

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



**July 2017, Version 1**

## KEY PROJECT INFORMATION

Title of Project:	Nepal Biogas Support Program – CPA 6: 18,504 digesters
Title of the PoA:	Nepal Biogas Support Program – PoA (UNFCCC ref: 9572; GS 3110)
Brief description of Project:	This Component Project Activity (CPA) is part of the Nepal Biogas Support Program-Programme of Activity (PoA) (UNFCCC Ref: 9572). This CPA includes 18,504 digesters which were implemented between 24/05/2013 and 04/04/2014. This CPA is already included in CDM on 8th July 2015. Alternative Energy Promotion Centre (AEPC) is responsible for overall coordination and the implementation of all the CPAs under the Nepal Biogas Support Program-PoA.
Expected Implementation Date: Expected duration of Project:	Implementation date: 24/05/2013 to 04/04/2014 Project duration: 20 years from the start date (23/05/2033)
Project Developer:	Alternative Energy Promotion Centre (AEPC)
Project Representative:	Alternative Energy Promotion Centre (AEPC)
Project Participants and any communities involved:	atmosfair gmbH; First Climate Markets AG
Version of PDD: Date of Version:	425/07/2018
Host Country / Location:	Nepal
Certification Pathway (Project Certification/Impact Statements & Products)	Normal/ <del>fast track</del>
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG
Methodologies applied:	AMS I.E. version 04
Product Requirements applied:	GS CER
Regular/Retroactive:	Retroactive inclusion
SDG Impacts:	1 – SDG 3 2 – SDG 7 3 – SDG 13
Estimated amount of SDG Impact Certified	61,565 tCO <sub>2e</sub>

## SECTION A. Description of project

### A.1. Purpose and general description of project

Biogas Support Program (BSP) in Nepal was started in July 1992 with funding from the Directorate General for International Cooperation of the Netherlands (DGIS) of the Netherlands government through the Netherlands Development Organization in Nepal (SNV/N). Government of Nepal (GoN) and the Kreditanstalt für Wiederaufbau of Germany (KfW) also started funding the BSP from the Phase-III, which started in March 1997 and lasted till June 2003. Until Phase-III, BSP was directly implemented by SNV/N. AEPC has executed the BSP Phase-IV (July 2003-December 2010). SNV/N support ended while other donors continued their support. In a subsequent interim phase (January 2011-July 2012) the BSP programme counted among others on carbon finance. Since July 2012 Phase-V was initiated, which makes BSP part of a wider program for the promotion renewable energy in Nepal. Thus, beyond the carbon component, BSP involves several national and especially international sources of financing.

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 18,504 digesters which were implemented between 24/05/2013 and 04/04/2014. Table 1 provides an overview of the digesters according to their size and location.

**Table 1: Digesters listed in this CPA.**

	Hill	Terai	Mountain or Remote Hill	Total
2 m <sup>3</sup>	86	2	0	88
4 m <sup>3</sup>	1,547	265	11	1,823
6 m <sup>3</sup>	5,965	9,772	52	15,789
8 m <sup>3</sup>	108	696	0	804
<b>Total</b>	<b>7,706</b>	<b>10,735</b>	<b>63</b>	<b>18,504</b>

## A.2. Eligibility of the project under approved PoA

Topic	No.	Eligibility Criteria	Possible Verification source	Complied Yes/No
Geographical boundary	1	<ul style="list-style-type: none"> <li>- All biogas digesters in the CPA#6 are located within the geographical boundaries of Nepal.</li> <li>- 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.</li> </ul>	<ul style="list-style-type: none"> <li>-Commissioning Report from Biogas Companies (BC).</li> <li>- CPA Database indicating digester code, address and GPS coordinate.</li> </ul>	-Yes
Double counting	2	<ul style="list-style-type: none"> <li>-Double counting is avoided by assuring that no digester is already included to a different CDM project or CPA.</li> <li>- 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).</li> </ul>	<ul style="list-style-type: none"> <li>-CPA Database indicating digester code, address and GPS coordinate.</li> <li>- Unique GPS reading of each digester.</li> <li>- CDM website indicating potential further projects not included to BSP using the same technology</li> </ul>	-Yes
Technology	3	<ul style="list-style-type: none"> <li>-AEPCC has implemented this CPA as part of the BSP.</li> <li>- All digesters listed in the CPA are household biogas digesters with a sludge and gas holding capacity range of 2-8 m<sup>3</sup>.</li> <li>-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.</li> <li>- The equipment for each biogas plant installation under CPA is new and not transferred from other project activities.</li> </ul>	<ul style="list-style-type: none"> <li>-Commissioning Report from Biogas Companies (BC).</li> <li>- Technical specification documents detailing digester models and equipment applied.</li> </ul>	-Yes
Start Date	4	<ul style="list-style-type: none"> <li>-The start date of a CPA is the date of commissioning of the first biogas digester included to that respective CPA.</li> <li>- The start date of CPA is 24/05/2013, which is the date of commissioning of the first digester in CPA.</li> <li>- The start of CPA is after the date of commissioning of the last installation included in CPA-5 i.e. 23/05/2013.</li> <li>- The date of commissioning is recorded in the Commissioning Report, which is archived and the date recorded in the CPA database.</li> </ul>	<ul style="list-style-type: none"> <li>-Commissioning Report from Biogas Companies (BC), indicating the commissioning date.</li> <li>-CPA Database</li> </ul>	-Yes
Compliance with applied methodology	5	<ul style="list-style-type: none"> <li>-The activity replaces non renewable biomass. This is confirmed through Biogas Users' Survey conducted by an independent</li> </ul>	<ul style="list-style-type: none"> <li>-Report confirming use of nonrenewable biomass as firewood</li> </ul>	-Yes

		third party for the biogas digesters implemented by BSP.	prior to installation of digesters (e.g. BUS)	
Diversion of official development assistance	6	-The CPA does not result into the diversion of official development assistance.	-Declaration from CPA implementer / AEPC. - Confirmation of ODA non diversion.	-Yes
Target Group and distribution mechanism	7	-The target groups within the CPA are households.	-Installation confirmation from Biogas Companies (BC) indicating that the digesters are installed in a household.	-Yes
Threshold check	8	-Number of biogas digester included in each CPA shall not exceed 20,000 units, which assures compliance with the small scale limit of 45MWth. <sup>1</sup>	-BSP/AEPC database to confirm the number of digesters in CPA#6 is 18,504.	-Yes
Other / Voluntary action	9	-The owners of the digesters listed in the CPA#6 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#6 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	-Yes

