Government of Nepal
Ministry of Energy, Water Resources and Irrigation
Alternative Energy Promotion Centr
Making Renewable Energy Mainstream Supply in Nepal

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Invitation to Comment on Component Project Activity under Nepal Biogas Support Programme-PoA for Crediting Period Renewal

Nepal Biogas Support Program - CPA 8: 19,445 digesters

Date of Notice Publication: 24/07/2023

Alternative Energy Promotion Centre (AEPC), Nepal from the support of atmosfair gGmbH, Germany has registered Nepal Biogas Support Programme-PoA and included 10 CPAs in the PoA successfully. Now, AEPC jointly with the atmosfair gGmbH is planning for the **renewal of the crediting period of** *GS3113: Nepal Biogas Support Program - CPA 8: 19,445 digesters under Gold Standard for Global Goals (GS4GG)*

The local stakeholder consultation (LSC) was done at PoA level as required by the Gold Standard and AEPC convey thanks to all who involved in stakeholder consultation and provided the fruitful feedback during feedback round of the PoA. This CPA contributed to important socio-economic-environmental benefits that are an integral part of the biogas program. So, we hereby invite all to provide comments on the component project activity – 8 (CPA -8) mentioned above. Following documents are available in hard copy from AEPC and/or atmosfair for your review and feedback:

- Revised Gold Standard Component Project Activity Design Document (GS-VPA-DD) for CPA -8
- Key Project Information for component project activity -8 (CPA -8)

The documents are also available in AEPC (www.aepc.gov.np) and atmosfair's website (https://www.atmosfair.de).
The documents for the PoA and corresponding CPA (CPA-8) that are registered under GS can be viewed from Gold Standard Website:

PoA: https://registry.goldstandard.org/projects/details/1570
CPA-8: https://registry.goldstandard.org/projects/details/1916

The comments can be provided through, phone call, e-mail or hardcopy to the following address/persons no **later than 2 months** from the date of publication.

Alternative Energy Promotion Centre **Mid- Baneshwor, Kathmandu, Nepal** Pratima KC Senior Officer e-mail: pratima.kc@aepc.gov.np Tel: +9771-4598013,4598014	**atmosfair gGmbH** **Berlin, Germany** Martin Herma Project Manager e-mail: herma@atmosfair.de Tel: +49 (0) 30 120 84 80 - 75

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Key Project Information:

Nepal Biogas Support Programme-PoA

Nepal Biogas Support Program - CPA 8: 19,445 digesters

1. Description of PoA and Component Project Activities

Nepal Biogas Support Programme-PoA is registered with the UNFCCC CDM executive board on 31/01/2013. Until now, there are 10 CPAs included in the PoA. Nepal Biogas Support Program is a nation-wide programme for the dissemination of household biogas digesters, managed by Alternative Energy Promotion Center (AEPC). It is registered under the Clean Development Mechanism (CDM) in order to allow for the generation of carbon credits since January 31 2013. Additionally, the PoA has retroactive registration under the Gold Standard, which implies a particular focus on sustainable development benefits. The PoA and its 10 CPAs are registered/included in GS.

The PoA includes the biogas plants implemented from 22nd June 2007. The PoA consists in several CDM project activities (CPAs) that will consist in the dissemination of approx. 20,000 household biogas digesters each; all CPAs will be implemented within the geographical boundary of Nepal. The type of the digesters included will receive the subsidies as governed by the subsidy policy and subsidy delivery mechanism of the Government of Nepal. These component project activities are implemented within the geographical boundary of Nepal. The type of the digesters included received the subsidies as governed by the subsidy policy and subsidy delivery mechanism of the Government of Nepal.

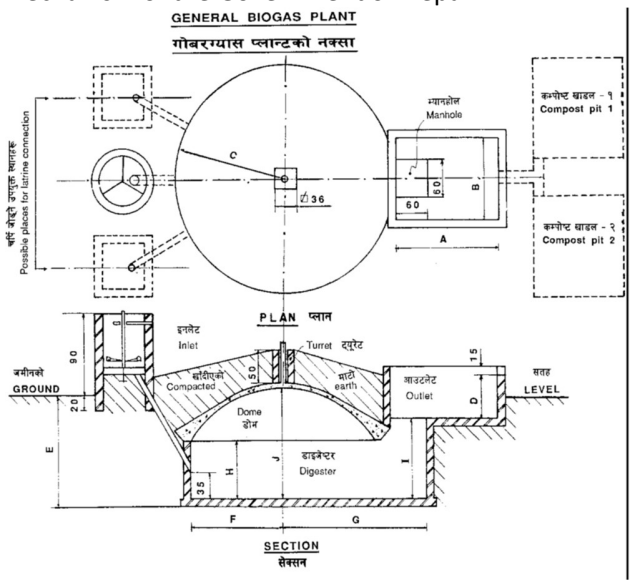

Fig: Plan and Section View of Biogas Plant

Fig: Biogas Digester in Operation

Nepal Biogas Support Program - CPA 8: 19,445 digesters

This Component Project Activity (CPA) is part of the Nepal Biogas Support Program-Programme of Activity (PoA). This CPA includes 19,445 digesters which were implemented between 01/01/2015 and 08/04/2016. The CPA was included in PoA on 1st Februrary 2017 under CDM and on 18th July 2019 under GS. The 1st crediting period in CDM is going to be ended on 14th February 2024. Table 1 provides an overview of the digesters according to their size and location.

Table 1: Digesters listed in this CPA.

Region / Size	Terai	Hill	Mountain or Remote Hill	Total
2 m^3	26	1	0	27
4 m^3	1365	187	18	1570
6 m^3	6927	9842	203	16,972
8 m^3	223	650	3	876
Total	**8541**	**10680**	**224**	**19445**

2. Responsible Parties

Alternative Energy Promotion Centre

Alternative Energy Promotion Centre (AEPC) is CME and Project Developer (PD) for these project activities. AEPC is a government institution to promote renewable energy in Nepal. AEPC provides subsidies to install the biogas plants in households and the biogas plants owners transfer the right on potential emission reduction/emission reduction generated to AEPC.

atmosfair gGmbH

atmosfair gGmbH is a German not-for-profit company providing voluntary offsets for greenhouse gas emissions e.g. from air travel by CDM Gold Standard projects. AEPC & atmosfair has the contractual agreement for the crediting period renewal of the CPAs to continue the CPAs in GS.

3. Social, economic and environmental benefits and impacts

The project activities contribute towards the sustainable development on following aspects:

i. Environmental Benefits:
   a. Prevents deforestation and forest soil degradation caused by the harvest of firewood.
   b. Prevents the emission of Greenhouse Gases from non-renewable biomass and that attributable to the anaerobic decomposition of the cattle dung that would have been left over for decay.
   c. The byproduct of the digestion process, bio-slurry, can be used as fertilizer which maintains the soil quality and avoids the possible soil pollution due to use of synthetic fertilizers.
   d. Improves indoor air quality by avoiding the smoky kitchen environment due to firewood use.

ii. Social Benefits:
   a. Reduces the drudgery in women caused due to tasks related to firewood collection and utensil cleaning and thereby saves time.
   b. Improves sanitation by triggering the toilet construction at household level as the toilet can also be used as feeding material for the biogas digesters.
   c. Improves the technical skills of the masons and other construction workers working in the sector.

iii. Economic Benefits:
   a. The use of the bio-digesters at households makes the households self-reliant on the energy for cooking and thereby saves the investment for energy sources in long run.
   b. The jobs created by the sector help in the increased economic activity locally and nationally.
   c. The bio-slurry produced from the digestion process saves the investment required to source synthetic fertilizers.

This demonstrates that the component project activities contributes positively towards sustainable development.

4. Continuous input/Grievance mechanism:

For this particular PoA, continuous grievance/input can be provided through one of the following methods:

Method	Detail
Continuous Input / Grievance Expression Process Book (mandatory)	Grievance Registration and continuous input: Grievance section: www.aepc.gov.np Alternative Energy Promotion Centre (AEPC) Phone +9771-4598013, 4598014 Fax : +9771-5542397, 5539392
GS Contact (mandatory)	Gold Standard Foundation: International Environment House 2 Chemin de Balexert 7-9, 1219 Châtelaine, Geneva, Switzerland e-mail: help@goldstandard.org
Other	Nepal Biogas Promotion Association (NBPA) Central Office: Kathmandu, Shantinagar, Gyankunja Marg, Ward No:31 Home No: 131/23 Near to: Tinkune Pool. P.O. Box No: 10074, Kathmandu, Nepal Tel: +977 (01)-4622113 Mob: +977-9851321496 Email: info@nbpa.org.np

For more detail information and feedback:

Alternative Energy Promotion Centre **Mid- Baneshwor, Kathmandu, Nepal** Pratima KC Senior Officer e-mail: pratima.kc@aepc.gov.np Tel: +9771-4598013,4598014	**atmosfair gGmbH** **Berlin, Germany** Martin Herma Project Manager e-mail: herma@atmosfair.de Tel: +49 (0) 30 120 84 80 - 75

Gold Standard for the Global Goals

TEMPLATE

KEY PROJECT INFORMATION & VPA DESIGN DOCUMENT (PDD)

PUBLICATION DATE **04.05.2022**

VERSION **v. 2.0**

RELATED SUPPORT - Programme of Activity requirements

This document contains the following Sections

KEY PROJECT INFORMATION

Type of VPA	☐ Real case VPA ☒ Regular VPA
Scale of VPA Note that a VPA can be of one scale. Please select applicable scale accordingly.	☐Microscale ☒Small scale ☐Large scale
Title of corresponding real case VPA (if applicable)	N/A
GS ID of real case VPA (if applicable)	N/A
GS ID of VPA	GS 7508
Title of VPA	Nepal Biogas Support Program – CPA 8: 19,445 digesters
Time of First Submission Date	N/A
Date of Design Certification	23/09/2019
Version number of the VPA-DD	3
Completion date of version	22/03/2023
Coordinating/managing entity	Alternative Energy Promotion Centre (AEPC)
VPA Implementer (s)	Alternative Energy Promotion Centre (AEPC)
Project Participants and any communities involved	atmosfair gGmbH; First Climate Markets AG
Host Country (ies)	Nepal
GS ID and Title of applicable Design Certified VPA	N/A
GS ID and Title of applicable Performance Certified VPA	N/A
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities

	☐ N/A
Other Requirements applied	N/A
Methodology (ies) applied and version number	AMS I.E. version 09
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A
VPA Cycle:	☒ Regular ☐ Retroactive

