

Gold Standard for the Global Goals
Transition Annex
*(To be used by all GS CDM/VER stand alone projects and PoAs, Micro
Scale stand alone projects and Micro PoAs)*



Version 1 – September 2017

KEY PROJECT INFORMATION

Title of Project/PoA/Activity:	Micro Scale Biogas CDM Project of CROSS
GS ID of the project/PoA/activity:	GS1199
GS Version:	2.2
Brief description of Project:	The Biogas CDM Project of CROSS is to set up 5,000 biogas plants for households in Chittoor District, Andhra Pradesh State, India by CROSS, a grass root level NGO. The households utilize cattle dung to feed the digester for the production of biogas for cooking purpose and heating of hot water; that replaces the commonly used inefficient non-renewable biomass fired mud stoves technology.
Project type: Energy/Land Use	Energy
For Renewable Energy Projects – intention to apply RECs Labels (y/n)	No
GS Stream (CDM/VER):	GS CDM
Scale (large/scale/micro):	Small Scale
GS Registration Date:	30/12/2013
GS Crediting period start date:	01/01/2014
CDM Registration Date:	18 Dec 12
CDM Crediting period start date:	01/01/2014
Project Developer:	M/s Community Reconstruction of Social Service (CROSS)
Project Representative:	Mr. Puvvani Bhupathi
Project Participants and any communities involved:	No
Host Country/Location:	India
Methodologies applied:	AMS-I.E. ver. 4 - Switch from non-renewable biomass for thermal applications by the user
SDG Impacts:	i. SDG 3: Good health and well-being ii. SDG 5: Gender Equality iii. SDG 7: Affordable and Clean Energy iv. SDG 8: Decent work and economic growth v. SDG 13: Climate Action vi. SDG 17: Partnerships for the Goals
Estimated amount of SDG Impact (GSVERs and others)	i. SDG 3: Good health and well-being: 100% reduction in indoor air pollution; reduction of pathogen load in biogas slurry ii. SDG 5: Gender Equality: 100% reduction in drudgery to women due to project activity, 50% women involved in the project; additional direct or indirect job opportunities due to time spent. iii. SDG 7: Affordable and Clean Energy: 100% functionality of biogas units due to repairs and maintenance of biogas units iv. SDG 8: Decent work and economic growth: At least 7 (Number of temporary and permanent) jobs due to the project activity v. SDG 13: Climate Action: 16,456 metric tonnes CO₂ equivalent per annum vi. SDG 17: Partnerships for the Goals: 50% Carbon Funding to construct, repair, maintain and monitor the project

NOTE: This Annex shall be used for all PoAs if the sustainable development assessment is conducted at PoA level. In case sustainable development assessment is conducted at activity level, then this Annex shall be filled for each of the activities.

Project Implementation Status

The project activity is to set up 5,000 biogas plants (digesters) of 2 m³ capacity each for single households. Each household utilises the dung of its cattle to feed the digester for the production of biogas for cooking purpose and heating of hot water. The aim of the project was to replace the commonly used inefficient wood fired mud stoves technology, with clean, sustainable and efficient biogas. Of the 5,000 units which were taken up as the CDM project, 3059 units were built, the details of which are as follows:

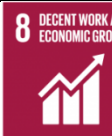
Mandal	Number of Villages	Number of Households
G.D.Nellore	78	805
Karvetinagaram	26	290
Nagalapuram	10	169
Nagari	12	153
Narayanavanam	12	168
Nindra	12	237
Pichatur	14	198
Puttur	10	192
Ramachandrapuram	16	78
S.R.Puram	27	377
Vadamalapeta	10	58
Vedurukuppam	35	334
Total	262	3059

As on July 2019, 95.03%% units were operational.

SECTION A Sustainable Development Goals (SDG) outcomes

A.1 Relevant target for each of the three SDGs

>> (Specify the relevant SDG target for at least each of three SDGs addressed by the project. Refer most recent version of targets [here](#). Contribution to SDG 13 is mandatory to be demonstrated for all projects and activities. Contribution to SDG 7 is recommended to be demonstrated for all community service projects and activities)

SDG	Target
 SDG 3: GOOD HEALTH AND WELL-BEING	3.9. By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
 SDG 5: GENDER EQUALITY	5.4. Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate
 SDG 8. DECENT WORK AND ECONOMIC GROWTH	8.5. By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value

 SDG 7: AFFORDABLE AND CLEAN ENERGY	7.2. By 2030, increase substantially the share of renewable energy in the global energy mix
 SDG 13: CLIMATE ACTION	13.3. Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
 SDG 17: PARTNERSHIPS FOR THE GOALS	17.1. Strengthen domestic resource mobilization, including through international support to developing countries

A.2 Explanation of methodological choices/approaches for estimating the SDG outcome

>> (Explain how the methodological steps in the selected methodology(ies) or proposed approach for calculating baseline and project outcomes are applied. Clearly state which equations will be used in calculating net benefit.)

The baseline scenario is the continued use of traditional inefficient cook stoves for cooking and heating water.

The project scenario is the use of biogas from cattle dung to produce biogas which is used for cooking and heating water. This renewable source of energy substitutes fuelwood of the baseline, thus reduction GHG emissions.

Hence the net benefit is due to the implementation of biogas units at the household level by the NGO, CROSS which is absent in the baseline scenario.