### A.3. Legal ownership of products generated by the project 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.

### A.4. Location of project

#### A.4.1. Host Country

Nepal

#### A.4.2. Region/State/Province etc.

The CPA is distributed all over Nepal

<sup>1</sup> Estimated maximum capacity of 1.86 kWth per stove. Considering that the limit for SSC is 45 MWth, the maximum number of digesters allowed under a CPA (20,000) remains well below the SSC threshold.

## A.4.3. City/Town/Community etc.

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.

## A.4.4. Physical/Geographical location

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

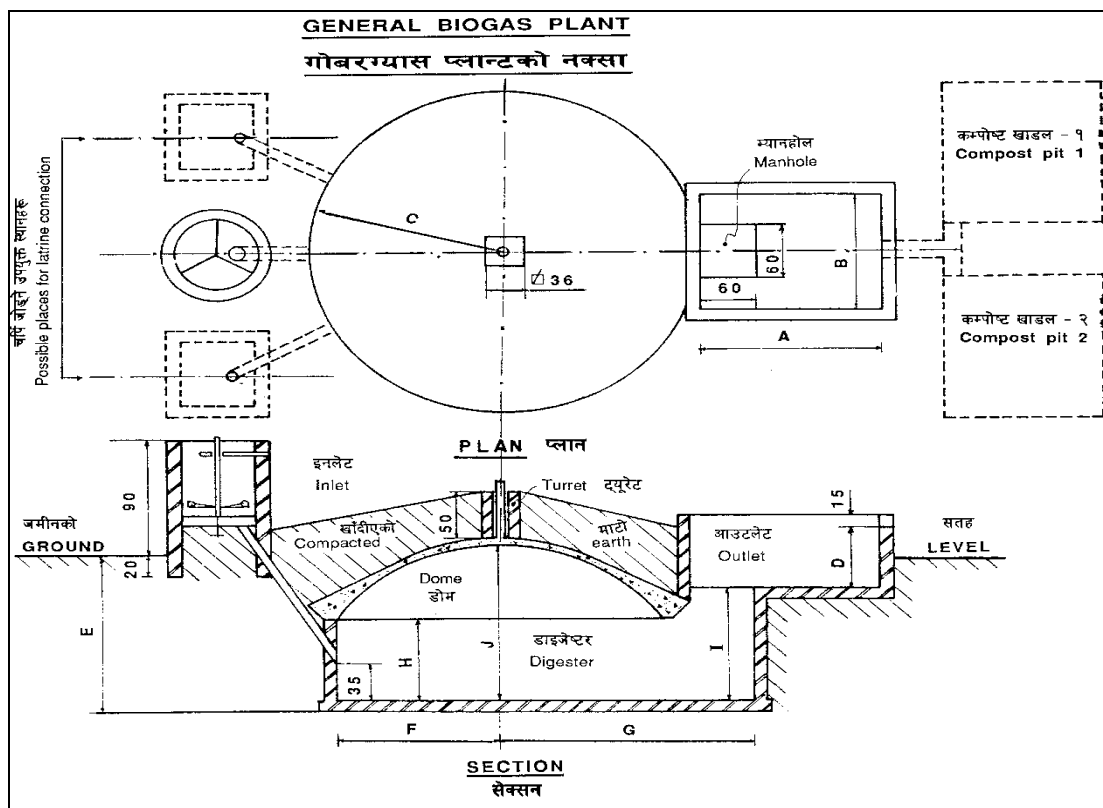
Longitude – East 80.07 degree to East 88.20 degree

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.

## A.5. 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<sup>3</sup>. The different sizes of the digesters that would be included in the programme would be of 2, 4, 6, and 8 m<sup>3</sup>. 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

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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.6. Scale of the project

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<sup>2</sup>. 1% of the 15 MW<sub>el</sub> (45MW<sub>th</sub>) threshold for type I projects is 150 kW<sub>el</sub> (450kW<sub>th</sub>). The capacity of a digester is 1.86 kW<sub>th</sub> (see section E.2. of the CDM-SSC-PoA) and hence remains well below the 1% of 15 MW threshold.

## A.7. Funding sources of project

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 selected approved Gold Standard methodology

### B.1. Reference of approved methodology

Title: Switch from non-renewable biomass for thermal applications by the user (AMS I.E. version 04)

Reference: <https://cdm.unfccc.int/methodologies/DB/WHTQUFLWCVNB9CIUZC198A712WGQR4>

### B.2. Applicability of methodology

The Nepal Biogas Support Programme-CPA-6 meets the applicability criteria of AMS-I.E (version 04) as follows:

Criteria AMS-I.E. (version 04)	Explanation
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 MW <sub>th</sub> 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 <sub>th</sub> per stove (Refer Calculation in the emission reduction spreadsheet). This means that around 24,000 stoves would still have an aggregated capacity below the 45MW <sub>th</sub> small scale threshold value; however the CPA#6 is limited to 18,504 installations only.
This comprises 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, solar cookers, passive solar homes, renewable energy based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass)	The digesters are indeed “small thermal appliances that displace the use of nonrenewable 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 nonrenewable biomass has been used since 31 December 1989, using survey methods or referring	The annual BUS conducted in 2012 demonstrated that the time needed to gather firewood, the price of firewood and the distance travelled to gather