Table 1 – Estimated Sustainable Development Contributions

Sustainable Development Goals Targeted	**SDG Impact (defined in** Error! Reference source not found.**)**	**Estimated Annual Average**	**Units or Products**
13 Climate Action (mandatory)	Emission Reduction	63,299	GS CER
3. Good Health and Well Beings			
3.9.1 Mortality rate attributed to household and ambient air pollution	Average annual consumption of woody biomass per household in the pre-project devices during the project activity	0.54	Ton/HH/year
3.9.1 Mortality rate attributed to household and ambient air pollution	Quantity of woody biomass that is substituted or displaced	77,877.23	Ton/year
3.9.1 Mortality rate attributed to household and ambient air pollution	Net calorific value of the non-renewable biomass that is substituted	0.0156	TJ/ton
3.9.1 Mortality rate attributed to household and ambient air pollution	Users' perception on reduction in indoor air pollution	100	% HH response
3.9.1 Mortality rate attributed to household and ambient air pollution	Users' perception on reduction in health problem	100	% HH response on eye infection, respiratory disease, Cough and Fire related injury

3.9.1 Mortality rate attributed to household and ambient air pollution	User's perception in Time saving for the cooking (reduce exposure to indoor air pollution)	100	% HH response for Men, Women and Children
3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	Users' perception on connection of toilet to biogas	100	% HH response
3.9.3 Mortality rate attributed to unintentional poisoning	Users perception in reduction of chemical fertilizers (use of Farmyard manure, Bio-slurry, Urea, DAP and Potash)	100	% response
7: Affordable and Clean Energy			
7.1.2 Proportion of population with primary reliance on clean fuels and technology	Users' perception on time saving due to project for firewood collection (For men, women and children)	100	% response
7.1.2 Proportion of population with primary reliance on clean fuels and technology	Number of people trained to promote Biogas plants	At least 20 mason for whole PoA	Number of human resource trained.

SECTION A. DESCRIPTION OF PROJECT

A.1. Purpose and general description of project

Main objective of the Nepal Biogas Support Programme-PoA is to further develop and disseminate biogas digesters as a renewable energy solution in Nepal, while better addressing poverty, social inclusion and regional balance issues and at the same time ensuring sustainability of the sector. Under this, AEPC currently supports to implement up to 20,000 digesters for each CPA under this PoA, which assures to remain within the small scale threshold. Besides investment subsidy to user households, AEPC needs funding on program level to maintain its activities. Target group under the PoA/CPA are households with at least one head of cattle (generally cows or buffalos) who currently use non-renewable biomass (firewood) for cooking purpose. The baseline of the PoA considers only non-renewable biomass replaced through household biogas applications. Only households previously using non-renewable biomass are eligible to the PoA. Before this PoA, four CDM projects activities have been registered that cover digesters implemented between 1st of November 2003 and 21 June 2007.

The baseline scenario is continued use of non renewable biomass (NRB) i.e. firewood for cooking. In addition to non renewable firewood, the households also use small amounts amount of cow dung and agricultural waste for cooking. Fossil fuels like kerosene and LPG are hardly used. Only firewood consumption is considered for the baseline estimates. Thus, in the absence of the programme the beneficiaries would have continued the use of non renewable biomass (firewood) leading to its associated GHG emissions. Hence, use of non renewable biomass is considered as the baselines and emission reductions will be claimed only for the displacement of non renewable fuelwood. The technology is environmentally sound. The programme may use accessories like Valve, Multilayer Pipes, Pressure meter, which has been procured from Thailand, China, and may also be procured from other countries.

This Component Project Activity (CPA) is part of the Nepal Biogas Support Program-Programme of Activity (PoA). This CPA includes 19,445 digesters which were implemented between 01/01/2015 and 08/04/2016.Table 1 provides an overview of the digesters according to their size and location.

Table 1: Digesters listed in this CPA.

Size/Region	Hill	Terai	Mountain or Remote Hill	Total
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Total	**8541**	**10680**	**224**	**19445**

A.1.1. Eligibility of the VPA under approved PoA

The CPA is proposed for the crediting period renewal. The CPA was included in the PoA for Nepal Biogas Support Program-PoA since it meets all the criteria listed in the eligibility criteria for inclusion of a CPA in the PoA as given in registered PoA-DD as under.

Table 2 Eligibility for VPA inclusion as per PoA requirements

No.	Eligibility Criterion	Description/ Required condition	Description of the VPA in relation to the criteria, Means of Verification and Supporting evidence for inclusion
1	Geographical boundary	- All biogas digesters in the CPA#8 are located within the geographical boundaries of Nepal. - This is confirmed by the CME by ensuring that each individual installation is a) located at an address that lies within the geographical boundaries of Nepal as demonstrated by providing the address of all biogas digesters in the CPA database; and b) has GPS coordinates that are situated within the geographical boundaries of Nepal.	-Commissioning Report from Biogas Companies (BC). - CPA Database indicating digester code, address and GPS coordinate.
2	Double counting	-Double counting is avoided by assuring that no digester is already included to a different CDM project or CPA. - This is confirmed by the CME based on a) the digester codes listed in the BSP database and b) if necessary also GPS coordinates (the latter applies if biogas projects emerge under the CDM that is not part of the BSP).	-CPA Database indicating digester code, address and GPS coordinate. - Unique GPS reading of each digester. - CDM website indicating potential further projects not included to BSP using the same technology
3	Technology	-AEPC has implemented this CPA as part of the BSP. - All digesters listed in the CPA are household biogas digesters with a sludge and gas holding capacity range of 2-8 m^3.	-Commissioning Report from Biogas Companies (BC). - Technical specification documents detailing digester models and equipment applied.

		-Biogas is supplied to a stove with a maximum capacity of 400 l/h leading to a maximum annual gas capacity of not more than 1.86 kWth per stove. - The equipment for each biogas plant installation under CPA is new and not transferred from other project activities.	
4	Start Date	-The start date of a CPA is the date of commissioning of the first biogas digester included to that respective CPA. - The start date of CPA is 01/01/2015, which is the date of commissioning of the first digester in CPA. - The start of CPA is after the date of commissioning of the last installation included in CPA-7 i.e. 31/12/2014. - The date of commissioning is recorded in the Commissioning Report, which is archived and the date recorded in the CPA database.	-Commissioning Report from Biogas Companies (BC), indicating the commissioning date. -CPA Database
5	Compliance with applied methodology	-The activity replaces non-renewable biomass. This is confirmed through Biogas Users' Survey conducted by an independent third party for the biogas digesters implemented by BSP.	-Report confirming use of nonrenewable biomass as firewood prior to installation of digesters (e.g. BUS)
6	Diversion of official development assistance	-The CPA does not result into the diversion of official development assistance.	-Declaration from CPA implementer/AEPC. - Confirmation of ODA non diversion.
7	Target Group and distribution mechanism	-The target groups within the CPA are households.	-Installation confirmation from Biogas Companies (BC) indicating that the digesters are installed in a household.
8	Threshold Check	-Number of biogas digester included in each CPA shall not exceed 20,000 units, which assures	-BSP/AEPC database to confirm the number of digesters in CPA#8 is 19,445.

		compliance with the small scale limit of 45MWth.[1]	
9	Other / Voluntary action	-The owners of the digesters listed in the CPA#8 have signed an agreement in which it allows AEPC to market the emission reductions from the installation and operation of the digester. - Digesters implemented in CPA#8 are voluntary action and not mandated by the Government of Nepal.	-Contract of AEPC and owners of digesters confirming emission reduction purchase. - Confirmation that each CPA is a voluntary action not mandated by the Government of Nepal

The CPA was validated against all the criteria for the inclusion including safeguarding principles and the SDG outcomes and found it in-line with the requirement and was included as CPA during first crediting period.

A.1.2. Legal ownership of products generated by the VPA and legal rights to alter use of resources required to service the project

The technology used in this PoA is the household level biogas plants and the owner of the technology is the particular household using biogas plants. The owners of a digester signed an agreement with AEPC by transferring all legal rights, interests, credits, entitlements, benefits or allowances arising from or in connection with any greenhouse gas emissions reductions arising from the operation of the digester (Emission Reduction), and agrees to take all necessary action required to ensure the transfer of those Emission Reductions to the Alternative Energy Promotion Centre or its nominee, including executing any relevant documents. So, the ownership of the products that are generated under Gold Standard Certification is under Alternative Energy Promotion Centre.

The CPA is located within the boundary of Nepal. Nepal being a Least Developed Country, it has no any cap enforced for the emission reduction. It is also non-annex 1 country under Kyoto Protocol. If any cap for the emission reduction will be enforced in future for Nepal and AEPC uses the GS-CERs issued to offset the emission reduction,

[1] Estimated maximum capacity of 1.86 kWth per stove. Considering that the limit for SSC is 45 MW_{th}, the maximum number of digesters allowed under a CPA (20,000) remains well below the SSC threshold.

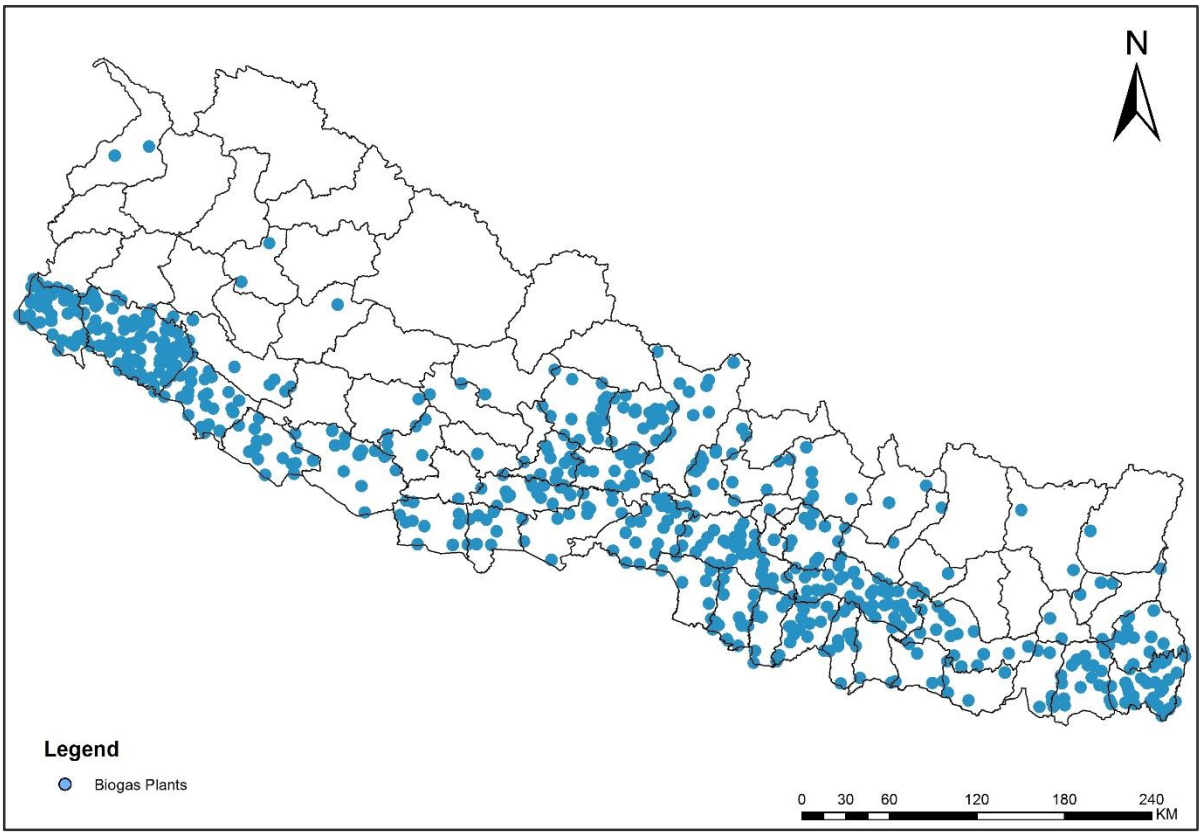
the equivalent amount of the CERs/GS-CERs will be voluntarily retired to fulfill the cap enforced for Nepal.

