Gold Standard for the Global Goals
Key Project Information & Project Design Document (PDD)

Version 1.1 – August 2017

Gold Standard

KEY PROJECT INFORMATION

Title of Project:	Adilabad biogas project
Brief description of Project:	The project activity aims to provide a clean and renewable energy by providing biogas plants to the households in Telangana state of India. The biogas use will substitute firewood and/or other fuels used for daily cooking needs and, thereby leading to decrease in the deforestation rate in the project area. The project beneficiaries will be trained to use the biogas slurry for agriculture as an organic compost. The use of the slurry will improve the soil fertility and reduce the expenses & dependence on chemical fertilisers.
Expected Implemetation Date: Expected duration of Project:	- 01/03/2018 15 years
Project Developer:	MYPLANET
Project Representative:	MYPLANET
Project Participants and any communities involved:	SKG SANGHA
Version of PDD: Date of Version:	Version: 3 11/02/2019
Host Country / Location:	Telangana, India
Certification Pathway (Project Certification/ Impact Statements & Products	Project certification
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG
Methodologies applied:	Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1), August 2017
Product Requirements applied:	GS4GG
Regular/Retroactive:	Retroactive
SDG Impacts:	• SDG 1 – No poverty • SDG 2 – Zero Hunger • SDG 3 – Good health and well-being • SDG 7 – Affordable and clean energy • SDG 13 – Climate Action • SDG 15 – Life on land
Estimated amount of SDG Impact Certified	SDG 13 - 64,793 tCO_2eq

SECTION A. Description of project

A.1. Purpose and general description of project

>> *(Provide a brief description of the project including the description of scenario existing prior to the implementation of the project.)*

The proposed project activity aims to provide biogas units (clean and sustainable source of renewable energy for cooking) to the target households in state of Telangana, India. The biogas units will be implemented in the following districts of Telangana state – *Adilabad, Mancherial, Nirmal and Kumurambheem (Asifabad).* The proposed project activity will be implemented by MyPlanet and SKG Sangha.

Scenario prior to the implementation of the project activity:
Major part of the population in Telangana reside in the rural areas and dependent on agriculture for their livelihoods[1]. In the context of the project activity a baseline survey was carried out for 644 rural households in the target project zones. The survey shows that the potential beneficiaries in the project areas use mainly firewood for cooking. The use of firewood with other fuels for cooking were also observed (use of LPG and kerosene). The use of firewood for daily cooking is not only one of the causes of deforestation but also indoor air pollution affecting directly or indirectly the health the women and children. Every year, 4.3 million people worldwide die prematurely from illnesses related to indoor air pollution in homes, which results from the inefficient use of solid fuels (according to World health organization data) for cooking. The breakdown of these deaths by cause is as follows: 34% strokes; 26% ischemic heart disease; 22% chronic obstructive pulmonary disease (COPD), 12% pneumonia; and 6% lung cancer[2]. The risk for women is higher due to more exposure to the indoor pollution while cooking.

The project activity aims to provide around 25,000 households with a biogas unit in 4 different districts of Telangana state, India. The size of the biogas unit to be provided to each household will be either of the capacity of $2m^3$ or $3m^3$ biogas generation per day depending on the size of the family. The construction of the biogas units will be initiated in February 2018. The biogas units are expected to be completely functional after 45 days of its installation. The installation of the biogas units will be carried out progressively throughout the year. A project database will be maintained to keep a track of the date of commissioning of each unit constructed. Each biogas unit constructed will be given a unique identification number so that they can be easily identified during the monitoring surveys and to avoid double counting of the total installed units.

The proposed project activity also estimates to address the following sustainable parameters as mentioned in the UN Sustainable Development Goals (SDG)[3]. The difference in the change in these SDG's are further elaborated in the section B.6.5 of the PDD.

- **SDG 1** – End poverty in all its forms everywhere
  - By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance
  - By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters

[1] Reference document, page 1 – statistical year book 2017: Telangana state report

[2] http://www.who.int/mediacentre/factsheets/fs292/en/

[3] https://www.un.org/sustainabledevelopment/sustainable-development-goals/

- **SDG 2** – End hunger, achieve food security and improved nutrition and promote sustainable agriculture
  - By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality
- **SDG 3** – Ensure healthy lives and promote well-being for all at all ages
  - By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
- **SDG 7** – Ensure access to affordable, reliable, sustainable and modern energy for all
  - By 2030, ensure universal access to affordable, reliable and modern energy services
  - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology
  - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support
- **SDG 13** – Take urgent action to combat climate change and its impacts
  - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
- **SDG 15** – Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss
  - By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

The difference in Change in SD parameters are elaborated in the section B.6.5 of the PDD.

A.2. Eligibility of the project under Gold Standard

>> *(Describe how the project meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document and the relevant activity requirements document)*

GS eligibility		Justification
3.1.1.1 A Project type is automatically eligible for Gold Standard Certification if there are Gold Standard published Activity Requirements and/or Gold Standard Approved Methodologies associated with it or as referenced in Gold Standard Product Requirements. These are published to the Gold Standard website and shall be followed where provided for a given Project type.	**OK**	The project activity is automatically eligible under the project type category "(c) Waste management and handling", as defined in the GS Activity requirements[4]. The Gold Standard approved methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption-version 3.1., August 2017", is applicable to the project activity.

[4] Section 1.2, https://globalgoals.goldstandard.org/200-gs4gg-community-services-activity-requirements/

3.1.1.2 For Project types not currently published to the Gold Standard website, the Project Developer may submit to Gold Standard for approval. This shall be done at minimum as part of the Preliminary Review, though it is recommended to engage with Gold Standard earlier to establish the criteria and requirements for approval.	***NA***	The project type is approved and published on the GS website[5].
3.1.1.3 Project types applying for Gold Standard approval are referred to the Gold Standard Vision and Mission. The Project Developer shall demonstrate how the Project would contribute to these and how the Gold Standard for the Global Goals Requirements would be met in their application for approval.	***OK***	The project activity will implement biogas units for individual households in Telangana state. The project activity is therefore promoting a sustainable and renewable energy, which will satisfy the household energy demand for daily cooking needs. The use of biogas will avoid CO_2 & CH_4 emissions that would have occurred - firstly due to the use of firewood for cooking and, secondly due to the dumping of the animal dung in open pits leading to anaerobic conditions. The monitoring process required to achieve the Global Goals, are also explained in the project document. Therefore, the project activity is in line with the GS vision of "Climate security and sustainable development for all" and GS mission, "To catalyse more ambitious climate action to achieve the Global Goals through robust standards and verified impacts".
3.1.1.4 In reviewing a new Project type for approval, Gold Standard may establish new Requirements to be met by the Project in order to achieve Gold Standard Design Certification and ongoing Project Certification. Where required, Gold Standard shall engage expert peer reviewers to establish these Requirements, at the Project Developer's expense.	***NA***	*Non-Applicable*
3.1.1.5 Gold Standard does not support Project types associated with geo-engineering or energy generated from fossil fuel or nuclear, fossil fuel switch, or any project that supports, enhances or prolongs such energy generation. In certain cases, concerning energy efficiency involving fossil fuels (for example, LPG stoves), an exception is made. This is captured in the relevant Activity Requirements, Gold Standard Approved Methodologies and/or Product Requirements.	***NA***	*Non-Applicable*

[5] https://globalgoals.goldstandard.org/200-gs4gg-renewable-energy-activity-requirements/ , Annex A – additional criteria for specific renewable energy project types (Biogas)

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

The project activity does not involve in any legal rights concerning in use of any resources (water rights, land rights etc.). The project activity consists of providing biogas units to the target households of the project zone. The implemented biogas unit will be owned by the respective beneficiary participating in the proposed project activity. The GS VER's generated by the proposed project activity will be owned by the project developer and an agreement will be signed with each beneficiary stating the transfer of the GS VER's.

A.4. Location of project

A.4.1. Host Country

India

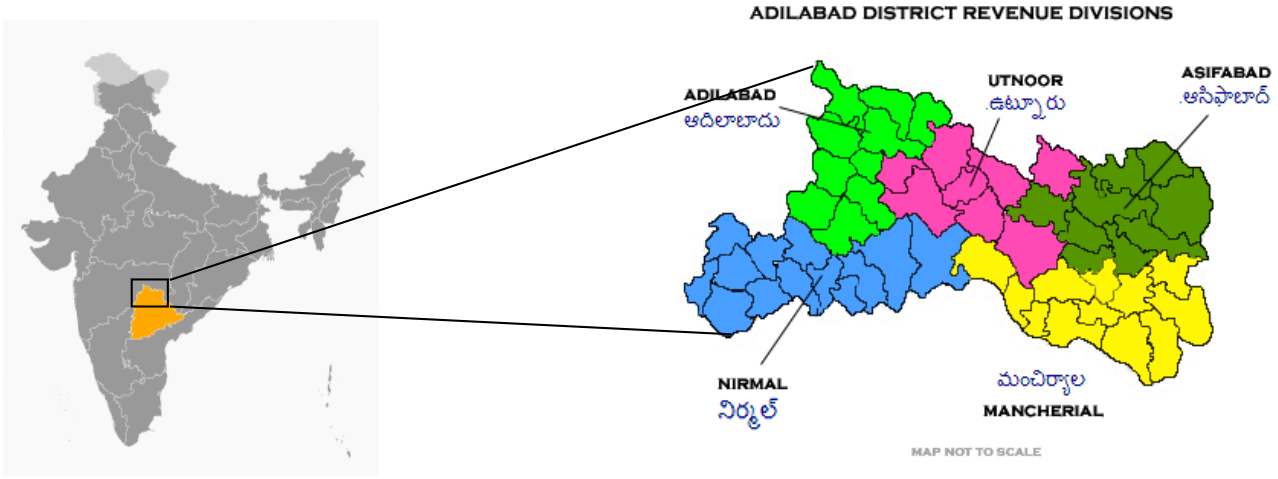
A.4.2. Region/State/Province etc.

Telangana state

A.4.3. City/Town/Community etc.

Adilabad district, Mancherial district, Nirmal district and Kumurambheem (Asifabad) district.

A.4.4. Physical/Geographical location



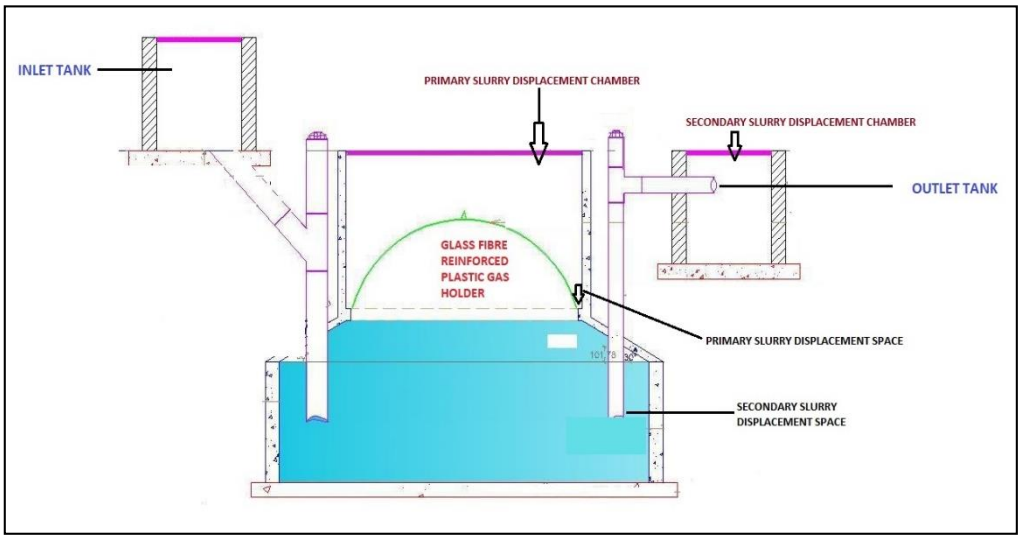
District	Latitude coordinates	Longitude coordinates
Adilabad	18°49'42.64"N	79°27'37.25"E
Mancherial	19°36'33.83"N	78°31'54.29"E
Nirmal	19° 5'11.05"N	78°20'34.64"E
kumurambheem (Asifabad)	19°21'42.60"N	79°17'34.92"E

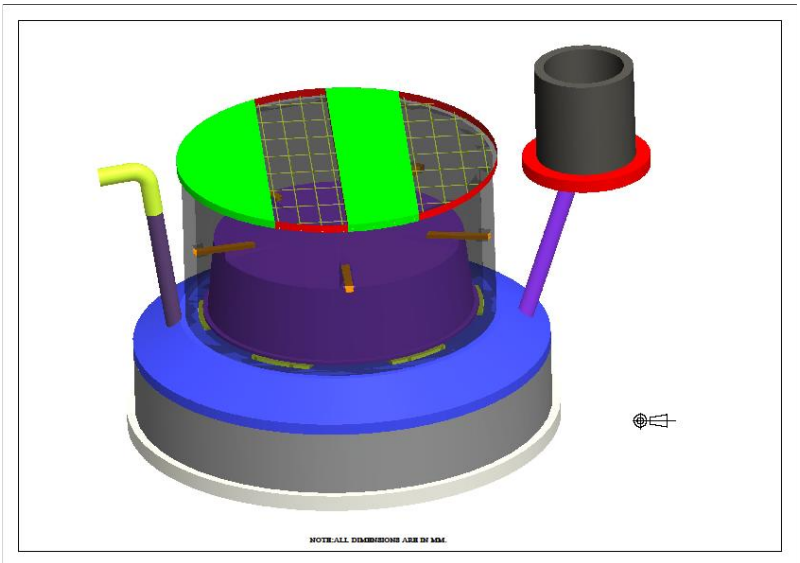
A.5. Technologies and/or measures

>> *(Describe the technologies and measures to be employed and/or implemented by the project, including a list of the facilities, systems and equipment that will be installed and/or modified by the project. Include information essential to understand the purpose of the project and how it will contribute positively to three SDGs.)*

This project activity is a GS-VER project, and according to the Annexes of the GS toolkit, the project falls under the 'Biogas' category.