SDG	Parameter	Baseline	Project	Net Benefit
 SDG 3: GOOD AND WELL-BEING	i. Continued improved indoor air condition and reduced respiratory problems especially for women and children. ii. Reduction of pathogens in slurry compared to that of dung	i. Use of traditional cookstove causing indoor smoke and health hazards. (0% of HHs having clear indoor air) ii. Pathogens in dung	i. Reduction in indoor air pollution (100% of HHs) ii. Pathogens in Biogas Slurry	i. 100% reduction in indoor air pollution. ii. Reduction in pathogen load.
 SDG 5: GENDER EQUALITY	i. Reduction in Hours for collection of woody biomass and cooking ii. Women in monitoring of the project activity iii. Income generation activities promoted due to the time saved for women	Women spent time and effort in fetching, processing and storing fuelwood for cooking and cooking on traditional stoves	i. Reduction in Hours for collection of woody biomass and cooking ii. Women in monitoring of the project activity iii. Income generation activities promoted due to the time saved for women	i. Reduction in Hours for collection of woody biomass and cooking ii. Number of Women in monitoring of the project activity iii. Type of Income generation activities promoted due to the time saved for women

 SDG 7: AFFORDABLE AND CLEAN ENERGY	i. Construction and maintenance of biogas units for rural communities. ii. Maintenance of constructed biogas units and elimination of use of firewood.	No Biogas Units	i. Number of biogas units constructed ii. Number of units operational	i. Number of biogas units constructed ii. Number of units operational
 SDG 8: Decent work and economic growth	Number of jobs created	No project related jobs created	Project related temporary or permanent jobs created for men and women	Number of permanent and temporary jobs created due to the project activity
 SDG 13: CLIMATE ACTION	GHGs emissions reduction per year	61,109 tCO ₂ emitted by using traditional cook stoves by 18,000 households	0 tCO ₂ emitted by using biogas	16,456 tCO ₂ emission reductions
 SDG 17: PARTNERSHIPS FOR THE GOALS	i. Access to domestic or international carbon funding to implement clean technologies	No funding in the baseline scenario	Domestic/international carbon funding to construct and maintain biogas units	Domestic/international carbon funding to construct and maintain biogas units

SDG 13: Emission Reduction Calculations

It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs and emission reductions is calculated as:

$$ER_y = B_y * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$$

Where:

ER_y	Emission reductions during the year y in tCO ₂ e
B_y	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB,y}$	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 (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO ₂ /TJ

Leakage relating to non-renewable biomass B_y will be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys will not required as per the methodology AMS-I.E, Para 10.

Project emissions or actual net removals

There are no project emissions in the project activity

Calculation of leakage emissions

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Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed based on ex post surveys of users and the areas from which this woody biomass is sourced (using 90/30 precision for a selection of samples). The following potential source of leakage shall be considered:

- (a) The use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass used by the non-project households/users, that is attributable to the project activity, then B_y is adjusted to account for the quantified leakage. Alternatively, B_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required.

If the equipment currently being utilised is transferred from outside the boundary to the project boundary, leakage is to be considered.

There will not be any transfer of equipment being currently utilized transferred from outside the project boundary to the project boundary. All the biogas units will be constructed at site. Thus leakage from equipment transfer need not be monitored.

B_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys will not be required.

According to the methodology, Version 4, after considering leakage, the emission reduction calculations are as follows:

$$ER = (B_y * 0.95) * f_{NRB} * NCV_{biomass} * ER_{projected_fossilfuel}$$

A.3 Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

(Include a compilation of information on the data and parameters that are not monitored during the crediting period but are determined before the design certification and remain fixed throughout the crediting period like IPCC defaults and other methodology defaults. Copy this table for each piece of data and parameter.)

Relevant SDG Indicator	 SDG 13: CLIMATE ACTION Target: Emission Reduction
Data/parameter	Rating Biogas
Unit	kW _{th} /digester
Description	Thermal capacity of a digester
Source of data	Calculated as shown in Section B.2
Value(s) applied	1.69
Choice of data or Measurement methods and procedures	Calculated as shown in Section B.2 of the registered PDD
Purpose of data	Qualifies as a micro-scale project activity.
Additional comment	This parameter is fixed for the entire crediting period

Relevant SDG Indicator	 SDG 13: CLIMATE ACTION Target: Emission Reduction
Data/parameter	B_y
Unit	Tonnes /year
Description	Quantity of woody biomass that is substituted or displaced in tonnes
Source of data	Survey
Value(s) applied	3.97 tonnes/year/family and 19,850 t/year for 5,000 families
Choice of data or Measurement methods and procedures	Based on survey conducted to estimate the average annual consumption of woody biomass. The details of the study are described in Annex 3 of the PDD. The average annual consumption of biomass is 3.58 ± 0.73 kg/capita/day. The

	lower bound of 95/5 confidence/precision level of per capita consumption is 3.48 kg/capita/yr. The adult equivalent per family in the project area is 3.13. $B_y = 3.48 \text{ kg/capita/day} \times 365 \text{ days} \times 3.13 \text{ adult equivalent/family} = 3.97 \text{ t/family/yr.}$ $B_y \text{ for } 5,000 \text{ biogas units is } 3.97 \times 5000 = 19,850 \text{ t/year.}$
Purpose of data	Emission Reduction Calculations
Additional comment	This parameter is fixed for the entire crediting period

Relevant SDG Indicator	 SDG 13: CLIMATE ACTION Target: Emission Reduction
Data/parameter	f_{NRB}, y
Unit	-
Description	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass
Source of data	Assessment of Non Renewable Biomass based on data provided by Forest Survey of India, 2011, Ministry of Environment and Forests, Govt of India.
Value(s) applied	0.95
Choice of data or Measurement methods and procedures	Based on data from State of Forest Report, 2011. Forest Survey of India, Ministry of Environment and Forests, Government of India. The data gives the consumption of fuel wood and production of fuel wood from forests and from trees outside forests. This data is assessed at the state level. Thus the f _{NRB} for Andhra Pradesh is applied for the project activity.
Purpose of data	Emission Reduction Calculations
Additional comment	This parameter is fixed for the entire crediting period