A.2. Location of VPA

The digesters in this CPA are located at various locations across Nepal. The geographical coordinates of Nepal are:

Latitude – North 26.20 degree to North 30.45 degree
Longitude – East 80.07 degree to East 88.20 degree

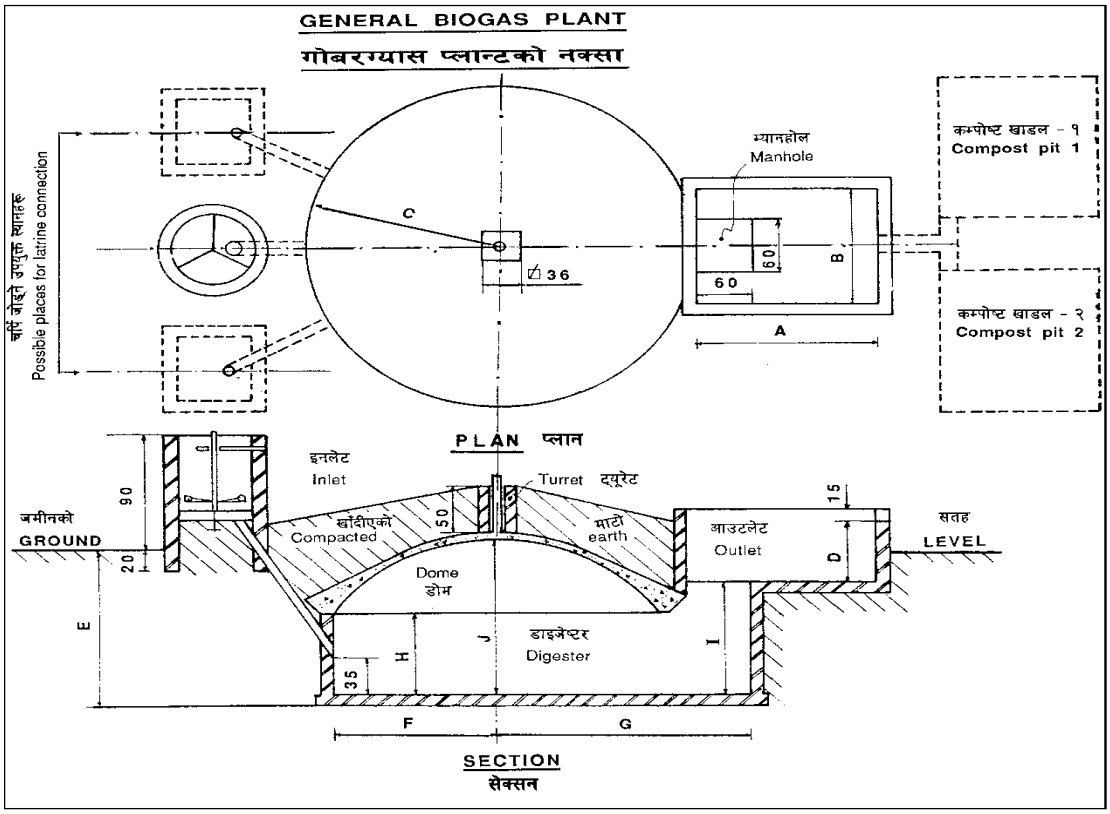
The CPA database contains the following information for each digester: owner's name, spouse name, VDC/NP, ward number or cluster, district, region, plant size, name of Installation Company, digester code and the commissioning date. The coverage of biogas plant in Map of Nepal is shown in figure 1.



A.3. Technologies and/or measures

The technologies used in this CPA are household biogas digesters with a sludge and gas holding capacity range of up to 8 m^3. The different sizes of the digesters that would be included in the programme would be of 2, 4, 6, and 8 m^3. The programmes uses only one design i.e. GGC 2047 model. The biogas digesters are based on a uniform technical design and are manufactured and installed following established technical standards in Nepal. The digester itself is a closed underground container made of concrete or other materials. The design of the digester is mentioned below:

Figure 1: Biogas Model GGC 2047



The GGC 2047 biogas digester consists of five main structures or components. They are the inlet, outlet, digester, dome and the compost pits. The required quantity of dung and water is mixed in the inlet tank and this mix in the form of slurry is allowed to be digested inside the digester. The gas produced in the digester is collected in the dome, called as the gas holder. The digested slurry flows to the outlet tank from the digester through the manhole. The slurry then flows through the overflow opening to the compost pit where it is collected and composted. The gas is supplied to the point of application through the pipeline.

A.4. Scale of the VPA

The proposed small scale CPA is not a de-bundled component of a large CDM project. Each of the independent subsystems (bio digesters) included in the CPA is not greater than 1% of the threshold defined for a small scale project[2]. 1% of the 15 MWel (45MWth) threshold for type I projects is 150 kW_{el} (450kW_{th}). The capacity of a digester is 1.86 kW_{th} (see section E.2. of the CDM-SSC-PoA) and hence remains well below the 1% of 15 MW threshold.

[2] Guidelines on Assessment of Debundling for SSC Project Activities – Version 03, (EB 54, Annex 13)

A.5. Funding sources of VPA

The digesters listed in the CPA receive subsidies and technical support under the BSP program. The BSP program is funded by the entities listed below. These include:

- Danida
- Norway

SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

B.1. Reference of approved methodology (ies)

Title: Switch from non-renewable biomass for thermal applications by the user (AMS I.E. version 09)
Reference: https://cdm.unfccc.int/methodologies/DB/CU5MMCFAZCZKDP0V9DYAS7VQ56OBJW

B.2. Applicability of methodology (ies)

The methodology AMS-I.E: "Switch from Non-Renewable Biomass for Thermal Applications by the User", version 04 was used for the PoA during first crediting period. The same methodology with version 9.0 is applied for crediting period renewable for the second crediting period. The applicability of the methodology is outlined as below:

Criteria AMS-I.E.	Explanation
The methodology is applicable for technologies displacing use of non-renewable biomass by renewable energy.	The PoA will replace non-renewable biomass by introducing the biogas digester producing renewable energy.
Small-Scale project requirement: For biomass, biofuel and biogas project activities, the maximal limit of 15MW(e) is equivalent to 45 MW thermal output of the equipment or the plant (e.g. boilers). For thermal applications of biomass, biofuels or biogas (e.g. the cookstoves), the limit of 45 MWth is the installed/rated capacity of the thermal application equipment or device/s (e.g. biogas stoves).	The biogas capacity of each stove is 400 litre/hour. With a methane content of 52%, this gives an annual natural gas capacity of not more than 1.86 kW_{th} per stove (validated during registration). This means that around 24,000 stoves would still have an aggregated capacity below the $45MW_{th}$ small scale threshold value, however the CPA will be limited to 20000 stoves only.
This methodology comprises of activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include, but are not limited to biogas stoves, bio-ethanol stoves, solar cookers, passive solar homes.	The digesters are indeed "small thermal appliances that displace the use of non-renewable biomass by introducing new renewable energy end-user technologies". AMS-I.E. even lists biogas stoves as an example of eligible end user technologies.

Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	The BUS conducted in 2018 demonstrated that the time needed to gather firewood, the price of firewood and the distance travelled to gather firewood is increasing at least since December 1989. In that survey the respondents were asked to provide averages for the time needed to gather firewood, the distance travelled and the price. The average of the estimates from all respondents, showed a clear increase on all three indicators.
For project activities introducing bio-ethanol cook-stoves, project participants or coordinating and managing entities shall demonstrate that the bio-ethanol cook-stoves are designed, constructed and operated to the requirements (e.g. with regard to safety) of a relevant national or local standard or comparable literature. Latest guidelines issued by a relevant national authority or an international organization may also be used.	The PoA does not include the bio-ethanol cookstoves and hence this is not applicable for this PoA.

B.3. VPA boundary

For the purpose of GHG mitigation/sequestration following table shall be completed

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Emissions from NRB use for cooking	CO_2	Included	Major emission
		CH_4	Not included	conservative
		N_2O	Not included	conservative
	Emissions from fossil fuel use for cooking	CO_2	Not included	conservative
		CH_4	Not included	conservative
		N_2O	Not included	conservative
Project scenario	Digester and biogas cooking stove	CO_2	Not included	Negligible
		CH_4	Not Included	Negligible

B.4. Establishment and description of baseline scenario

The baseline scenario is continued use of NRB i.e. firewood for cooking. As the CPA displaces the use of non-renewable biomass by introducing a renewable energy technology, AMS-I.E, Version 09 is used to estimate the emission reductions for the first crediting period. According to AMS-I.E, Version 09, "in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs". As per the methodology, the baseline scenario adopted for the project is the use of fossil fuels (Non-renewable Biomass) for thermal energy applications. To confirm that NRB based cook stoves continue to be used, the project participants conducted a survey to check whether the firewood replaced by the digesters is subject to the trends defined in AMSI.E.: version 09 increasing amount of time needed or distance travelled for firewood gathering, increasing firewood prices or changes in the type of firewood used.

The indicators selected to monitor the continued displacement of NRB in the project are:

1) Increase in time needed to gather firewood or increase in distance travelled to gather firewood
2) Increasing trend in fuel wood price.

The baseline scenario has been determined at the PoA level during the crediting period renewal of PoA. The survey was conducted in 2017/18 and was established that the continuation of use of current baseline equipment, (non-renewable biomass based cook stove) is the most likely scenario for the crediting period.

The Methodological tool "Assessment of validity of the original/current baseline and update of the baseline at the renewal of a crediting period" Version 03.0.1 (EB 66, Annex 47) was used to assess the continued validity of the original baseline. This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period.

