

**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:                                       | <b>Accion Fraterna Biogas CDM project for rural communities in Anantapur, Andhra Pradesh</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| GS ID of the project/PoA/activity:                                   | GS980                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| GS Version:                                                          | 2.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Brief description of Project:                                        | The Biogas CDM Project of Accion Fraterna is to set up 15,000 biogas plants for households in Ananthpur District, Andhra Pradesh State, India by Accion Fraterna, 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:                                                | 02/07/2012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| GS Crediting period start date:                                      | 31/05/2014                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| CDM Registration Date:                                               | 10 April 20 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| CDM Crediting period start date:                                     | 31/05/2014                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Project Developer:                                                   | M/s Accion Fraterna Ecology Centre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Project Representative:                                              | Mr. Malla Reddy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 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:                                                         | <ul style="list-style-type: none"> <li>i. SDG 3: Good health and well-being</li> <li>ii. SDG 4: Quality Education</li> <li>iii. SDG 5: Gender Equality</li> <li>iv. SDG 7: Affordable and Clean Energy'</li> <li>v. SDG 13: Climate Action</li> <li>vi. SDG 17: Partnerships for the Goals</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Estimated amount of SDG Impact (GSVERs and others)                   | <ul style="list-style-type: none"> <li>i. SDG 3: Good health and well-being: 100% reduction in indoor air pollution; reduction of pathogen load in biogas slurry</li> <li>ii. SDG 5: Quality Education: At least 2 training programs conducted annually</li> <li>iii. SDG 5: Gender Equality: At least 50% reduction in time and drudgery to women due to project activity; 50% women involved as village volunteers; type of activities taken up due to time saved</li> <li>iv. SDG 7: Affordable and Clean Energy: 100% functionality of biogas units due to repairs and maintenance of biogas units</li> <li>v. SDG 13: Climate Action: 48,528 metric tonnes CO<sub>2</sub> equivalent per annum</li> <li>vi. SDG 17: Partnerships for the Goals: 50% Carbon Funding to construct, repair, maintain and monitor the project</li> </ul> |

**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 15,000 biogas plants (digesters) of 2 m<sup>3</sup> 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 15,000 units which were taken up as the CDM project, 2991 units were built, the details of which are as follows. As on July 2019, 94.05%% units were operational.

| Mandals           | Total       |
|-------------------|-------------|
| Anantapur         | 243         |
| Atmakur           | 145         |
| Battalapalli      | 275         |
| Bukkarayasamudram | 358         |
| Dharmavaram       | 366         |
| Garladinne        | 130         |
| Kanaganepalli     | 286         |
| Kuderu            | 90          |
| Narpala           | 196         |
| Pamidi            | 26          |
| Pedda Vadaugur    | 22          |
| Putaparthi        | 88          |
| Rapthadu          | 262         |
| Singanamala       | 332         |
| Tadimarri         | 172         |
| <b>Total</b>      | <b>2991</b> |

## 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                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>SDG 3: GOOD HEALTH AND WELL-BEING</b> | <b>3.9.</b> By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.                                               |
|  <b>SDG 4: Quality Education</b>          | <b>Target 4.4.</b> By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship. |
|  <b>SDG 5: GENDER EQUALITY</b>            | <b>5.4.</b> 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                                                                                        |
|  <b>SDG 7: AFFORDABLE AND CLEAN ENERGY</b> | <b>7.2.</b> By 2030, increase substantially the share of renewable energy in the global energy mix                                                                  |
|  <b>SDG 13: CLIMATE ACTION</b>             | <b>13.3.</b> Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning |
|  <b>SDG 17: PARTNERSHIPS FOR THE GOALS</b> | <b>17.1.</b> 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, Accion Fraterna which is absent in the baseline scenario.