Relevant SDG Indicator	 SDG 13: CLIMATE ACTION Target: Emission Reduction
Data/parameter	NCV_{biomass}
Unit	TJ/tonne
Description	Net Calorific Value of Biomass
Source of data	AMS_I.E., Version 4 methodology
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	-
Purpose of data	Emission Reduction Calculations
Additional comment	This parameter is fixed for the entire crediting period

Relevant SDG Indicator	 SDG 13: CLIMATE ACTION Target: Emission Reduction
Data/parameter	EF_{projected_fossilfuel}
Unit	tCO ₂ /TJ
Description	Emission Factor for fossil fuel. Emission factor for substitution of non-renewable woody biomass by similar consumers.
Source of data	AMS-I.E., Version 4 methodology
Value(s) applied	81.6
Choice of data or Measurement methods and procedures	Based on the methodology, this value represents the emission factor of the substitution fuels likely to be used by similar users on a weighted average basis. It is assumed that the mix of present and future fuels would consist of a solid, liquid and gaseous fossil fuel.
Purpose of data	Emission Reduction Calculations

Additional comment	This parameter is fixed for the entire crediting period
Relevant SDG Indicator	 SDG 13: CLIMATE ACTION Target: Emission Reduction
Data/parameter	Diversion of non-renewable biomass saved under the project activity by non-project households
Unit	tonnes / year
Description	Diversion of non-renewable biomass saved under the project activity by non-project households
Source of data	Based on the methodology B_y will be multiplied by a net to gross adjustment factor of 0.95 to account for leakages.
Value(s) applied	Biomass (t) - $3.97 \times 0.95 = 3.77$ t/yr. The biomass diversion is $3.97 - 3.77 = 0.20$ t/family/yr or 1000 t/yr for 5,000 families. Emissions (tCO ₂) - $4.61 - 4.38 = 0.23$ tCO ₂ /family/yr; $0.23 \times 5000 = 1150$ tCO ₂ /year
Choice of data or Measurement methods and procedures	According to I.E, Version 4, B_y can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required. $3.97 \times 0.95 = 3.77$ t/Household/yr. Thus the diversion is $3.97 - 3.77 = 0.20$ t/family/yr or 1000 t/yr for 5000 families. In terms of leakage of emissions, $4.61 - 4.38 = 0.23$ tCO ₂ /family/yr and $0.23 \times 5000 = 1150$ tCO ₂ /year.
Purpose of data	Leakage Calculations
Additional comment	This parameter is fixed for the entire crediting period. Surveys will not be conducted to determine leakage

SECTION B Safeguarding Principles Assessment

B.1 Analysis of social, economic and environmental impacts

>> (Refer the GS4GG Safeguarding Principles and Requirements document for detailed guidance on carrying out this assessment. The assessment of following Safeguarding Principles Assessment is required to be carried out by GS Version 2.0, 2.1 and 2.2 projects. GS v1.0 projects will carry out assessment of all the safeguarding principles discussed in the GS4GG Safeguarding Principles and Requirements document.)

With regard to Principle 2, Gender Equality and Women's Right, the project promotes gender equality and the empowerment of women through the project. the project is a biogas project and directly contributes to upliftment of women by addressing their drudgery issues and ease of cooking food. The project does not in any way contribute to discrimination against women or their inequalities. In fact the project is for women.

In terms of contributing to SDG 5 and referring to Gender Equality Requirements Guidelines, - Question 1: the project addresses the key issues and requirements of Gender Sensitive design and implementation to address the hardships of women. CROSS is a grassroot level NGO working in the field of rural development of which one of the major activity is mainstreaming gender and organizational development. With the support of SCINDeA Network, CROSS engages the EcoPP program in Chitoor District of Andhra Pradesh. The major activities under this program include Socio-economic assistance to poor households, promote community organisation, community organisation and promotion of community federations, livelihood promotion for poor households, rights based child and adolescent development, health and sanitation and green initiatives¹. The

¹ <http://www.crossorg.in/scindea-network-activities.html>

focus thrust of CROSS is organizing women and youth into self help groups, conducting health campaigns, environmental development and child labour eradication².

The foundational gender-sensitive standards were addressed as follows:

- The gender equality safeguards and principles is described below.
- The gender inequalities and gender-related risks have been addressed by making the women as beneficiaries of the technology. The end user agreement are invariably signed with the women of the family and is also the beneficiary of any products of the project activity. CROSS is predominantly working with the socio-economically weaker section of the community.
- Women and men participate equitably and meaningfully in the project design and implementation. The project benefits are experienced by men and women in terms of clean indoor air.
- The project is monitored by women village level volunteers and share the details with the staff of CROSS.
- Regular feedback can be given by the end users to Village level volunteers and they in terms convey to the staff of CROSS.
- The project is implemented in the rural regions of Chittoor district, Andhra Pradesh for the marginalized families and there is no discrimination of caste, creed or religion for selection of families. Only families that have cattle and space to built biogas and voluntarily wanted to have biogas units were part of the project. This is one of the principles of FCN and CROSS is part of the Network.

With regard to question 2 with regard to alignment with existing country policies, strategies and best practices, as gender policy is institutionalized by the NGO, it addresses all the gender policies as set forth in the GS4GG and India National policy (National Policy for the Empowerment of Women (2001))³, which are as follows.