Step 1: Assess the validity of the current baseline for the next crediting period

The "Procedures for the renewal of the crediting period of a registered CDM project activity" requires assessing the impact of new relevant national and/or sectoral policies and circumstances on the baseline.

Step 1: Assess the validity of the current baseline for the next crediting period
Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

There are no mandatory national and/or sectoral policies that affect the baseline scenario during the renewal of the crediting period. The relevant national and sectoral policies for the promotion of the biogas digester in the Nepal are the Rural Energy Policy, the Renewable (Rural) Energy Subsidy Policy and the Renewable (Rural) Energy Subsidy

Delivery Mechanism. The Rural Energy Policy was published in the year 2006. The Renewable (Rural) Energy Subsidy Policy was initially published in 2000 (prior to PoA start date) and latest revision has happened in 2016. Similarly, the Renewable (Rural) Energy Subsidy Delivery Mechanism was initially published in 2000 (prior to PoA start date) and latest revised in 2017. The Renewable (Rural) Energy Subsidy Policy has made provisions of financial subsidy support for the installation of the household biogas plants. The Rural Energy Policy has put emphasis to increase efficiency, reduce cost of the household biogas production technology, and to promote it in high mountains.

The Renewable (Rural) Energy Subsidy Policy 2016 has made provisions of financial subsidy support for the installation of the household biogas plants in the range from 2, 4, 6, m^3 and above. The subsidy support is categorised based on the location of the biogas plants in the Terai (Southern Plains), Hills and Remote Hills. The subsidy support provided would cover a maximum of around 40% cost of installation of the biogas plants. The Renewable (Rural) Energy Subsidy Delivery Mechanism, prepared based on the Subsidy Policy, has made arrangements to channel the subsidy to the biogas users through the pre-qualified biogas companies, which provide installation and after sales services related to biogas as per the standard and guidelines approved by the AEPC.

The above policies only provide the incentives for the installation of household biogas plants and do not provide any obligations or enforced targets, nor do they ban the use of fuel wood for cooking. The baseline scenario established for the PoA is therefore still valid.

Step 1.2: Assess the impact of circumstances

There is no impact of circumstances existing at the time of requesting renewal of the crediting period on the current baseline emissions.

As demonstrated in Step 1.1, the promotion of household biogas plants through national policies set up is on voluntary basis. The Renewable (Rural) Energy Subsidy Delivery Mechanism is part of the package design to enhance the Biogas Support Program. No other market transformation activities or circumstances outside the implementation of the BSP have influenced households shift from non-renewable biomass for cooking in rural areas or the shift to rural households biogas plants using renewable biomass. The deployment of BSP has continued during the first crediting period of the PoA with subsequent development of 8 CPAs using the same baseline. As described in Step 1.3, despite the policies, NRB continue to be the main energy source for cooking in rural areas. This is confirmed by the Biogas Users Survey 2017/18 for PoA. The conditions used to determine the baseline emission in the previous crediting period are still valid.

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

This sub-step is applicable to the PoA since the baseline is the continuation of the existing practice, i.e. the households will rely on traditional cook stoves using non-renewable biomass in the absence of the project activity. The traditional stoves made from local materials are expected to continue in the absence of the project. Therefore, the continued use of baseline materials is possible.

To confirm that NRB based cook stoves continue to be used, the project participants conducted a survey to check whether the firewood replaced by the digesters is subject to the trends defined in AMS-I.E.: version 09 increasing amount of time needed or distance travelled for firewood gathering, increasing firewood prices or changes in the type of firewood used. The indicators selected to monitor the continued displacement of NRB in the project are:

1) Increase in time needed to gather firewood or increase in distance travelled to gather firewood
2) Increasing trend in fuel wood price.

The Biogas Users Survey 2017/18 reveals the following:

- Increase in time and distance travelled to gather firewood.

Trends in distance travelled for firewood gathering or trends in time needed for firewood gathering indicating depletion of resources available was monitored through perception survey and the result is given in table below:

Type	**% of people perceived**							
	CPA-1	**CPA-2**	**CPA-3**	**CPA-4**	**CPA-5**	**CPA-6**	**CPA-7**	**CPA-8**
Increased	52	58	51	75	39	52	74	56
Same as Previous	39	23	14	23	54	43	26	21
Decreased	08	20	35	2	6	5	0	22

Source: Table 6, Biogas User Survey, 2018 (for all CPAs)

The result above indicates that the sourcing biomass from forest over the years have become even more difficult.

- Increase in fuel wood price:

The households were interviewed on the perceived price of firewood in 1989, 2000 and 2018 during Biogas User Survey 2017/18 for the PoA. The results reveal that the

average market price of one bhari[3] of fuel wood in 1989, 2000 and in 2018 is in increasing trend.

Year	Average price of fuel-wood (NPR)							
	CPA-1	CPA-2	CPA-3	CPA-4	CPA-5	CPA-6	CPA-7	CPA-8
1989	45	34	41	28	63	61	63	37
2000	182	180	149	126	208	184	208	139
2018	494	494	453	429	502	459	502	390

Source: Table 8, Biogas User Survey, 2018 (for all CPAs)

If the operational lifetime of the biogas digesters is completed within this crediting period, that particular biogas digester will not be considered for the baseline emission calculation from the next consecutive monitoring period. As it can be seen that, the continuation of use of current baseline equipment, (non-renewable biomass based cook stove) is the most likely scenario for the crediting period for which renewal is being requested.

Step 1.4: Assessment of the validity of the data and parameters

There are some parameters such as emission factors per fuel source (IPCC default values), emission reduction factor of the biogas units, which were determined at the start of the first crediting period and not monitored during the first crediting period, are not valid anymore. AMS-I.E, Version 09 provides new guidance on key parameters, different default values and emission reductions calculation formulas. So the current baseline is updated for the 2nd crediting period according to the AMS-I.E, Version 09. Application of Steps 1.1, 1.2, 1.3 and 1.4 confirmed that the current baseline is valid for the second crediting period, but data and parameters needs to be updated. Therefore, step 2 is used.

Step 2: Update the current baseline and the data and parameters

Step 2.1: Update the current baseline

As per the outcome of step 1, this step is not applicable as the current baseline is still valid.

Step 2.2: Update the data and parameters

[3] 1 Bhari is about 35 kg in an average

As mentioned in step 1.4 above, many default parameters have been updated and new parameters have been used (as per AMS-I.E Version 09) for this crediting period. More details can be seen in sections I.6 and I.7 of the PoA-DD.

B.5. Demonstration of additionality

Specify the methodology, activity requirement or product requirement that establishes deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	Guidelines on the demonstration of additionality of small scale project activities" (version 09) EB 68 Annex 27.
Describe how the proposed VPA meets the criteria for deemed additionality.	The paragraph 2 of this guideline states that, "Documentation of barriers, as per paragraph 1 above is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW") The sub-section 2 (c) of paragraph states that, "Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds." Each unit of biogas digester has the capacity of not more than 1.86 kWth which is less than 5% of the small-scale CDM threshold, or 750 kW installed capacity. The PoA is thus additional and there is no need for further assessment and demonstration of additionality.

B.5.1. Prior Consideration

Not applicable

B.5.2. Ongoing Financial Need

The CPA consists of household technologies and are fixed dome biogas plants that require minimum management cost and repair and maintenance. Also, the technologies

under the CPAs are already implemented; the ongoing financial need is basically for the management and repair/maintenance of the technologies. Since the CPA is automatically additional, the detail demonstration of ongoing financial need is not applicable for CPA. However, the sales of GS CERs are instrumental for the repair/maintenance and management of the PoA. So, the ongoing financial need derived from the GS certification is necessary to enhance the project's operation in 2nd crediting period. The financial benefit from GS certification helps to maintain the PoA contributing to the sustainable development of the community and the country and further emission reduction.

B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the three SDGs

Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact Indicator (Proposed or SDG Indicator)
SDG 3: Ensure healthy lives and promote well-	3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	3.9.1 Mortality rate attributed to household and ambient air pollution -Average annual consumption of woody biomass per household in the pre-project devices during the project activity (ton/HH/year) - Quantity of woody biomass that is substituted or displaced (Tons) - Net calorific value of the non-renewable biomass that is substituted (TJ/ton) - Users' perception on reduction in indoor air pollution (%) - Users' perception on reduction in health problem (eye infection, respiratory disease, Cough and Fire related injury) (%) - User's perception in Time saving for the cooking (reduce exposure to indoor air pollution for men, women and children) (%) 3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to

		unsafe Water, Sanitation and Hygiene for All (WASH) services) - Users' perception on connection of toilet to biogas (%) 3.9.3 Mortality rate attributed to unintentional poisoning - Users perception in reduction of chemical fertilizers (use of Farmyard manure, Bio-slurry, Urea, DAP and Potash) (%)
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all	7.1: By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.2 Proportion of population with primary reliance on clean fuels and technology - Users' perception on time saving due to project for firewood collection (For men, women and children) (%) - Number of people trained to promote Biogas plants (No)
SDG 13: Climate Action	N/A	Emission Reduction

B.6.1. Explanation of methodological choices/approaches for estimating the SDG Impact

Baseline Estimate
Baseline estimate for SDG 13
According to AMS-I.E. version 09, para 20, the baseline emission reductions under a CPA are calculated as the following:

$$BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossil\_fuel} \quad (1)$$

In which:

BE_y	Baseline Emissions during the year y (tCO2e)
B_y	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB.y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel: 0.0156 TJ/tonne. The value is according to the methodology AMS I.E.

$EF_{projected-.fossilfuel}$	Emission factor for substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 tCO_2/TJ[4]

Following option a) of paragraph 21, B_y is "Calculated as the product of the number of households multiplied by the estimate of average annual consumption of woody biomass per household that is displaced by the project activity (tonnes/household/year)".

Thus, B_y will be calculated as follows:

$$B_y = N_{HH} \times (BC_{BL,HH,y} - BC_{PJ,HH,y}) \qquad \text{Equation (2)}$$

Where:

N_{HH}	=	Number of households in the project activity, number
$BC_{BL,HH,y}$	=	Average annual consumption of woody biomass per household before the start of the project activity, tonnes/household/year
$BC_{PJ,HH,y}$	=	If it is found that pre-project devices were not completely displaced but continue to be used to some extent, average annual consumption of woody biomass per household in the pre-project devices during the project activity, tonnes/household/year

B_y will be calculated multiplying with the actual household of this CPA that have operational digester in year y identified through survey method. Calculations will be carried out based on Excel spread sheets using the database of CPA that are already included. The database provides e.g. commissioning date.