| SDG                                                                                                                   | Parameter                                                                                                                                                                       | Baseline                                                                                                                              | Project                                                                                                       | Net Benefit                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|  <b>SDG 3: GOOD AND WELL-BEING</b> | i. Continued improved indoor air condition and reduced respiratory problems especially for women and children.<br>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)<br>ii. Pathogens in dung | i. Reduction in indoor air pollution (100% of HHs)<br>ii. Pathogens in Biogas Slurry                          | i. 100% reduction in indoor air pollution.<br>ii. Reduction in pathogen load.                                     |
|  <b>Quality Education</b>          | Number of training sessions/workshops /seminars in the project area for the personnel.                                                                                          | No training programs to end users and staff for construction and use of biogas                                                        | At least two training workshops will be conducted annually for all the personnel during implementation phase. | At least two training workshops will be conducted annually for all the personnel during implementation phase.     |
|  <b>SDG 5: GENDER EQUALITY</b>     | 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                                   | 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; women involved as volunteers and |

|                                                                                                                             |                                                                                                                                                           |                                                                                       |                                                                              |                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                                                                                                                             |                                                                                                                                                           | traditional stoves                                                                    |                                                                              | various activities taken up                                                  |
|  <b>SDG 7: AFFORDABLE AND CLEAN ENERGY</b> | i. Construction and maintenance of biogas units for rural communities.<br>ii. Maintenance of constructed biogas units and elimination of use of firewood. | No Biogas Units                                                                       | i. Number of biogas units constructed<br>ii. Number of units operational     | i. Number of biogas units constructed<br>ii. Number of units operational     |
|  <b>SDG 13: CLIMATE ACTION</b>             | GHGs emissions reduction per year                                                                                                                         | 61,109 tCO <sub>2</sub> emitted by using traditional cook stoves by 18,000 households | 0 tCO <sub>2</sub> emitted by using biogas                                   | 43,528 tCO <sub>2</sub> emission reductions                                  |
|  <b>SDG 17: PARTNERSHIPS FOR THE GOALS</b> | 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 <sub>2</sub> 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 <sub>2</sub> /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:

- 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                               |  <b>SDG 13: CLIMATE ACTION</b><br>Target: Emission Reduction |
| Data/parameter                                       | <b>Rating Biogas</b>                                                                                                                           |
| Unit                                                 | kW <sub>th</sub> /digester                                                                                                                     |
| Description                                          | Thermal capacity of a digester                                                                                                                 |
| Source of data                                       | Calculated as shown in Section B.2                                                                                                             |
| Value(s) applied                                     | 1.78                                                                                                                                           |
| 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                               |  <b>SDG 13: CLIMATE ACTION</b><br>Target: Emission Reduction                                                                                                                                                                                                        |
| Data/parameter                                       | <b>By</b>                                                                                                                                                                                                                                                                                                                                              |
| Unit                                                 | Tonnes /year/family                                                                                                                                                                                                                                                                                                                                    |
| Description                                          | Quantity of woody biomass that is substituted or displaced in tonnes                                                                                                                                                                                                                                                                                   |
| Source of data                                       | Survey                                                                                                                                                                                                                                                                                                                                                 |
| Value(s) applied                                     | 3.57 tonnes/year/family                                                                                                                                                                                                                                                                                                                                |
| Choice of data or Measurement methods and procedures | Based on survey conducted to estimate the average annual consumption of woody biomass and further supported by a study Ramachandra, 2005. The details of the study are described in Annex 3 of the PDD. The average annual consumption of biomass is 3.57 t/family/year.<br><br>$B_y$ for 15,000 biogas units is $3.57 \times 15,000 = 53,550$ t/year. |
| Purpose of data                                      | Emission Reduction Calculations                                                                                                                                                                                                                                                                                                                        |
| Additional comment                                   | This parameter is fixed for the entire crediting period                                                                                                                                                                                                                                                                                                |