- The project provides positive economic and social incentives for full development of women
- There is not hindrance to human rights and fundamental freedom by women on equal basis with men
- There is equal access to participation and decision making of women in the project
- The NGO has promoted self help groups (SHGs) to empower them. These SHGs undertake activities to help needy women.
- The NGO is also involved in changing societal attitudes and community practices by active participation and involvement of both men and women.
- Mainstreaming a gender perspective in the development process and elimination of discrimination and all forms of violence against women and the girl child; and building and strengthening partnerships with civil society, particularly women's organizations through SHGs are done.

With regard to question 3, the safeguarding principles and requirement document is included below in the document.

With regard to Question 4, the stakeholders meeting was conducted on initially before the start of the project as mentioned in the PDD. Stakeholders were involved not just at the beginning of the project, but is a continuous process. Women are involved in monitoring and repair and maintenance of the units. Meetings are conducted periodically to address all issues of the communities including the project.

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
3.2 Gender Equality and Women's Rights	Questions in the relevant section of the safe guarding	No	- The project does not contribute to gender based discrimination and lead to sexual harassment or any	Not required.

² <https://scindea.org/partner-organizations/>

³ <https://wcd.nic.in/womendevelopment/national-policy-women-empowerment>

	principles and guidelines ⁴		form of violence against women. Neighter does the project contribute to slavery, imprisonment, physical or mental drudgery. In fact the project addresses to alleviate women drudgery. - The project does not reduce or risk women's access to or control of resources, entitlements and benefits. The project will in fact reduce the burden of women to gather fuelwood and associated problems including dudgery. - The project is being implemented for the rural communities in semi arid region, thereby addressing the needs of vulnerable communities of the region. - There is no discrimination of caste or creed and all families are part of the project voluntarily. - The project is not leading to any sexual harassment of women or obstruction to any of their rights. - The project promotes women participation, as the technologies benefit them. Women volunteers monitor the project at village level, thereby are able to interact better with the technology users. - In conclusion, the project is mainly implemented to alleviate the problems of women by providing decentralised energy systems to them and in the process also	
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⁴ 3.2.1 The Project shall not directly or indirectly reinforce gender-based discrimination and shall not lead to/contribute to adverse impacts on gender equality and/or the situation of women. Specifically, this shall include (not exhaustive): (a) Sexual harassment and/or any forms of violence against women – address the multiple risks of gender-based violence, including sexual exploitation or human trafficking. (b) Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. (c) Restriction of women's rights or access to resources (natural or economic). (d) Recognise women's ownership rights regardless of marital status – adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources. 3.2.2 Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work, specifically: (a) Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities. (b) Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status. (c) Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits. 3.2.3 The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks. 3.2.4 Based on the responses to assessment questions above, Gold Standard may require that the Project seek the input of an Expert Stakeholder(s) and to include their recommendations in the Project design.

			empower them and provide employment opportunities through the project and also providing them time to do what they wish, which is usually used to provide additional income. - The project does not require an input of any expert stakeholder as the project directly contributes to women empowerment and alleviating their drudgery.	
3.4.3 Land Tenure and Other Rights	1. Does the Project require any change to land tenure arrangements and/or other rights? 2. For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?	No	The project does not involve land tenure and rights associated with it, as the biogas dome is constructed in their own land with connection to the stoves in the kitchen.	Not required.
3.6.2 Negative Economic Consequences	The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also including those that will occur beyond the Project Certification period. 2. The Projects shall consider economic impacts and demonstrate a consideration of potential risks to the local economy and how these have been taken into account in Project design,	No	There is no negative economic consequences. The technology is given to the communities with no costs, thereby have a positive impact on the families. The project was implemented with carbon revenue and is continued to be repaired and maintained through carbon revenue.	Not required.

	implementation, operation and after the Project. Particular focus shall be given to vulnerable and marginalised social groups in targeted communities and that benefits are socially-inclusive and sustainable			
4.1.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The project does not increase GHG emissions over the baseline. It also decreases indoor air pollution compared to baseline scenario.	Not required.
4.1.2 Energy Supply	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project does not use energy from the local grid or power supply or biomass that provides for other local users. On the contrary, it reduces the use of biomass by existing users.	Not required.
4.2.1 Impact on natural water patterns and flow	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The biogas stoves are installed in houses and does not affect the natural or pre-existing pattern of water courses, watersheds or any other natural water bodies.	Not required.
4.2.1 Erosion and/or water body stability	1. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural	No	The project does not directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion and hence not applicable.	Not required.

	pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2. 2. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?			
4.2.3 Landscape modification and soil	Does the Project involve the use of land and soil for production of crops or other products?	No	The Project does not involve the use of land and soil for production of crops or other products and hence not applicable.	Not required.
4.3.2 Vulnerability to Natural Disaster	Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	The project area could be vulnerable to drought. During drought periods, cattle population decreases temporarily, thereby effecting the use of biogas. This is for a short period and is revived after rains. The project falls under least active seismic zone ⁵ and falls under the least vulnerable zone in India ⁶ .	Not required.
4.3.3 Genetic Resources	Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	No	The project is a renewable and energy efficiency project and hence does not involve use of GMOs	Not required.
4.3.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	No	The project does not involve release of pollutants to the environment. The slurry from biogas is used as manure for their fields, which enriches the soil compared to baseline scenario.	Not required.
4.3.5 Hazardous and Non-	Will the Project involve the manufacture,	No	The project does not involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous	Not required.