Baseline estimation for SDG 3 and SDG 7:
Since the baseline technologies used for the project is considered as the traditional cookstoves users, the baseline situation will be analyzed based on the impact of the technology to the households and users. The baseline situation identified are poor situation when used the traditional stoves. The impact of the project activities are basically monitored during the project activity. The net calorific value of woody biomass will be taken from IPCC guideline. Following parameters will be monitored:

SDG 3
3.9.1 Mortality rate attributed to household and ambient air pollution

[4] This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. The value is calculated, based on the global average ratio of cooking fuels (the normalized ratio of kerosene and liquefied petroleum gas (LPG) excluding coal), i.e. 9 per cent for kerosene (71.5 t CO2/TJ) and 91 per cent for LPG (63.0 t CO2/TJ).

- Average annual consumption of woody biomass per household in the pre-project devices during the project activity (ton/HH/year)
- Quantity of woody biomass that is substituted or displaced (ton/year)
- Net calorific value of the non-renewable biomass that is substituted (TJ/ton)
- Users' perception on reduction in indoor air pollution (% response)
- Users' perception on reduction in health problem (% response)
- User's perception in Time saving for the cooking (% response)

3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

- Users' perception on connection of toilet to biogas (% connection)

3.9.3 Mortality rate attributed to unintentional poisoning

- Users perception in reduction of chemical fertilizers (% in increase/reduction)

SDG 7

7.1.2 Proportion of population with primary reliance on clean fuels and technology

- Users' perception on time saving due to project for firewood collection (% response)
- Number of people trained to promote Biogas plants

Project Estimate

Project estimate for SDG 13

The AMS I.E Version 9 requires calculation of project emission using "TOOL16: Project and leakage emissions from biomass". As the fuel-wood are basically sourced from the nearby and natural forest, which does not require processing of the feedstock and also does not include the cultivation, the project emissions (PE_y) is not applicable to this PA and is taken as zero.

Leakage

The default factor of 0.95 is used to account for any potential leakage (i.e. By is multiplied by a net to gross adjustment factor of 0.95 to account for leakages).
Thus the leakage emission under a CPA is calculated as the following:

$$LE_y = 0.05 \times B_y . f_{NRB.y} . NCV_{biomass} . EF_{projected\_fossilfuel} \quad 3$$

Project estimate for SDG 3 and SDG 7:

Since the implementation of biogas used for the project is considered as beneficial for reducing indoor air pollution and increase the access to renewable and clean energy, this will be identify through the perception survey conducted with the biogas users under the project activities. The parameters to be monitored for the SDG 3 and SDG 7 are given under section B.7.1 of the VPA-DD. The net calorific value of woody biomass will be taken from IPCC guideline. Following parameters will be monitored through Biogas User Survey:

SDG 3

3.9.1 Mortality rate attributed to household and ambient air pollution

- Average annual consumption of woody biomass per household in the pre-project devices during the project activity (ton/HH/year)
- Quantity of woody biomass that is substituted or displaced (ton/year)
- Net calorific value of the non-renewable biomass that is substituted (TJ/ton)
- Users' perception on reduction in indoor air pollution (% response)
- Users' perception on reduction in health problem (% response)
- User's perception in Time saving for the cooking (% response)

3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

- Users' perception on connection of toilet to biogas (% connection)

3.9.3 Mortality rate attributed to unintentional poisoning

- Users perception in reduction of chemical fertilizers (% in increase/reduction)

SDG 7

7.1.2 Proportion of population with primary reliance on clean fuels and technology

- Users' perception on time saving due to project for firewood collection (% response)
- Number of people trained to promote Biogas plants

Net Benefit

Net benefit estimate for SDG 13

Emission Reductions

As the methodology AMS IE version 9, the emission reductions are to be estimated based on the following equation:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y, tonnes CO_2eq

Net benefit estimation for SDG 3 and SDG 7:

Since the implementation of biogas used for the project is considered as beneficial for reducing indoor air pollution and increase the access to renewable and clean energy, this will be identify through the perception survey conducted with the biogas users under the project activities and compared with the baseline situation, the net benefit for the SDGs will be identified.

SDG 3

3.9.1 Mortality rate attributed to household and ambient air pollution

- Average annual consumption of woody biomass per household in the pre-project devices during the project activity (ton/HH/year)

- Quantity of woody biomass that is substituted or displaced (ton/year)
- Net calorific value of the non-renewable biomass that is substituted (TJ/ton)
- Users' perception on reduction in indoor air pollution (% response)
- Users' perception on reduction in health problem (% response)
- User's perception in Time saving for the cooking (% response)

3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

- Users' perception on connection of toilet to biogas (% connection)

3.9.3 Mortality rate attributed to unintentional poisoning

- Users perception in reduction of chemical fertilizers (% in increase/reduction)

SDG 7

7.1.2 Proportion of population with primary reliance on clean fuels and technology

- Users' perception on time saving due to project for firewood collection (% response)
- Number of people trained to promote Biogas plants

B.6.2. Data and parameters fixed ex ante

SDG13

Data/parameter	$EF_{projected\_fossil\ fuel}$
Unit	tCO2/TJ
Description	Emission factor for the projected fossil fuel consumption in the baseline.
Source of data	IPCC
Value(s) applied	63.7
Choice of data or Measurement methods and procedures	AMS-I.E version 09 requires using this value.
Purpose of data	Emission Reduction calculation
Additional comment	NA

SDG 3

Data/parameter	$f_{NRB,y}$
Unit	%
Description	Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass

Source of data	Calculated as per "TOOL30: Calculation of the fraction of non-renewable biomass"
Value(s) applied	86.1%
Choice of data or Measurement methods and procedures	The value is calculated as 86.1% using the national statistics and also validated by the Ministry of Forest and Environment, Government of Nepal. This value is for the national level, so will not be monitored.
Purpose of data	Calculation of baseline emission
Additional comment	This parameter shall remain fixed for the crediting period.

Data/parameter	$BC_{BL,HH,y}$
Unit	tonne/household/year
Description	Average annual consumption of woody biomass per household before the start of the project activity
Source of data	Based on survey (Biogas User Survey (BUS)) for similar project activities. The woody biomass substituted or displaced is conservatively taken as 4.5 tons/HH/years for ex-ante calculation of emission reduction for which the annual average consumption of woody biomass before the start of the project activities is 5.04 tons/HH/year and the average annual woody biomass consumption by pre-project device during the project activities is 0.54 tons/HH/Year.
Value(s) applied	5.04 tonne/household/year
Choice of data or Measurement methods and procedures	Calculated using option (b) Historical data or a sample survey conducted as per the latest version of the "Standards: Sampling and surveys for CDM project activities and programme of activities;" Biogas User Survey follows the standard sampling and surveys guidelines
Purpose of data	Calculation of baseline emission
Additional comment	This value is used in the calculations and shall remain fixed for the crediting period.

SDG 7

Data/parameter	N_{HH}
Unit	Numbers
Description	Number of households in each CPA in year y
Source of data	BSP database for the CPA
Value(s) applied	19,445 digesters

Choice of data or Measurement methods and procedures	The registration procedure of the database avoids double counting of digesters and the registration of digesters that have not been commissioned.
Purpose of data	Calculation of baseline emission
Additional comment	During calculation of Emission Reduction, it will be based on actual number of households having the biogas operational

The emission reduction calculation is based on data that is specified to digester size and region. This section provides explanation of calculation made.

B.6.3. Ex ante estimation of SDG Impact

The emission reduction calculation is based on data that is specified to digester size and region. This section provides explanation of calculation made.

Baseline Estimates
Baseline estimate for SDG 13

Baseline Emission
According to AMS-I.E (version 09), the baseline emission under a CPA are calculated as the following:

$$BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossil\_fuel}$$

In which:

BE_y	Baseline Emissions during the year y (tCO2e)
B_y	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB.y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass, Use 86.1%[5]
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel: 0.0156 TJ/tonne). The value is according to the methodology AMS I.E.

[5] The value is calculated using "TOOL 30: Calculation of the fraction of non-renewable biomass" as given in section I.6.1 of CDM PoA-DD and the value is fixed ex-ante. Use 86.1%

$EF_{projected-.fossilfuel}$	Emission factor for substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 tCO_2/TJ[6]

Thus, B_y will be calculated as follows:

By is calculated as using the following values

N_{HH}	19,445 in CPA-8
Displacement of Woody Biomass ($BC_{BL,HH,y}$ - $BC_{PJ,HH,y}$)	4.50 tonne/household/year[7]
Operational status of Biogas	89%[8]
Number of Household with operational digester	N_{HH} * Operational status of Biogas

By = 19,445*0.89*4.5 = 77877.23 tonne/year

Substituting the values,
Baseline Emission (BE_y) = 77877.23 *0.861*0.0156*63.7 = 66,631 tCO_{2e}

Baseline estimation for SDG 3:

1) 3.9.1 Mortality rate attributed to household and ambient air pollution (Average annual consumption of woody biomass per household in the pre-project devices during the project activity): 0 tonne/household/year (as no project devices was introduced)
2) 3.9.1 Mortality rate attributed to household and ambient air pollution (Quantity of woody biomass that is substituted or displaced): 0 tonnes/year
3) 3.9.1 Mortality rate attributed to household and ambient air pollution (Net calorific value of the non-renewable biomass that is substituted): 0 TJ/tone
4) 3.9.1 Mortality rate attributed to household and ambient air pollution (Users' perception on reduction in indoor air pollution): 0% households (As using biomass for cooking)
5) 3.9.1 Mortality rate attributed to household and ambient air pollution (Users' perception on reduction in health problem): 0% households perceived in reduction of eye infection, respiratory disease, cough and fire related injury (as using biomass for cooking)

[6] This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. The value is calculated, based on the global average ratio of cooking fuels (the normalized ratio of kerosene and liquefied petroleum gas (LPG) excluding coal), i.e. 9 per cent for kerosene (71.5 t CO2/TJ) and 91 per cent for LPG (63.0 t CO2/TJ).

[7] Conservative value taken as stipulated in section I.6.1 of CDM PoA DD and is fixed ex-ante.

[8] For ex ante, operational status of the CPA-6 is taken as 89% stipulated in the VPA-DD. The actual operational status will be arrived using sample survey for ex-post and may vary (higher or lower) for the CPA.

6) 3.9.1 Mortality rate attributed to household and ambient air pollution (User's perception in Time saving for the cooking (reduce exposure to indoor air pollution)): 0% households for men, women and children (as using biomass for cooking)
7) 3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) (Users' perception on connection of toilet to biogas): 0% connection of toilet to Biogas as No biogas was used before project activity
8) 3.9.3 Mortality rate attributed to unintentional poisoning (Users perception in reduction of chemical fertilizers): 0% reduction in use of chemical fertilizers (use of Farmyard manure, Bio-slurry, Urea, DAP and Potash) as using no biogas slurry.