The biodigester used is a fixed dome model. The biogas model used in the project activity has been designed by SKG Sangha. The model design is an improved version from the existing other biogas models (e.g. the deenbhandhu model) built by the organisation. This new improved model used in the project activity has a longer life, higher efficiency and low maintenance for the beneficiaries. The material used to construct the new model will be concrete and HDPE (High-density polyethylene). The inlet tank, slurry chamber, primary displacement chamber and the secondary displacement chamber will be constructed using concrete and the gas holder is made of the HDPE. The materials used to construct the biogas units provides a longer life and less maintenance for the project beneficiaries in the following years. The gas storage area is higher compared to the previous biogas models built by SKGS. The higher gas storage will also provide increased availability of biogas for cooking to each household in the project. The design of the proposed biogas model is provided in the diagram below.





Positive contribution of the proposed biogas technology to at least three SDGs.

- SDG 1 – No poverty
  Access to basic services, ownership and appropriate new technology -The proposed new biogas model to each household is more efficient and required less maintained compared to the previous models that were implemented by SKGS in other states of India. Therefore, each household participating the project activity will not only have a continuous free access to clean and renewable energy in form of biogas for daily cooking needs but will also have less maintenance issues due to an appropriate improved household size biogas model. The biogas units will be fully owned by each household participating in the proposed project activity.

- SDG 2 – Zero Hunger
  Each household in the project activity will informed and trained on the importance of the biogas slurry as a rich organic fertiliser for agriculture. The use of biogas slurry by each project beneficiary will assure resilient agricultural practices that will eventually lead to good crop yield and progressively improve the soil quality.

- SDG 3 – Good health and well-being
  The use of biogas for daily cooking needs will directly replace of the firewood, which has been a principle cause for indoor air pollution. Therefore, the project activity will reduce the number of deaths and illnesses from indoor air pollution by providing access to clean and renewable energy – biogas. The women will specifically benefit from the project activity due to clean environment for indoor cooking and also reduced burden to collect/buy firewood for cooking.

- SDG 7 – Ensure access to affordable, reliable, sustainable and modern energy for all
  The proposed project activity will implement biogas units for each participating household, therefore it directly ensures access to an affordable, reliable and sustainable form of energy for daily cooking demand of each of these households.

- SDG 13 – Take urgent action to combat climate change and its impacts
  The project will reduce GHG's emissions by two approaches, firstly by replacing the use of firewood by biogas for daily cooking needs. Secondly using the available animal dung in the biodigester, which otherwise would have dumped and left to decay leading to methane emissions.

- SDG 15 – Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss
  The project beneficiaries are highly dependent on firewood for daily cooking. The use of the biogas for cooking will replace the use of firewood and decrease in the use and demand of wood, which will eventually lead to sustainable forests in the project area. The project beneficiaries will also be trained to use the biogas slurry as an organic compost, which will reduce the use of chemical fertilisers and reduce the land degradation in a longer term.

A.6. Scale of the project

>> (Define whether project is micro scale, small scale or others. Justify the scale referring to relevant activity requirement.)

The proposed project activity is a "Large scale" project[6].

A.7. Funding sources of project

>> (Provide the public and private funding sources for the project. Confidential information need not be provided.)

The project activity is developed by MYPLANET, a private entity based in France.The GS VER's generated by the project activity will be owned by the project developer .

[6] Section 6.0 : scale of projects - https://globalgoals.goldstandard.org/500-gs4gg-ghg-emissions-reductions-sequestration-product-requirements/#post-1372-_Toc507583596

A.8. Assessment that project complies with 'gender sensitive' requirements

The project activity does not seek the gender certification at the performance level, therefore does not include the second level (gender-responsive). The section below provides the project assessment to demonstrate that the project activity complies with the 'gender sensitive' section according to the 'GS Gender equality guidelines and requirements' -

STEP 1: BASIC CONTEXT

1.1 Align the project to the Gold Standard Gender Policy

The key issues and the requirements of the Gender sensitive design and implementation as outlined in the GS Gender policy is taken into account in the project activity and the required explanations are provided below:

The project activity aims to implement around 25,000 biogas units for households in Telangana, where the local population are highly dependent on firewood for cooking. The project will allow the beneficiaries, especially the rural women, an access to renewable and free source of energy for daily cooking needs. Various studies have shown health risks due to the use of firewood for cooking on inefficient stoves, and especially the women and children are directly affected due to the indoor air pollution. Therefore, to improve the cooking conditions for the women, the proposed project activity was designed by encouraging equal participation of the local population. During the initial stages, both men and women from the project areas were contacted and encouraged to participate in the project activity. Apart from high interest of women in the project activity, the men have also shown a proactive response to the project.

The project proponents have held series of local stakeholder meetings both at village and at the district level, during which the women were highly encouraged to participate and share their feedback on the project activity. The details of the stakeholder meetings are provided in the section E of the PDD.

1.2 Conduct background gender research and align project to existing national policies, strategies, and best practices.

India is a part to various International conventions (UN Conventions) and treaties which are committed to secure equal rights of women. For instance, India is a signatory to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), Beijing Platform for Action and Convention on Rights of the Child where the commitment of the nation to protect and empower its women and girls is quite pronounced (signed on 30 July 1980 and ratified on 9 July 1993)[7].More recently, India committed to the 2030 Sustainable Development Goals (SDGs), which should allow to address the key challenges such as poverty, inequality, and violence against women.

These various national and International commitments, laws and policies were not as efficient as expected. India is ranked 125th out of 188 countries in 2016 on its Gender Inequality Index (GII)[8]. Moreover, the Human Development Index (HDI) is higher for males (0.671) than for females (0.549), showing the persisting inequalities between genders. Other gender issues are still subsisting; female infanticide, domestic violence; sexual harassment and so on. This is particularly high in rural area, mainly because of a lack of education and fewer job opportunities than in urban areas.

In 2016, that is to say a decade and a half after the establishment of a National Policy for Empowerment of Women in 2001 by the Government of India, the Ministry of Women and Child Development launched the draft of a National Policy for Women[9]. The mission of this policy is to enable the process of developing policies, programmes and practices which will ensure equal rights and opportunities for women in the family, community, workplace and in governance.

[7] *CEDAW*, Consideration of reports submitted by States parties under article 18 of the Convention, Combined fourth and fifth periodic reports of States parties, India

[8] *2016 Human Development Report (HDR),* United Nations Development Program

[9] *National Policy for Women 2016 (Draft),* Government of India, Ministry of Women and Child Development, 2016

The proposed project activity will be implemented in Telangana state of India. The Telangana state was a part of the Andhra Pradesh state and was formed as a new state of India in 2014[10]. In this new state, even if sex ratio of the total population is quite high in rural areas (1,035 females per 1,000 males), this is not the case for sex ratio at birth for children born in the 7 last years (865 females per 1,000 males)[11]. This huge deviation shows the persistence and increase of gender disparities, particularly in rural areas were female infanticide rate is very high.
The rate of illiterate women in rural Telangana is incredibly high compared to urban zones (respectively 47.6% and 20.7% of the women), and compared to men in both zones (respectively 23.5% and 9.2% of the men). This lack of education is not aligned with state policies which try to reduce inequalities between men and women and to empower women in their lives. State government gives priority to women related issues. The government intends to make women self-reliant and economically strong through formulating effective schemes, policy and legal provisions.

As mentioned in the section A.4 of the PDD, the project activity will be implemented in 4 districts of the Telangana state, where both the gender from the urban and rural population were contacted and communicated regarding the project activity. During the initial project planning and implementation, the role of women has been considered exactly at the same level as men as they play a major role in the project establishment. Thus, the beneficiary agreement for the implementation of a biogas unit is signed by women as first signatory. They own the units, and are directly concerned by all the meetings, proposed activities and trainings. The women of each household in the project activity will be trained on the maintenance and to the use of biogas units to assure that they understand the basic working of a biogas unit.
The project activity falls in line with the objectives mentioned in the national and the state policy for women. Some examples of the objectives met by the project as follows –

i. *The project activity will create a conducive environment to enable women enjoy de jure and de facto fundamental rights to express their views on the project activity (stakeholder meetings), have continuous access to renewable energy for cooking and access to training programmes.*
ii. *The project activity promotes and encourages active participation of women and men during the stakeholder meetings, giving an equal opportunity to both genders.*
iii. *The project has adopted a holistic approach to improve women's health by providing a clean environment for cooking by reduction of indoor air pollution and affordable access to clean energy for cooking.*
iv. *The project will assure transfer of knowledge on biogas through active participation of the women in training programmes for the maintenance of the biogas units and on the application of biogas slurry for agriculture.*
v. *The project will try to encourage especially the women belonging to the vulnerable and marginalized groups during such training programmes. Various women groups or associations will also be encouraged to participate in the project to strengthen the partnerships for women empowerment.*

The biogas technology will provide a real advantage to women and improve their living conditions. First, the installation of biogas units helps reduce the wood collection time for women, allowing them to better organise their day and even allowing time for other activities and/or other income-generating activities. Secondly, women will be less submitted to hazards and risks since the wood collecting time is reduced. Spending less time on unsecured roads lead to fewer acts of aggression against women and young girls.

Such expected results from the proposed project activity are in accordance with regional, national and international policies for women rights and women empowerment.

[10] http://www.telangana.gov.in/About/History

[11] State Fact Sheet Telangana, *National Family Health Survey 2015-16 (NFHS-4)*, Government of India

STEP 2: APPLY GOLD STANDARD SAFEGUARDING PRINCIPLES

Question 3: Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document? Explain how.

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES				
1. Human rights	**a.** The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. **b.** The Project shall not discriminate with regards to participation and inclusion.	No	**a.** The proposed project activity respects internationally proclaimed human rights and does not complicit in violence or human rights abuses of any kind. The project activity consists of providing biogas units, thereby promoting sustainable free source of energy for cooking, alleviating poverty and ensuring fair distribution of development opportunities and benefits to the rural households in the project area. **b.** The project actively promotes participation of both the local population regardless of the sex, religion, age, disability etc.	
2. Gender Equality and Women's Rights	**a.** Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits? **b.** Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)? **c.** Is there a possibility that the Project might not take into account gender roles and the	No	a.The project does not put the women at any risk to access or control of entitlement and benefits of the project activity. b.The project does not adversely affect marginalised or vulnerable communities but infact decrease the womens burden of collecting firewood by providing a renewable and clean of energy to meet their daily cooking needs. The target beneficiaries in the project activity are also from margilinalised communities who do not have access to clean energy for cooking. c.The project activity has taken into account the gender roles and therefore had invited both men and	

	abilities of women or men to participate in the decisions/designs of the project's activities?		women to actively participate in the stakeholder consultation meeting. Moreover, both the women and men will be equally considered in the participation of the project. Without any discrimination, both will be equally trained on the maintenance and to the use of biogas units for daily cooking needs.	
	d. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?		d.The project activity has taken into account the roles and the abilities of women and men to benefit from the project. The biogas plants are provided to beneficiaries who have the required minimum number of animals (3 to 4) and enough land space near their house to construct the biogas unit. Potential beneficiaries, irrespective of minority or landless people, who do not meet these basic requirements are not selected in the project activity.	
	e. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?		e.The installation of biogas units helps reduce the wood collection time for women, allowing them to better organise their day and even allowing time for other activities and/or other income-generating activities.	
	f. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?		f.The project does not produce or deepen any kind of discrimination against women. The project activity has provided an opportunity to actively participate in the implementation of project activity. The women will also benefit from training programs on the use and maintenance of the biogas units during the crediting period.	
	g. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?		g.The Project does not limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing the biogas plants. Both genders were equally explained and will be trained on the use of biogas for cooking and the use of biogas slurry for agriculture.	

	h. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?		h.Women will be less submitted to hazards and risks since the wood collecting time is reduced. Indeed, spending less time on unsecured roads lead to fewer acts of aggression against women and young girls.	
3. Community Health, Safety and Working Conditions	The Project shall avoid community exposure to increased health risksvand shall not adversely affect the health of the workers and the community.	No	The use firewood for cooking is one of the main reason for the indoor air pollution. On the other hand, according to the world health organisation (WHO), indoor air pollution in homes is responsible for the premature death of over 4 million people through respiratory or eye infections. The use of biogas for cooking will avoid indoor air pollution by providing a clean environment for cooking.	
4. Cultural Heritage, Indigenous Peoples, Displacement and Resettlement				
4.1. Sites of Cultural and Historical Heritage	Does the project area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations or practices)?	NA	The project activity is not implemented in areas where there are cultural sites or any other historical heritage.	
4.2. Forced Eviction and Displacement	Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	NA	The biogas units are constructed near the beneficiary household premises, therefore does not involve any forced eviction or displacement of the project population.	
4.3. Land Tenure and Other Rights	Does the Project require any change to land tenure arrangements and/or other rights?	No	The biodigesters are built on the beneficiary's land and there will not be any change in land tenure. Before construction of the biogas units, SKGS team will ensure there is sufficient place to install everything.	
4.4. Indigenous Peoples	Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	NA	The biogas units are provided to each rural household's dependent on subsistence agriculture and does not involve any Indigenous people.	