⁵ <https://www.scoopwhoop.com/Earthquake-Zoning-Map-Reveals-59-Of-India-Is-Prone-To-Moderate-Severe-Earthquakes/>

⁶ <https://www.tandfonline.com/doi/pdf/10.1080/19475705.2014.897656>

hazardous Waste	trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?		chemicals and/or materials.	
4.3.6 Pesticides and fertilizers	Will the Project involve the application of pesticides and/or fertilisers?	No	The Project does not involve the application of pesticides and/or fertilisers.	Not required.
4.3.7 Harvesting of forests	Will the Project involve the harvesting of forests?	No	The project does not involve harvesting of forests. In fact, it reduces harvesting of trees for fuelwood use.	Not required.
4.3.8 Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The project does not involve crop regime alteration or export or economic incentives to modify the quantity or nutritional quality of food. Hence not applicable	Not required.
4.3.9 Animal Husbandry	Will the Project involve animal husbandry?	No	The project is not related to animal husbandry and hence not applicable.	Not required.

SECTION C Monitoring plan

C.1 Data and parameters to be monitored

(Include specific information on how the data and parameters that need to be monitored in the selected methodology(ies) or proposed approaches or as per mitigation measures from safeguarding principles assessment or as per feedback from stakeholder consultations would actually be collected during monitoring. Copy this table for each piece of data and parameter.)

Relevant SDG Indicator/Safeguarding Principle	 SDG 3: GOOD HEALTH AND WELL-BEING Target 3.9. By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter	i. Continued improved indoor air condition and reduced respiratory problems especially for women and children. ii. Reduction of pathogens in slurry compared to that of dung
Unit	i. % of respondents ii. % reduction in bacterial count

Description	i. % of biogas-users responding positively to improved indoor air condition and reduced health problems during sample survey ii. Animal waste carries high level of microorganisms and pathogens, which cause health related problems to human and animals. Anaerobic digestion of such animal waste is considered to be an effective way to destroy pathogens as proved by various studies.
Source of data	i. Based on experience by the communities for reduction in health problems. through sample survey. ii. Laboratory Analysis
Value(s) applied	i. 100% of the surveyed families ii. Percent reduction in bacterial count
Measurement methods and procedures	i. Sample survey and record the experience by the communities for reduction in health problems compared to baselines. ii. Laboratory Analysis of dung and biogas slurry
Monitoring frequency	i. Once in 2 years. ii. Once during the beginning of crediting period
QA/QC procedures	A minimum of 30 households will be sample surveyed.
Purpose of data	To determine the impact of the project to the SDG
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	 SDG 5: GENDER EQUALITY Target 5.4. Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate
Data / Parameter	Reduction in drudgery of cooking – Save time
Unit	Hrs
Description	i. Reduction in Hours for collection of woody biomass and cooking ii. Women in monitoring of the project activity iii. Income generation activities promoted due to the time saved for women
Source of data	i and iii. Sample survey ii. Data base of CROSS
Value(s) applied	i. Atleast reduction of 50% of time ii. Atleast 50% women involved in the project iii. based on sample survey – direct or indirect benefit
Measurement methods and procedures	i and iii. Sample survey and record the experience of women for reduction in time spent and other activities undertaken compared to baseline. ii. Database of CROSS
Monitoring frequency	Once in 2 years
QA/QC procedures	A minimum of 30 households will be sample surveyed.
Purpose of data	To determine the impact of the project to the SDG
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	 SDG 7: Affordable and Clean Energy Target 7.2. By 2030, increase substantially the share of renewable energy in the global energy mix
Data / Parameter	i. Construction and maintenance of biogas units for rural communities. ii. Maintenance of constructed biogas units and elimination of use of firewood.
Unit	i. No. of biogas systems constructed ii. Number of units operational
Description	Number of biogas units constructed for the rural communities thereby reducing the use of fuelwood. ii. Number of biogas units repaired and maintained for continuous use of biogas units making them operational
Source of data	Based on data from online monitoring solution
Value(s) applied	No fixed value. Will depend on the number of units repaired
Measurement methods and procedures	The village level volunteers/biogas case workers collect data of the units that are non-operational and needs repairs. This information is entered into the monitoring solution for the project. As and when the units are repaired, it is entered in the monitoring solution. This data provides information of the parameter.
Monitoring frequency	Continuous
QA/QC procedures	Real time data of all the units ensure high reliability and low uncertainty as every unit is monitored
Purpose of data	To assess the contribution to the SDG 7, with regard to affordable, reliable, and sustainable thermal energy to the rural communities
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	 SDG 8. Decent work and economic growth Target 8.5. By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
Data / Parameter	Employment created due to the project activity
Unit	Number
Description	Number of permanent and temporary jobs created due to the project activity
Source of data	Financial transactions
Value(s) applied	Will vary depending on the stage of the project. A minimum total of 7 temporary and permanent jobs
Measurement methods and procedures	Based on financial statements of the project
Monitoring frequency	Continuous
QA/QC procedures	Is based on salaries provided as proof
Purpose of data	To assess the contribution to the SDG 8 with regard to jobs created
Additional comment	CDM Staff and Village level volunteers are involved in the monitoring, repair and maintenance of the project

Relevant SDG Indicator/Safeguarding Principle	 SDG 13: Climate Action Target: Emission Reduction
Data / Parameter	GHGs emissions reduction per year
Unit	tCO ₂ eq per year
Description	Reduction in GHG emissions due to the project activity that is determined applying the approved UNFCCC methodology I.E.
Source of data	PDD
Value(s) applied	61,109 tCO ₂
Measurement methods and procedures	The measurement methods and procedures are as described in the registered PDD
Monitoring frequency	Annual
QA/QC procedures	Emission Reduction calculations is based on real time monitoring of all the households
Purpose of data	To determine the following SD Indicators that contributes to the SDG: Climate Action i. GHGs emissions reduction per year
Additional comment	

Relevant SDG Indicator/Safeguarding Principle	 SDG 17: Partnerships for the goals Target: 17.3. Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Data / Parameter	i.Access to domestic or international carbon funding to implement clean technologies
Unit	Rs.
Description	Domestic/international carbon funding to construct and maintain biogas units
Source of data	Audited statement for the project
Value(s) applied	The value will be assessed as and when carbon finance is generated
Measurement methods and procedures	Carbon fund received for construction, repair and maintenance to the project
Monitoring frequency	Continuous
QA/QC procedures	The carbon revenue will be accessible to the rural women, which can be transparently tracked through bank transfers.
Purpose of data	To assess the contribution to the SDG 17, with regard to strengthening domestic/international support to projects in developing countries
Additional comment	

C.1.1 Other elements of monitoring plan (if applicable)

>> Management

1. Implementation Plan

So far biogas units were built for 3059 families. The rest of the units 1,941 is in construction phase.