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevant SDG Indicator                               |  <b>SDG 13: CLIMATE ACTION</b><br>Target: Emission Reduction                                                                                                                                                                                                                                                                                                                                                                   |
| Data/parameter                                       | <b>fNRB, y</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 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                                     | 0.91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Choice of data or Measurement methods and procedures | Based on a national study conducted by the Forest Survey of India, Ministry of Environment and Forests, Government of India to assess the woody biomass demand and availability at the state and national level in India during 1995. Based on the same concept and the national, local, remote sensing data and peer-reviewed research papers, the renewable and non-renewable component of biomass has been established at the Mandal level for the project area as detailed and shown in Table 4 of the PDD. |
| Purpose of data                                      | Emission Reduction Calculations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Additional comment                                   | This parameter is fixed for the entire crediting period                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                                                      |                                                                                                                                               |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Relevant SDG Indicator                               |  <b>SDG 13: CLIMATE ACTION</b><br>Target: Emission Reduction |
| Data/parameter                                       | <b>NCVbiomass</b>                                                                                                                             |
| 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                               |  <b>SDG 13: CLIMATE ACTION</b><br>Target: Emission Reduction                                                                                                                                |
| Data/parameter                                       | <b>EF<sub>projected_fossilfuel</sub></b>                                                                                                                                                                                                                                       |
| Unit                                                 | tCO <sub>2</sub> /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 |  <b>SDG 13: CLIMATE ACTION</b><br>Target: Emission Reduction |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                             |                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data/parameter</b>                                       | <b>Diversion of non-renewable biomass saved under the project activity by non-project households</b>                                                                                                                                                                                                 |
| <b>Unit</b>                                                 | tonnes / year                                                                                                                                                                                                                                                                                        |
| <b>Description</b>                                          | Diversion of non-renewable biomass saved under the project activity by non-project households                                                                                                                                                                                                        |
| <b>Source of data</b>                                       | Based on the methodology $B_y$ will be multiplied by a net to gross adjustment factor of 0.95 to account for leakages.                                                                                                                                                                               |
| <b>Value(s) applied</b>                                     | Biomass (t) – $3.57 \times 0.95 = 3.39$ t/yr. The biomass diversion is $3.57 - 3.39 = 0.18$ t/family/yr or 2700 t/yr for 15,000 families.                                                                                                                                                            |
| <b>Choice of data or Measurement methods and procedures</b> | 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. $3.57 \times 0.95 = 3.39$ t/Household/yr. Thus the diversion is $3.57 - 3.39 = 0.18$ t/family/yr or 2700 t/yr for 15,000 families. |
| <b>Purpose of data</b>                                      | Leakage Calculations                                                                                                                                                                                                                                                                                 |
| <b>Additional comment</b>                                   | 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. Accion Fraterna 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<sup>1</sup>. AF works to increase the participation of women in CBOs and their involvement in decision making. AF continuously makes efforts to integrate gender perspective within AF and in programmes in various ways. AF is moving towards a holistic perspective on gender and its mainstreaming in the organization and its programmes, increase women's participation in its activities and community based institutions, promot women leadership with an objective to take up village issues and Consciously increase recruitment of women in the Staff.

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 AF.
- Regular feedback can be given by the end users to Village level volunteers and they in terms convey to the staff of AF.
- 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.

<sup>1</sup> <http://af-ecologycentre.org/about-us/overview/>

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)<sup>2</sup>, 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.

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.

| <b>Safeguarding principles</b>         | <b>Assessment questions</b>                                                                   | <b>Assessment of relevance to the project (Yes/potentially/no)</b> | <b>Justification</b>                                                                                                                  | <b>Mitigation measure (if required)</b> |
|----------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| 3.2 Gender Equality and Women's Rights | Questions in the relevant section of the safe guarding principles and guidelines <sup>3</sup> | No                                                                 | - The project does not contribute to gender based discrimination and lead to sexual harassment or any form of violence against women. | Not required.                           |

<sup>2</sup> <https://wcd.nic.in/womendevelopment/national-policy-women-empowerment>

<sup>3</sup> 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.

|                       |                                 |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
|-----------------------|---------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                       |                                 |    | <p>Neither does the project contribute to slavery, imprisonment, physical or mental drudgery. In fact the project addresses to alleviate women drudgery.</p> <ul style="list-style-type: none"> <li>- 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 drudgery.</li> <li>- The project is being implemented for the rural communities in semi arid region, thereby addressing the needs of vulnerable communities of the region.</li> <li>- There is no discrimination of caste or creed and all families are part of the project voluntarily.</li> <li>- The project is not leading to any sexual harassment of women or obstruction to any of their rights.</li> <li>- 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.</li> <li>- 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 providing them time to do what they wish, which is usually used to provide additional income.</li> <li>- The project does not require an input of any expert stakeholder as the project directly contributes to women empowerment and alleviating their drudgery.</li> </ul> |               |
| 3.4.3 Land Tenure and | 1. Does the Project require any | No | The project does not involve land tenure and rights associated with it, as                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Not required. |