5. Corruption	The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	The Project does not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	
6. Economic Impacts				
6.1. Labour Rights	1. The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions.? 2. Workers shall be able to establish and join labour organisations. 3. Working agreements with all individual workers shall be documented and implemented. 4. The Project Developer shall justify that the employment model applied is locally and culturally appropriate. 5. Child labour, as defined by the ILO Minimum Age Convention is not allowed. The Project Developer shall use adequate and verifiable mechanisms for age verification in recruitment procedures. Exceptions are children for		1. The project does not imply forced labour. Sustainable long, middle and short term jobs will be created. All workers will follow specific trainings on the use, management and monitoring of biogas units. Thus, living conditions of the local population will be improved by job creation, stabilising rural families and generating new income. 2. Not applicable. The project activity provides short term employment to the trained masons and the employment model respects the local regulations. 3. Working agreements with all individual workers will be documented and implemented. 4. The local masons are trained on the new biogas model and are employed by the organisation for future work. The contracts signed with workers respect the local employment model. 5. The Project does not promote child labour. Even more, the installation of these units helps reduce the wood collection time for children, allowing them to regularly attend the school. This should increase their education and scholar results.	

	work on their families' property as long as: (a) Their compulsory schooling (minimum of 6 schooling years) is not hindered, AND (b) The tasks they perform do not harm their physical and mental development, AND (c) The opinions and recommendations of an Expert Stakeholder shall be sought and demonstrated as being included in the Project design. 6. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.		6. The workers are provided safety equipment's (helmets, boots, gloves etc.) during the construction work to avoid any accidents at the construction area.	
6.2. Negative Economic Consequences	1. The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also including those that will occur beyond the Project Certification period. 2. The Projects shall consider economic impacts and demonstrate a consideration of potential risks to the local economy and how these have been taken into account in Project design, implementation, operation and after the Project. Particular focus shall be given to vulnerable and marginalised social groups in targeted communities and that benefits	NA	The project activity will provide access to free and renewable form of energy for daily cooking needs. The access to free energy will lead to income savings for the project beneficiaries. And secondly, the use of biogas slurry for agriculture will reduce their expenses on chemical fertilisers. Therefore the project activity does not have any negative economic consequences.	

	are socially-inclusive and sustainable.			
ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES				
1. Climate and Energy				
1.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	Projects does not increase emissions over the Baseline Scenario, as it reduces the methane emissions that would have occurred if the cow-dung was left to decay in the traditional compost pits. And secondly, the regular use of biogas for daily cooking will avoid the use of firewood thereby reducing potential CO_2 emissions. SKGS will monitor the project annually to make sure that beneficiaries are continuously using the biogas and thus greenhouse gas emissions do not increase. Through these monitoring, SKGS will also asses the part of reduced emissions induced by the project.	
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 do not affect the availability and reliability of energy supply to other users. Biogas replaces the use of wood-stoves or other fossil based cooking-stoves, and beneficiaries will be autonomous in energy supply. Indeed, the construction and use of renewable energy like biogas, helps reduce households' dependency on other expensive fuels (Kerosene or LGP), thus producing significant financial savings.	
2. Water				
2.1. Impact on Natural Water Patterns/Flows	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?	NA	The project does not have any kind of impact on the natural water patterns/flows.	

2.2. Erosion and/or Water Body Instability	Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2. 2. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	No	The project is not linked to any other kind of activity other than implementation of the biogas units which might lead to erosion and/or water body instability.	
3. Environment, ecology and land use				
3.1 Landscape Modification and Soil	Does the Project involve the use of land and soil for production of crops or other products?	No	Biogas plant are independent aft any cropping system. Nevertheless, the animal dung put into a biodigestor turns into slurry that can be utilised to partially or fully substitute the use of chemical fertilisers. Thus, the Project does not alter soil quality, but the use of the biogas slurry will eventually increase the soil fertility, reduce soil degradation and pollution in the long term.	
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?	NA	The project activity is implemented in rural areas of Telangana. There are no disaster in the project region as far as the history goes.	
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)?	NA	The project activity involved construction and monitoring of biogas plants for rural households and therefore, is not linked to any activity related to genetic resources.	
3.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	No	The Project will avoid the release of pollutants that might have been caused due to the use of firewood for daily cooking needs of the beneficiaries. Moreover, foul smell of the cow-dung is also reduced leading to an environment more hygienic for the beneficiaries in the project area.	

			Indoor and outdoor air quality will thus be improved by the implementation of the Project. Pollution prevention and control technologies and practices consistent with national regulation or international good practice are applied during the Project life cycle. First, the design and the materials used in the new biogas model have been tested with recognized government agencies to assure that all the safety norms are respected as per the Indian law and regulations. Secondly, SKGS will provide a permanent monitoring through regular visits on all biogas plants (at list once a month). The team is well trained to verify any technical problems and resolve them as soon as they are notified.	
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 in the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials.	No
3.6 Pesticides & Fertilisers	Will the Project involve the application of pesticides and/or fertilisers?	No	The manure put into a biodigestor turns into slurry that can be utilised along with other agricultural wastes as an 'organic compost', to partially or fully substitute the use of chemical fertilisers for agriculture.	
3.7 Harvesting of Forests	Will the Project involve the harvesting of forests?	No	The project does not directly relate to forest management, but implementing biogas plants will reduce the human pressure on the forest. Beneficiaries will stop collecting wood, and SKGS will monitor the project annually to make sure that beneficiaries are continuously using the biogas and do not switch back to firewood. In the long-term the project will help to restore the forest.	

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?	NA	The manure put into a biodigestor turns into slurry that can be utilised along with other agricultural wastes as an 'organic compost', to improve the soil fertility and in the long-term increasing the crop yields.	
3.9 Animal husbandry	Will the Project involve animal husbandry?	NA	The project activity involves construction and monitoring of biogas plants for rural households and therefore, is not linked to any activity related to animal husbandry.	
3.10 High Conservation Value Areas and Critical Habitats	Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	There is a tiger reserve, "Kawal tiger sanctuary", occupying about 850 square kilometre area within the project area. Project directly helps in keeping the forests intact so that the tigers, an endangered species can survive. The Project activity will help to combat deforestation and consequently to preserve surrounding nature reserves where tigers are living.	
3.11 Endangered Species	1. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? 2. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	There are no endangered species as potentially being present within the project boundary and the project does not lead to the reduction or negative impact of any recognised Endangered, Vulnerable or Critically Endangered species. Moreover, in the long-term the project will help to restore the forest that can sustain various species of both plant and animals depending on this forest area.	

STEP 3: CONDUCT STAKEHOLDER CONSULTATION

Question 4: Does the project apply the Gold Standard Stakeholder Consultation & Engagement Procedure Requirements? Explain how.

Key steps to the Stakeholder Consultation process	**Was the step taken in account?**	**Details on the implementation of each step**
Prepare the stakeholder consultation		
Global Goals Principles & Requirements	Yes	Please refer to the step 2 in the above section.
Be alert to social barriers	Yes	Considering the state of gender inequalities in India, the project developer has decided to give women a major role during the project installation. Thus, the beneficiary agreement for the implementation of a biogas unit is signed by women as first signatory. They own the units, and are directly concerned by all the meetings, proposed activities and trainings.
Key project information	Yes	The key project information was made available in English and in the local language. The document includes details of the project and its design, its proposed timetable and social, economic and environmental benefits and impacts.
Stakeholder identification	Yes	Identified stakeholders are: - Direct beneficiaries: families concerned by the implantation of a biogas units. Men and women are invited. - Ministry of environment of India - Local NGOs - Gold Standard NGOs - Local women associations - Governmental agency
Invitation	Yes	Invitations were send to all identified stakeholders, in their own language (English or Telugu), by post or email. All the invitations sent are tracked with a completed table in the documentation.
Hold a consultation meeting		
Date of the meeting	Yes	The meeting was held on 17/02/2018
Agenda of the meeting	Yes	12.00 – 12.10 Opening of the meeting 12.10 – 12-30 Explanation of the project – Rep. SKG Sangha 12.30 -12-45 Discussion of continuous input /grievance mechanism 12.45 -01-15 Questions for clarification about the project 1.15 – 01.45 Lunch 1.45 – 02 .15 Blind Sustainable Development exercise (including a discussion on the safeguarding principles) 2.15 – 02.45 Discussion on monitoring SD 2.45 – 03.00 Evaluation forms and Closure of the meeting
Document		
Participant list	Yes	The list of participants has been separately provided.
Incorporate feedback	Yes	The documents related to the participants' comments have been prepared, in English and local language.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

>> Gold Standard Methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 3.1 – Published August 2017

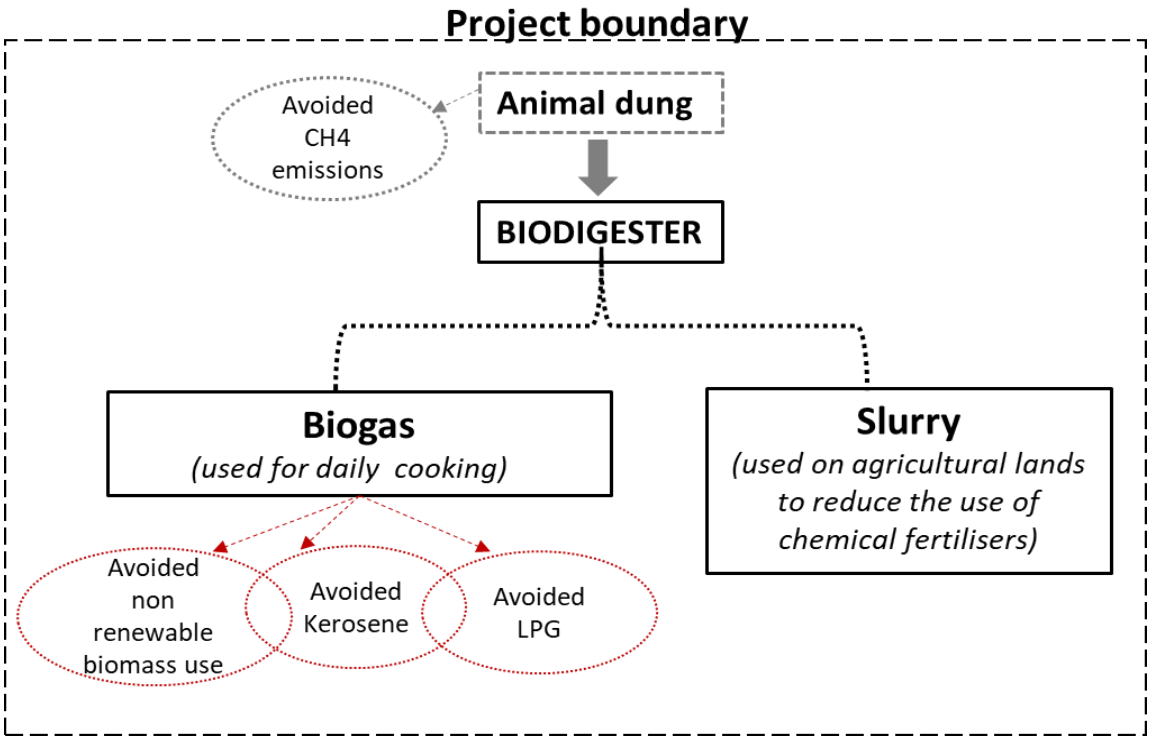
B.2. Applicability of methodology

Applicability	Justification	Comments
The project boundary needs to be clearly identified, and the technologies counted in the project are not included in any other voluntary market or CDM project activity (i.e. no double counting takes place).	The project boundary is clearly defined in section section A 4.4 and the project activity is not included in any other carbon market (both voluntary and CDM). Each biogas unit has been provided a unique identification number to avoid double counting during the monitoring period. There are no other CDM or GS biogas project registered in the project boundary.	*A project database has been maintained to keep a clear track of the biogas units installed, and each unit has been provided with a unique identification number based on the its location (address, village, district name etc.)*
The technologies each have continuous useful energy outputs of less than 150kW per unit.	The biogas units to be installed have continuous useful energy outputs of less than 150kW per unit as required	*Details provided in the VER's calculation sheet.*
Using the baseline technology as a backup or auxiliary technology in parallel with the improved technology introduced by the project activity is permitted as long as a mechanism is put into place to encourage the removal of the old technology (e.g. discounted price for the improved technology) and the definitive discontinuity of its use.	The baseline technology (3 stones stove for firewood use) in the project activity will be replaced by the use of biogas for daily cooking. To assure the use of the biogas, a continuous monitoring will be put in place by the project team.	*The continuous monitoring will also provide an opportunity to check if the beneficiary are regularly using the unit and if require train the beneficiary on the required maintenance of the unit.*
The project proponent must clearly communicate to all project participants the entity that is claiming ownership rights of and selling the emission reductions resulting from the project activity.	A contract has been signed with the beneficiary explaining in local language the ownership rights of the emission reductions resulting from the project.	*A copy of the beneficiary agreement has been provided for verification*.
Project activities making use of a new biomass feedstock in the project situation (e.g. shift from non-renewable to green charcoal, plant oil or renewable biomass briquettes) must comply with relevant Gold Standard specific requirements for biomass related project activities, as defined in the latest version of the Gold Standard rules7.	Not applicable to the project activity.	
Furthermore, the following conditions apply:	The technology used for daily cooking is biogas, which does not lead to indoor air pollution	

a. Adequate evidence is supplied to demonstrate that indoor air pollution (IAP) levels are not worsened compared to the baseline, and greenhouse gases (as listed in section 2.1) emitted by the project fuel/stove combination are estimated with adequate precision8. The project fuel/stove combination may include instances in which the project stove is a baseline stove.	therefore the indoor air pollution level will not be worsened compared to the baseline.	
b. Records of renewable fuel sales may not be used as sole parameters for emission reduction calculation, but may be used as data informing the equations in section 2.0 of this methodology. These records need to be correlated to data on distributiong and results of field tests and surveys confirming (a) actual use of the renewable fuel and usage patterns (such as average fraction of non-renewable fuels used in mixed combustion or seasonal variation of fuel types), (b) GHG emissions, (c) evidence of CO levels not deteriorating (d) any further factors effecting emission reductions significantly.	Not applicable to the project activity as there is no renewable fuel sales.	