2. Project Management and Monitoring

This Biogas CDM project is implemented and monitored by CROSS. CROSS facilitates the End User families to set up village level institutions to take care of minor repair, maintenance and the social controls/peer support needed to cope with various exigencies that will crop up. These are participatory mutual support systems in each and every village. The sudden loss of animals, destruction of fodder, family illness and other exigencies that lead to a non-functioning of biogas units will be considerably reduced due to the operation of these grassroots structures and systems.

2.1. Biogas Project Management Unit within CROSS

A dedicated team within CROSS is there for management and monitoring of the Biogas CDM Project. This Project Management & Monitoring Unit consists of the following staff:

- **One Biogas CDM Project Manager and two Assistant Biogas Managers:** The main function are follows:
 - To deal with CDM issues (DOE, DNA, CDM Consultants),
 - Coordinate Biogas CDM Staff and village functionaries,
 - Ensure quality from material supply, through construction, to commissioning of units
 - Set up a repair and maintenance system to attend to issues that cannot be locally addressed through the Village level systems
- **IT Professional:** The IT professional is responsible for the following:
 - Maintain the digitized monitoring solution and monitoring sheets for CDM Verification
 - Ensure that authentic data is entered into the solution and make spot checks to verify
 - Deal with the IT Company, TRISTLE that prepared the solution.
 - Peruse the analytical reports in the digitized monitoring solution and recognise patterns to predict problem areas and under-performance
- **Accountant:** The accountant is responsible for ensuring a strict and diligent spending of CER Revenues and the recording thereof in a computerised accounting package. He administers the following tasks:
 - Arrange for the bulk purchase of cement and hardware and transfer them to the Mandal storehouses
 - Arrange timely payments for material suppliers and masons
 - Inspect quality of material (bricks and sand) before making payments
 - Negotiate for the timely supply of high quality cement and hardware
 - Prepare statutory reports for end of year audit
- **Biogas Field Workers:** Biogas field workers oversee the construction of biogas units. Each field worker is in-charge of construction during the construction phase. They report to the Project Manager and their tasks are:
 - Inspect the number of cattle, distance from kitchen in each household, mark and arrange for excavation of pits
 - Identify local suppliers of material (bricks and sand) for each village, get the price and quality approved by the Project Manager, and arrange for transportation to the villages
 - Transport cement and hardware from the Mandal storehouses
 - Assign Masons to particular villages and oversee the quality of their work and ensure that End User family labour is actively used
 - Record the progress of processes in specially designed formats and enter the data into the digitized monitoring solution on a fixed day every week
- **Local Masons:** They were trained by NEDCAP. They were assigned to each Biogas Field Worker.

Similarly, the personal and contact details of each Material Supplier is recorded, along with their bank account numbers. Payments are made only by crossed cheque.

Post construction of the biogas units for the initial four years, the biogas field workers continue to be responsible to:

- Form and support village level institutions; assist in selection of Volunteers, train and support them

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- Record the monthly totals from the Daily Monitoring Books maintained by Volunteers and, once a month, enter the data into the digitized monitoring solution
- Contract Masons and attend to major repairs that cannot be handled by the village level institution.

2.2. Management system at village level:

- **End User Groups:** About 20-25 End User families are organized into a group called End User Group. These function on the lines of Self Help Groups (SHGs) specifically for local management of construction and post construction, ensuring proper functioning of all biogas units in their respective villages. These End User Groups are a support system to each End User. E.g. If a cow or buffalo suddenly dies and the family faces a dung shortage, the Group make arrangement with neighbours to ensure that the unit functions uninterrupted.
- **Volunteers:** Every participating village have a Volunteer, preferably women staff with either minimum SSLC or PUC qualification, to monitor usage of about 20 - 25 biogas units. She is a young woman, selected by the End User Group of her Village.

She is responsible for post construction monitoring of usage and be the first to identify dysfunctional units. The Volunteer either prompt the End User Group to set right a problem or bring it to the notice of the Biogas Field Worker.