<sup>2</sup> Guidelines on Assessment of Debundling for SSC Project Activities – Version 03, (EB 54, Annex 13)

<p>to published literature, official reports or statistics.</p>	<p>firewood is increasing at least since December 1989. This conclusion was confirmed in the NRB survey<sup>3</sup>, conducted as a part of BUS, conducted during July/August 2012. 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, pointing towards the use of NRB. In addition, these trends seen are not on the account of the enforcement of national legislation. A relevant policy initiative is the development of community forests. However, the Nepal National Action Programme<sup>4</sup> shows that community forestry has the opposite effect and significantly reduces the time spend on firewood gathering. Therefore the increase demonstrated by the BUS cannot be a result of this policy.</p>
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### B.3. Project boundary

The project boundary follows the definition in AMS-I.E (version 4.0) and is the physical, geographical area of the use of biomass or the renewable energy. This includes the digesters and the cooking stoves where the emission reduction takes place due displacement of non renewable biomass. Emissions other than those from non-renewable biomass (e.g. from fossil sources for cooking) have not considered in the establishment of the baseline.

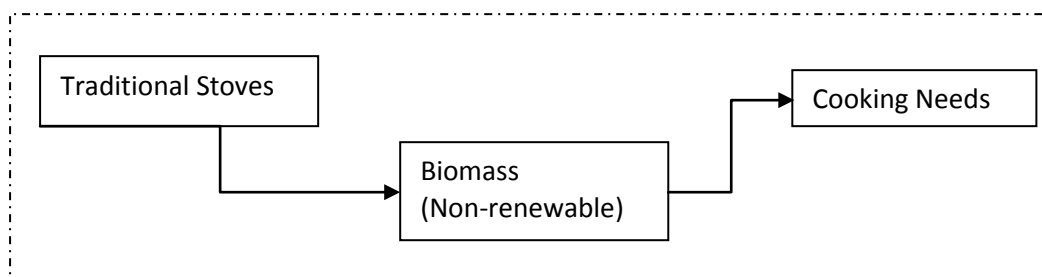


Figure 2: Baseline Emission Project Boundary

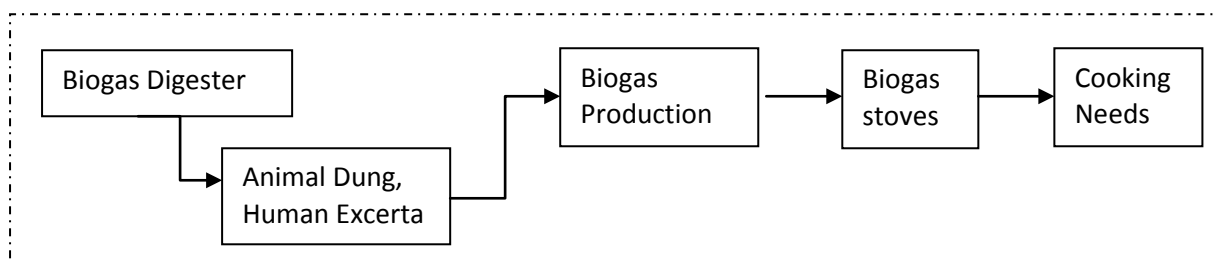


Figure 3: Project Boundary

<sup>3</sup> The Non Renewable Biomass (NRB) survey, as a part of annual BUS, was conducted in 2012 to confirm that the biomass used by households has been subject to the trends listed in AMS-I.E. (version 05 paragraph 7) since 31 December 1989.

<sup>4</sup> Nepal, National Action Programme on Land Degradation and Desertification in the context of the United Nations Convention to Combat Desertification (UNCCD), Kathmandu, April 2004 (page 52)



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 <sub>2</sub>	Included	Major emission
		CH <sub>4</sub>	Not included	conservative
		N <sub>2</sub> O	Not included	conservative
	Emissions from fossil fuel use for cooking	CO <sub>2</sub>	Not included	conservative
		CH <sub>4</sub>	Not included	conservative
		N <sub>2</sub> O	Not included	conservative
Project scenario	Digester and biogas cooking stove	CO <sub>2</sub>	Not included	Negligible
		CH <sub>4</sub>	Not Included	Negligible

#### B.4. Establishment and description of baseline scenario

The baseline scenario has been determined at the PoA level. The baseline scenario is continued use of NRB i.e. firewood for cooking. Research indicates that use of firewood has a low sensitivity to economic determinants. Even if income in rural areas increases, households continue using firewood. There are two main explanations why the baseline scenario is continued use of NRB:

- The first is that firewood is an effective and available fuel, in particular during the winter season, when heat demand is higher.
- Secondly, Nepal has a low population density and the area is mountainous. This makes the availability of alternative fuels very low.

The project applies the emission factor for the substitution of non-renewable biomass as required by methodology AMS-I.E. (version 4.0.0). This stipulates the use of the default emission factor of 81.6 tCO<sub>2</sub>/TJ for the substitution of non-renewable woody biomass by similar consumers. The default value applied for NRB has been obtained from EB 67 Annex 22 (Default values of fraction of non-renewable biomass for least developed countries and small island developing states. Ver 01).

While the NRB default is applied, the following is included as complementary information:

Already in the context of previous CDM projects, that were initiated prior to the approval of a default for NRB, it was confirmed that NRB would be continued to be used by the participants. For this purpose, a survey was conducted to check whether the firewood replaced by the digesters is subject to the trends defined in AMS-I.E. (version 4.0).

The following indicators have been captured from the Biogas Users Survey to confirm that NRB is used in Nepal.

- 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.

Households also use renewable sources of biomass, in particular agricultural residues. Since these sources are mainly renewable, they do not contribute to the reduction of GHG emissions and they are therefore also not considered under this programme. Furthermore, the existing Nepalese law and regulation do not restrict the use of firewood as a source of fuel for cooking.