B.3. Project boundary

The flow diagram of the project boundary is provided below :



Source		GHGs	Included?	Justification/Explanation
Baseline scenario	FIREWOOD	CO_2	YES	Important source of emissions
		CH_4	YES	Can be significant
		N_2O	YES	Can be significant
	LPG	CO_2	YES	Important source of emissions
		CH_4	YES	Can be significant
		N_2O	YES	Can be significant
	KEROSENE	CO_2	YES	Important source of emissions
		CH_4	YES	Can be significant
		N_2O	YES	Can be significant
	Animal Dung (*Animal waste management system – Composting pit)*	CH_4	YES	Important source of emissions
		CO_2	YES	Not significant
		N_2O	YES	Not significant
Project scenario	FIREWOOD	CO_2	YES	Important source of emissions
		CH_4	YES	Can be significant
		N_2O	YES	Can be significant
	LPG	CO_2	YES	Important source of emissions
		CH_4	YES	Can be significant
		N_2O	YES	Can be significant
	KEROSENE	CO_2	YES	Important source of emissions
		CH_4	YES	Can be significant
		N_2O	YES	Can be significant
	Animal Dung (*Animal waste management system – Composting pit & Biodigester)*	CH_4	YES	Important source of emissions
		CO_2	YES	Not significant
		N_2O	YES	Not significant

B.4. Establishment and description of baseline scenario

>> (Explain how the baseline scenario is established in accordance with guidelines provided in GS4GG Principles & Requirements and the selected methodology(ies). In case suppressed demand baseline is used then same should be explained and justified.)

The baseline scenario for the project activity was defined based on the baseline survey carried out in the project areas. Following the guidelines mentioned in the applied GS methodology, the baseline scenarios were identified for two components of the project activity –

i) the use the fuel for daily cooking needs of the target population and
ii) the animal waste management system practiced by each household.

Baseline survey representiveness –

The baseline for the proposed project activity was identified by carrying a baseline survey in the target population of the project activity. A total of 644 households without the project technology were interviewed in person by the survey members of SKGS in the target areas. The interviewers included both men and women depending on the person available at the time of the visit of the survey members.

Baseline survey sample sizing –
As per the guidelines provided in the GS methodology, the minimum sample size criteria are as follows –

- *Group size < 300: Minimum sample size 30 or population size, whichever if smaller*
- *Group size 300 to 1000: Minimum sample size 10% of group size*
- *Group size > 1000: Minimum sample size 100*

As per the above guidelines a total of 644 households were surveyed to identify the baseline scenario for the proposed project activity.

Data Collected
The data collected during the baseline survey include the following information –

1. *Address location*
2. *Mobile number or landline number (if available)*
3. *Number of people served by the baseline technology*
4. *Types of fuels used for cooking and estimated quantities*
5. *Sources of fuels (purchased, price of fuel, time spent to collect etc.)*
6. *Type of the animal waste management system practiced by the end-users*
7. *Total number of animals owned by each household*
8. *Time spent by the animals for grazing and in shed and*
9. *Average amount of the animal dung collected and dumped in the traditional composting pits*

From the data collected during the baseline survey, it can be stated that more than 95% of the surveyed population depend on firewood for daily cooking needs. It has been also observed that some households also use other fuels like – Kerosene and LPG for both cooking and heating water.
As per the baseline survey results, the average use of the mix of these combustibles for cooking and heating water are as follows – firewood use is 13 kg per day, whereas the use of Kerosene is less than one litre per month, and the use of LPG is around 2.5 cylinder per year. The average use of the above fuels used for daily cooking were determined through the baseline field tests. The tests were carried out for 4 days. The results of the tests are also provided in the emission reduction calculation sheets.

Regarding the animal waste management system, the survey data shows that collecting and dumping the animal dung in open pits is a common practice of each households. The open pits are mostly found near the animal sheds, where the dumped dung is left to decay without turning/mixing, creating an anaerobic conditions leading to methane emissions. The survey result shows that each household have on an average of 4 animals (dairy cow, oxen, buffaloes, calves). And on average these animals spend about 16 hours of the day in the confined shed and spend the remaining 8 hours on the field for grazing. The animal dung produced during the grazing are not collected and are left in the field for decay.

The project activity aims to provide biogas unit to each target household in the project activity. The biogas produced will be used for cooking and/or for heating water depending on daily energy demand of the household. And secondly, the use of the animal dung in the biodigester will replace the usual practice of dumping the dung in open pits.

Therefore, the baseline scenario in the absence of the project activity is using firewood for cooking on inefficient stoves and dumping of the cattle dung directly into the open composting pits.

B.5. Demonstration of additionality

>> (If the proposed project is not a type of project that is deemed additional, as stated below, then follow guidelines in section 3.5.1 of GS4GG Principles & Requirements to demonstrate additionality.)

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	**GS methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 3.1 – Published July 2015.** **Page 11, section 3. Additionality** **"In situations where it can be shown that the project technology has been adopted by less than 20% of the population in the target area (*as defined in section 2, 1.b), the technology can be qualified as "first of its kind" and hence a realistic and credible barrier due to prevailing practice can be claimed".** ***section 2, 1.b (page 7) - The target area is the region(s) or town(s) where the considered baseline scenario(s) are deemed to be uniform across political borders. This area could be within a single country, or across multiple adjacent countries. The target area provides an outer limit to the project boundary in which the project has a target population.**
Describe how the proposed project meets the criteria for deemed additionality.	The proposed project technology (biogas for cooking) has been adopted less than 20% of the population in the target areas of the project and has been justified in the following paragraphs. The project activity is being implemented in 4 different districts of Telangana state, India. The Telangana state is the 29th new state of India and was formed in the year 2014. This new state was previously part of the Andhra Pradesh state of India[12]. Therefore, the data used as reference in this section refer to the districts of Andhra Pradesh (Adilabad), which since June 2014, are part of the administrative zones of the Telangana state. India faces a challenge to ensure availability of reliable and modern forms of energy for all its citizens. Almost 85 per cent of rural households depend on solid fuel for their cooking needs and only 55 per cent of all rural households have access to electricity[13]. The state government has been promoting the biogas programme for rural and semi-rural households under the national programme known as "Implementation of National Biogas and Manure Management Programme (NBMMP)". The national census carried out in the year 2011 by the Government of India, provides detailed information on the total number of household, total population (both urban and rural), average income, cooking habits etc. for each state of the country[14]. Upon analysing the data provided for the zones mentioned in the project activity, it can be clearly observed that less than 1% (table below) of the target population have access to biogas technology for cooking.

Total number of households in the project area	Total number of households using Biogas in the project area	Reference document
1,38,374	683	Excel data: National census for the year 2011_Adilabad

[12] http://www.dw.com/en/telangana-indias-29th-state-is-born/a-17449648

[13] http://mnre.gov.in/file-manager/annual-report/2015-2016/EN/Chapter%201/chapter_1.htm

[14] http://www.censusindia.gov.in/2011census/Hlo-series/HH10.html

	The national data clearly shows that there is higher potential of biogas technology especially in the rural areas, where the women are highly dependent on firewood for daily cooking needs. **As per the applied methodology, the project activity is a "first of its kind", since less than 20% of the population of the target areas have access to biogas technology for cooking needs.**

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

>> (Specify the relevant SDG target for each of three SDGs addressed by the project. Refer most recent version of targets here .)

The following SDG's are relevant and will be monitored in the project activity. The monitoring method for each SDG has been explained below in the section B.7.

- **SDG 1** – End poverty in all its forms everywhere
  - By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance
  - By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters

- **SDG 2** – End hunger, achieve food security and improved nutrition and promote sustainable agriculture
  - By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

- **SDG 3** – Ensure healthy lives and promote well-being for all at all ages
  - By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

- **SDG 7** – Ensure access to affordable, reliable, sustainable and modern energy for all
  - By 2030, ensure universal access to affordable, reliable and modern energy services
  - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology
  - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support

- **SDG 13** – Goal 13: Take urgent action to combat climate change and its impacts
  - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

- **SDG 15** – Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss
  - By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

B.6.2. 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.)

- For estimating the SDG 1, SDG 2, SDG 3, SDG 7, & SDG 15 a baseline survey approach was used.
  - As mentioned in the section B.4, a baseline survey was held in the project areas. The baseline survey was carried with the guidelines provided in the applied GS methodology.
  - The methodology used to estimate the SDG outcome will be through the monitoring surveys and will be compared to the baseline situation.

The baseline outcomes of the SDG1, SDG2, SDG3, SDG7 & SDG15 are as follows and the project outcomes are explained in the section B.6.5 of the PDD:

- **SDG 1** – End poverty in all its forms everywhere

- From the baseline survey it is observed that the target project beneficiaries do not have access to clean and affordable form of energy to meet their daily cooking needs. It can be observed that most of the families are highly dependent on the use firewood for cooking. Less than 2% of the target population in the project area have access to the biogas technology (reference section B.5). The aim of the project outcome is to provide a biogas unit to each family participating the project. The methodology used to estimate the SDG outcome will be through the monitoring surveys.

- **SDG 2– End hunger, achieve food security and improved nutrition and promote sustainable agriculture**

- In the baseline scenario, the animal dung that is collected from the confined shed is directly dumped into the traditional composting pit, and are left to decay creating anaerobic conditions, and therefore leading to CH_4 emissions. Due to the biogas plants, the beneficiaries will be trained to use the biogas slurry as an organic compost for agriculture. In the longer term the use of the biogas slurry will promote and create a sustainable agricultural practice. The use of the slurry will also reduce the application of chemical fertilisers leading to income savings. The methodology used to estimate the SDG outcome will be through the monitoring surveys to know the total number of project beneficiaries using biogas slurry as an organic compost for agriculture.

- **SDG 3– Ensure healthy lives and promote well-being for all at all ages**

- The target population in the project use mostly firewood for cooking, and due to which are continuously exposed to indoor air pollution. The health of the women is the most affected due to continuous exposure to smoke while cooking. The methodology used to estimate the SDG outcome will be through the monitoring surveys to know the total number of the project beneficiaries agreeing that the indoor air pollution has decreased due to the use of the biogas for daily cooking.

- **SDG 7– Ensure access to affordable, reliable, sustainable and modern energy for all**

- In the project areas, most of the target beneficiaries are dependent on firewood for cooking. Very few families can afford to buy LPG due to its high costs and the time taken to go and collect it from the nearest city centre. The biogas units will be owned by the households and will be free, sustainable and renewable form of energy for meeting their daily cooking needs. The methodology used to estimate the SDG outcome will be through the monitoring surveys to know the total number of project beneficiaries using biogas for daily cooking.

- **SDG 15 – Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss**

  - The methodology used to estimate the SDG outcome will be through the monitoring surveys to know the total number of project beneficiaries who have, first replaced the use of firewood by using biogas for daily cooking and secondly used the biogas slurry for agricultural use to improve the soil quality.

- For estimating the SDG 13, the calculations were carried out as per the applied GS methodology.
    - The ex-ante calculations were based on conservative assumptions for both baseline and project scenarios based on the following steps –

The baseline emissions involve carbon emissions from

i) use of fossil fuel and non-renewable biomass for cooking and water heating, and
ii) emissions from the handling of animal waste in the baseline situation.

In order to determine total baseline emissions, the emissions per household are calculated as follows:

$BE_{b,y} = BE_{th} + BE_{awms}$

Where:

$BE_{b,y}$ = Total Baseline emissions for baseline scenario b in year y (tCO2e/yr)
BE_{th} = Baseline emissions from fuel consumption for cooking and water heating (tCO2e/yr)
BE_{awms} = Baseline emissions from animal waste handling (tCO2e/yr)

I. **Baseline emissions from fuel consumption for cooking and heating water are calculated as follows:**

$$\mathbf{BE_{b,y} = B_{b,y} * ((f\ NRB,\ y * EF_{b,fuel,\ CO_2}) + EF_{b,fuel,\ nonCO_2}) * NCV_{b,\ fuel}}$$

Where:

BEb,y	Emissions for baseline scenario b during the year y in tCO2e
Bb,y	Quantity of fuel consumed in baseline scenario b during year y, in tons, as per by-default factors24 (cases with project performance field test only)
fNRB, y	Fraction of biomass used during year y for the considered scenario that can be established as non-renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)
$NCV_{b,fuel}$	Net calorific value of the fuel that is substituted or reduced (IPCC default for wood fuel, 0.015 TJ/ton)
$EF_{b,fuel,CO_2}$	CO2 emission factor of the fuel that is substituted or reduced. 112 tCO2/TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel
$EF_{b,fuel,nonCO_2}$	Non-CO2 emission factor of the fuel that is substituted or reduced

$$\mathbf{B_{b,y} = N_{p,y} * P_{b,y}}$$

Where:

Np,y	Project technology-days in the project database for scenario p through year y
Pb,y	Specific fuel consumption for an individual technology in baseline scenario b during year y converted to tons/day

II. **Baseline emissions from Animal waste management systems**

The baseline emissions, from animal waste handling have been estimated using the IPCC TIER 2 approach (households with distinctive animal waste management systems where animals are kept in a confined area and the manure is collected following a specifically designed system). The formulae are:

$$\mathbf{BEawms,h = GWP_{CH_4} * \sum (EFawms_{(T)} * N_{(T),h})}$$

Where,

BEawms,h	The baseline emission from handling of animal waste in for premise h (tCO2e per year)

N(T)h	Number of animals of livestock category T in premise h
EFawms,T,	Emission factor for the defined livestock category T, (tonCH4per animal per year)
GWPCH4	Global Warming Potential (GWP) of methane (tCO2e per tCH4): 21 for the first commitment period. It shall be updated according to any future COP/MOP decisions.

