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

Gold Standard

KEY PROJECT INFORMATION

Title of Project/PoA/Activity:	Social Education and Development Society (SEDS) Biogas CDM project for the rural poor
GS ID of the project/PoA/activity:	GS849
GS Version:	2.1
Brief description of Project:	The Biogas CDM Project of SEDS is to set up 5,000 biogas plants for households in Ananthpur District, Andhra Pradesh State, India by the NGO SEDS, a grass root level NGO. The households utilizes 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:	17/02/2012
GS Crediting period start date:	01/01/2011
CDM Registration Date:	09/09/2010
CDM Crediting period start date:	01/01/2011
Project Developer:	Social Education and Development Society (SEDS)
Project Representative:	Ms. Manil Jayasena Joshua
Project Participants and any communities involved:	No
Host Country/Location:	India
Methodologies applied:	AMS-I.E. ver. 7 - 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 13: Climate Action v. 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; 50% reduction of pathogen load in biogas slury ii. SDG 5: Gender Equality: At least 50% reduction in time and drudgery to women due to project activity iii. SDG 7: Affordable and Clean Energy: 5,000 biogas units constructed and 100% functionality of biogas units due to repairs and maintenance of biogas units and reduction of 2.85 t of fuelwood/HH. iv. SDG 13: Climate Action: 15,749 metric tonnes CO_2 equivalent per annum v. 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 m^3 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. All the 5,000 units were constructed, the details of which are as follows.

Mandal	Number of Villages	Number of Households
Chilamathur	70	1,030
Gorantla	82	1,058
Penukonda	33	481
Roddam	57	1,544
Somandepalli	44	887
Total	**286**	**5,000**

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 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. There are several studies that shows the impacts of biogas on SDGs. Based on a scientific study conducted in India, by Lewis et al., 2017[1]., the following impacts were seen:

- Compared to traditional stove users, biogas users showed a reduction of fuelwood use @3.8 kg per day/family.
- Filters from household air sampling were analyzed for PM2.5 and PAH. The study also shows significantly lower levels of household PM2.5 associated with biogas compared to traditional stoves. There was a reduction of 72% reduction in PM2.5. Biogas users was associated with lower levels of seven high-risk PAHs, total PAH, and WSON
- The study showed negative associations between ICS use and hospitalization (days and money spent) for respiratory infections. Regression analysis showed the relationship between hospitalization and ICS use is particularly significant for subjects less than 35 years of age and for specific measures of
- air quality (e.g., high levels of PM2.5 and PAH). Also, beyond respiratory illness, ICS use was associated with reduced systemic blood pressure. Specifically, the study observed that increased systolic and diastolic blood pressure is associated with (i) high PM2.5 exposure and (ii) elevated levels of watersoluble organic nitrogen, especially in older (>35 years) cooks.
- Biogas users saved substantial time in firewood collection. Biogas users spent 1.5 h per day lesser on firewood collection compared to traditional stove users.
- A study of biogas slurry and manure was conducted on 114 samples from livestock farms and biogas plants. The livestock manure showed the presence of E. coli, Salmonella spp., and Staphylococcus spp. that varied from 0–5.11, 0–4.84, and 0–5.59 log cfu/gm. The above-mentioned bacteria were absent in bio-slurry collected from anaerobic digester after bio-digestion at environmental temperature. Bacterial counts were reduced significantly in both household slurry pits and experimental anaerobic digester[2].

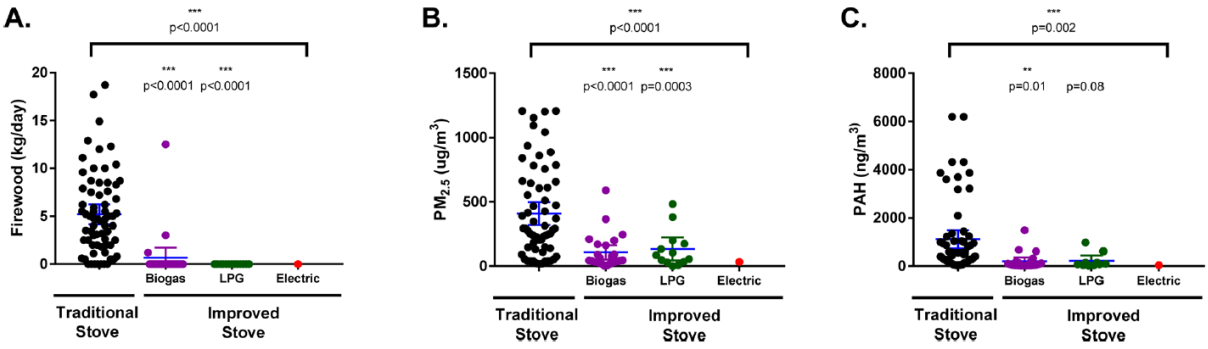

Figure 1. (a) Average firewood consumption by stove type; (b) average household $PM_{2.5}$ concentrations by stove type (WHO interim standard is 35 $\mu g/m^3$); (c) average PAH concentrations by stove type Error bars shown at the 95% confidence interval show difference between traditional stoves and all ICS.

