$BE_{manure} = \sum_{(T)} (EF_T * N_T) * N * GWP_{CH_4} / 1000$ (3)	
BE_{manure}	Baseline emissions from methane emissions from anaerobic decay of manure (t CO ₂ e/year)
T	Species/category of livestock
EF_T	Emissions factor for a defined livestock population (category T), (kg CH ₄ /animal/year)
N_T	The number of head of livestock species/category T in an average household
N	Number of households involved in the project
GWP_{CH_4}	Global potential warming for methane

The proposed project lies in one climatec region. The manure management system is different at different times of the year. The formula used for EF_T is:

$$EF_{(T)} = VS_{(T)} * 365 * B_o(T) * 0.67 \text{ kg/m}^3 * \left(\frac{MCF_{liquid}}{100} * MS_{liquid} + \frac{MCF_{liquid with crust}}{100} * MS_{liquid with crust} + \frac{MCF_{solid}}{100} * MS_{solid} \right) \quad (4)$$

$EF_{(T)}$	Emissions factor for a defined livestock population (category T), (kg CH ₄ /animal/year)
$VS_{(T)}$	Daily volatile solid excreted for livestock category T (kg dry matter/animal/day)
365	Basis for calculating annual VS production (days/year)
$B_{o(T)}$	Maximum methane producing capacity for manure produced by livestock category m ³ CH ₄ /kg per VS
0.67	Conversion factor for converting m ³ CH ₄ to kg CH ₄
MCF_{liquid}	Methane conversion factor for the liquid/slurry manure management system [note: liquid/slurry is a type of manure management system]
MS_{liquid}	Faction of livestock category T's manure handled using liquid/slurry manure management system
$MCF_{liquid\ with\ crust}$	Methane conversion factor for the liquid/slurry manure management system with natural crust cover
$MS_{liquid\ with\ crust}$	Faction of livestock category T's manure handled using liquid/slurry manure management system with natural crust cover
MCF_{solid}	Methane conversion factor for the solid storage manure management system
MS_{solid}	Faction of livestock category T's manure handled using solid storage manure management system

Calculation applying the actual values:

In the monitoring survey has shown that in the project activity the average number of animals per household are 2.37 heads for dairy cow, 0.33 heads for buffalos and 0.47 heads for other cattle.

The following values are used:

Parameter	Value	Unit	Source
GWP_{CH_4}	25	Kg CO ₂ /kg CH ₄	IPCC, for second commitment period
MCF_{liquid}	80	%	IPCC 2006 T. 10A-4 to 10A-6
$MCF_{liquid\ with\ crust}$	50	%	IPCC 2006 T. 10A-4 to 10A-6
MCF_{solid}	5	%	IPCC 2006 T. 10A-4 to 10A-6
MS_{liquid}	0.40	-	Baseline Survey
$MS_{liquid\ with\ crust}$	0.24	-	Baseline Survey
MS_{solid}	0.20	-	Baseline Survey
Dairy Cow			
N_T	2.55	-	Monitoring survey
$VS_{(T)}$	3.8	Kg dry matter/(head*day)	Biogas Technology by B.T. Nijaguna
$B_{o(T)}$	0.15	m ³ CH ₄ /kg VS	Biogas Technology by B.T. Nijaguna
Buffalo			
N_T	0.35	-	Monitoring survey
$VS_{(T)}$	3.1	Kg dry matter/(head*day)	IPCC 2006 T. 10A-4 to 10A-6
$B_{o(T)}$	0.1	m ³ CH ₄ /kg VS	IPCC 2006 T. 10A-4 to 10A-6
Other Cattle			
N_T	0.20	-	Monitoring survey
$VS_{(T)}$	1.4	Kg dry matter/(head*day)	IPCC 2006 T. 10A-4 to 10A-6
$B_{o(T)}$	0.1	m ³ CH ₄ /kg VS	IPCC 2006 T. 10A-4 to 10A-6

Therefore:

$$EF_{dairy\ cow} = 3.8\ kg\ VS/(head*day) * 365 * 0.15\ m^3\ CH_4/kg\ VS * 0.67\ kg/m^3 * (80/100 * 0.40 + 50/100 * 0.24 + 5/100 * 0.20) = 62.68\ kgCH_4/year$$