The emission factor (EFawms(T)) for tier 2 approach is calculated as follows,

$$EF_{awms(T)} = VS_{(T)} * 365 * (Bo_{(T)} * D_{CH4} * MCF_{BL,k}/100 * MS_{(T,k)k}) \quad \text{.....(A)}$$

Where:

EFawms(T)	CH4 emission factor for livestock category T, (tCH4per animal per year)
VS(T)	Daily volatile solid excreted for livestock category T, (kg dry matter per animal per day)
365	Basis for calculating annual VS production, (days per year)
Bo(T)	Maximum methane production capacity for manure produced by livestock category T, (m3CH4 per kg of VS excreted)
DCH4	CH4 density (0.00067 t per m3 at room temperature (20 ºC) and 1 atm pressure)
MCF(BL,k)	Methane conversion factors for the animal waste handling system in the baseline situation by climate zone k, (%)
MS(T,S,k)	Fraction of livestock category T's manure treated in the animal waste management system, in climate region k (dimensionless)

III. Project emission calculations:

$$PE_{p,y} = B_{p,y} * ((f_{NRB,y} * EF_{p,fuel,CO2}) + EF_{p,fuel,nonCO2}) * NCV_{p,fuel}$$

Where :

$PE_{p,y}$	Emissions for project scenario p during year y in tCO_2e
$B_{p,y}$	Quantity of fuel consumed in project scenario p during year y, in tons,
$f_{NRB,y}$	Fraction of the non-renewable biomass
$NCV_{p,fuel}$	Net calorific value of the project fuel
$EF_{p,fuel,CO2}$	CO2 emission factor of the project fuel.
$EF_{p,fuel,nonCO2}$	Non--CO2 emission factor of the project fuel.

$$B_{p,y} = N_{p,y} * ((P_{p,y} * U_{p,y}) + (P_{b,y} * (1 - U_{p,y})))$$

Where:

$N_{p,y}$	Project technology-days in the project database for project scenario
$P_{b,y}$	Specific fuel consumption for an individual technology in baseline scenario
$U_{p,y}$	Cumulative usage rate for technologies in project scenario

The project emissions involve emissions from the bio-digester, which include physical leakage and incomplete combustion of biogas, as well as emissions from the animal waste not treated in the bio-digester are calculated as per the following equation:

$$PE_{awms,h,y} = GWP_{CH4} * \sum (N_{(T),h,y} \cdot EFawms_{T}) \cdot PL_{y} + \sum (N_{(T),h,y} \cdot EFawms_{T}) \cdot (1 - \eta_{biogastove})(1 - PL_{y})$$

Where:

$N_{(T),h,y}$	Number of animals of livestock category T in year y in premise h
EFawmsT	Emission factor for the defined livestock category T, (tonCH4 per animal per year).
PLy	The physical leakage of the bio-digester system. Estimated using IPCC guidelines, i.e. 10% of total methane production or project-specific data.

GWP_{CH_4} Global Warming Potential (GWP) of methane (tCO_2e per tCH_4

$\eta_{biogastove}$ Combustion efficiency of the used type of biogas stove to account for incomplete combustion resulting in emission of methane post- combustion.

Project emissions from the animal waste not treated in the bio-digester in project scenario shall be calculated using equation (A) and with the following changed definition of parameters:

$MCF_{(P,S,k)}$ Methane conversion factors for the animal waste handling system used in addition to bio-digester in the project scenario by climate zone k, (%)

$MS_{(P,s,k)}$ Fraction of livestock category T's manure not treated in bio-digester, in climate region k, (dimensionless)

IV. Leakage

The following potential sources of leakage were investigated:

a. The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.

b. Non-project users who previously used lower emitting energy sources use the non-renewable biomass or fossil fuels saved under the project activity.

c. The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.

d. The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology17.

e. By virtue of promotion and marketing of a new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

If the leakage assessment quantifies an increase in fuel consumption by the non- project households/users attributable to the project activity, then calculations must be adjusted to account for the quantified leakage. Leakage is either calculated as a quantitative emissions volume (tCO_2e) or as a percentage of total emission reductions. Leakage risks deemed very low can be ignored as long as the case for their insignificance is substantiated. The leakage assessment is provided in the section B.6.4 of the PDD

V. The overall GHG reductions (emissions from cooking/ heating water and from animal waste management) were calculated as follows:

$$\mathbf{ER_y = \sum BE_{b,y} - \sum PE_{p,y} - \sum LE_{p,y}}$$

Where

ER_y Emission reduction for total project activity in year y (tCO_2e/yr)

$BE_{p,y}$ Baseline emissions for baseline scenario b in year y tCO_2e/yr)

$PE_{b,y}$ Project emissions for project scenario p in year y (tCO_2e/yr)

$LE_{p,y}$ Leakage for project scenario p in year y (tCO_2e/yr)

VI. Project scenario overall emission reduction calculations -

The overall GHG reductions achieved by the project activity in year y are calculated as follows:

$$ER_y = \sum_{b,p} (N_{p,y} * U_{p,y} * P_{p,b,y} * NCV_{b,\,fuel} * (f_{NRB,b,\,y} * EF_{fuel,\,CO2} + EF_{fuel,\,nonCO2})) - \sum LE_{p,y}$$

Where:

$\sum_{b,p}$	Sum over all relevant (baseline b/project p) couples
$N_{p,y}$	Cumulative number of project technology-daysincluded in the project database for project scenario p against baseline scenario b in year y
$U_{p,y}$	Cumulative usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate revealed by usage surveys (fraction)
$P_{p,b,y}$	Specific fuel savings for an individual technology of project p against an individual technology of baseline b in year y, in tons/day, as derived from the statistical analysis of the data collected from the field tests
$f_{NRB,b,\,y}$	Fraction of biomass used in year y for baseline scenario b that can be established as non--renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)
$NCV_{b,fuel}$	Net calorific value of the fuel that is substituted or reduced (IPCC default for wood fuel, 0.015 TJ/ton)
$EF_{b,fuel,CO2}$	CO2 emission factor of the fuel that is substituted or reduced. 112 tCO2/TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel
$EF_{b,fuel,nonCO2}$	Non--CO2 emission factor of the fuel that is reduced
$LE_{p,y}$	Leakage for project scenario p in year y (tCO2e/yr)

B.6.3. 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.)

Relevant SDG Indicator	**SDG 13**
Data/parameter	EF_bCO2
Unit	Kg CO2e/GJ
Description	CO2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC 2006 Vol2 Chap 2 Table 2.5
Value(s) applied	Firewood - 112 Kerosene – 71.9 LPG - 63.1
Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	

Relevant SDG Indicator	**SDG 13**
Data/parameter	EF_b nonCO2
Unit	Kg CO2e/GJ
Description	Non CO2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC 2006 Vol2 Chap 2 Table 2.5 ; IPCC 2006 Vol2 Chap 2 Table 2.9
Value(s) applied	Firewood – 8.69 Kerosene – 0.43 LPG - 0.15
Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	

Relevant SDG Indicator	**SDG 13**
Data/parameter	EF_pCO2
Unit	Kg CO2e/GJ
Description	CO2 emission factor arising from use of fuels in project scenario
Source of data	IPCC 2006 Vol2 Chap 2 Table 2.5
Value(s) applied	Firewood - 112 Kerosene – 71.9 LPG - 63.1
Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	

Relevant SDG Indicator	**SDG 13**
Data/parameter	EF_p nonCO2
Unit	Kg CO2e/GJ
Description	Non CO2 emission factor arising from use of fuels in project scenario
Source of data	IPCC 2006 Vol2 Chap 2 Table 2.5 ; IPCC 2006 Vol2 Chap 2 Table 2.9
Value(s) applied	Firewood – 8.69 Kerosene – 0.43 LPG - 0.15

Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	

Relevant SDG Indicator	**SDG 13**
Data/parameter	NCV_b
Unit	TJ/ton
Description	Net calorific value of the fuels used in the baseline
Source of data	IPCC 2006 Vol2 Chap 1 Table 1.2
Value(s) applied	Firewood – 15.6 Kerosene – 43.8 LPG - 47.3
Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	

Relevant SDG Indicator	**SDG 13**
Data/parameter	NCV_p
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project
Source of data	IPCC 2006 Vol2 Chap 1 Table 1.2
Value(s) applied	Firewood – 15.6 Kerosene – 43.8 LPG - 47.3
Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	

Relevant SDG Indicator	SDG 13
Data / Parameter	$P_{b,y}$
Unit	Kg/day/household
Description	Quantity of fuel consumed in baseline scenario
Source of data	Baseline survey

Value(s) applied	Firewood – 12.82 Kerosene – 0.25 LPG - 0.10
Choice of data or Measurement methods and procedures	Baseline surveys and the baseline field tests for 4 days (KPT) carried out as per the guidelines mentioned in the GS methodology.
Purpose of data	Emission reduction calculations
Additional comment	

Relevant SDG Indicator	**SDG 13**
Data/parameter	$VS_{(T)}$
Unit	Kg dry matter per animal per day
Description	Daily volatile solid excreted for livestock category T
Source of data	2006 IPCC guidelines for national greenhouse gas inventories & B.T. Nijaguna (for dairy cow)
Value(s) applied	Dairy cow - 0.09 Buffalo - 1.34 Other cattle - 1.57 Oxen - 1.49
Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	The value used for 'dairy cow' is referred from the reference document - B.T. Nijaguna

Relevant SDG Indicator	**SDG 13**
Data/parameter	$Bo_{(T)}$
Unit	$m^3 CH_4$ per Kg of VS excreted
Description	Maximum methane production capacity for manure produced by livestock category T
Source of data	2006 IPCC guidelines for national greenhouse gas inventories & B.T. Nijaguna (for dairy cow)
Value(s) applied	Dairy cow - 0.15 Buffalo - 0.1 Other cattle – 0.1 Oxen - 0.1
Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	The value used for 'dairy cow' is referred from the reference document - B.T. Nijaguna

Relevant SDG Indicator	**SDG 13**
Data/parameter	$MCF_{(K)}$
Unit	[-] %
Description	Methane conversion factor for each manure management system by climate region k
Source of data	2006 IPCC guidelines for national greenhouse gas inventories
Value(s) applied	$MCF_{liquid\ slurry}$ - 80 $MCF_{liquid\ crust}$ - 50 MCF_{soild} - 5 MCF_{dry} - 2
Choice of data or Measurement methods and procedures	Available default values from IPCC
Purpose of data	Emission reduction calculation
Additional comment	

Relevant SDG Indicator	**SDG 13**
Data/parameter	$EF_{awms,\ T}$
Unit	tCO_2 / animal/ year
Description	Animal waste CO_2e emission factor
Source of data	Calculated (baseline data and IPCC default values)
Value(s) applied	$EF_{dairy\ cow}$ - 0.046 $EF_{buffalo}$ - 0.025 $EF_{Other\ cattle}$ - 0.011 EF_{Oxen} - 0.025
Choice of data or Measurement methods and procedures	Calculated based on the baseline data and the available IPCC default values
Purpose of data	Emission reduction calculation
Additional comment	The EF factor for the baseline calculations for each animal category were calculated using the default data mentioned in the tables above and the IPCC.

Relevant SDG Indicator	**SDG 13**
Data/parameter	$\eta_{biogastove}$
Unit	[-] %
Description	Combustion efficiency of biogas
Source of data	Reference: Biogas Technology, B.T.Nijajuna, New Age International Publishers, New Delhi, 2002 (Page no 38)
Value(s) applied	55

Choice of data or Measurement methods and procedures	Reference book - Biogas Technology, B.T.Nijajuna, New Age International Publishers, New Delhi, 2002 (page 38)
Purpose of data	Emission reduction calculation
Additional comment	

Relevant SDG Indicator	**SDG 13**
Data/parameter	GWP_{CH4}
Unit	$tCO2_e$ per $tCH4$
Description	Global warming potential (GWP) of methane
Source of data	IPCC
Value(s) applied	25
Choice of data or Measurement methods and procedures	Available IPCC default value.
Purpose of data	Emission reduction calculation
Additional comment	The data will be updated according to any future COP/MOP decisions

Relevant SDG Indicator	**SDG 13**
Data/parameter	D_{CH4}
Unit	t per m^3
Description	$CH4$ density
Source of data	GS methodology
Value(s) applied	0.00067
Choice of data or Measurement methods and procedures	Default value as per the applied GS methodology.
Purpose of data	Emission reduction calculation
Additional comment	

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

The ex-ante estimation of outcomes linked to the SDG 13 is as follows-
For detailed calculations, please refer the data provided in the ER calculation sheets.