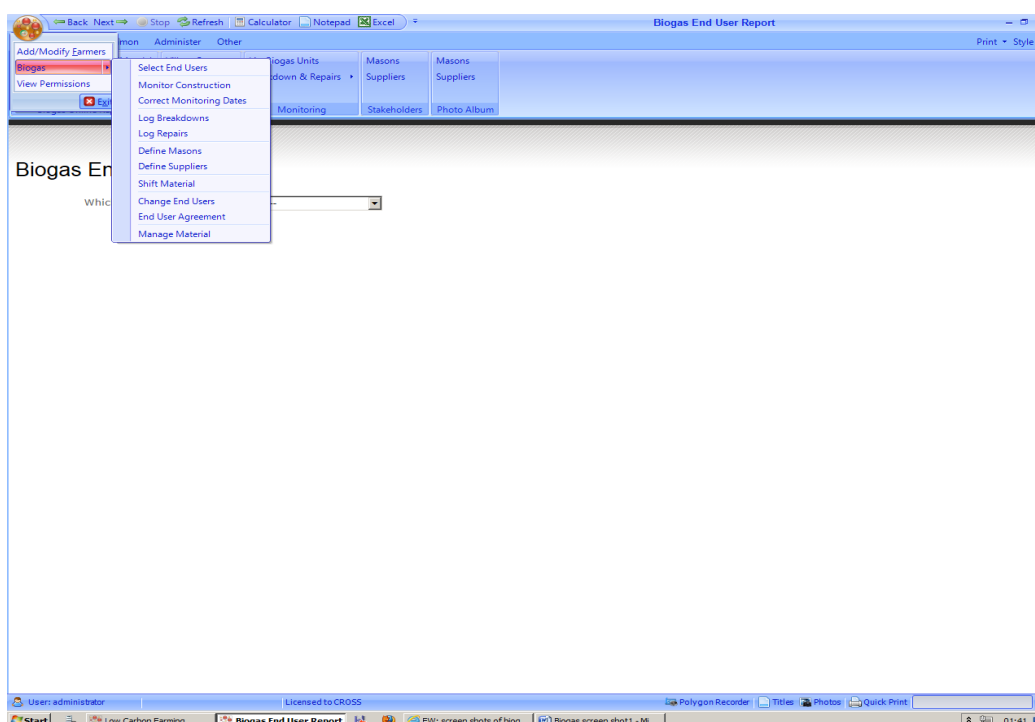
Volunteers are paid by their respective End User Groups from the maintenance fund given to them.

2.3 Digitized Monitoring system

A customised Biogas CDM Monitoring database Solution developed and tested by Tristle Technologies Pvt. Ltd. for CROSS, is used to maintain demographic data, construction processes, and the regular monitoring of the project activity. Tristle Technologies Pvt. Ltd. has developed a database which is permission driven, intuitive and easy to use by Project Staff and Volunteers. All activity processes, including financial transactions, is digitally entered and monitored at the CROSS head office. Open and transparent online reports are used by all the Project Staff and secondary stakeholders to know the Progress and Results. Reports can be generated at all levels – Project, Mandal, Gram Panchayat, Village and Participating Family. The database is updated on an everyday basis, as and when Project Staff return from their respective villages.

Progress Reports: Real-time Progress Reports is available to everyone in an open and transparent manner for the following:

- Implementation Progress (overall project to village reports) on
 - Construction progress, time line & efficiency
 - Gender disaggregated analysis & dwelling details of participating families
 - Daily usage resume, Audit & Maintenance & CER generation to date
 - Total expenditure & average cost per unit
- Participating Families
 - Demographic details
 - Mason, Commissioned Date & Usage Days
 - Construction Details with Date, Process, & Who Monitored
- Construction Overview
 - Village-wise Progress
 - Output, Outcome & Results
- Monitoring of operating units
- Masons & Suppliers
 - Masons
 - Suppliers
 - Photo Albums of Masons and Suppliers
- Reports that meet CER Verification requirements
 - Monitoring operating units
 - Full List of all the Commissioned Units



Snapshot of the TRISTLE Monitoring Database Solution

a) Processes: The solution is used to:

- Record the Mandals, Gram Panchayats and Villages where the CDM project is implemented
- Enter demographic details on participating Families
- Select Villages & Families
- Assign Staff and Volunteer responsibilities during the actual construction and monitoring phases, respectively

b) 2.4 Monitoring during Construction Phase

c) Construction of 5,000 Biogas Units will be carried out in a phased manner. The various processes involved in the implementation of the technology are as follows:

- Selection of Participating Families
- Defining Masons & Material Suppliers
- Monitoring Construction Progress
 - Marking
 - Excavation
 - Supplying crushed Stone Jelly, Sand, Bricks and Cement
 - Supplying Hardware
 - Concreting, Brick Work & Plastering
 - Filling dung
 - Supplying & Fixing Pipes and Stove
 - Fixing the Safety Grill
- Commissioning the Biogas Units
- Generating End User Agreements
- Monitoring operating units
- Logging Breakdowns & Repairs – Non usage days

Project Staff will ensure quality of installed Biogas Units. They will check the quality and ensure that the required quantities of material are used during construction. All payments are made by cheque and Suppliers irrefutably identified with personal data and digital photographs fed into the computerized databank.

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Each Biogas Unit is marked with a unique Identification Number. Along with the Village Code and Family Code, these irrefutably identify each of the 5,000 Biogas Units on the digitized monitoring database.

After commissioning and satisfactory functioning of the Biogas Unit for a minimum of 2 weeks, an End User Agreement is signed with the Participating Family. Full account of emission reduction is considered from Day 1 of commissioning.

d) 2.5 Monitoring after Commissioning of biogas units

A Daily monitoring book is maintained in each of the villages where the volunteers record number of non usage days. This data is fed into the individual Biogas User's monitoring database solution, once a month, for days not used and reasons.

If any Biogas Unit is faulty or not functional, the problem report is passed on to the Area Team for action. There is continuous database maintained of all the Biogas Units not operational on a day-to-day basis. The computerized solution provide all the details at the Participating Family level for the number of non-operational days, and the reasons of non-operation. This monitoring gives the operational Biogas Units and serve to triangulate the data.

This monitoring solution will positively impact Staff and Volunteers to enhance Performance and produce good Results.

- The features, organisation and ordering accurately mirror the implementation plan and serve as unambiguous job descriptions for secondary stakeholders. Project processes are sequentially ordered into jobs and tasks. Project staff will know exactly where they stand in terms of progress and results. They will be comfortable in the knowledge that objective standards like number of commissioned Units, recording of breakdowns, conducting timely repairs, etc. will be used to measure their performance.
- The totally open and transparent reports track progress from marking to commissioning. These, along with budget realisations, will keep a wider audience constantly informed on progress and financial health. They will also give up-to-date information on the volume of CERs generated and thereby serve as an indicator on financial viability and feasibility.
- Verification data needed by the DoE will be generated as Excel files from the monitoring solution.