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

SDG	Parameter	Baseline	Project	Net Benefit
3 GOOD HEALTH AND WELL-BEING **SDG 3: GOOD HEALTH**	i. Continued improved indoor air condition and reduced respiratory	i. Use of traditional cookstove causing indoor smoke and health hazards.	i. Reduction in indoor air pollution (100% of HHs)	i. 100% reduction in indoor air pollution. ii. Reduction in pathogen load.

[1] Lewis et al., 2017. Biogas Stoves reduce firewood use,household air pollution and hospital vists in Odisha, India. Environ. Sci. Technol. 2017, 51, 560−569. DOI: 10.1021/acs.est.6b02466.

[2] Microbial load in bio-slurry from different biogas plants in Bangladesh - PMC (nih.gov)

AND WELL-BEING	problems especially for women and children. ii. Reduction of pathogens in slurry compared to that of dung	(o% of HHs having clear indoor air) ii. Pathogens in dung	ii. Pathogens in Biogas Slury	
 **SDG 5: GENDER EQUALITY**	Reduction in drudgery of cooking and ease of cooking	Women spent time and effort in fetching, processing and storing fuelwood for cooking and cooking on traditional stoves	Save time for fuelwood collection and cooking due to ease of cooking on biogas	Time saved for fuelwood collection and cooking due to ease of cooking on biogas and collection of fuelwood.
 **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 untis constructed ii. Number of units operational and reduction of fuelwood	i. Number of biogas untis constructed ii. Number of units operational and amount of fuelwood reduction/HH
 **SDG 13: CLIMATE ACTION**	GHGs emissions reduction per year	15,749 tCO_2 emited by using traditional cook stoves by 5,000 households	0 tCO_2 emited by using biogas	15,749 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 tCO2e
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 tCO2/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

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 By is adjusted to account for the quantified leakage. Alternatively, By 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.)

SDG 13

Data/Parameter	**$f_{NRB,y}$**
Unit	*Fraction*
Description	Fraction of woody biomass saved by the project activity during 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, Government 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/parameter	Calculation of baseline emissions
Additional comments	This parameter is fixed for the entire crediting period. The f_{NRB} calculations is based on the latest available statistics of the Forest Survey of India, Government of India. Further, f_{NRB} calculations done at the project activity level, i.e. Anantapur district, based on latest statistics gives a value of 0.98. As this value is conservative, it has been used.

Data/Parameter	**N_{HH}**
Unit	Number
Description	Number of households in the project activity in year y
Source of data	Online Monitoring Solution
Value(s) applied	5,000
Choice of data or measurement methods and procedures	Established ex ante prior to start of the project activity
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	During calculation of Emission Reduction, it will be based on actual number of households in which the units have been constructed and commissioned

Data/Parameter	**$BC_{BL,HH,y}$**
Unit	tonnes/year/family
Description	Average annual consumption of woody biomass per household before the start of the project activity, tonnes/household/year
Source of data	Based on survey in the project region during 2016-17 as mentioned in the methodology
Value(s) applied	2.85 tonnes/year/family and 14,257 t/year for 5,000 families
Choice of data or measurement methods and procedures	Calculated using option (a) Calculated as the product of the number of households multiplied by the estimate of average annual consumption of woody biomass per household displaced by the project activity (tonnes/household/year).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	This parameter is fixed for the entire crediting period. According to CDM-EB93-A04-STAN Standard CDM project standard for project activities, if data and parameters used for determining the original baseline, that were determined ex ante and not monitored during the crediting period, are no longer valid, the project participants shall update such data and parameters in accordance with the "Methodological tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period". 85.71% of the rural population in Anantapur district still use fuelwood for cooking and hence the new circumstances have not impacted the baseline scenario. Based on a survey conducted during 2016-17, the fuelwood use has been updated, which is lesser than that considered for the first crediting period.

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	The parameter shall be adjusted for leakage, wherein B_y will be multiplied by 0.95, which is fixed for the crediting period. Biomass (t) – 2.85 x 0.95 = 2.71 t/yr for 365 days. The biomass diversion is 2.85 – 2.71 = 0.14 t/family/yr.
Choice of data or measurement methods and procedures	According to I.E, Version 07, 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. 2.85 x 0.95 = 2.71 t/household/yr. Thus the diversion is 2.85 – 2.71 = 0.14 t/family/yr.
Purpose of data/parameter	Calculation of leakage
Additional comments	This parameter is fixed for the entire crediting period. Surveys will not be conducted to determine leakage

Other SDGs

There are no ex-ante parameters for other SDG parameters that are fixed for the crediting period.