Parameter		Value	Unit	Reference
f NRB,y	Fraction the non-renewable biomass	%	96	Calculated (Source for biomass data: Forest Survey of India report 2011: (http://www.fsi.org.in/sfr_2011.htm)
NCVb,fuel	Net calorific value of the fuel	TJ/Gg	15.6	IPCC 2006 Vol2 Chap 1 Table 1.2 – firewood
			43.8	IPCC 2006 Vol2 Chap 1 Table 1.2 – Kerosene
			47.3	IPCC 2006 Vol2 Chap 1 Table 1.2 – LPG
EFCO2	CO2 emission factor of the fuel that is reduced	tCO2/GJ	112	IPCC 2006 Vol2 Chap 2 Table 2.5 – firewood
			71.9	IPCC 2006 Vol2 Chap 2 Table 2.5 – Kerosene
			63.1	IPCC 2006 Vol2 Chap 2 Table 2.5 – LPG
EFnonCO2	Non-CO2 emission factor of the fuel that is reduced	Kg/GJ	8.69	Firewood - Calculated
			0.43	Kerosene - Calculated
			0.15	LPG - Calculated
Baseline Emissions from cooking and heating water				
Np,y	Cumulative number of project technology-days		365	Project technology days
Pb,y	Quantity of fuel consumed in baseline scenario	Kg/day/HH	12.82	Firewood - Baseline survey
			0.25	Kerosene - Baseline survey
			0.10	LPG - Baseline survey
Bb,y	Quantity of fuel consumed in baseline scenario	Tons/yr	4.68	For firewood use
			0.09	For Kerosene use
			0.036	For LPG use
BEb,y	**Emissions for baseline scenario for cooking**	**tCO2/yr/hh**	**8.86**	**Calculated**
Baseline Emissions from Animal Waste Management Systems				
Dairy cow	Average number of dairy cow per household	No.	0.09	Baseline survey
Buffalos	Average number of buffalos per household	No.	1.34	Baseline survey
Other cattle	Average number of other cattles per household	No.	1.57	Baseline survey
Oxen	Average number of Oxen per household	No.	1.49	Baseline survey
VS_dairy cow	Daily volatile solid excreted for dairy cow	Kg dry matter/ head/day	3.8	Reference book: B.T Nijaguna
VS_buffalos	Daily volatile solid excreted for dairy cow	Kg dry matter/ head/day	3.1	IPCC V4_10_Ch10_Livestock

VS_Other cattle	Daily volatile solid excreted for dairy cow	Kg dry matter/ head/day	1.4	IPCC V4_10_Ch10_Livestock
VS_Oxen	Daily volatile solid excreted for dairy cow	Kg dry matter/ head/day	3.1	IPCC V4_10_Ch10_Livestock
Bo_dairy cow	Maximum methane producing capacity for manure produced by dairy cow	m3 CH_4/kg VS	0.15	Reference book: B.T Nijaguna
Bo_buffalos	Maximum methane producing capacity for manure produced by buffalo	m3 CH_4/kg VS	0.1	IPCC V4_10_Ch10_Livestock
Bo_Other cattle	Maximum methane producing capacity for manure produced by other cattle	m3 CH_4/kg VS	0.1	IPCC V4_10_Ch10_Livestock
Bo_Oxen	Maximum methane producing capacity for manure produced by oxen	m3 CH_4/kg VS	0.1	IPCC V4_10_Ch10_Livestock
MCF_liquid	Methane correction factor for liquid/slurry manure management system	%	80	IPCC V4_10_Ch10_Livestock
MCF_liquid_crust	Methane correction factor for liquid/slurry with crust manure management system	%	50	IPCC V4_10_Ch10_Livestock
MCF_solid	Methane correction factor for solid storage manure management system	%	5	IPCC V4_10_Ch10_Livestock
MCF_dry	Methane correction factor for dry storage manure management system	%	2	IPCC V4_10_Ch10_Livestock
MS_liquid	Fraction of manure handled in liquid/slurry manure management system	-	0.18	Calculated_reference VER calculation sheet : Baseline survey AWMS
MS_liquid_crust	Fraction of manure handled in liquid/slurry with crust manure management system	-	0.33	Calculated_reference VER calculation sheet : Baseline survey AWMS
MS_solid	Fraction of manure handled in solid storage manure management system	-	0.39	Calculated_reference VER calculation sheet : Baseline survey AWMS
MS_dry	Fraction of manure handled in dry storage manure management system	-	0.10	Calculated_reference VER calculation sheet : Baseline survey AWMS
GWP_CH_4	Global warming potential of CH_4	-	25	IPCC
DCH_4	CH_4 density	t per m3	0.00067	GS methodology
Days	Basis for calculating annual VS production	-	365	GS methodology
EF_dairy_cow	Emission factor_dairy cow	tCO_2e/animal/ year	0.046	Calculated

EF_buffalo	Emission factor_buffalo	tCO2e/animal/ year	0.025	Calculated
EF_other_cattle	Emission factor_other cattle	tCO2e/animal/ year	0.011	Calculated
EF_Oxen	Emission factor_Oxen	tCO2e/animal/ year	0.025	Calculated
BEawms	**Emissions for baseline scenario AWMS**	**tCO2/yr/hh**	**1.58**	**Calculated**
Project Emissions from cooking and heating water				
Np,y	Project technology days in the project database for project scenario		365	GS methodology
Up,y	Cumulative usage rate for technologies in project scenario	%	0.9	Based on conservation estimation
Pb,y	Specific fuel consumption for an individual technology in baseline scenario	Kg/day/HH	12.82	Firewood - Baseline survey
		Kg/day/HH	0.31	Kerosene - Baseline survey
		Kg/day/HH	0.01	LPG - Baseline survey
Pp,y	Specific fuel consumption for an individual technology in project scenario	Kg/day/HH	1.28	Estimated Firewood use - Based on conservative estimation
		Kg/day/HH	0.00	Estimated Kerosene - Based on conservative estimation
		Kg/day/HH	0.00	Estimated LPG - Based on conservative estimation
PEb,y	**Emissions for project scenario for cooking**	**tCO2/yr/hh**	**1.65**	**Calculated**
Project Emissions from Animal Waste Management Systems				
PL	Physical leakage of biodigester	%	10	GS methodology
$\eta_{biogastove}$	Combustion efficiency of the used type of biogas stove	%	55	Reference: Biogas Technology, B.T.Nijajuna, New Age International Publishers, New Delhi, 2002 (Page no 38)
$MCF_{(P,S,k)}$	Methane conversion factors for the awms used in addition to bio-digester in the project scenario	%	71	IPCC;Vol 4;Chap 10; table 10,17
$MS_{(P,s,k)}$	Fraction of livestock category T's manure not treated in bio-digester	%	27	Estimated value for project emission calculations. The estimated value is based on the time spent by the cattle in the confined sheds (please refer to the comment in the ER calculation sheet)
EF_dairy_cow	Emission factor_dairy cow	tCO2e/animal/ year	0.027	Calculated
EF_buffalo	Emission factor_buffalo	tCO2e/animal/ year	0.015	Calculated
EF_other_cattle	Emission factor_other cattle	tCO2e/animal/ year	0.007	Calculated
EF_Oxen	Emission factor_Oxen	tCO2e/animal/ year	0.015	Calculated

PEawms	Emissions for project scenario AWMS	tCO2/yr/hh	1.40	Calculated
Project Emissions biodigester				
$MCF_{(P,S,k)}$	Methane conversion factors for the bio-digester in the project scenario	%	1	IPCC;Vol 4;Chap 10; table 10,17
$MS_{(P,s,k)}$	Fraction of livestock category T's manure treated in bio-digester	%	73	Estimated for project emission calculations
EF_dairy_cow	Emission factor_dairy cow	tCO2e/animal/ year	0.10	Calculated
EF_buffalo	Emission factor_buffalo	tCO2e/animal/ year	0.055	Calculated
EF_other_cattle	Emission factor_other cattle	tCO2e/animal/ year	0.025	Calculated
EF_Oxen	Emission factor_Oxen	tCO2e/animal/ year	0.055	Calculated
$PE_{biodigester}$	Emissions for project scenario AWMS	tCO2/yr/hh	0.59	Calculated
PEp,y	**Total Emissions for project scenario**	**tCO2/yr/hh**	**3.05**	**Calculated**
LEp,y	Leakage	tCO2/yr/hh	0	Leakage assement provided in the table below.
ERy	**Average Emission reduction for total project activity**	**tCO2/HH/yr**	**7.40**	**Calculated**

Leakage assessment:

	Potential sources of leakage	Risks (high, medium, low)	justification
a.	The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project	**Low**	The biogas will displace the use of firewood (three stone stoves) used for daily cooking. Therefore, the reuse of the same three stones outside the project boundary is low.
b.	Non-project users who previously used lower emitting energy sources use the non-renewable biomass or fossil fuels saved under the project activity	**Low**	The baseline survey was carried out for non-project users. And the data obtained shows that the target population are highly dependent on non-renewable biomass or fossil fuels for cooking. Therefore, the risk is highly low because they do not use any other lower emitting energy sources.
c.	The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.	**Low**	No other CDM or VER projects are registered in the project area, therefore the risk is low.

d.	The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology	**N/A**	The project activity is implemented in project areas where the target population does not use fuels for space heating.
e.	By virtue of promotion and marketing of a new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.	**N/A**	The proposed project activity does not involve any kind of product promotion and/or marketing of the biogas in the proposed project areas. The biogas units are implemented for households who are interested and satisfy the required criteria (sufficient availability of animal dung) to own a biogas unit. Therefore, this risk is not applicable to the project activity.

From the above table, the leakage risks are deemed very low and therefore not taken into account in the project activity.

For detailed calculations, please refer the ER calculation sheets, which has been provided separately.

B.6.5. Summary of ex ante estimates of each SDG outcome

Estimated of each SDG 13 outcome

The estimated calculations are explained in the section B.6.4 for the SDG 13.

Year	Baseline estimate (tCO2eq)	Project estimate (tCO2eq)	Net benefit (tCO2eq)
Year 1 – 2018	24017	7005	17012
Year 2 – 2019	60565	17665	42899
Year 3 – 2020	87714	25584	62130
Year 4 – 2021	123218	35940	87278
Year 5 – 2022	161854	47209	114645
Total	457367	133404	323963
Total number of crediting years: 5 years (renewable)			
Annual average over the crediting period	91473	26681	64793

Estimated of each SDG 1 outcome

The SDG 1 outcome has been estimated on the total number of beneficiaries of the project activity, who will have continuous access to biogas (renewable energy) for daily cooking. The project activity will build the resilience of the target population (highly dependent on firewood), especially the rural households who are vulnerable to climate related economic, social and environmental shocks. The use of biogas will reduce the dependence on firewood and decrease the related environmental shocks in the project area. In the baseline, none of the beneficiaries use the biogas for cooking, therefore estimated to be zero.

Year	Baseline estimate (total no. of beneficiaries)	Project estimate (total no. of beneficiaries)	Net benefit (total no. of beneficiaries)
Year 1 – 2018	0	2300	2300
Year 2 – 2019	0	5800	5800
Year 3 – 2020	0	8400	8400
Year 4 – 2021	0	11800	11800
Year 5 – 2022	0	15500	15500
Total	0	15500	15500
Total number of crediting years – 5 years (renewable)			
Annual average over the crediting period	0	3100	3100

Estimated of each SDG 2 outcome

The SDG 2 outcome has been estimated on the total number of beneficiaries of the project activity, who will have continuous access to biogas (renewable energy) for daily cooking and will use the biogas slurry as an organic compost for agriculture. The use of biogas slurry by the project beneficiaries will not only improve the land and soil quality but will also reduce their annual expenses on chemical fertilisers. In the baseline, none of the beneficiaries use the biogas slurry, therefore estimated to be zero.

Year	Baseline estimate (total no. of beneficiaries)	Project estimate (total no. of beneficiaries)	Net benefit (total no. of beneficiaries)
Year 1 – 2018	0	2300	2300
Year 2 – 2019	0	5800	5800
Year 3 – 2020	0	8400	8400
Year 4 – 2021	0	11800	11800
Year 5 – 2022	0	15500	15500
Total	0	15500	15500
Total number of crediting years – 5 years (renewable)			
Annual average over the crediting period	0	3100	3100

Estimated of each SDG 3 outcome

The SDG 3 outcome has been estimated on the total number of beneficiaries, who will have continuous access to biogas (renewable energy) for daily cooking. The use of biogas will provide a clean, smoke free environment for daily cooking and reduce health problems, especially the woman who are constantly exposed and inhale harmful smoke while cooking with firewood. In the baseline, none of the beneficiaries use the biogas for cooking, therefore estimated to be zero.

Year	Baseline estimate (total no. of beneficiaries)	Project estimate (total no. of beneficiaries)	Net benefit (total no. of beneficiaries)
Year 1 – 2018	0	2300	2300
Year 2 – 2019	0	5800	5800
Year 3 – 2020	0	8400	8400
Year 4 – 2021	0	11800	11800
Year 5 – 2022	0	15500	15500
Total	0	15500	15500
Total number of crediting years – 5 years (renewable)			
Annual average over the crediting period	0	3100	3100

Estimated of each SDG 7 outcome

The SDG 7 outcome has been estimated on the total number of beneficiaries of the project activity, who will have continuous access to biogas and will use the biogas slurry as an organic compost for agriculture. The use of animal dung for biogas production will replace the traditional practice of dumping the animal dung in open pits near the households. Therefore, the project activity will not only promote waste reduction (animal dung dumping) but will significantly reduce the methane emissions in the environment, which could have occurred in the absence of the project activity. In the baseline, none of the beneficiaries use the biogas, therefore estimated to be zero.