EF_{buffalo} = 3.1 kg VS/(head*day) * 365 * 0.1 m³ CH₄/kgVS * 0.67 kg/m³ * (80/100 * 0.40 + 50/100 * 0.24 + 5/100 * 0.20) = 34.09 kgCH₄/year

EF_{other cattle} = 1.4 kg VS/(head*day) * 365 * 0.1 m³ CH₄/kgVS * 0.67 kg/m³ * (80/100 * 0.40 + 50/100 * 0.24 + 5/100 * 0.20) = 15.40 kgCH₄/year

BE_{manure} annual for a 3m³ unit = (66.31 kgCH₄/year * 3.8 + 36.06 kgCH₄/year * 0.31 + 16.29 kgCH₄/year * 0.22) * 25 kgCO₂/kgCH₄ / 1000 = 4.37 tCO₂e

BE_{manure} annual for a 2m³ unit = 4.37 tCO₂e * (2/3) = 1.94 tCO₂e

BE annual for 1 average unit = (4.37 * 1416 + 1.94 * 4987) / 6403 = 2.48 tCO₂e

BE emissions for 1 unit per day = 2.48/365 = 0.0068 tCO₂e

Total Baseline Emissions from use methane for the third monitoring period = 0.0068 * 6403 * 329.5 (average functioning days) = **14,337 t CO₂ e**

Total Baseline emissions for the third monitoring period: 358 t /CO₂e + 22,934 t /CO₂e + 14,337 tCO₂e = **37,629 tCO₂e**

E.2. Calculation of project emissions or actual net GHG removals by sinks

For component 1: Kerosene component

The project households kerosene consumption for cooking needs has been surveyed during the monitoring survey. Average household is using 0.0 liter kerosene per month. Thus no PE have to be considered for kerosene consumption.

There are no project emissions generated.

For component 2: Non-renewable biomass component

The project households fuelwood consumption for cooking needs has been surveyed during the monitoring survey. Average household is using 0.0 kg fuel wood per day for cooking needs. Thus no PE have to be considered for biomass consumption.

There are no project emissions generated.

For component 3: Cattle manure component

Project emissions are calculated under methodology AMS-III.R "Methane recovery in agricultural activities at the household/small farm level", version 1 as a physical leakage of methane from the biogas unit (in the biogas reactor and when biogas is combusted in the burner).

$PE = LF_{AD} * (GWP_{CH_4} * D_{CH_4} * B_{o(T)} * VS_{(T)}) / 1000$ (5)	
PE	Annual project emissions from physical leakages in the biogas digesters (t CO ₂ e/year)
LF_{AD}	Methane leakages from anaerobic digesters (dimensionless). Default value of 0.1 specified in the AMS-III.R is used.
D_{CH_4}	CH ₄ density (0.00067 t/m ³ at room temperature (20 °C) and 1 atm pressure)
B_o	Maximum methane producing capacity for manure produced by livestock category T (m ³ CH ₄ /kg of VS excreted)
GWP_{CH_4}	Global Warming Potential of CH ₄
$VS_{(T)}$	Daily volatile solid excreted for livestock category T (kg dry matter/animal/day)

Calculation applying the actual values:

Parameter	Value	Unit	Source
LF_{AD}	0.1	dimensionless	AMS-III.R
D_{CH_4}	0.67	Kg/m ³	AMS- III.D
GWP_{CH_4}	25		
Dairy Cow			
N_T	2.55	-	Monitoring survey
$VS_{(T)}$	3.8	Kg dry matter/(head*day)	Biogas Technology by B.T. Nijaguna
$B_o(T)$	0.15	m ³ CH ₄ /kg VS	Biogas Technology by B.T. Nijaguna
Buffalo			
N_T	0.35		Monitoring survey
$VS_{(T)}$	3.1	Kg dry matter/(head*day)	IPCC 2006 T. 10A-4 to 10A-6
$B_o(T)$	0.1	m ³ CH ₄ /kg VS	IPCC 2006 T. 10A-4 to 10A-6
Other Cattle			
N_T	0.20		Monitoring survey
$VS_{(T)}$	1.4	Kg dry matter/(head*day)	IPCC 2006 T. 10A-4 to 10A-6
$B_o(T)$	0.1	m ³ CH ₄ /kg VS	IPCC 2006 T. 10A-4 to 10A-6

Therefore:

PE annual for a 3m³ unit = $0.1 * 25 * 0.67 * (2.55 * 0.15 * 3.8 + 0.35 * 0.1 * 3.1 + 0.20 * 0.1 * 1.4) / 1000 * 365 = 0.972 \text{ tCO}_2\text{e}$

PE annual for a 2m³ unit = $0.972 \text{ tCO}_2\text{e} * (2/3) = 0.648 \text{ tCO}_2\text{e}$

PE annual for 1 average unit = $(0.972 * 1416 + 0.648 * 4987) / 6403 = 0.720 \text{ tCO}_2\text{e}$

Total $PE = 0.720 / 365 * 6403 * 329.5$ (average functioning days) = **4,161 tCO₂e**

Total Project emissions for the second monitoring period = 4,161 tCO₂e

E.3. Calculation of leakage

Leakage relating to non-renewable biomass was assessed from ex-post surveys of users and areas from where biomass is sourced.

126 Non-project households within the project boundary have been surveyed to assess to the quantity of biomass consumed. The amount of biomass consumed per household is compared to the amount of biomass consumed in the baseline survey. In case the biomass consumption in non-project households is significantly higher than the biomass consumption in the baseline, it must be presumed that the increase of biomass consumption is attributed to easier access to fuelwood, due to the project activity.

Increase in the use of non-renewable woody biomass outside the project boundary.

Non-project households were surveyed in the monitoring to know whether their wood usage has been increased compared to the baseline. If at all the survey shows a significant increase of " $B_{\text{biomass non-project}}$ " in comparison to " $\text{Total } B_{\text{biomass,y}}$ " due to the project activity, than the difference between " $\text{Total } B_{\text{biomass,y}}$ " and " $B_{\text{biomass non-project}}$ " will be considered for leakage calculation.

Leakage due to increased use of fuelwood in non-project households will be calculated as follows:

$$LE_y = (B_{biomass\ non-project,y} - B_{biomass,y}) * f_{NRB,y} * NCV_{biomass} * EF_{kerosene}$$

Where:

LE_y	Project emissions due to leakage during the year y in tCO ₂ e
$B_{biomass\ non-project,y}$	Quantity of woody biomass that is used during Project Activity in non-project household in tonnes
$B_{biomass,y}$	Total Quantity of woody biomass that is used in Baseline in tonnes
f_{NRB}	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (According to AMS.I.E. para 5, IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{kerosene}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers.

The non-project households were surveyed to make sure that there is no increase in fuel wood consumption in non-project households due to higher fuel wood availability based on project activity. Following fuel wood consumption was measured in the baseline and in the non-project households. The collected data has been fed to Excel sheet and net values have been arrived at 95% confidence level.

Item	Baseline HH	Non-Project HH	Units
Fire wood use for cooking	12.9	8.12	Kg/d
Fire wood use for water heating	8.6	4.6	Kg/d
Total fire wood use	21.5	12.72	Kg/d

It is clear that that 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.4. Summary of calculation of emission reductions or net GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	37,629	4,161	0	-	33,468	33,468

E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO ₂ e)	46,930	33,468

E.6. Remarks on difference from estimated value in registered PDD

The actual values of ER achieved during this monitoring period are below the values estimated in the ex - ante calculation of the registered PDD. This is due to the fact that the implementation of Bio digesters in the field moved forward slower than originally planned in the PDD.

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input checked="" type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
Organization name	SKG Sangha
Street/P.O. Box	2nd Main Road, Gandhi Nagar
Building	# 532
City	Kolar
State/Region	Karnataka
Postcode	563101
Country	India
Telephone	+91 8152241370
Fax	+91 8152241146
E-mail	skgsangha@gmail.com
Website	www.skgsangha.org
Contact person	Kiran Kumar Kudaravalli
Title	Secretary
Salutation	Mr.
Last name	Kudaravalli
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First name	Kiran Kumar
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Personal e-mail	kiranofkolar@gmail.com

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
Organization name	Foundation myclimate – the climate Protection Partnership
Street/P.O. Box	Pfingstweidstrasse 10
Building	
City	Zürich
State/Region	Zürich
Postcode	8005
Country	Switzerland
Telephone	0041 (0)44 500 43 72
Fax	0041 (0)44 500 43 51
E-mail	tanja.schmid@myclimate.org
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Contact person	Tanja Schmid
Title	Project Manager
Salutation	

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		