All data will be archived and stored throughout the crediting period and an additional 2 years.

The screenshot shows a web browser window displaying the 'Biogas Monitor Construction' application. The interface includes a navigation menu with tabs for 'End User', 'Taluk/Mandal', 'Village Progress', 'List Biogas Units', 'Masons', and 'Masons Suppliers'. Below the menu, there are dropdown menus for 'Which Taluk/Mandalam?' (set to 'G.D.NELLORE') and 'Which Gram Panchayat?' (with a list of options including 'KARVATI NAGARAM', 'KARVATI NAGARAM1', 'KARVATI NAGARAM2', 'S.R. PURAM', and 'VEDHURUKUPPAM'). The main content area is titled 'Monitor Biogas Construction'. The browser's address bar shows 'Biogas > Monitor Construction'. The taskbar at the bottom indicates the user is 'administrator' and the session time is '5 minutes'. The system tray shows the time as '01:45'.

3. Participation Agreements

Farmer families have been educated on project dynamics, CDM mechanism and the carbon market. This has ensured an informed participation right from the planning state of the CDM Project. They further are educated on their responsibilities during the construction and post-construction phases.

4. End User Agreements

About 15 days after commissioning each Biogas Unit (i.e. after the satisfactory functioning of the unit), a legally binding End User Agreement is signed between the Project Proponent (CROSS) and every single End User. These formally spell out the roles, entitlements and responsibilities of both parties.

Once the farmers are ready for participating in the project, an End User Agreement is signed by each participating farmer with CROSS.

5. Maintenance, Servicing & dealing with Emergencies

A Volunteers has about 25-30 units and record Daily Monitoring data. They are the point persons who immediately identify problems. Minor repairs are conducted either by the End User family or the Volunteer herself, since she is trained and given a kit with tools and spare parts.

If the repair involves the expenditure of monies for the purchase of material, the matter is discussed in the End User Group and resources obtained. If the problem is beyond their scope, the Biogas Field Worker are be informed and the problem attended to within 3-4 working days.

Trainings are conducted before project implementation at various stages. The types of trainings imparted are:

- Orientation to end users on the effects of climate change, CDM processes and biogas.
- Training beneficiary farmers on quality aspects to be ensured while constructing the units.
- Training beneficiary farmers, particularly women on use and maintenance of bio-gas units.
- Training the masons on construction parameters and quality of construction, including assessment of the quality of materials like bricks, cement etc.
- Training the Volunteers and End User Groups (EUGs) on maintaining Monitoring Records of usage of bio-gas stoves by the families.
- Training the beneficiary families and Volunteers on the "Repair and Maintenance" of Bio-gas units.
- Any other training as need arises.

SECTION D Duration and crediting period

D.1 Duration of project

D.1.1 Start date of project

>> (Specify start date of the project, in the format of DD/MM/YYYY)

01/04/2013

D.1.2 Expected operational lifetime of project

>> (Specify in years)

25y-0m⁷

⁷ Dheenabandhu Model 2000 Biogas Units, developed by AFPRO, Action For Food Production, New Delhi

D.1 GS Crediting period of the project/activity

Type: Renewable Crediting period

Years: 21 Years; Renewable twice

Based on the GS4GG updates, transition Projects shall maintain their existing crediting cycle and maximum crediting periods upon transition to GS4GG. A 7 year renewable project shall maintain the balance of its existing crediting period upon renewal. Its future renewals shall take place as per a 7 year cycle instead of 5 as envisaged under GS4GG, up to the maximum 21 years⁸.

D.2.1 Start date of the ongoing GS crediting period

>> (Specify in dd/mm/yyyy)

01/01/2014

D.2.3 End date of the ongoing GS crediting period

>> (Specify in dd/mm/yyyy)

31/12/2020

D.2.3 Total length of the GS crediting periods

>> (Specify the total length of crediting period in years in line with GS4GG Principles & Requirements or relevant activity requirements)

Total length of the GS crediting periods is 21 Years

7 years of each GS crediting period

Based on the GS4GG updates, transition Projects shall maintain their existing crediting cycle and maximum crediting periods upon transition to GS4GG. A 7 year renewable project shall maintain the balance of its existing crediting period upon renewal. Its future renewals shall take place as per a 7 year cycle instead of 5 as envisaged under GS4GG, up to the maximum 21 years⁹.

SECTION E Stacking of new assets

>> (If project is looking to stack new assets over GSVERs the required information to demonstrate compliance to the relevant methodology, product specification and additionality shall be presented in the new PDD template launched with GS4GG)

There is no stacking of new assets.

⁸ <https://www.goldstandard.org/globalgoals>

⁹ <https://www.goldstandard.org/globalgoals>

Appendix 1. Contact information of project participants

Organization name	Community Reconstruction of Social Service - CROSS
Registration number with relevant authority	
Street/P.O. Box	Velkur Village & Post, Gangadhara Nellore Mandal
Building	-
City	Chittoor
State/Region	Andhra Pradesh / South India
Postcode	517 125
Country	India
Telephone	08572 – 273292
Fax	-
E-mail	cross_org2005@yahoo.com
Website	-
Contact person	-
Title	Director
Salutation	Mr.
Last name	Bhupathi
Middle name	-
First name	Puvvani
Department	-
Mobile	098854 12972
Direct fax	-
Direct tel.	-
Personal e-mail	-