Year	Baseline estimate (total no. of beneficiaries)	Project estimate (total no. of beneficiaries)	Net benefit (total no. of beneficiaries)
Year 1 – 2018	0	2300	2300
Year 2 – 2019	0	5800	5800
Year 3 – 2020	0	8400	8400
Year 4 – 2021	0	11800	11800
Year 5 – 2022	0	15500	15500
Total	0	15500	15500
Total number of crediting years – 5 years (renewable)			
Annual average over the crediting period	0	3100	3100

Estimated of each SDG 15 outcome

The SDG 15 outcome has been estimated based on the quantity of firewood used per day for cooking and heating water by each beneficiary. The increasing use of firewood by the target population has direct impact on the nearby forests (deforestation, unsustainable management etc.). In the baseline situation, the average firewood use for cooking and heating water has been estimated to be 12 kg/day/household. The use of biogas will reduce the quantity of firewood use by 50% in the initial years of the project. In the long term the decrease in firewood demand will eventually reduce the adverse impacts on local forests.

Year	Baseline estimate (Kg/day/hh)	Project estimate (Kg/day/hh)	Net benefit (Kg/day/hh)
Year 1 – 2018	**12.82**	**1.28**	**11.54**
Year 2 – 2019	**12.82**	**1.28**	**11.54**
Year 3 – 2020	**12.82**	**1.28**	**11.54**
Year 4 – 2021	**12.82**	**1.28**	**11.54**
Year 5 – 2022	**12.82**	**1.28**	**11.54**
Total			
Total number of crediting years – 5 years (renewable)			
Annual average over the crediting period	12.82	1.28	11.54

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

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

Relevant SDG Indicator	SDG 13
Data / Parameter	fNRB
Unit	Fractional non-renewability
Description	Non-renewability status of woody biomass fuel in project scenario
Source of data	Data used from the report of Forest survey of India (FSI), 2011.
Value(s) applied	0.96
Measurement methods and procedures	As per the FSI report, 2011
Monitoring frequency	The NRB fraction has been calculated based on the data that is provided by the Ministry of Environment & Forests, India. The NRB will be revised in the monitoring period if there are any revisions/updates in the report.
QA/QC procedures	None
Purpose of data	Emission reduction calculations
Additional comment	The FSI report, 2011 provides a state-wise data on the demand/supply of firewood. This data has been used to calculate the NRB for the project area. The NRB will revised if there are any further updates in the FSI report and the emission reductions will be accordingly calculated.

Relevant SDG Indicator	SDG 13
Data / Parameter	$P_{p,y}$
Unit	Kg/day/household
Description	Quantity of fuel consumed in project scenario
Source of data	Monitoring survey
Value(s) applied	Firewood – 1.28 Kerosene – 0.00 LPG - 0.00
Measurement methods and procedures	The above values are an estimation. The actual values in the monitoring will be based on the monitoring surveys to be carried out every year.
Monitoring frequency	Updated every two years
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	Emission reduction calculations
Additional comment	During the monitoring surveys, the total quantity of the fuel used will be measured by the team. The data will be verified first by the project supervisor and rechecked by the project manager to avoid any errors while collecting the data. Before analysing the collected the data, the outliers will be checked and as required values which are very different from the majority will either be rechecked for errors while recording or reinvestigated with the concerned team member. If required, the observation will be removed or corrected before the analysis.

Relevant SDG Indicator	SDG 13
Data / Parameter	$N_{p,y}$
Unit	Numbers
Description	Total biogas units installed in the project activity
Source of data	Project database
Value(s) applied	25000
Measurement methods and procedures	A project database will be maintained to record the details of each installed unit (date of functioning). The project database will be updated at regular interval.
Monitoring frequency	Continuous
QA/QC procedures	The project database is updated every month by the field team. The data is cross checked for errors by the project officer during the field visits and will be corrected/changed if any errors found.
Purpose of data	Emission reduction calculations
Additional comment	The project database will be cross-checked by the MyPlanet team during the field visits. The aim of the project is install 25 000 biogas units. Since the biogas units will be installed in different phases, the emission reductions will be calculated based on the total number of installed units per year.

Relevant SDG Indicator	SDG 13
Data / Parameter	$MS_{(T)}$
Unit	%
Description	Fraction of livestock category T's manure fed into the bio-digester
Source of data	Monitoring survey
Value(s) applied	73%
Measurement methods and procedures	The above value is estimated value used for the VER's calculation. The actual value will be defined from the monitoring surveys.
Monitoring frequency	Every year
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	Emission reduction calculations
Additional comment	This is an estimated value based on the total time spent by the cattle in the shed. In the project scenario it can be estimated that not all of the dung that is collected from the shed is used in the biodigester, therefore for the calculations, 73% of the total dung collected from the confined shed, is estimated to be used in the biodigester and the remaining 27% would be dumped in the composting pit. The actual % will be calculated according to the monitoring data collected during the crediting years.

Relevant SDG Indicator	SDG 13
Data / Parameter	$MS_{(p)}$
Unit	%
Description	Fraction of livestock category T's manure NOT fed into the bio-digester

Source of data	Monitoring survey
Value(s) applied	27%
Measurement methods and procedures	The above value is estimated value used for the VER's calculation. The actual value will be defined from the monitoring surveys.
Monitoring frequency	Every year
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	Emission reduction calculations
Additional comment	This is an estimated value based on the total time spent by the cattle in the shed. In the project scenario it can be estimated that not all of the dung that is collected from the shed is used in the biodigester, therefore 27% of the total collected dung is estimated to be dumped in the composting pit. The actual % will be calculated according to the monitoring data collected during the crediting years.

Relevant SDG Indicator	SDG 13
Data / Parameter	$N_{(T)}$
Unit	-
Description	Number of animals of livestock category T
Source of data	Monitoring survey
Value(s) applied	Dairy cow - 0.09 Buffalo - 1.34 Other cattle - 1.57 Oxen - 1.49
Measurement methods and procedures	For the VER estimation in the PDD, the above values are used from the baseline survey. The actual value for each category of animal will be defined from the monitoring surveys. The data will be verified first by the project supervisor and rechecked by the project manager to avoid any errors while collecting the data. Before analysing the collected the data, the outliers will be checked and as required values which are very different from the majority will either be rechecked for errors while recording or reinvestigated with the concerned team member. If required, the observation be will removed or corrected before the analysis.
Monitoring frequency	Every year
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	Emission reduction calculations
Additional comment	The above value are obtained from the baseline survey, which were also used for the estimated VER's calculation.

Relevant SDG Indicator	SDG 13
Data / Parameter	PL
Unit	%
Description	Physical leakage of the bio-digester
Source of data	IPCC
Value(s) applied	10%

Measurement methods and procedures	IPCC
Monitoring frequency	Every year
QA/QC procedures	The value will revised if there any updates from the IPCC
Purpose of data	Emission reduction calculations
Additional comment	none

Relevant SDG Indicator	SDG 13
Data / Parameter	Usage rate
Unit	Fraction
Description	Percentage of biodigester in use in year y
Source of data	Monitoring surveys
Value(s) applied	100
Measurement methods and procedures	The above value applied is an estimated used for the estimated VER calculations. The actual values in the monitoring will be based on the monitoring surveys to be carried for the project activity.
Monitoring frequency	Annual or more frequently
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	Emission reduction calculations
Additional comment	The usage rate will be defined based on the total number of beneficiaries using biogas units.

Relevant SDG Indicator	SDG 1
Data / Parameter	End of poverty in all its forms everywhere
Unit	Total number of households
Description	The SDG 1 outcome will be estimated on the total number of beneficiaries, who will have "continuous access" to biogas (renewable energy) for daily cooking. The access to the use biogas for cooking will also ensure that the target beneficiaries have "free" access to basic energy needs for cooking and a sense of ownership of the installed biodigesters. The beneficiaries will also be trained on the proper maintenance of the units during the crediting years. The project beneficiaries are poor and cannot always afford to invest in other fuels for cooking (e.g. LPG), which makes them highly dependent firewood for cooking. Therefore, in the longer term, the project activity will build the resilience among the project population who are vulnerable climate related and other socio-economic shocks.
Source of data	Monitoring surveys
Value(s) applied	25 000
Measurement methods and procedures	The above value is an estimation of the total number of units to be installed during the crediting period. The actual values will be based on the data collected during the monitoring surveys.
Monitoring frequency	Annually or more frequently

QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	To monitor the positive contribution of the proposed project related to the SDG1.
Additional comment	The project database and the monitoring data will be cross-checked by the MyPlanet team during the field visits.

Relevant SDG Indicator	SDG 2
Data / Parameter	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Unit	Total number of households
Description	The SDG 2 outcome has been estimated on the total number of beneficiaries who will be trained on the application of the biogas slurry as an organic compost for agriculture. The use of biogas slurry by the project beneficiaries will not only improve the land and soil quality but will also reduce their annual expenses on chemical fertilisers. This is will eventually lead to resilient agricultural practices in the project area, and will progressively improve the land and soil quality.
Source of data	Monitoring surveys
Value(s) applied	25 000
Measurement methods and procedures	The above value is an estimation of the total number of units to be installed during the crediting period. The actual values will be based on the data collected during the monitoring surveys
Monitoring frequency	Annually or more frequently
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	To monitor the positive contribution of the proposed project related to the SDG2.
Additional comment	The project beneficiaries will be informed and trained on the application of the biogas slurry to their agricultural lands. The project database and the monitoring data will be cross-checked by the MyPlanet team during the field visits.

Relevant SDG Indicator	SDG 3
Data / Parameter	Ensure healthy lives and promote well-being for all at all ages
Unit	Total number of households
Description	The SDG 3 outcome has been estimated on the total number of beneficiaries, who will have a clean, smoke free kitchen with the use of biogas for cooking. The regular use of biogas will eventually reduce health problems related to indoor air pollution, especially among the woman who are constantly exposed and inhale harmful smoke while cooking with firewood.
Source of data	Monitoring surveys
Value(s) applied	25 000

Measurement methods and procedures	The above value is an estimation of the total number of units to be installed during the crediting period. The actual values will be based on the data collected during the monitoring surveys
Monitoring frequency	Annually or more frequently
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	To monitor the positive contribution of the proposed project related to the SDG3.
Additional comment	The project database and the monitoring data will be cross-checked by the MyPlanet team during the field visits.

Relevant SDG Indicator	SDG 7
Data / Parameter	Ensure access to affordable, reliable, sustainable and modern energy for all
Unit	Total number of households
Description	The SDG 7 outcome has been estimated on the total number of beneficiaries of the project activity, who will have continuous access to biogas and will use the biogas slurry as an organic compost for agriculture. The project activity allows each household to benefit a free access to renewable and sustainable energy (biogas) for cooking.
Source of data	Monitoring surveys
Value(s) applied	25000
Measurement methods and procedures	The above value is an estimation of the total number of units to be installed during the crediting period. The actual values will be based on the data collected during the monitoring surveys
Monitoring frequency	Annually or more frequently
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	To monitor the positive contribution of the proposed project related to the SDG7.
Additional comment	The project database and the monitoring data will be cross-checked by the MyPlanet team during the field visits.

Relevant SDG Indicator	SDG 15
Data / Parameter	Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss
Unit	Kg/day/household
Description	The SDG 15 outcome has been estimated based on the quantity of firewood used per day for cooking and heating water, which eventually should decrease compared to the baseline situation without the availability of biogas for cooking. In the baseline situation, the average firewood use for cooking and heating water has been estimated to be 12 kg/day/household. The use of firewood by the target population has direct impact on the nearby forests (deforestation, unsustainable management etc.). The use of biogas will reduce the quantity of firewood use by 80% in the initial years of the project. In the long term the decrease in firewood demand will eventually reduce the adverse impacts on local forests.

Source of data	Monitoring surveys
Value(s) applied	2.5
Measurement methods and procedures	The above value is an estimation of the total number of units to be installed during the crediting period. The actual values will be based on the data collected during the monitoring surveys.
Monitoring frequency	Annually or more frequently
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	To monitor the positive contribution of the proposed project related to the SDG15.
Additional comment	The project database and the monitoring data will be cross-checked by the MyPlanet team during the field visits. The use of firewood in the project scenario will be taken into account in the ER calculations during the crediting years.

B.7.2. Sampling plan

>> *(If data and parameters monitored in section B.7.1 above are to be determined by a sampling approach, provide a description of the sampling plan.)*

The sampling approach, used to determine all the parameters mentioned in section B.7.1, is as per the guidelines provided in the applied GS methodology[15]. The monitoring surveys will be carried out in the project scenario using representative and random sampling. The required minimum sample methodology guidelines for minimum sample size:

- Group size <300: Minimum sample size 30 or population size, whichever is smaller
- Group size 300 to 1000: Minimum sample size 10% of group size
- Group size > 1000 Minimum sample size 100

Therefore, for the total biogas units installed in the project activity, a minimum sample size of 100 will be randomly selected to collect the required monitoring data.