Baseline estimation for SDG 7:

1) 7.1.2 Proportion of population with primary reliance on clean fuels and technology (Users' perception on time saving due to project for firewood collection): 0% households for men, women and children as no biogas was used in baseline
2) 7.1.2 Proportion of population with primary reliance on clean fuels and technology (Number of people trained to promote Biogas plants): 0 Mason trained as no biogas were in use in baseline

Project Estimates

Project Estimate for SDG 13

Project Emissions

$PE_y = 0$

Leakage

The default factor of 0.95 is used to account for any potential leakage, as prescribed by the methodology. Thus the leakage emission under a CPA is calculated as the following:

$LE_y = 0.05*77877.23*0.861*0.0156*63.7 = 3{,}332\ tCO_{2e}$

Project Estimate for SDG 3:

1) 3.9.1 Mortality rate attributed to household and ambient air pollution (Average annual consumption of woody biomass per household in the pre-project devices during the project activity): 0.54 tonne/household/year (Biogas will be in use)

2) 3.9.1 Mortality rate attributed to household and ambient air pollution (Quantity of woody biomass that is substituted or displaced): 77877.23 tons/year (Biogas displaces the firewood)

3) 3.9.1 Mortality rate attributed to household and ambient air pollution (Net calorific value of the non-renewable biomass that is substituted): 0.0156 TJ/tones

4) 3.9.1 Mortality rate attributed to household and ambient air pollution (Users' perception on reduction in indoor air pollution): 100% households (As by using biogas, it is expected 100% users will perceive reduction)

5) 3.9.1 Mortality rate attributed to household and ambient air pollution (Users' perception on reduction in health problem): 100% households perceive reduction in eye infection, respiratory disease, cough and fire related injury (As by using biogas, it is expected 100% users will perceive reduction)

6) 3.9.1 Mortality rate attributed to household and ambient air pollution (User's perception in Time saving for the cooking (reduce exposure to indoor air pollution)): 100% households for men, women and children by using biogas for cooking

7) 3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) (Users' perception on connection of toilet to biogas): 100% connection of toilet to Biogas

3.9.3 Mortality rate attributed to unintentional poisoning (Users perception in reduction of chemical fertilizers): 100% changes in use of chemical fertilizers ((use of Farmyard manure, Bio-slurry, Urea, DAP and Potash) using biogas slurry.

Baseline estimation for SDG 7:

1) 7.1.2 Proportion of population with primary reliance on clean fuels and technology (Users' perception on time saving due to project for firewood collection): 100% households for men, women and children due to using biogas
2) 7.1.2 Proportion of population with primary reliance on clean fuels and technology (Number of people trained to promote Biogas plants): As and when required, 20 Mason will be trained for the biogas installation during period of PoA.

Net benefit

Net Benefit for SDG 13

Emission Reductions

As the methodology AMS IE version 09, para 27, the ex-ante emission reduction is estimated as below:

$$ER_y = BE_y - PE_y - LE_y$$

$$= 66{,}631 - 0 - 3{,}332$$

$$= 63{,}299\ tCO_{2e}$$

Please refer ER calculation spreadsheet for further details of the calculation.

Net benefit for SDG 3:

1) 3.9.1 Mortality rate attributed to household and ambient air pollution (Average annual consumption of woody biomass per household in the pre-project devices during the project activity): reduce by 0.54 tonne/household/year

2) 3.9.1 Mortality rate attributed to household and ambient air pollution (Quantity of woody biomass that is substituted or displaced): reduced by 77,877.23 tonnes/year.

3) 3.9.1 Mortality rate attributed to household and ambient air pollution (Net calorific value of the non-renewable biomass that is substituted): reduced by 0.0156 TJ/tones

4) 3.9.1 Mortality rate attributed to household and ambient air pollution (Users' perception on reduction in indoor air pollution): 100% households (As by using biogas, it is expected 100% users will perceive reduction)

5) 3.9.1 Mortality rate attributed to household and ambient air pollution (Users' perception on reduction in health problem): 100% households perceive reduction in eye infection, respiratory disease, cough and fire related injury (As by using biogas, it is expected 100% users will perceive reduction)

6) 3.9.1 Mortality rate attributed to household and ambient air pollution (User's perception in Time saving for the cooking (reduce exposure to indoor air pollution)): 100% households for men, women and children by using biogas for cooking

7) 3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) (Users' perception on connection of toilet to biogas): 100% connection of toilet to Biogas

3.9.3 Mortality rate attributed to unintentional poisoning (Users perception in reduction of chemical fertilizers): 100% changes in use of chemical fertilizers ((use of Farmyard manure, Bio-slurry, Urea, DAP and Potash) using biogas slurry.

Net benefit for SDG 7:

2) 7.1.2 Proportion of population with primary reliance on clean fuels and technology (Users' perception on time saving due to project for firewood collection): 100% households for men, women and children due to using biogas

7.1.2 Proportion of population with primary reliance on clean fuels and technology (Number of people trained to promote Biogas plants): As and when required, 20 Masons will be trained for biogas installation during crediting period of PoA.

B.6.4. Summary of ex ante estimates of each SDG outcome

Year	Baseline estimate	Project estimate	Net benefit
Year 1	66,631	3,332	63,299
Year 2	66,631	3,332	63,299
Year 2	66,631	3,332	63,299
Year 4	66,631	3,332	63,299
Year 5	66,631	3,332	63,299
Year 6	66,631	3,332	63,299
Year 7	66,631	3,332	63,299
Total	**466,417**	**23,324**	**443,093**
Total number of crediting years	7		
Annual average over the crediting period	66,631	3,332	63,299

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

SDG 3

Data / Parameter	$BC_{PJ,HH,y}$
Unit	tonnes/household/year
Description	Average annual consumption of woody biomass per household in the pre-project devices during the project activity, if it is found that pre-project devices were not completely displaced but continue to be used to some extent.
Source of data	Biogas User Survey
Value(s) applied	0.54 tonnes/household/year for the ex-ante calculation as per the Biogas User Survey for similar project activities. For this crediting period, this parameter will be determined using regular user survey.
Measurement methods and procedures	Biogas User Survey will be conducted on a sample of households. The sample size is determined to achieve 90% confidence interval and a 10% margin of error. During the survey, the estimates of the biogas users on the average annual consumption of woody biomass during the monitoring period will be captured.
Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	Though the methodology requires sample survey biennially, CME conducts the user survey annually to ensure the number of biogas digesters operational for that particular year for each CPA and the consumption of the woody biomass by pre-project device if any during the project activities.
Purpose of data	Calculation of baseline emission
Additional comment	ERs will be accounted only for functional biogas in the particular monitoring period

Data / Parameter	By
Unit	tones/year
Description	Quantity of woody biomass that is substituted or displaced
Source of data	Biogas User Surveys
Value(s) applied	This will be calculated based on the operational status of the biogas digesters for particular monitoring period and the woody biomass consumed by pre-project devices during project activity. It ranges from zero when biogas

	is not in operation to 5.04 tonnes/household/year when $BC_{PJ,HH,y}$ is zero and biogas is operational.
Measurement methods and procedures	The calculation of the By depends on the operational status of the biogas units for the particular monitoring period and the operational status will be checked annually during the Biogas User Survey. From the total population of biogas units included in the project activity, statistically representative samples will be drawn for the purpose of carrying out the survey. The sample size is determined to achieve 90% confidence interval and a 10% margin of error. The percentage of biogas units found to be operational during the sample survey shall be used to calculate the weighted average operational status of the biogas which then will be used to calculate By as follows: $By = NHH*(BC_{BL,HH,y} - BC_{PJ,HH,y})$ where NHH will be the household with operational biogas digester for the particular monitoring period. $NHH = N * P_Y$, where N is the number of bio digesters installed in the project and Py is Proportion of Bio digesters operational estimated based on the sample survey
Monitoring frequency	Once in a Year
QA/QC procedures	Though the methodology requires sample survey biennially, CME conducts the user survey annually to ensure the number of biogas digesters operational for that particular year for each CPA.
Purpose of data	Calculation of baseline emission
Additional comment	Once the biogas included in the component project activity completes its operational lifetime, those biogas will not be considered for the next consecutive monitoring.

Data / Parameter	**$NCV_{biomass}$**
Unit	TJ/tonne
Description	Net calorific value of the non-renewable biomass briquettes or charcoal used in project devices
Source of data	Methodology AMS I.E. Version 09
Value(s) applied	0.0156
Measurement methods and procedures	De-fault value will be applied from the methodology AMS I.E version 09

Monitoring frequency	N/A
QA/QC procedures	N/A
Purpose of data	AMS-I.E. Ver 09 requires using this value.
Additional comment	Calculation of baseline emission

Data / Parameter	Users' perception on reduction in indoor air pollution
Unit	Qualitative
Description	Users' perception on reduction in indoor air pollution
Source of data	Biogas User Survey
Value(s) applied	To be monitored
Measurement methods and procedures	Air quality will be assess through users interviews during the Biogas User Survey.
Monitoring frequency	at least biennial
QA/QC procedures	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA; survey will try to capture the view of the women actually involved in cooking.
Purpose of data	Sustainable Development Assessment.
Additional comment	Requirements as defined in the sampling plan shall be met.

Data / Parameter	Reduction in health problem
Unit	Qualitative
Description	Users' perception on reduction in health problem
Source of data	Biogas User Survey
Value(s) applied	To be monitored
Measurement methods and procedures	Reduction in health problem will be assess through users interviews during the Biogas User Survey.
Monitoring frequency	at least biennial
QA/QC procedures	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA.
Purpose of data	Sustainable Development Assessment.
Additional comment	Requirements as defined in the sampling plan shall be met.

Data / Parameter	Users perception in reduction of chemical fertilizers
Unit	Qualitative
Description	Users' perception on reduction in use of chemical fertilizers and use of bio-slurry
Source of data	Biogas User Survey
Value(s) applied	To be monitored
Measurement methods and procedures	Assess through users interviews during the Biogas User Survey.
Monitoring frequency	at least biennial
QA/QC procedures	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA
Purpose of data	Sustainable Development Assessment.
Additional comment	Requirements as defined in the sampling plan shall be met.

SDG 7

Data / Parameter	Time saving (Fuel wood collection)
Unit	Qualitative
Description	Users' perception on time saving due to project for firewood collection
Source of data	Biogas User Survey
Value(s) applied	To be monitored
Measurement methods and procedures	Assess through users interviews during the Biogas User Survey.
Monitoring frequency	at least biennial
QA/QC procedures	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA
Purpose of data	Sustainable Development Assessment.
Additional comment	Requirements as defined in the sampling plan shall be met.

Data / Parameter	Trainings to Masons
Unit	Number of people trained to promote Biogas plants
Description	Masons involved in constructing the biogas plants shall receive training on the proper installation of biogas digesters.