For detail, please refer section E.4 of the registered CDM PoA-DD.

## B.5. Demonstration of additionality

The additionality of the SSC CPA is demonstrated in line with “Standard on the Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities, Version 03”. If the above indicated eligibility criteria on technology and thresholds are met, additionality is complied with automatically (Please refer to section E.5.1, E.5.2 and A.4.2.2 of the registered CDM PoA-DD for this PoA). Hence by complying with the eligibility criteria 3 and 8, the CPA need not be further assessed for additionality.

## B.6. Sustainable Development Goals (SDG) outcomes

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

Table below discusses the relevant SDG target for each three SDGs addressed by the project.

SDGs	Targets
3. Good Health and Well beings	<ul style="list-style-type: none"> <li>By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</li> </ul>
7. Affordable and Clean Energy	<ul style="list-style-type: none"> <li>By 2030, ensure universal access to affordable, reliable and modern energy services</li> <li>By 2030, increase substantially the share of renewable energy in the global energy mix</li> <li>By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support</li> </ul>
13. Climate Action	<ul style="list-style-type: none"> <li>Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning</li> <li>Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities</li> </ul>

### B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

According to AMS-I.E. version 04, para 11 the emission reductions under a CPA are calculated as the following:

$$ER_y = B_y \cdot f_{NRB,y} \cdot NCV_{\text{biomass}} \cdot EF_{\text{projected fossilfuel}}$$

In which:

$ER_y$	Emissions Reductions during the year y (tCO <sub>2</sub> e)
$B_y$	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB,y}$	Default value of fraction of non renewable biomass for Nepal, EB 67 Annex 22 "Default values of fraction of non-renewable biomass for Least Developed Countries and Small Island Developing States (version 01.0)". Use a value of fNRB 86%
$NCV_{\text{biomass}}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne. The value is according to the methodology AMS I.E.
$EF_{\text{projected-fossilfuel}}$	Emission factor for substitution of non renewable woody biomass by similar consumers. Use a value of 81.6 tCO <sub>2</sub> /TJ.

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Following option a) of paragraph 6,  $B_y$  is “calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass per appliance (tonnes/year)”.

In the case of the present CPA, “the number of appliances” as deducted from the internal records (database) is corrected with the share of digesters actually in operation. The “average annual consumption of woody biomass per appliance (tonnes/year)” is the biomass substituted or displaced, which is fixed ex ante at 3.33 tonnes/year per appliance.

Thus,  $B_y$  will be calculated as follows:

$$B_y = N_{sr} \times P \times Q_{NRB_{repl}}$$

In which:

- $N_{sr}$  The number of appliances. The parameter refers to the number of digesters in each size and category and is hence unitless.
- $P$  Performance of digesters as the share of digesters implemented that is actually operational, determined through survey methods (%).
- $Q_{NRB_{repl}}$  Average quantity of biomass replaced per appliance and year (tonnes/year)

Calculations will be carried out based on Excel spread sheets using the data of the BSP database. The database provides e.g. commissioning date. The commissioning date plus 7-10 days up to operation start will provide the starting date for the emission reduction achieved by the individual digester.

## 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:

$$LE_y = 0.05 \times B_y \cdot f_{NRBy} \cdot NCV_{biomass} \cdot EF_{projected.fossilfuel}$$

### B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

<b>Relevant SDG Indicator</b>	SDG 3/SDG 13
<b>Data/parameter</b>	$NCV_{biomass}$
<b>Unit</b>	TJ/tonne
<b>Description</b>	Net calorific value of the non-renewable biomass that is substituted
<b>Source of data</b>	This value will be kept up to date with the IPCC guidelines.
<b>Value(s) applied</b>	0.015
<b>Choice of data or Measurement methods and procedures</b>	AMS-I.E. Ver 4 requires using this value.
<b>Purpose of data</b>	Baseline emission calculation
<b>Additional comment</b>	NA

<b>(Relevant SDG Indicator</b>	SDG 3/SDG 13
<b>Data/parameter</b>	$EF_{projected\_fossil\ fuel}$
<b>Unit</b>	tCO <sub>2</sub> /TJ
<b>Description</b>	Emission factor for the projected fossil fuel consumption in the baseline.
<b>Source of data</b>	Approved small scale methodology AMS.I.E (version 4.0)
<b>Value(s) applied</b>	81.6

<b>Choice of data or Measurement methods and procedures</b>	AMS-I.E. requires using this value.
<b>Purpose of data</b>	Baseline emission calculation
<b>Additional comment</b>	NA

<b>Relevant SDG Indicator</b>	SDG 3/SDG13
<b>Data/parameter</b>	$f_{NRB,y}$
<b>Unit</b>	%
<b>Description</b>	Fraction of biomass used in the absence of the project activity in year y that can be established as non renewable biomass using nationally approved methods
<b>Source of data</b>	"Default values of fraction of non-renewable biomass for Least Developed Countries and Small Island Developing States (version 01.0)" EB 67 Annex 22
<b>Value(s) applied</b>	86%
<b>Choice of data or Measurement methods and procedures</b>	Default approved by the CDM EB as the value for the fraction of NRB in Nepal.
<b>Purpose of data</b>	Baseline emission calculation
<b>Additional comment</b>	EB 67 Annex 22 decision stipulates using this value