B.7.3. Other elements of monitoring plan

>>

The monitoring data collected is specific to the characteristics of the project scenario, and the following information will be collected during each monitoring survey:

- User follow up
  - Address or location
  - Mobile telephone number and/or landline telephone number (if possible)

- End user characteristics

[15] Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1), July 2015 – page 31 & page 12.

- Number of people served by the biogas technology
- Number of biogas hours used per day per household
- Number of animals (per category) per household
- Amount of dung collected from the shed etc.

- Biogas and other fuels used for cooking
  - Types of project technologies used and estimated frequency
  - Types of fuels used and quantities
  - Seasonal variations
  - Sources of fuels other than biogas; (purchased or hand-collected, etc.) and prices paid or effort made (e.g. walking distances, persons collecting, opportunity cost)

- SDG's impact
  - If had any technical problems with the biodigester (cracks) pipe damaged, stove damaged etc.)
  - If received training by the project supervisors on the maintenance of the unit
  - Use of the biogas slurry
  - Reduction in the use of firewood for cooking and heating water
  - Etc....

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

02/12/2017

C.1.2. Expected operational lifetime of project

30 years (operational lifetime of the biogas unit)

C.2. Crediting period of project

C.2.1. Start date of crediting period

01/03/2018

C.2.2. Total length of crediting period

15 years (5 years renewable twice)

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

>> (Refer the GS4GG Safeguarding Principles and Requirements document for detailed guidance on carrying out this assessment.)

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES				
1. Human rights	**a.** The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. **b.** The Project shall not discriminate with regards to participation and inclusion.	No	The project respects human rights and does not complicit in violence or human rights abuse. The project does not discriminate people participation. Secondly, the project actively promotes participation regardless of the sex, religion, age, disability etc.	None
2. Gender Equality and Women's Rights	**a.** Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits? **b.** Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?	No	**a.** The project does not put the women at any risk to access or control of entitlement and benefits of the project activity. b.The project does not adversely affect marginalised or vulnerable communities but infact decrease the womens burden of collecting firewood by providing a renewable and clean of energy to meet their daily cooking needs. The target beneficiaries in the project activity are also from margilinalised communities who do not have access to clean energy for cooking.	None

	c. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities?		c.The project activity has taken into account the gender roles and therefore had invited both men and women to actively participate in the stakeholder consultation meeting. Moreover, both the women and men will be equally considered in the participation of the project. Without any discrimination, both will be equally trained on the maintenance and to the use of biogas units for daily cooking needs.	
	d. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?		d.The project activity has taken into account the roles and the abilities of women and men to benefit from the project. The biogas plants are provided to beneficiaries who have the required minimum number of animals (3 to 4) and enough land space near their house to construct the biogas unit. Potential beneficiaries, irrespective of minority or landless people, who do not meet these basic requirements are not selected in the project activity.	
	e. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?		e. The installation of biogas units helps reduce the wood collection time for women, allowing them to better organise their day and even allowing time for other activities and/or other income-generating activities.	
	f. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation		f.The project does not produce or deepen any kind of discrimination against women. The project activity has provided an opportunity to actively participate in the implementation of project activity. The women will also benefit from training programs on the use and maintenance of the biogas units during the crediting period.	

	or access to opportunities and benefits? **g.** Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?		g. Women will be less submitted to hazards and risks since the wood collecting time is reduced. Indeed, spending less time on unsecured roads lead to fewer acts of aggression against women and young girls.	
3. Community Health, Safety and Working Conditions	The Project shall avoid community exposure to increased health risksvand shall not adversely affect the health of the workers and the community.	No	The use of biogas for cooking will avoid indoor air pollution by providing a clean environment for cooking.	None
4. Cultural Heritage, Indigenous Peoples, Displacement and Resettlement				
4.1. Sites of Cultural and Historical Heritage	Does the project area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations or practices)?	NA	The project activity is not implemented in areas where there are cultural sites or any other historical heritage: there are no historical sites within 100 kilometres of the project area.	N/A
4.2. Forced Eviction and Displacement	Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	NA	The biogas units are constructed near the beneficiary household premises, therefore does not involve any forced eviction or displacement of the project population.	NA
4.3. Land Tenure and Other Rights	Does the Project require any change to land tenure arrangements and/or other rights?	No	The biodigesters are built on the beneficiary's land and there is no land tenure. Before construction of the biogas units, SKGS team will ensure there is sufficient place to install the biogas units.	None

4.4. Indigenous Peoples	Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	NA	The biogas units are provided to each rural household's dependent on subsistence agriculture and does not involve any Indigenous people.	NA
5. Corruption	The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	The project does not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt projects.	None
6. Economic Impacts				
6.1. Labour Rights	1. The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions.? 2. Workers shall be able to establish and join labour organisations. 3. Working agreements with all individual workers shall be documented and implemented. 4. The Project Developer shall justify that the employment		1. The project does not imply any forced labour. Sustainable long, middle and short term jobs will be created. All workers will follow specific trainings on the use, managThus, living conditions of the local population will be improved by job creation, stabilising rural families and generating new income. 2. The project activity provides short term employment to the trained masons and the employment model respects the local regulations. 3. Working agreements with all individual workers will be documented and implemented. Signed contracts between SKGS and all workers will be established and verified. 4. The local masons are trained on the new biogas	None

	model applied is locally and culturally appropriate. 5. Child labour, as defined by the ILO Minimum Age Convention is not allowed. The Project Developer shall use adequate and verifiable mechanisms for age verification in recruitment procedures. Exceptions are children for work on their families' property as long as: (a) Their compulsory schooling (minimum of 6 schooling years) is not hindered, AND (b) The tasks they perform do not harm their physical and mental development, AND (c) The opinions and recommendations of an Expert Stakeholder shall be sought and demonstrated as being included in the Project design. 6. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.		model and are employed by the organisation for future work. The contracts signed with workers respect the local employment model. 5. The project does not promote child labour. Even more, the installation of these units helps reduce the wood collection time for children, allowing them to regularly attend the school. This should increase their education and scholar results. 6. The workers are provided safety equipment's (helmets, boots, gloves etc.) during the construction work to avoid any accidents at the construction area.	
6.2. Negative Economic Consequences	1. The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also including those that will occur	NA	The project activity will provide access to free and renewable form of energy for daily cooking needs. The access to free energy will lead to income savings for the project beneficiaries.	None

	beyond the Project Certification period. 2. The Projects shall consider economic impacts and demonstrate a consideration of potential risks to the local economy and how these have been taken into account in Project design, implementation, operation and after the Project. Particular focus shall be given to vulnerable and marginalised social groups in targeted communities and that benefits are socially-inclusive and sustainable.		And secondly, the use of biogas slurry for agriculture will reduce their expenses on chemical fertilisers. Therefore, the project activity does not have any negative economic consequences.	
ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES				
1. Climate and Energy				
1.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	Projects does not increase emissions over the Baseline Scenario, as it reduces the methane emissions that would have occurred if the cow-dung was left to decay in the traditional compost pits. And secondly, the regular use of biogas for daily cooking will avoid the use of firewood thereby reducing potential CO_2 emissions.	None
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 affect the availability and reliability of energy supply to other users. Biogas replaces the use of wood-stoves or other fossil based cooking-stoves, and beneficiaries will be autonomous in energy supply. Indeed, the construction and use of renewable energy like biogas, helps reduce households' dependency on other expensive fuels (Kerosene or LGP), thus	None

			producing significant financial savings.	
2. Water				
2.1. Impact on Natural Water Patterns/Flows	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?	NA	The project does not have any kind of impact on the natural water patterns/flows.	NA
2.2. Erosion and/or Water Body Instability	Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2. 2. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	No	The project is not linked to any other kind of activity other than implementation of the biogas units which might lead to erosion and/or water body instability.	None
3. Environment, ecology and land use				
3.1 Landscape Modification and Soil	Does the Project involve the use of land and soil for production of crops or other products?	No	Biogas plant are independent aft any cropping system. Nevertheless, the animal dung put into a biodigestor turns into slurry that can be utilised to partially or fully substitute the use of chemical fertilisers. Thus, the project does not alter soil quality, but the use of the biogas slurry will eventually increase the soil fertility, reduce soil degradation in the long term.	None
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?	NA	The project activity is implemented in rural areas of Telangana. There are no disaster in the project region as far as the history goes.	N/A

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)?	NA	The project activity involved construction and monitoring of biogas plants for rural households and therefore, is not linked to any activity related to genetic resources.	NA
3.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	No	The project will avoid the release of pollutants that might have been caused due to the use of firewood for daily cooking needs of the beneficiaries. Moreover, foul smell of the cow-dung is also reduced leading to an environment more hygienic for the beneficiaries in the project area. Indoor and outdoor air quality will thus be improved by the implementation of the project. SKGS will monitor the units through regular visits to the installed biogas plants.	None
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	Project does not involve in hazardous material production, trade or release.	None
3.6 Pesticides & Fertilisers	Will the Project involve the application of pesticides and/or fertilisers?	No	The project does not involve any application of pesticides and/or fertilisers. The manure put into a biodigestor turns into slurry that can be utilised along with other agricultural wastes as an 'organic compost', to partially or fully substitute the use of chemical fertilisers for agriculture.	None
3.7 Harvesting of Forests	Will the Project involve the harvesting of forests?	No	The project does not directly relate to forest management, but implementing biogas plants will reduce the human pressure on the forest. Beneficiaries will stop collecting wood, and SKGS will monitor the project annually to	None

			make sure that beneficiaries are continuously using the biogas. In the long-term the project will help to restore the forest.	
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?	NA	The manure put into a biodigestor turns into slurry that can be utilised along with other agricultural wastes as an 'organic compost', to improve the soil fertility and in the long-term increasing the crop yields.	None
3.9 Animal husbandry	Will the Project involve animal husbandry?	NA	The project activity involves construction and monitoring of biogas plants for rural households and therefore, is not linked to any activity related to animal husbandry.	NA
3.10 High Conservation Value Areas and Critical Habitats	Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	There is a tiger reserve, "Kawal tiger sanctuary", occupying about 850 square kilometre area within the project area. Project directly helps in keeping the forests intact so that the tigers, an endangered species can survive. Indeed, the project will help to combat deforestation and consequently to preserve surrounding nature reserves where tigers are living.	None
3.11 Endangered Species	1. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? 2. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	Endangered species are not in competition with humans in the project zone and the project does not lead to the reduction or negative impact of any recognised endangered, vulnerable or critically endangered species. Moreover, in the long-term the project will help to restore the forest that can sustain various species of both plant and animals depending on this forest area.	None

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

>> (Describe how stakeholder consultation was conducted in accordance with GS4GG Stakeholder Procedure Requirements and Guidelines.)

As per the GS requirements, a broad range of stakeholder lists was generated. To promote equal participation of both genders, personal invitations were sent to the local women (potential project beneficiaries).

The first local stakeholder meeting was held on the 17th Febraury 2018. The invitation letter was sent in in the local language (Telugu) and/or in English to the respective stakeholder. The key project information was also made available both in English and the local language. The project information was provided in a simple manner which was readily understandable to a lay-person.

Various local organisations (both non-for-profit and private) were sent invitations either by post or were contacted by telephone by the SKG team. The stakeholder meeting invitations were also sent to the relevant government officials/department in the project areas (e.g. the Forest department of the state, the Women and Child development department, Collectorate, CEO of the Zilla Panchayats etc.). For further details on the list of the invitees for the meeting please refer the LSC document of the project activity.

The women's participation in the stakeholder meeting was also taken into account. Particular attention was paid to feedback received from women or women's groups or other groups who were fearful to come forward to provide their feedback. Considering the possible issues of communication either related to illiteracy and/or fear, the SKGS team member helped the women to understand the contents presented during the meeting.

The LSC meeting resulted in active participation of the stakeholders from different background irrespective of age, gender, religion and other background.

The local stakeholder feedback round was held on the 08th February 2019. There were no negative comments raised during the feedback round therefore, there was no requirement to modify the project activity.
The stakeholders for the feedback round were contacted via email, by post and by publishing the invitation letter in the local newspaper. The meeting was physically held at the project site office in Mancherial district of Telangana.

The details of the stakeholders invited, comments received and are provided in a separate Annexe (Please refer the PDF document –GS 6395 LSC feedback document).

The details of the feedback round are also incorporated in the GS4GG stakeholder consultation report.

E.2. Summary of comments received

>> (Provide a summary of key comments received during the consultation process.)

Stakeholder comment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
How many days are required for unit to function?	YES	It will take about 25 days during the initial period.
How many units will be installed and how many years units will be maintained?	YES	There will be around 8,400 units in the project and project units will be maintained for 10 years.
Who can set up the plant?	YES	The households who are having 3-4 animals and have a proper space and willing to have unit.
What should be the type of area required to set up a plant?	YES	The plant area should be near should be near by the area of cow dung.
How the GHGs will be reduced by biogas plant?	YES	By replacing the fuel wood use with biogas for daily cooking needs and by treating the dung in the biodigester.

E.3. Report on consideration of comments received

>> (Describe how the comments have been addressed by providing a clarification to the stakeholder or by altering the design of the project or by proposing to monitor any anticipated negative impacts etc.)

The comments and clarifications requested during the LSC meeting were taken into account and accordingly explained by the SKG team members. There were no comments that led to a requirement to modify the project activity.

Appendix 1. Contact information of project participants

Organization name	MYPLANET
Registration number with relevant authority	491 251 252 R.C.S. Paris
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Appendix 2. Summary of post registration design changes

Revision History

Version	Date	Remarks
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1	10 July 2017	Initial adoption