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. SEDS 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[3]. SEDS works to increase the participation of women and their involvement in decision making. SEDS continuously makes efforts to integrate gender perspective in programmes in various ways..

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.
- 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 SEDS.
- Regular feedback can be given by the end users to Village level volunteers and they in terms convey to the staff of SEDS.
- The project is implemented in the rural regions of Anantapur dostrict, Andhra Pradesh for the marginalized and landless 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.

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)[4], 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
- Though not directly associated with the project, the NGO provides equal access to women to agriculture sector, vocational guidance, employment and equal remuneration, etc.
- 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 CBOs are done.

[3] https://sedsngo.org/

[4] https://wcd.nic.in/womendevelopment/national-policy-women-empowerment

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 inititally 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.

Safeguard-ing 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 principles and guidelines[5]	No	- The project does not contribute to gender based discrimination and lead to sexual harassment or any 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	Not required.

[5] The Gold Standard Certification: (a) Promotes gender equality and the empowerment of women. (b) Does not recognise Projects that contribute to discrimination against women or reinforce gender-based discrimination and/or inequalities (c) Recognises and seeks to contribute to SDG 5 – Achieve gender equality and empower all women and girls. The Project Developers shall refer to the Gold Standard Gender Equality Requirements Guidelines and Gold Standard Gender Policy for further details in this regard. The Gold Standard Certification requires that 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.

			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 empower them and provide employment opportunities through the project and also provding 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. - The constitution of India has several articles that protect women which includes Article 14 – Equality before law, article 15 prohibiting discrimination on ground of religion, race, caste, sex or place of birth, Article 16 which is equality of opportunity in matters of public employment and the sexual harassment of women at workplace (Prevention, Prohibition and Redressal act, 2013) and Equal Remuneration Act, 1976[6].	
3.4.3 Land Tenure and Other Rights	1. Does the Project require any change to land	No	The project does not involve land tenure and rights associated with it, as the biogas dome is constructed in	Not required.

[6] https://www.worldwidejournals.com/paripex/recent_issues_pdf/2015/September/September_2015_1492176817__30.pdf

	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?		their own land with connection to the stoves in the kitchen. Beneficiary should have their own land of space of about 50-60 sq mt area installing small biogas plant[7].	
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, implementation, operation and after the Project. Particular focus shall be given to vulnerable and marginalised social	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 100% carbon revenue[8] and is continued to be repaired and maintained through carbon revenue.	Not required.

[7] Ministry of New and Renewable Energy,Biogas,Goverment of India for Biogas (mnre.gov.in)

[8] ERPA document was made available to the DOE during site visit.

	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 and in fact decreases GHG emissions as the methodology applicable is I.E to estimate emission reductions over the baseline[9]. It also decreases indoor air pollution compared to baseline scenario[10].	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	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.

[9] Renewable biogas for efficient emission cuts | Gasum

[10] Biogas, a Climate and Clean Air Solution with Many Benefits. | Climate & Clean Air Coalition (ccacoalition.org)

	disrupt the natural 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[11] and falls under the least vulnerable zone in India[12].	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[13].	Not required.

[11] https://www.scoopwhoop.com/Earthquake-Zoning-Map-Reveals-59-Of-India-Is-Prone-To-Moderate-Severe-Earthquakes/

[12] https://www.tandfonline.com/doi/pdf/10.1080/19475705.2014.897656

[13] English (ctae.ac.in)

4.3.5 Hazardous and Non-hazardous Waste	Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	The project does not involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials.	Not required.
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 haresting 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 husbandary 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 respondants 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 the first monitoring period
QA/QC procedures	i. 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	Reduction in Hours for collection of woody biomass and cooking
Source of data	Sample survey
Value(s) applied	Atleast reduction of 50% of time
Measurement methods and procedures	Sample survey and record the experience of women for reduction in time spent compared to baseline
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 5.
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 enterd 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 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	15,749 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.** Mobilize financial resources for developing countries
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. The biogas units were build with 100% forward funded carbon investment for construction, maintenance and the staff to monitoring.

Source of data	Audited statement for the project showing carbon funding received for the project activity.
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 accessable to the rural women, which can be transperantly tracked through bank transfers after the ERPA period.
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	The project is still under ERPA and repaying through credits to BFW, Germany.

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

>>

This biogas CDM project will be implemented and monitored by the Social Education and Development Society, a grass root people's organisation that has been operating in the project boundary for the last 35 years.

This biogas CDM project will be implemented for 5000 members of the SEDS village organisational network made up of individual village organisations.

The project implementation and monitoring team comprises of the following:

- CDM coordinator: Appointed by the SEDS board of trustees, manages the project on a full time basis.
- Project Staff: 1 database manager, 11 biogas field workers appointed by the CDM coordinator.
- Masons: 91 individuals were selected through the village organisations to partake in an apprenticeship programme through which they were fully trained as biogas masons. Each was contracted, on a piece-rate basis, for the construction of these 5,000 units. Now for repair and maintenance, these masons are contacted as and when required.
- Village level volunteers (VLV): Villages have village level volunteers who maintain a daily usage register for each unit built in their village and enter them into the digitized monitoring system on a monthly basis.
- A maintenance team post implementation ensures that all units are fully operational for the lifetime of the project.

Monitoring database

An online digitized system, custom built for monitoring this Biogas CDM Project, is used to enter data on an everyday basis and generate real-time online Progress Reports. Inputting data into this intranet solution is permission driven – i. e. each Biogas Field Worker recorded construction progress of only those villages entrusted to her/him; Volunteers record daily usage only for their respective village; etc. Progress and Analytical Reports are totally transparent, open for one and all. These reports are perused by:

- Village organisation functionaries who meet regularly to discuss the progress made in their respective villages. All of these meetings are also attended by the respective biogas field worker of the area. Any problems identified are discussed and solutions found.
- Project staff meets regularly to ensure take stock of the functionality of biogas units.
- After the construction and satisfactory functioning of each biogas plant for a minimum of 2 weeks, an end user agreement on legal paper was signed with the respective beneficiary, and this date was taken as the day of commissioning of that particular biogas unit. Thus from day 1 of the commissioning of the biogas plant, full account of emission reduction is considered.
- All data is archived and stored throughout the crediting period and an additional two years.

Maintenance/Servicing of the biogas units

The post-construction daily usage monitoring immediately identifies dysfunctional units and specific problems faced by the end user.

Repairs and maintenance are undertaken by the maintenance team appointed post implementation. The village level volunteer through daily usage monitoring discovers if any unit has become dysfunctional. They inform the biogas field worker who will visit the unit and assess requirements. If necessary, a member from the maintenance team will be called out to fix the problem. The phone number of village volunteers, biogas workers and CDM coordinator is given to all the end users, so that they can inform for any repairs and maintenance.

Monitoring Plan:

- The single relevant project aspect deemed necessary to monitor and report reliable emission reductions is the continued use of the biogas plant. The number of systems operating annually is recorded through evidence of continuous daily monitoring at the village level by the village level volunteer.
- Provided all plants are in continuous use throughout the project period, and emergency preparedness arrangements are recorded as having been used, it is expected that the ex-ante emission reductions will be achieved.
- To monitor this single most important project aspect, the CDM Coordinator will depend on the continued servicing and maintenance management done by the project and documented in the database.
- All monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs for the project activity, whichever occur later both on paper and electronically.

Frequency of Monitoring:

- 100% of plants will be monitored every day for operation of the biogas units and monitoring report prepared for verification.

Leakage:

Leakage will not be monitored as 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

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)*

(a) Start date of the project activity: 01/07/2010

(b) Start Date: 01/01/2011 for the first crediting period;

01/01/2018 for the second crediting period

(c) Length of the crediting period: 7 yrs – 0 months

First Crediting Period (01 Jan 11 - 31 Dec 17)
Second Crediting Period (01 Jan 18 - 31 Dec 24)

D.1.2 Expected operational lifetime of project

>> (*Specify in years)*

25y-0m[14]

[14] 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 years[15].

D.2.1 Start date of the ongoing GS crediting period

>> (Specify in dd/mm/yyyy)

01/01/2018

D.2.3 End date of the ongoing GS crediting period

>> (Specify in dd/mm/yyyy)

31/12/2024

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 credting 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 years[16].

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.

[15] https://www.goldstandard.org/globalgoals

[16] https://www.goldstandard.org/globalgoals

Appendix 1. Contact information of project participants

Organization name	**M/s SOCIAL EDUCATION AND DEVELOPMENT SOCIETY (SEDS)**
Registration number with relevant authority	
Street/P.O. Box	Anandapuram,
Building	Peddamanthur SO,
City	Penakonda, Anantapur District,
State/Region	Andhra Pradesh,
Postcode	515124
Country	INDIA
Telephone	
Fax	
E-mail	maniljayasena@gmail.com ; sedsngo@gmail.com
Website	www.sedsngo.org
Contact person	
Title	CEO
Salutation	Mrs.
Last name	Joshua
Middle name	Jayasena
First name	Manil
Department	-
Mobile	+91 8555 245424
Direct fax	-
Direct tel.	+91 8555 245436
Personal e-mail	