<b>Relevant SDG Indicator</b>	SDG 7/SDG 13				
<b>Data/parameter</b>	$N_{s,r}$				
<b>Unit</b>	Numbers				
<b>Description</b>	Number of digesters in each size category (in m <sup>3</sup> ) and region (Terai, Hill and, if available, Remote Hill or Mountain) implemented under the CPA				
<b>Source of data</b>	BSP-Nepal database, including 18,504 digesters with starting date between 24/05/2013 and 04/04/2014 included in the CPA.				
<b>Value(s) applied</b>	These digesters are divided over the various regions as indicated in the table in section A.2 , table 1 of registered CDM CPA DD.				
		<b>Hill</b>	<b>Terai</b>	<b>Mountain or Remote Hill</b>	<b>Total</b>
	<b>2 m<sup>3</sup></b>	86	2	0	88
	<b>4 m<sup>3</sup></b>	1547	265	11	1823
	<b>6 m<sup>3</sup></b>	5965	9772	52	15789
	<b>8 m<sup>3</sup></b>	108	696	0	804
	<b>Total</b>	<b>7706</b>	<b>10735</b>	<b>63</b>	<b>18504</b>
<b>Choice of data or Measurement methods and procedures</b>	The registration procedure of the BSP database avoids double counting of digesters and the registration of digesters that have not been commissioned. The BSP database is the basis for subsidy disbursement. The data used to maintain this database is gathered according to defined procedures, making it a reliable source of information.				

<b>Purpose of data</b>	Baseline emission calculation
<b>Additional comment</b>	Based on the size category of digester implementation between 24/05/2013 and 04/04/2014

<b>Relevant SDG Indicator</b>	SDG 3/SDG 13
<b>Data/parameter</b>	$Q_{NRB\text{repl}}$
<b>Unit</b>	Tonne per year and appliance
<b>Description</b>	Quantity of woody biomass that is substituted or displaced in tonnes per year and appliance
<b>Source of data</b>	Calculated
<b>Value(s) applied</b>	3.33
<b>Choice of data or Measurement methods and procedures</b>	Calculated based on survey and historic data, such as Biogas User Survey (BUS). The BUS is based on survey techniques and has been confirmed in the context of registered CDM project 5416. <sup>5</sup>
<b>Purpose of data</b>	Calculation of baseline emissions
<b>Additional comment</b>	To be re-assessed at renewal of crediting period of CPA. - As per paragraph 6 (a) of the methodology By represents: The estimated average annual consumption of woody biomass per appliance (tonnes/year) derived from surveys or historic information. - As per SSC WG clarification SSC 543 the estimate can be fixed ex ante

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

The emission reduction calculation is based on data that is specified to digester size and region. This section provides a short explanation of the calculations made. For further detail please refer to Annex 3 of registered CDM-PoA DD.

According to AMS-I.E (version 04), the emission reductions under a CPA are calculated as the following:

$$ER_{y=} B_y \cdot f_{NRBy} \cdot NCV_{\text{biomass}} \cdot EF_{\text{projected fossilfuel}}$$

In which:

$ER_y$	Emissions Reductions during the year y (tCO <sub>2</sub> e)
$B_y$	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB,y}$	Default value of fraction of non renewable biomass for Nepal, EB 67 Annex 22 "Default values of fraction of non-renewable biomass for Least Developed Countries and Small Island Developing States (version 01.0)". Use a value of fNRB 86%
$NCV_{\text{biomass}}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne. The value is according to the methodology AMS I.E.
$EF_{\text{projected-fossilfuel}}$	Emission factor for substitution of non renewable woody biomass by similar consumers. Use a value of 81.6tCO <sub>2</sub> /TJ.

<sup>5</sup> <http://cdm.unfccc.int/Projects/DB/RWTUV1321020993.82/view>

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Following option a) of paragraph 6,  $B_y$  is “calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass per appliance (tonnes/year)”.

In the case of the present CPA, “the number of appliances” as deducted from the internal records (database) is corrected with the share of digesters actually in operation. The “average annual consumption of woody biomass per appliance (tonnes/year)” is the biomass substituted or displaced, which is fixed ex ante at 3.33 tonnes/year per appliance.

Thus,  $B_y$  will be calculated as follows:

$$B_y = N_{sr} \times P \times Q_{NRB_{repl}}$$

In which:

$N_{sr}$  The number of appliances (18,504).

$P$  Performance of digesters as the share of digesters implemented that is actually operational (99.8%)

$Q_{NRB_{repl}}$  Average quantity of biomass replaced per appliance and year (3.33 tonnes/year taken as ex-ante fixed value)

Calculations will be carried out based on Excel spread sheets using the data of the BSP database. The database provides e.g. commissioning date. The commissioning date plus 7-10 days up to operation start will provide the starting date for the emission reduction achieved by the individual digester.

## 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:

$$LE_y = 0.05 \times B_y \cdot f_{NRBy} \cdot NCV_{biomass} \cdot EF_{projected.fossilfuel}$$

From the above equations,

$$B_y = 64,806$$

$$LE_y = 3,241$$

$$ER_y = 61,565$$

Please refer ER calculation spreadsheet and appendix 4 of the registered CDM CPA DD for further details of the calculation.

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

Year	Baseline estimate	Project estimate	Leakage	Net benefit
Year A	64,806	0	3,241	61,565
Year B	64,806	0	3,241	61,565
Year C	64,806	0	3,241	61,565
Year D	64,806	0	3,241	61,565
Year E	64,806	0	3,241	61,565
Year F	64,806	0	3,241	61,565
Year G	64,806	0	3,241	61,565
<b>Total</b>	453,642	0	22,587	430,955
<b>Total No of Crediting Years</b>	7			
<b>Annual average over the crediting period</b>	64,806	0	3,241	61,565

## B.7. Monitoring plan

### B.7.1. Data and parameters to be monitored

<b>Relevant SDG Indicator</b>	SDG 7/SDG 13
<b>Data / Parameter</b>	<b>P</b>
<b>Unit</b>	%
<b>Description</b>	The share of digesters operational (based on the total number implemented using non renewable biomass).
<b>Source of data</b>	Performance report elaborated at least biennial (as part of BUS or as part of internal quality control reports of AEPC or other monitoring reports)
<b>Value(s) applied</b>	To be monitored
<b>Measurement methods and procedures</b>	The value of parameter P used for ex-post emission reduction calculation will be based on the operation report elaborated at least biennial and conducted for each individual CPA. The report will be based on a survey. The survey shall also reconfirm the use of non-renewable biomass. Sampling shall follow the established sampling plan.
<b>Monitoring frequency</b>	at least biennial
<b>QA/QC procedures</b>	The Internal Quality Control system samples 5% of the digesters that are newly implemented, 2.5% of the digesters that are two year in operation and 2.5% of the digesters that have been operational for three years as part of the Internal Quality Control system. If, for the digesters listed in the CPA, the outcome of this survey is a lower percentage than the outcome of the operation report (as e.g. included to BUS), the lower of the two values will be used. After the three-years after sales service is over, this value will depend on the performance report or other monitoring reports. The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA.
<b>Purpose of data</b>	ER calculation
<b>Additional comment</b>	Requirements as defined in the sampling plan shall be met.

<b>Relevant SDG Indicator</b>	SDG 3
<b>Data / Parameter</b>	Users' perception on smoke/Air Quality
<b>Unit</b>	Qualitative
<b>Description</b>	Users' perception on reduction in indoor air pollution
<b>Source of data</b>	Sampling Surveys/Annual usage survey/Monitoring survey
<b>Value(s) applied</b>	To be monitored
<b>Measurement methods and procedures</b>	Air quality will be assess through users interviews during the Biogas User Survey.
<b>Monitoring frequency</b>	at least biennial
<b>QA/QC procedures</b>	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.
<b>Purpose of data</b>	Sustainable Development Assessment.
<b>Additional comment</b>	Requirements as defined in the sampling plan shall be met.

<b>Relevant SDG Indicator</b>	SDG 3
<b>Data / Parameter</b>	Reduction in health problem
<b>Unit</b>	Qualitative
<b>Description</b>	Users' perception on reduction in health problem
<b>Source of data</b>	Sampling Surveys/Annual usage survey/Monitoring survey
<b>Value(s) applied</b>	To be monitored
<b>Measurement methods and procedures</b>	Reduction in health problem will be assess through users interviews during the Biogas User Survey.
<b>Monitoring frequency</b>	at least biennial
<b>QA/QC procedures</b>	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA.
<b>Purpose of data</b>	Sustainable Development Assessment.
<b>Additional comment</b>	Requirements as defined in the sampling plan shall be met.

<b>Relevant SDG Indicator</b>	SDG 3
<b>Data / Parameter</b>	Time saving and use of the time saved
<b>Unit</b>	Qualitative
<b>Description</b>	Users' perception on time saving due to project (comparing to baseline) and use of the saved time
<b>Source of data</b>	Sampling Surveys/Annual usage survey/Monitoring survey
<b>Value(s) applied</b>	To be monitored
<b>Measurement methods and procedures</b>	Assess through users interviews during the Biogas User Survey.
<b>Monitoring frequency</b>	at least biennial
<b>QA/QC procedures</b>	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.
<b>Purpose of data</b>	Sustainable Development Assessment.
<b>Additional comment</b>	Requirements as defined in the sampling plan shall be met.

<b>Relevant SDG Indicator</b>	SDG 7
<b>Data / Parameter</b>	- Households using biogas plants
<b>Unit</b>	Number
<b>Description</b>	No of household/No of Biogas installed under the project
<b>Source of data</b>	CPA database
<b>Value(s) applied</b>	To be monitored
<b>Measurement methods and procedures</b>	Sample survey to confirm if Biogas Unit are operational. Operational status will confirms that the users are accessed to affordable and clean energy
<b>Monitoring frequency</b>	at least biennial
<b>QA/QC procedures</b>	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA
<b>Purpose of data</b>	Sustainable Development Assessment.
<b>Additional comment</b>	Requirements as defined in the sampling plan shall be met.



<b>Relevant Indicator/Safeguarding Principle</b>	<b>SDG</b> SDG 3
<b>Data / Parameter</b>	Use of slurry as fertilizer
<b>Unit</b>	Qualitative
<b>Description</b>	Users' perception on reduction in use of chemical fertilizers and use of bio-slurry
<b>Source of data</b>	Sampling Surveys/Annual usage survey/Monitoring survey
<b>Value(s) applied</b>	To be monitored
<b>Measurement methods and procedures</b>	Assess through users interviews during the Biogas User Survey.
<b>Monitoring frequency</b>	at least biennial
<b>QA/QC procedures</b>	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA
<b>Purpose of data</b>	Sustainable Development Assessment.
<b>Additional comment</b>	Requirements as defined in the sampling plan shall be met.

<b>Relevant SDG Indicator</b>	SDG 3
<b>Data / Parameter</b>	Livelihood of Poor/Improved access to sanitation services
<b>Unit</b>	No of toilets installed
<b>Description</b>	Number of toilet connection after the installation of Biogas will be assessed as per monitoring plan for user survey.
<b>Source of data</b>	Sampling Surveys will be done as per the monitoring plan envisaged in PoA - DD.
<b>Value(s) applied</b>	To be monitored
<b>Measurement methods and procedures</b>	User Survey Users will be asked whether toilets are connected to the biogas plant
<b>Monitoring frequency</b>	At least Bi-annual
<b>QA/QC procedures</b>	The selection of households under the surveys will ensure that these percentages are met also for each individual CPA included in the PoA
<b>Purpose of data</b>	Sustainable Development Assessment.
<b>Additional comment</b>	Requirements as defined in the sampling plan shall be met.

<b>Relevant SDG Indicator</b>	SDG 7
<b>Data / Parameter</b>	Trainings to Masons
<b>Unit</b>	Number of people trained
<b>Description</b>	Masons involved in constructing the biogas plants shall receive training on the proper installation of biogas digesters.
<b>Source of data</b>	Training Report
<b>Value(s) applied</b>	To be monitored
<b>Measurement methods and procedures</b>	Training Report
<b>Monitoring frequency</b>	At least Bi-annual

QA/QC procedures	
Purpose of data	Sustainable Development Assessment.
Additional comment	

Relevant Indicator/Safeguarding Principle	SDG Safeguarding Principle 4.3.8
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 high quality standards. 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, adopting "rewards or punishment" system to biogas companies etc. At least 5% of the constructed digesters in any year are visited by staffs of BSP-Nepal for quality control. Note that this quality control is carried out to ensure quality of the digesters but not necessarily to calculate the emission reductions. BSP-Nepal also provides support to calculate a Biogas Performance Index (BPI) which is a composite of allocated points for Production, Average Default, Average Penalty, Average Feeding %, Accuracy, Maintenance, and After Sales Service Progress. BPI helps to show the status of each participating biogas company. District Energy and Environment Units/Sections (DEEU/Ss) will monitor the digesters in the respective district. AEPC randomly samples and provides list of digester to DEEU/S for monitoring.

### Monitoring

#### 1) Digester performance

The performance of the bio-digesters and continued displacement of NRB will be assessed based on the performance reports. 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 survey will be conducted according to the sampling plan and following "Standard for sampling and surveys for CDM project activities and programme of activities" (version 04.0) Annex 6, EB 74. To obtain reliable and accurate data on the digesters implemented under each CPA of the PoA, the surveyed digester population will include a statistically significant sample for each CPA reflecting all sizes and ecological zone categories. A stratified random sampling method will be applied during sample selection in the Biogas User Survey. Sample size will be chosen for 90% confidence interval and 10% margin of error for parameter values as stipulated by the Executive Board.

In order to have an unbiased and independent assessment, the survey is carried out through an independent agency. A structured questionnaire will be used to collect data and information to assess the performance of the biogas digesters implemented under each CPA. The sample size will be calculated using stratified random sampling technique. Resulting sample will then be proportionately distributed among various sizes of the biogas plant belonging to each strata i.e. ecological zone.

Thus, the at least biennial performance reports 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. For the detail sampling plan please refer Annex 4 (Monitoring Information) of the registered CDM PoA DD.

## 2) Displacement of NRB

The “average annual consumption of woody biomass per appliance (tonnes/year)” is the biomass substituted or displaced, which is fixed ex ante at 3.33 tonnes/year per appliance. This value is based on the details given in Annex 3 / baseline of the CDM SSC PoA DD. The value may be updated at the renewal of the crediting period of CPAs.

For the fraction of non renewable biomass in Nepal a default of 86% will be used as established by EB 67 Annex 22 "Default values of fraction of non-renewable biomass for Least Developed Countries and Small Island Developing States (version 01.0)".

## 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.

### 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 specified under paragraph 10 of the methodology, 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	This shall be ensured by	Yes (based on the

displacement or substitution of the non-renewable woody biomass at each location.	monitoring the number of appliances (digesters in case of the project) still performing	performance reports carried out at least biennial, e.g. BUS, and in addition to eligibility criteria that also confirm use of NRB)
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## SECTION C. Duration and crediting period

### C.1. Duration of project

#### C.1.1. Start date of project

24/05/2013

The CPA started with the construction of the first digester listed which is 24/05/2013. The actual start of gas production will be 5 to 7 days after installation of biogas plant. The plant will be recorded in central database after 7-10 days of plant installation. Hence, by the time the plant is recorded in database, the gas production is already started.

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

The operational lifetime of each digester is 20 years. Since the first digester covered by the CPA was implemented on 24/05/2013, the operational lifetime of the small scale CPA is up to 23/05/2033.

### C.2. Crediting period of project

#### C.2.1. Start date of crediting period

The crediting period starts at the date of inclusion of CPA in the PoA which is 08/07/2015.

#### C.2.2. Total length of crediting period

The duration of the crediting period is 7 years. Since the PoA will use renewable crediting period, the lifetime of the PoA will be 28 years after registration. PoA is registered on 31/01/2013, with an expected lifetime of 28 years, the end date of the PoA is 30/01/2041 and thereby creates limit on the duration of the crediting period of the CPA#6 i.e. the CPA#6 will have crediting period maximum up to 30/01/2041.

## SECTION D. Safeguarding principles assessment

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

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
3.1. Human Right	<p>a. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights</p> <p>b. The Project shall not discriminate with regards to participation and inclusion.</p>	<p>a. No</p> <p>b. No</p>	<p>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. <b>Conclusion: the parameter will not be monitored.</b></p> <p>b. The project shall not discriminate any people to have biogas plants rather it enhances the participation and inclusion. <b>Conclusion: the parameter will not be monitored.</b></p>	
3.2 Gender Equality and Women's Rights	<p>1. The Project shall complete the following gender assessment questions in order to inform Requirements 2-4, below:</p> <p>a) Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?</p> <p>b) Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?</p> <p>c) Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to</p>	<p>a) No</p> <p>b) No</p>	<p>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. <b>Conclusion: the parameter will not be monitored</b></p> <p>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</p>	

	<p>participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?</p> <p>d) Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?</p> <p>e) Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?</p> <p>f) Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?</p> <p>g) Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?</p> <p>h) Is there likelihood that the proposed Project would expose women and girls to further risks or hazards?</p>	<p>c) No</p> <p>d) Yes</p> <p>e) No</p> <p>f) No</p> <p>g) No</p>	<p>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.</p> <p><b>Conclusion: the parameter will not be monitored</b></p> <p>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.</p> <p><b>Conclusion: the parameter will not be monitored</b></p> <p>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.</p> <p><b>Conclusion: the parameter will not be monitored as the CPAs are implemented already</b></p> <p>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.</p> <p><b>Conclusion: the parameter will not be monitored</b></p> <p>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</p>	
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			with the household problems. The potential of the project to enable women economically will help reduce discrimination against women rather than deepening it. <b>Conclusion: The parameter will not be monitored</b>	
3.3 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. <b>Conclusion: Since the CPA is included already, health risk of the worker will not be monitored but the emission reduction and improve in health condition will be monitored.</b>	
3.4.3 Land Tenure and Other Rights	a. Does the Project require any change to land tenure arrangements and/or other rights?	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. <b>Conclusion: the parameter will not be monitored</b>	
3.5 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. <b>Conclusion: The parameter will not be monitored.</b>	
3.6.2 Negative Economic Consequences	a. The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also including those that will occur beyond the Project Certification period. b. The Projects shall consider economic impacts and demonstrate a consideration of	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. <b>Conclusion: the parameter will not be monitored</b>	

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	potential risks to the local economy and how these have been taken into account in Project design, implementation, operation and after the Project. Particular focus shall be given to vulnerable and marginalised social groups in targeted communities and that benefits are socially-inclusive and sustainable.			
4.1.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	Yes	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. <b>Conclusion: The parameters will be calculated based on the operational status of the project units</b>	
4.1.2 Energy Supply	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project 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. <b>Conclusion: the parameter will not be monitored</b>	
4.2.1 Impact on natural water patterns and flow	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The 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. <b>Conclusion: the parameter will not be monitored</b>	
4.2.2 Erosion and/or water body stability	Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?	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	



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			project. <b>Conclusion: the parameter will not be monitored</b>	
4.3.1 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. <b>Conclusion: the parameter will not be monitored.</b>	
4.3.2 Vulnerability to Natural Disaster	Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	The project units are household based units and are less susceptible to the natural disasters. Therefore the safeguarding principle under consideration will not be triggered by the project. <b>Conclusion: the parameter will not be monitored.</b>	
4.3.3 Genetic Resources	Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	No	The project doesn't involve any activity related to GMOs. Therefore the safeguarding principle under consideration will not be triggered by the project. <b>Conclusion: the parameter will not be monitored.</b>	
4.3.4 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 Bioslurry. 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. <b>Conclusion: the parameter will not be monitored.</b>	
4.3.5 Hazardous and Non-hazardous Waste	Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	The project unit does not require or releases any hazardous and non-hazardous chemicals. Therefore the safeguarding principle under consideration will not be triggered by the project. <b>Conclusion: the parameter will not be monitored.</b>	
4.3.6 Pesticides and	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	

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fertilizers			content of nitrogen in the fertilizer the bio-slurry is a potent replacer of the Urea . <b>Conclusion: the parameter will be monitored through the perception survey with the users.</b>	
4.3.7 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. <b>Conclusion: the parameter will not be monitored.</b>	
4.3.8 Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	Yes	The project units produces the bioslurry that potentially increases the productivity of crop as it has good content of nitrogen. <b>Conclusion: the parameter will be monitored through the perception survey with the users.</b>	
4.3.9 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. <b>Conclusion: the parameter will not be monitored.</b>	

## SECTION E. Local stakeholder consultation

### E.1. Solicitation of comments from stakeholders

Please refer to the section D.1 of the CDM-SSC-PoA-DD for the stakeholder consultation as per CDM requirement.

The local stakeholder consultation as per GS requirement was conducted on PoA level. This is considered appropriate due to following reasons:

- CPAs are not geographically distinct; CPAs will be determined by stove numbers, not by geographic boundaries. The project area is Nepal for all project activities.
- The same technology (with different size of biogas plant) will be used in all CPAs covered by this LSC.
- The target population is rural households all over Nepal. Rural households in Nepal have very similar socio-economic characteristics and fuel wood collection. Therefore, project impacts on target population will be the same all over Nepal.
- Since the baseline scenario is replacement of non-renewable biomass, and fuel wood resources decrease in the whole country, the environmental impact of wood savings due to the use of Biogas stoves is not site dependent.

The LSC was organized in the meeting hall of Chetana Kendra, Dhulikhel Kavre. The meeting was conducted on 15 August 2014.

Its outcome is described in detail in the LSC report as well as in section E of the PoA Passport.

### E.2. Summary of comments received

Please refer to the section D.3 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 the LSC report as well as in section E of the PoA Passport.

### E.3. Report on consideration of comments received

Please refer to the section D.4 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 the LSC report as well as in section E of the PoA Passport.

## Appendix 1. Contact information of project participants

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<b>Registration number with relevant authority</b>	NA
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## Appendix 2. Summary of post registration design changes

Not applicable

## Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
<b>03.0</b>	<b>25 June 2014</b>	<p>Revisions to:</p> <ul style="list-style-type: none"> <li>• Include the Attachment: Instructions for filling out the component project activity design document form for small-scale CDM component project activities (these instructions supersede the "Guidelines for completing the component project activity design document form for small-scale component project activities" (Version 01.0));</li> <li>• Include provisions related to standardized baselines;</li> <li>• Add contact information on a CPA implementer and/or responsible person/ entity for completing the CDM-SSCCPA- DD-FORM in A.14. and Appendix 1;</li> <li>• Add general instructions on post-registration changes in paragraph 4 and 5 of general instructions and <b>Error! Reference source not found.</b>;</li> <li>• Change the reference number from <i>F-CDM-SSC-CPADD</i> to <i>CDM-SSC-CPA-DD-FORM</i>;</li> <li>• Editorial improvement.</li> </ul>
<b>02.0</b>	<b>13 March 2012</b>	<p>EB 66, Annex 17</p> <p>Revision required to ensure consistency with the "Guidelines for completing the component project design document form for small-scale component project activities".</p>
<b>01.0</b>	<b>27 July 2007</b>	<p>EB33, Annex44</p> <p>Initial adoption.</p>

Decision Class: Regulatory

Document Type: Form

Business Function: Registration

Keywords: component project activity, project design document, SSC project activities