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |    |                                                                                                                                                                                                                                                                                   |               |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Other Rights                         | change to land tenure arrangements and/or other rights?<br>2. For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?                                                                                                                                                                                                                                                                                                                                                                              |    | the biogas dome is constructed in their own land with connection to the stoves in the kitchen.                                                                                                                                                                                    |               |
| 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.<br>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 groups in targeted communities and that benefits are socially-inclusive and sustainable | 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 and is continued to be repaired and maintained through carbon revenue. | Not required. |
| 4.1.1                                | Will the Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No | The project does not increase GHG                                                                                                                                                                                                                                                 | Not           |

|                                                 |                                                                                                                                                                                                                                                                                                            |    |                                                                                                                                                                                       |               |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Emissions                                       | increase greenhouse gas emissions over the Baseline Scenario?                                                                                                                                                                                                                                              |    | emissions over the baseline. It also decreases indoor air pollution compared to baseline scenario.                                                                                    | 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 pattern of erosion?<br>If 'Yes' or 'Potentially' proceed to question 2.<br>2. Is the Project's area of influence susceptible to excessive erosion and/or water body instability? | 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. |
| 4.2.3 Landscape                                 | Does the Project involve the use of                                                                                                                                                                                                                                                                        | No | The Project does not involve the use of land and soil for production of crops                                                                                                         | Not required. |

|                                         |                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                |               |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| modification and soil                   | land and soil for production of crops or other products?                                                                                                                             |    | or other products and hence not applicable.                                                                                                                                                                                                                                                                                                    |               |
| 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 <sup>4</sup> and falls under the least vulnerable zone in India <sup>5</sup> . | 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-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                                                                                                                                           | No | The project does not involve harvesting of forests. In fact, it reduces harvesting of trees for fuelwood use.                                                                                                                                                                                                                                  | Not required. |

<sup>4</sup> <https://www.scoopwhoop.com/Earthquake-Zoning-Map-Reveals-59-Of-India-Is-Prone-To-Moderate-Severe-Earthquakes/>

<sup>5</sup> <https://www.tandfonline.com/doi/pdf/10.1080/19475705.2014.897656>

|                        |                                                                                                                                                        |    |                                                                                                                                                                  |               |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                        | forests?                                                                                                                                               |    |                                                                                                                                                                  |               |
| 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.)

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Relevant SDG Indicator/Safeguarding Principle</b> |  <b>SDG 3: GOOD HEALTH AND WELL-BEING</b><br><b>Target 3.9.</b> By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.                                                                                               |
| <b>Data / Parameter</b>                              | i. Continued improved indoor air condition and reduced respiratory problems especially for women and children.<br>ii. Reduction of pathogens in slurry compared to that of dung                                                                                                                                                                                                                 |
| <b>Unit</b>                                          | i. % of respondents<br>ii. % reduction in bacterial count                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>                                   | i. % of biogas-users responding positively to improved indoor air condition and reduced health problems during sample survey<br>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. |
| <b>Source of data</b>                                | i. Based on experience by the communities for reduction in health problems. through sample survey.<br>ii. Laboratory Analysis                                                                                                                                                                                                                                                                   |
| <b>Value(s) applied</b>                              | i. 100% of the surveyed families<br>ii. Percent reduction in bacterial count                                                                                                                                                                                                                                                                                                                    |
| <b>Measurement methods and procedures</b>            | i. Sample survey and record the experience by the communities for reduction in health problems compared to baselines.<br>ii. Laboratory Analysis of dung and biogas slurry                                                                                                                                                                                                                      |
| <b>Monitoring frequency</b>                          | i. Once in 2 years.<br>ii. Once during the beginning of crediting period                                                                                                                                                                                                                                                                                                                        |
| <b>QA/QC procedures</b>                              | A minimum of 30 households will be sample surveyed.                                                                                                                                                                                                                                                                                                                                             |