Source of data	Training report
Value(s) applied	To be monitored
Measurement methods and procedures	Training report
Monitoring frequency	At least bi-ennial
QA/QC procedures	N/A
Purpose of data	Sustainable Development Assessment.
Additional comment	N/A

Safeguarding Principle 6.8

Data / Parameter	Impact on Crop Productivity
Unit	Qualitative
Description	Users' perception on Impact on crop productivity (comparing to baseline)
Source of data	Sampling Surveys/Annual usage survey/Monitoring survey
Value(s) applied	To be monitored
Measurement methods and procedures	Assess through users interviews during the Biogas User Survey.
Monitoring frequency	at least biennial
QA/QC procedures	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA
Purpose of data	Sustainable Development Assessment.
Additional comment	Requirements as defined in the sampling plan shall be met.

B.7.2. Sampling plan

Internal monitoring activities as part of the overarching BSP programme
AEPC carries out thorough quality control activities to ensure that the biogas digesters are built according to set quality standards following the subsidy delivery mechanism and other set standard. This includes setting up random sampling, field visits, on the spot advice to biogas companies and biogas owners, collecting and analyzing data obtained through questionnaire during visits. Note that this quality control is carried out to ensure quality of the digesters but not necessarily to calculate the emission reductions.

Monitoring
1) Digester performance and average annual consumption of woody biomass

The performance of the bio-digesters and average annual consumption of woody biomass by project devices will be assessed based on the performance reports (Biogas User Survey). The corresponding survey may be conducted as part of the quality control procedures of AEPC.

A statistically representative sample will be surveyed individually for each CPA of the PoA. The Annual Biogas User Survey will be conducted following the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB 86, Annex 4). As part of the survey, statistically representative sample of biogas users will be surveyed and in order to achieve 90% confidence interval and a 10% margin of error requirement for the sampled parameters. Stratified random sampling will be applied in conducting survey. The sample to be surveyed will be drawn randomly from the population of biogas digester distributed in each stratum (i.e. remote hill, hill and terai) spread within the project boundary of the PoA. In order to have an unbiased and independent assessment, the survey will be carried out through an independent agency to check the operation/functioning of the biogas units installed as part of each CPA.

Thus, the at least biennial performance reports (Biogas User Survey) will be used for the identification of the proportion of biogas digesters included in the CPAs that are operational. The proportion of biogas digesters that are operational will be counted towards the emission reduction for the CPAs while the proportion of the non-operational plants will not be considered towards ER calculation.

2) Displacement of NRB

The fraction of the Non-renewable biomass displaced by the PoA has been determined ex-ante in the PoA-DD and has been fixed for the second crediting period. The following indicators will be monitored through Biogas User Survey to confirm the displacement of NRB by households and perceptions of the biogas users on these indicators would be captured through survey and analysed. These indicators include:

- Trends in distance travelled for firewood gathering or trends in time needed for firewood gathering indicating depletion of resources available
- Trends in price of firewood indicating demand and scarcity
- Trends in type of cooking fuel collected that could indicate scarcity of fire wood

At least two of the above indicators should confirm the displacement of non-renewable biomass. The survey will seek to collect the data pertaining to the indicators for monitoring year.

3) Monitoring of other Sustainable Development Parameters

The monitoring of other sustainable development parameters will be done through the Biogas User Survey as mentioned above. The same sampled household will be used to assess those parameters along with the digesters performance and monitoring of continued displacement of NRB. The corresponding sampling plan is given in Appendix 5 of registered CDM PoA-DD (version 17, dated 05/09/2019).

B.7.3. Other elements of monitoring plan

The various aspects to be monitored according to the methodology are presented in the table below:

Aspects to be monitored according to Methodology	**Applicability to the Project**	**Parameter to be Monitored (YES/NO/NA)**
Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance.	Emission reductions is directly proportional to the number of appliances (digesters in case of the project) still performing. So this needs to be monitored.	Yes (based on operation reports carried out at least biennial)
In order to assess the leakages, monitoring shall include data on the amount of woody biomass saved under the project activity that is used by non-project households/users (who previously used renewable energy sources). Other data on nonrenewable woody biomass use required for leakage assessment shall also be collected	The methodology allows the use of a default factor of 0.95 to account for leakage. So this will not be monitored in the project.	No (Instead a default factor of 0.95 shall be used)
Monitoring should confirm the displacement or substitution of the non-renewable woody biomass at each location.	This shall be ensured by monitoring the number of appliances (digesters in case of the project) still performing	Yes (based on the performance reports carried out at least biennial, e.g. BUS, and in addition to eligibility criteria that also confirm use of NRB)
Sustainable development parameters and safeguarding principles to be assessed as per PoA DD	This shall be ensured by different parameters listed in B.7.2 above	Yes (Biogas User Survey Report conducted at least Biennial following the applicable sampling guideline for PoA)

SECTION C. DURATION AND CREDITING PERIOD

C.1. Duration of project

C.1.1. Start date of VPA

01/01/2015

C.1.2. Expected operational lifetime of VPA

The operational lifetime of each digester is 20 years.

C.2. Crediting period of project

C.2.1. Start date of crediting period

15/02/2024.

C.2.2. As the first crediting period is ended on 14/02/2024, this pertains to the starting date of the second crediting period.Total length of crediting period

7 years. This pertains to the length of the second crediting period

SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

D.1. Safeguarding Principles that will be monitored

A completed Safeguarding Principles Assessment is in Appendix 1, ongoing monitoring is summarised below.

Principles	Mitigation Measures added to the Monitoring Plan
Principle 7.1 Emission	The project replaces the use of non-renewable biomass and hence this will be calculated during the project period through monitoring of different parameters in the VPA DD.
Principle 9.8 Food	Though the project activity and its boundary does not involve the food production, crop regime alteration or export or economic incentives, the bi-product of the project (Bio-slurry) application potentially increases the productivity. This will be monitored through perception survey whether the users perceived the increase in productivity.

D.2. Assessment that project complies with GS4GG Gender Sensitive requirements

Question 1 - Explain how the project reflects the key issues and requirements of Gender Sensitive design and	The project reflects the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy. As the Gold Standard Gender Policy recognizes that gender relations, roles and responsibilities exercise important influence on women and men's access to and control over natural resources and the goods and

implementation as outlined in the Gender Policy?	services they provide, the project has given access to biogas to both men and women without inequality. Since the cooking and household chores in Nepal basically comes under the women's activity, the biogas promoted under the CPAs contributes multiple benefit to the women and children. The project meaningfully address attribution, generate livelihood benefits and promote approaches that enable women and men to more equitably contribute to and benefit from the project. The Biogas User Survey is being done continuously for the Biogas PoA and from the regular survey, it is evidenced that the time for firewood collection and cooking has been reduced and is perceived by the users incase of men, women and children. The time saving that they achieved from the biogas is being used for other income generating activities and social activities. The health of the users especially women have been improved caused by air pollution. It basically offers the drudgery reduction of women and children and also provides the leverage to the women to involve in economic activities and other social participation utilizing the time saved for the firewood collection. Considering the size of the technology and the service that it offers, it has potential to enable women economically which help reduce discrimination against women rather than deepening it.
Question 2 - Explain how the project aligns with existing country policies, strategies and best practices	Being a focal government entity to promote renewable energy in Nepal, the PD follows Renewable Energy Subsidy Policy 2016[9] which has provisioned the additional support to construct Biogas for "targeted beneficiary group (women-led households with dependent children, earthquake victims from earthquake affected districts, endangered indigenous community identified by GoN and Dalit). PD has also developed the GESI Policy in 2018[10] which is given in Nepali language and it focuses on improving livelihood assets and capacities of women, poor and the excluded so that they can have access to different energy source. In addition, as per the Gender Equality and Social Inclusion Policy of AEPC it has mentioned that it will enhance their voice so that they can recognize their rights and influence decisions affecting

[9] https://www.aepc.gov.np/uploads/docs/2018-06-19_RE%20Subsidy%20Policy,%202073%20(English).pdf

[10] https://www.aepc.gov.np/uploads/docs/l-uu-l-1542168651.pdf

	them. So in every stakeholder consultation of renewable energy projects, it has to be ensure the women's participation and their comments are addressed. The rural energy policy 2006[11] of Nepal also ensures the implementation of the special programmes of promotional activities that emphasize on access to rural energy and role of rural energy in sustainable development, poverty reduction and positive impacts on women and children. As the rural energy is directly linked to activities traditionally carried out by the women in Nepal, the policy also emphasizes on the implementation of such technologies considering it as an integral part of the women's enabling activities. So, all the technologies are implemented under those national policies (rural energy policy and subsidy policy).
Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?	Since the project is already implemented and proposed for crediting period renewal, and is and delivering its benefits to the users. Further assessment is not required. However, PD will welcome the feedback from the GS.
Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	Since the project is already implemented and proposed for crediting period renewal, and is and delivering its benefits to the users. Further assessment is not required. However, PD will welcome the feedback from the GS.

SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the 2 step GS4GG Consultation for monitoring purposes. Please refer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

E.1. Summary of stakeholder mitigation measures

Please refer to the section D.14 of the CDM-SSC-PoA-DD for the stakeholder consultation as per CDM requirement. The LSC for GS was conducted on PoA level. The detail of it is given in section E of the PoA Passport.

[11] https://www.aepc.gov.np/uploads/docs/2018-06-24_Rural%20Energy%20Policy,%202006%20(English).pdf

For the inclusion of CPA-8, stakeholder feedback round was started on 6th May 2019. A public notice was published in AEPC's website to provide the feedback on Local Stakeholder Consultation Report, CPA-DDs for CPA-8, along with CPA-9. Similarly, the notice and the related documents were also published in atmosfair gGmbH's website as well. For follow-up, an e-mail was also sent to the related stakeholders to provide the feedback on the documents.

During the stakeholder feedback round which was started on 6th May 2019 for two months, no comments/feedbacks were received for CPA-8.