|                           |                                                   |
|---------------------------|---------------------------------------------------|
| <b>Purpose of data</b>    | To determine the impact of the project to the SDG |
| <b>Additional comment</b> |                                                   |

|                                                  |                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Relevant Indicator/Safeguarding Principle</b> |  <p><b>SDG 4: Quality Education</b><br/>Target 4.4. By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.</p> |
| <b>Data / Parameter</b>                          | Number of training sessions/workshops/seminars in the project area for the personnel.                                                                                                                                                                                                                                          |
| <b>Unit</b>                                      | Number                                                                                                                                                                                                                                                                                                                         |
| <b>Description</b>                               | Training programs conducted to the end-users and staff.                                                                                                                                                                                                                                                                        |
| <b>Source of data</b>                            | Minutes of the meetings                                                                                                                                                                                                                                                                                                        |
| <b>Value(s) applied</b>                          | Atleast 2 training programs in an year.                                                                                                                                                                                                                                                                                        |
| <b>Measurement methods and procedures</b>        | Minutes of the meeting will be recorded with the details of attendance and agenda of the meeting.                                                                                                                                                                                                                              |
| <b>Monitoring frequency</b>                      | As and when conducted                                                                                                                                                                                                                                                                                                          |
| <b>QA/QC procedures</b>                          | No                                                                                                                                                                                                                                                                                                                             |
| <b>Purpose of data</b>                           | To assess the contribution of the project to SDG 4                                                                                                                                                                                                                                                                             |
| <b>Additional comment</b>                        |                                                                                                                                                                                                                                                                                                                                |

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Relevant SDG Indicator/Safeguarding Principle</b> |  <p><b>SDG 5: GENDER EQUALITY</b><br/><b>Target 5.4.</b> 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</p> |
| <b>Data / Parameter</b>                              | Reduction in drudgery of cooking – Save time<br>Women in monitoring of the project activity<br>Type of income generation activities taken up by women.                                                                                                                                                                                                                                             |
| <b>Unit</b>                                          | Hrs<br>Number of village volunteers for the project activity<br>Number of type of activities taken up by women                                                                                                                                                                                                                                                                                     |
| <b>Description</b>                                   | Reduction in Hours for collection of woody biomass and cooking<br>Paid Village level volunteers monitoring the project<br>Different type income generation activities taken up by women                                                                                                                                                                                                            |
| <b>Source of data</b>                                | i and iii. Sample survey<br>ii. Records of Accion Fraterna, the PP                                                                                                                                                                                                                                                                                                                                 |
| <b>Value(s) applied</b>                              | Atleast reduction of 50% of time<br>Atleast 50% women are village volunteers<br>Atleast 1 type of activities taken up by women                                                                                                                                                                                                                                                                     |
| <b>Measurement methods and procedures</b>            | Sample survey and record the experience of women for reduction in time spent compared to baseline and type of activities taken up.<br>Records of Accion Fraterna, the PP.                                                                                                                                                                                                                          |
| <b>Monitoring frequency</b>                          | Once in 2 years                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>QA/QC procedures</b>                              | A minimum of 30 households will be sample surveyed.                                                                                                                                                                                                                                                                                                                                                |
| <b>Purpose of data</b>                               | To determine the impact of the project to the SDG 5.                                                                                                                                                                                                                                                                                                                                               |

|                    |  |
|--------------------|--|
| Additional comment |  |
|--------------------|--|

|                                               |                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevant SDG Indicator/Safeguarding Principle |  <p>SDG 7: Affordable and Clean Energy<br/><b>Target 7.2.</b> By 2030, increase substantially the share of renewable energy in the global energy mix</p>                                                                                       |
| Data / Parameter                              | i. Construction and maintenance of biogas units for rural communities.<br>ii. Maintenance of constructed biogas units and elimination of use of firewood.                                                                                                                                                                       |
| Unit                                          | i. No. of biogas systems constructed<br>ii. Number of units operational                                                                                                                                                                                                                                                         |
| Description                                   | Number of biogas units constructed for the rural communities thereby reducing the use of fuelwood.<br>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 |  <p>SDG 13: Climate Action<br/>Target: Emission Reduction</p> |
| Data / Parameter                              | GHGs emissions reduction per year                                                                                                                |
| Unit                                          | tCO <sub>2</sub> 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                              | 48,528 tCO <sub>2</sub>                                                                                                                          |
| 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<br>i. GHGs emissions reduction per year                     |
| Additional comment                            |                                                                                                                                                  |

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

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

### >> Management

#### 1. Implementation Plan

The project activity was implemented only after registration as a GS CDM project activity. CERs generated was sold, in advance, to a Carbon Investor under an ERPA drawn up for the purpose. Revenues is used in a completely open and transparent manner to construct the 15,000 biogas units. Orders to various local entrepreneurs for construction of biogas units i.e. bricks, cement, sand, stoves, pipes, noozle is placed after procuring the advance CER revenues as the project is funded only from CER revenues.

As elaborated below, before commencement of the Biogas CDM Project, village-wise Participation Agreements was signed between AF Ecology Centre and potential End Users, describing the roles and responsibilities.

A CDM Team appointed to facilitate construction and maintenance of the biogas units as described below.

A Standard Operation Procedure Manual is prepared for implementation and monitoring of the project activity, which is followed by the CDM Team.

#### 2. Project Management and Monitoring

This Biogas CDM project is implemented and monitored by AF Ecology Centre, which involves construction of 15,000 domestic biogas units of 2m<sup>3</sup> capacity, for as many farmer families in Anantapur district, A.P., India.

AF Ecology Centre 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 is the 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 AF Ecology Centre

A dedicated team is set up within AF Ecology Centre for management and monitoring of the Biogas CDM Project. This Project Management & Monitoring Unit consists of the following staff:

1. **Biogas CDM Project Manager:** A biogas CDM project manager is for overall in-charge of the project activity. The CDM project manager is responsible for overall project implementation in the first 3-4 years and meeting the requirements of monitoring protocol thereafter. He is directly appointed by AF Ecology Centre Board of Trustees and reports to the Director, AF Ecology Centre. His main functions are as follows:

2.4 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
2. **IT Professional:** A IT profession directly reports to the Director, AF Ecology Centre. He 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
  - a) **Accountant:** He is responsible for ensuring a strict and diligent spending of CER Revenues and the recording thereof in a computerised accounting package. He will report to Finance Manager, AF Ecology Centre, and be an integral part of the general finance team of the Centre. He administers the following tasks:
    - Arrange for the bulk purchase of cement and hardware and transfer them to the Mandalam 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 of approximately 500 units during the 3-4 year construction phase. They report to the Project Manager and their tasks are to:
    - 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 Mandalam 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 were trained at ongoing Biogas CDM Projects in the neighbourhood. They were assigned to each Biogas Field Worker. They are paid a piece rate for each unit they build and their personal and contact details are stored in the digitized monitoring solution to fix responsibility.

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 three 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
- 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 institutions

## 2.2. Management system at village level:

- **End User Groups:** About 30 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 makes arrangement with neighbours to ensure that the unit functions uninterrupted.

A Volunteer at the village level maintains the Daily Monitoring Books where usage hours and reasons for non-usage are recorded every single day. They create an environment of transparency, trust, and feelings of belonging and solidarity. The scope of these Groups go beyond the Biogas, into fostering and managing cooperation in agriculture, timely credit, better bargaining with Government agencies, traders, etc.

- **Volunteers:** Every participating village has a Volunteer to monitor usage of about 30 biogas units. She is usually a young, schooled 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.

## 2.3 Digitized Monitoring system

A customised Biogas CDM Monitoring Solution developed and tested by Tristle Technologies Pvt. Ltd., is used to maintain demographic data, construction processes, and the regular monitoring.

Tristle Technologies Pvt. Ltd. has developed a web based solution which is permission driven, intuitive and easy to use by Project Staff and Volunteers. All activity processes, including financial transactions, are digitally monitored using an Intranet solution. Open and transparent online reports is used by all the Project Staff and secondary stakeholders to know the Progress and Results. Reports are 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.

The screenshot displays a web application interface for the 'AF Biogas CDM Project'. The main content area is titled 'Participating Families - 003 B. Yaleru'. Below this title is a table listing the details of participating families. The table has four columns: 'Head of Household', 'Age', 'Father's Name', and 'Caste'. Each row represents a family, with the first column containing a unique ID and the name of the head of household. The 'Age' column shows the age of the head of household. The 'Father's Name' column shows the name of the father. The 'Caste' column shows the caste of the family. To the right of each row, there are two buttons: 'Add' and 'Remove'. At the bottom of the table, there are two buttons: 'Add a Family' and 'Another Village'.

| Head of Household     | Age | Father's Name  | Caste             |
|-----------------------|-----|----------------|-------------------|
| 104 AKHILANNA         | 41  | OBULESU        | Boya              |
| 105 C. ESWARAJAH      | 41  | N. RAJANNA     | Boya              |
| 106 C. ESWARAJAH      | 41  | OBULAPPA       | Boya              |
| 107 CHANDRAPPA        | 41  | HANUMANNA      | Boya              |
| 108 CHINNA RAMUDU     | 41  | NAGANNA        | Madiga            |
| 109 KARDALLAPPA       | 41  | BALAPP         | Madiga            |
| 110 M. ESWARAJAH      | 41  | VENKATAPPA     | Mangali           |
| 111 MURALANNA         | 41  | OBULESU        | Kuruba            |
| 112 NAGESDRA          | 41  | SANDEEVAPPA    | Kuruba            |
| 113 OBULESU           | 41  | SIDDALAH       | Kuruba            |
| 114 P. ESWARAJAH      | 41  | OBULESU        | Sugali            |
| 115 RAMAKRISHNA REDDY | 41  | NARAYANA REDDY | Kapu              |
| 116 sidrafiad         | 41  | sidrafiad      | Aghi Kula Khatiya |
| 117 SHANKARAJAH       | 41  | OBULESU        | Boya              |

**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
  - Non-usage days

Process: The solution is used to:

- Record the Mandalams, 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
- **Monitoring the Construction Phase**

Construction of 15,000 Biogas Units will be carried out in a phased manner over 3 years. 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 Gobar
  - 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 ensure quality of installed Biogas Units. They 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.

Each Biogas Unit is marked with a unique Identification Number and date of construction. Along with the Village Code and Family Code, these are irrefutably identify each of the 15,000 Biogas Units.

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.

## 2.5 Monitoring after Commissioning of biogas units

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A Daily Monitoring Book with a separate sheet for each of the Biogas User is maintained in each of the villages. This data is fed into the individual Biogas User's on-line database, once a month, for days not used and reasons.

Additional parameters monitored by a separate Audit Team, after commissioning of Biogas Units:

- Logging Audit Visits
- Logging Repairs
- Automatic calculation of Days Not Used

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

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

1. 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 know exactly where they stand in terms of progress and results. They are 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.
2. 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.
3. Verification data needed by the DoE is generated as Excel files.

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

### **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 are further 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 was signed between the Project Proponent (AF Ecology Centre) 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 on stamp paper is signed by each participating farmer with AF Ecology Centre.

### **5. Maintenance, Servicing & dealing with Emergencies**

From the forward sale of CERs mentioned earlier, a some of money are kept aside for maintenance and servicing.

Volunteers have about 30 units to visit on a daily basis and record Daily Monitoring data. They therefore are the point persons who immediately identify problems. Minor repairs are conducted either by the End User family or the Volunteer herself, since she will be 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 informed and the problem attended to within 3-4 working days.

Other emergencies like the sudden loss of cattle and fodder, etc. are dealt with by the End User Groups as described earlier.

A serious and well thought through bottom-up plans is chalked out to ensure a 95% + functionality of the 15,000 biogas units that will be built under this CDM Project.

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

- Orientation to end users on the effects of climate change, CDM processes and bio-gas.
- 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 per the arising future needs.

## 6. Monitoring Parameter for Emission Reduction

In accordance with Paragraphs 12 to 16 of the chosen methodology, Type I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, version 04:

*Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance.*

- The single relevant project aspect deemed necessary to monitor and report reliable emission reductions is the continued use of the biogas plant. As mentioned above, the number of systems built and operating annually will be recorded through evidence of continuous daily monitoring at the village level by the village level volunteer as mentioned above.

This is not just for monitoring of emission reduction, but to ensure that none of the biogas units have fallen to despair and are providing energy for continuous use by the communities.

*In order to assess the leakages specified under paragraph 10, monitoring shall include data on the amount of woody biomass saved under the project activity that is used by non-project households/users (who previously used renewable energy sources). Other data on non-renewable woody biomass use required for leakage assessment shall also be collected.*

- As stated in para 10(a) of the methodology, By is multiplied by a net to gross adjustment factor of 0.95 to account for leakages.
- Thus case survey are not be conducted to assess leakage.

*Monitoring should confirm the displacement or substitution of the non-renewable woody biomass at each location. In the case of appliances switching to renewable biomass the quantity of renewable biomass used shall be monitored.*

- 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 and there is complete displacement of non-renewable woody biomass by biogas.
- The project activity does not include production of renewable biomass as the substrate is dung. Thus leakage in the production of renewable biomass need not be monitored.

Para 15 of methodology on monitoring is not applicable as option (b) in Para 6 is not chosen.

Para 16 of methodology on monitoring is not applicable, as it is not water treatment technologies that is implemented.

## Frequency of Monitoring

- 100% of plants will be monitored for non-usage of biogas units on daily basis and accordingly calculate emission reduction in the monitoring report for only usage days for verification.

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.

## 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)

03/10/2014

#### D.1.2 Expected operational lifetime of project

>> (Specify in years)

25y-0m<sup>6</sup>

### 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<sup>7</sup>.

#### D.2.1 Start date of the ongoing GS crediting period

>> (Specify in dd/mm/yyyy)

31/05/2014

#### D.2.3 End date of the ongoing GS crediting period

>> (Specify in dd/mm/yyyy)

30/05/2021

#### 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)

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<sup>6</sup> Dheenabandhu Model 2000 Biogas Units, developed by AFPRO, Action For Food Production, New Delhi

<sup>7</sup> <https://www.goldstandard.org/globalgoals>

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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 years<sup>8</sup>.

## **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.

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

## Appendix 1. Contact information of project participants

|                                                    |                                                                                  |
|----------------------------------------------------|----------------------------------------------------------------------------------|
| <b>Organization name</b>                           | <b>Accion Fraterna Ecology Centre</b>                                            |
| <b>Registration number with relevant authority</b> |                                                                                  |
| <b>Street/P.O. Box</b>                             | Upparapalli Road                                                                 |
| <b>Building</b>                                    | Bangalore Highway                                                                |
| <b>City</b>                                        | Anantapur                                                                        |
| <b>State/Region</b>                                | Andhra Pradesh / South India                                                     |
| <b>Postcode</b>                                    | 515002                                                                           |
| <b>Country</b>                                     | India                                                                            |
| <b>Telephone</b>                                   | +91 8554244222                                                                   |
| <b>Fax</b>                                         | -                                                                                |
| <b>E-mail</b>                                      | <a href="mailto:mallareddy@accionfraterna.org">mallareddy@accionfraterna.org</a> |
| <b>Website</b>                                     | <a href="http://www.af-ecologycentre.org">www.af-ecologycentre.org</a>           |
| <b>Contact person</b>                              | -                                                                                |
| <b>Title</b>                                       | Director                                                                         |
| <b>Salutation</b>                                  | Mr.                                                                              |
| <b>Last name</b>                                   | Reddy                                                                            |
| <b>Middle name</b>                                 | -                                                                                |
| <b>First name</b>                                  | Malla                                                                            |
| <b>Department</b>                                  | -                                                                                |
| <b>Mobile</b>                                      | 09849056555                                                                      |
| <b>Direct fax</b>                                  | 08554 244990                                                                     |
| <b>Direct tel.</b>                                 | 08554 246660                                                                     |
| <b>Personal e-mail</b>                             | <a href="mailto:yvmallareddy@yahoo.co.in">yvmallareddy@yahoo.co.in</a>           |