E.2. Final continuous input / grievance mechanism

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.
Continuous Input / Grievance Expression Process Book (mandatory)	Grievance Registration and continuous input: Grievance section: www.aepc.gov.np Alternative Energy Promotion Centre (AEPC) Phone +9771-4498013, 4498014 Fax : +9771-5542397, 5539392
GS Contact (mandatory)	help@goldstandard.org
Other	Nepal biogas promoters association Central Office Kathmandu: Phone: 01- 5535116 Nepal biogas promoters association regional offices: 1. Pokhara: Phone: 061-526785 2. Butwal: Phone: 071-551514 3. Itahari: Phone: 025-5817745 4. Nepalgunj: Phone: 081-528066 5. Dhangadi: Phone: 091- 527379 6. Chitwan: Phone: 056- 521749

SECTION F. **Eligibility and inclusion criteria for VPAs inclusion**

Please refer section A.1.1 Table 3 Eligibility for VPA inclusion as per PoA requirements

APPENDIX 1 - SAFEGUARDING PRINCIPLES ASSESSMENT

Complete the Assessment below and copy all Mitigation Measures for each Principle into SECTION D above. Please refer to the instructions in the Guide to Completing this Form below.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			
1. 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 2. The Project shall not discriminate with regards	a. No b. No	a. The project doesn't involve any activity that affects human right but promotes the human rights to have access to clean energy and environment. Conclusion: the parameter will not be monitored. b. The project shall not discriminate any people to have biogas plants rather it enhances the participation and inclusion. Conclusion: the parameter will not be monitored.	N/A

to participation and inclusion			
Principle 2. Gender Equality			
1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women 2. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)	a. No b. No c. No	a) The project enhances the women's access and entitlement of benefits. Since the women will be direct user of the Biogas stoves, it will benefit women by reducing their exposure to the indoor air pollution thereby improving their health. In addition, the replacement of firewood after the installation of Biogas will reduce workload of women for the collection of firewood. Reduced workload for firewood collection results in time saving that the women can use for other productive activities. Conclusion: the parameter will not be monitored b) The project will not adversely affect men and women in marginalized or vulnerable communities. Implementation of the project will contribute towards preservation of common resources in form of "firewood". Households duties related to firewood collection, cooking and cleaning utensils remain with women. The project therefore tends to decrease burden on women and won't result in social isolation of men. Conclusion: the parameter will not be monitored c) The project duly accounts the gender roles. Time saving is one of the key benefits from the project which the beneficiary can utilize to fulfill their gender roles. With the saved time, one can perform the respective gender role more effectively. Conclusion: the parameter will not be monitored	N/A

	d. Yes e. No f. No g. No	d) The project shall make every effort to include landless people in its design. Benefits from the project is expected to culminate in form of creation of entrepreneurial opportunities. While the focus is on capacitating women to take advantage of the entrepreneurial opportunity, the project shall not deprive men from the families of minority groups or the landless people to take advantage of the capacity building activities. Conclusion: the parameter will not be monitored as the CPAs are implemented already e) No, the project is not designed such that it increased workload of women and their care responsibilities. By introducing Biogas, the overall performance of women in kitchen will be more efficient. This will enable them engage in other activities. Conclusion: the parameter will not be monitored f) The project will enhance social participation and decision making role of women. Moreover, the women are expected to develop entrepreneurial skills which will enable them economically to deal with the household problems. The potential of the project to enable women economically will help reduce discrimination against women rather than deepening it. Conclusion: The parameter will not be monitored	

Principle 3. Community Health, Safety and Working Conditions			
1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	Yes	The Project shall make every effort to avoid health risks of worker during construction of biogas. Emission reduction and reduction on indoor air pollution is one of the key benefits of the project for community that will improve the health of those communities. Conclusion: Since the CPA is included already in CDM and all the biogas are constructed already, health risk of the worker will not be monitored but the emission reduction and improve in health condition will be monitored.	N/A
Principle 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?	No	The project units are simple and small in dimension. This will not involve anything related to removal of sites, objects or structures of cultural significance. Therefore the safeguarding principle under discussion will not be triggered by the project. Conclusion: the parameter will not be monitored	**N/A**
>>			
Principle 4.2 Forced Eviction and Displacement			
Does the Project require or cause the physical or economic relocation of peoples		The project units are simple and small in dimension. This will not involve anything related to removal of sites, objects or structures of cultural significance. Therefore the safeguarding	**N/A**

(temporary or permanent, full or partial)?		principle under discussion will not be triggered by the project. Conclusion: the parameter will not be monitored	
>>			
Principle 4.3 Land Tenure and Other Rights			
a. Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership? b. For Projects involving land use tenure, are there any uncertainties with regards to land tenure, access rights, usage rights or land ownership?		The project units are simple and small in dimension. This will not involve anything related to removal of sites, objects or structures of cultural significance. Therefore the safeguarding principle under discussion will not be triggered by the project. Conclusion: the parameter will not be monitored	**N/A**
>>			
Principle 4.4 - Indigenous people			
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?			**N/A**
>>			
Principle 5. Corruption			

1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	No	The project implementation is guided by the government 's subsidy policy and duely followed the set quality standard. Quality assurance and quality control is an intregal part of the project impleentation ensuring the quality throughout the project cycle. Conclusion: The parameter will not be monitored.	N/A
Principle 6.1 Labour Rights			
1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the 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 and include: a) Working hours (must not exceed 48 hours			N/A

per week on a regular basis), AND b) Duties and tasks, AND c) Remuneration (must include provision for payment of overtime), AND d) Modalities on health insurance, AND e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. No child labour is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion) 5. 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			
Principle 6.2 Negative Economic Consequences			
1. Does the project cause negative economic consequences during and after project implementation? >>	No	The project units are simple and have less moving parts. So, it requires less repair and maintenance. Hence the operational cost is less in comparision to the energy access and the additional benefits that it offers. So, the project implemented is sustainable financially and has positive economic impacts by offering the time saving, ease in cleaning the utensils, reducing health risk and indoor air pollution etc. This has no any negative economic impacts. Conclusion: the parameter will not be monitored	N/A
Principle 7.1 Emissions			
Will the Project increase greenhouse gas emissions over the Baseline Scenario? >>	No	The project will replace the use of non-renewable biomass. The baseline of the project is the use of firewood for cooking. So, this project will reduce the GHG over the baseline scenario. Conclusion: The parameters will be calculated based on the operational status of the project units	The project replaces the use of non-renewable biomass and hence this will be calculated during the project

			period through monitoring of different parameters in the VPA DD.
Principle 7.2 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 will not use any fuel resources that provides for other local users. It uses the animal dung. Therefore the safeguarding principle under discussion will not be triggered by the project. Conclusion: the parameter will not be monitored	N/A
>>			
Principle 8.1 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?	No	The project requires very less water to make the slurry that can be fetched at household level itself. Therefore the safeguarding principle under discussion will not be triggered by the project. Conclusion: the parameter will not be monitored	N/A
>>			

Principle 8.2 Erosion and/or Water Body Instability			
a. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? b. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	No	The project units are installed at household level which will not directly or indirectly cause additional erosion or disrupt the water body. Therefore the safeguarding principle under discussion will not be triggered by the project. Conclusion: the parameter will not be monitored	N/A
>>			
Principle 9.1 Landscape Modification and Soil			
Does the Project involve the use of land and soil for production of crops or other products?	No	The project doesn't involve use of land and soil for production or crops or other products. Therefore the safeguarding principle under consideration will not be triggered by the project. Conclusion: the parameter will not be monitored.	N/A
>>			
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding,	No	The project units are household based units and are less succesptible to the natural disasters. Therefore the safeguarding principle under consideration will not be triggered by the project.	N/A

drought or other extreme climatic conditions?		Conclusion: the parameter will not be monitored.	
>>			
Principle 9.3 Genetic Resources			
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?	No	The project doesn't involve any activity related to GMOs. Therefore the safeguarding principle under consideration will not be triggered by the project. Conclusion: the parameter will not be monitored.	N/A
>>			
Principle 9.4 Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment?	No	The project units generally yields the Biogas and Bio-slurry. The biogas is used for the cooking purposes whereas the bioslurry is used as nutrients (manure) in the agriculture field. Therefore the safeguarding principle under consideration will not be triggered by the project. Conclusion: the parameter will not be monitored.	N/A
>>			
Principle 9.5 Hazardous and Non-hazardous Waste			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and	No	The project unit does not require or releases any hazardous and non-hazardous chemicals. Therefore the safeguarding	N/A

non-hazardous chemicals and/or materials? >>		principle under consideration will not be triggered by the project. Conclusion: the parameter will not be monitored.	
Principle 9.6 Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilisers? >>	Yes	The project units produces the bioslurry that potentially displaces the chemical fertilizers. Basically due to good content of nitrogen in the fertilizer the bio-slurry is a potent replacer of the Urea. Conclusion: the parameter will be monitored through the perception survey with the users.	N/A
Principle 9.7 Harvesting of Forests			
Will the Project involve the harvesting of forests? >>	**No**	The project doesn't involve any activity that requires harvesting of forest products. Therefore the safeguarding principle under consideration will not be triggered by the project. Conclusion: the parameter will not be monitored.	N/A
Principle 9.8 Food			
Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives? >>	Yes	The project units produces the bioslurry that potentially increases the productivity of crop as it has good content of nitrogen. Conclusion: the parameter will be monitored through the perception survey with the users.	Though the project activity and its boundary does not involve the

			food production, crop regime alteration or export or economic incentives, the bi-product of the project (Bio-slurry application potentially increases
Principle 9.9 Animal husbandry			
Will the Project involve animal husbandry? >>	No	The project doesn't involve any activity that requires animal husbandry. Therefore the safeguarding principle under consideration will not be triggered by the project. Conclusion: the parameter will not be monitored	N/A
Principle 9.10 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?		The project technologies are household technologies and will not have any impacts on identified habitat and have no adverse impact on bio-diversity. Therefore the safeguarding principle under consideration will not be triggered by the project. **Conclusion: the parameter will not be monitored.**	N/A

>>			
Principle 9.11 Endangered Species			
a. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? b. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?		The project technologies are household technologies and do not lead to the adverse impact on endangered, vulnerable or critically endangered species. Therefore the safeguarding principle under consideration will not be triggered by the project. **Conclusion: the parameter will not be monitored.**	N/A
>>			

APPENDIX 2- CONTACT INFORMATION OF VPA IMPLEMENTER

Organization name	Alternative Energy Promotion Centre (AEPC)
Registration number with relevant authority	NA
Street/P.O. Box	Mid Baneshwor, Kathmandu
Building	
City	
State/Region	Bagmati
Postcode	
Country	Nepal
Telephone	+977-1-4498013
E-mail	nawa.dhakal@aepc.gov.np
Website	www.aepc.gov.np
Contact person	Nawa Raj Dhakal
Title	Acting Executive Director
Salutation	Mr.
Last name	Dhakal
Middle name	Raj
First name	Nawa
Department	Alternative Energy Promotion Centre
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Direct tel.	+977-1-4498013
Personal e-mail	nawa.dhakal@aepc.gov.np

APPENDIX 3- LUF ADDITIONAL INFORMATION

Not Applicable

APPENDIX 4-SUMMARY OF APPROVED DESIGN CHANGES

Not Applicable

Revision History

Version	Date	Remarks
2.0	4 May 2022	
1.1	7 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Inclusion criteria table added Gender sensitive requirements added Prior consideration (1 yr rule) and Ongoing Financial Need added Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on Stakeholder Consultation information required Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption