



GOLD STANDARD MONITORING REPORT
Version 4.0, 17/03/2017
for
Nepal Biogas Support Program-PoA
UNFCCC Ref. 9572, Gold Standard Ref. GS3110

Nepal Biogas Support Program CPA- 1: 20,000 digesters (GS3109)
Nepal Biogas Support Program CPA - 2: 19,927 digesters (GS3113)
Nepal Biogas Support Program CPA - 3: 19,959 digesters (GS3114)
Nepal Biogas Support Program CPA - 4: 19,970 digesters (GS3116)

Monitoring Period: 14.08.2013 - 31.07.2014 (including both days)
RETRO-ACTIVE GS LABELING

Table of Content

1. Background.....	2
2. Emission Reductions	3
3. Monitoring Period, Survey and Sampling.....	4
4. SD Monitoring.....	8
5. Continuous Grievance Mechanism	21
6. Additional Remarks on Monitoring.....	22
7. Contact	22

LIST OF ABBREVIATIONS

AEPC	Alternative Energy Promotion Centre
BSP-N	Biogas Sector Partnership–Nepal
BUS	Biogas User Survey
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CPA	Component Project Activity
CPA-PP	CPA-Passport
ER	Emission Reductions
GS	Gold Standard
MP	Monitoring Period
MR	Monitoring Report
NGO	Non-governmental organisation
PoA	Programme of Activities
PoA-PP	PoA-Passport
PDD	Project Design Document



1. Background:

The Nepal Biogas Support Program (BSP) is a household biogas plant Programme of Activities (CDM ref. 9572, GS ref. 3110). The biogas plants displace firewood and fossil fuels with biogas created by anaerobic digestion from animal waste and human excreta. The biogas is used as a fuel for cooking, therefore displacing the use of non-renewable biomass leading to net emission reductions. Target group 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.

The technologies disseminated under this PoA are household biogas digesters of type GGC 2047 with a sludge and gas holding capacity range of 2, 4, 6, 8 to 10 m³. 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.

All the biogas digesters implemented under this PoA are maintained by the Biogas Sector Partnership–Nepal, a national level NGO supporting AEPC implement the PoA. BSP-Nepal maintains the record of installed biogas digesters in an Oracle supported database software. Each biogas digester installed under different CPAs is identified with its unique dome gas pipe number and hence the uniqueness of the identity is maintained for each digester. Since all the digesters implemented under all CPAs of the PoA are centrally maintained, possibility of double counting of the digesters between and within CPAs is avoided.

The Nepal Biogas Support Program-PoA includes 4 CPAs (GS3109, GS3113, GS3114 and GS3116) that have been GS registered retroactively, with GS registration date being 14 August 2015. A two-years retro-active registration period applies. Due to the different GS registration dates of the four CPAs, the following Monitoring Periods apply:

Monitoring Period:

CPA-1: 14/08/2013 - 31/07/2014

CPA-2: 08/05/2014 – 31/07/2014

CPA-3: 08/05/2014 – 31/07/2014

CPA-4: 08/05/2014 – 31/07/2014

For CDM monitoring please refer to the CDM Monitoring Reports.

Table 1: Registration reference numbers and registration dates of PoA-9572 and each CPA included in the Gold Standard registration

	CDM Registration Number	CDM Registration/ Inclusion date	GS Registration Number	GS Registration Date
PoA	9572	31/01/2013	3110	14/08/2015
CPA-1	9572-0001	31/01/2013	3109	14/08/2015
CPA-2	9572-0002	08/05/2014	3113	14/08/2015
CPA-3	9572-0003	08/05/2014	3114	14/08/2015
CPA-4	9572-0004	08/05/2014	3116	14/08/2015



In total the four GS registered CPAs covered by this Monitoring Report include 79,856 digesters, with locations in all three different ecological zones of Nepal:

Table 2: Number of biogas plants installed under each CPA

	Total number of biogas plants	Terai region	Hill	Mountain or Remote Hill
CPA-1	20,000	10,955	8,940	105
CPA-2	19,927	10,346	9,437	144
CPA-3	19,959	9,044	10,754	161
CPA-4	19,970	9,127	10,720	123
TOTAL	79,856	39,472	39,851	533

Table 3: Important dates of Gold Standard Registration

Date	Activity
15/08/2014	Local Stakeholder Consultation in Kavre (PoA-level)
17/07/2014 – 17/08/2014	Design Consultation
09/10/2014 – 26/01/2015	Stakeholder Feedback Round
14/08/2015	End of 6-weeks Registration Period (retro-active)
14/08/2013	Start of retro-active Gold Standard period for CPA-1
08/05/2014	Start of retro-active Gold Standard period for CPA-2, CPA-3 and CPA-4

2. Emission Reductions:

Total emission reductions achieved during the monitoring period (14/08/2013 - 31/07/2014) in all four CPAs is **106,481 tons of CO₂e** (see table 4).

Table 4: Emission reductions under retro-active GS cycle from 14/08/2013 until 31/07/2014

Vintage	Start and End of MP	days	CPA-1	CPA-2	CPA-3	CPA-4	Total ER (t CO ₂ e)
2013	14/08/2013 – 31/12/2013 (CPA-1)	140	24,575	0	0	0	24,575
2014	01/01/2014 – 31/07/2014 (CPA-1) 08/05/2014 – 31/07/2014 (CPA-2, CPA-3, CPA-4)	212/ 85	37,214	14,992	14,465	15,235	81,906
Total 2013 + 2014	14/08/2013 – 31/07/2014	352	61,789	14,992	14,465	15,235	106,481

For reference: the CDM issuance of MP 2013/2014 took place on 22/06/2015.



3. Monitoring Period, Survey and Sampling:

Please note that the applied GS Monitoring Period is not identical with the complete CDM Monitoring Period (MP) which covered a period from 31/01/2013 until 31/07/2014. Retro-active GS registration for CPA-1, CPA-2, CPA-3 and CPA-4 was achieved on 14/08/2015. A two-year retro-active registration period applies. Due to the different GS registration dates of the four CPAs, different Monitoring Periods apply (see table 5 below):

Table 5: CDM and GS Monitoring Period

CDM Monitoring Period:	31/01/2013 – 31/07/2014			
Length of CDM Monitoring Period:	547 days			
Retroactive GS Labelling Period:	Not GS labelled:	To be GS labelled: = GS Monitoring Period:		
		CPA-1:	14/08/2013 - 31/07/2014	(352 days)
	31/01/2013 -13/08/2013 (195 days)	CPA-2:	08/05/2014 – 31/07/2014	(85 days)
		CPA-3:	08/05/2014 – 31/07/2014	(85 days)
		CPA-4:	08/05/2014 – 31/07/2014	(85 days)

For Monitoring purposes AEPC commissioned so-called “Biogas Users’ Surveys” (BUS) to be conducted every year as part of the Monitoring Survey that covers all four CPAs (GS3109, GS3113, GS3114, GS3116). A third party (consultant) conducts the Biogas User Survey. The BUS serves as the basis for emission reduction calculation. It also assesses the benefits from biogas plants such as households having access to toilets, usage of bio slurry, impacts on environment, health and sanitation as stated in the Gold Standard Passport. The sample group is asked whether biogas plants are still operational as well as how households use the biogas plant and the kinds of economic and health benefits that they reaped from the use of the biogas plant.

Table 6: Monitoring Survey 2013/2014

Date of on-site visits for Monitoring:	May 2014
Company in charge:	Square One Research and Training, Kopundole Height, Lalitpur, Nepal
Number of field visitors:	10 enumerators (five groups of two each)
Sample Size:	89 biogas plants and its users
Sample group/location:	from 13 different districts representing 5 different regions and 3 ecological belts (hill; remote hill; terai).
Survey type:	Structured questionnaires (summarized in the “Biogas Users’ Survey (BUS) 2013/2014”)

Sample size was determined using stratified random sampling as stipulated in annex 4 of the registered CDM PoA DD and consistent with “Guidelines for sampling and surveys for CDM project activities and programme of activities, Version 03.0” which prevailed while conducting the survey. The sampling was performed within the level of precision of 10% and a confidence level of 90%. For more details on sampling plan and methods, please refer to CDM MR.



Table 7: Sample size per CPA of Monitoring Survey 2013/2014:

CPA-1				
	Installed Biogas Plants		Sample Biogas Plants	
Ecological Belts	Number	Percentage	Number	Percentage
Hill	8,940	44%	41	46%
High/Remote Hill	105	1%	2	2%
Terai	10,955	55%	46	52%
Total	20,000	100%	89	100%
CPA-2				
	Installed Biogas Plants		Sample Biogas Plants	
Ecological Belts	Number	Percentage	Number	Percentage
Hill	9,437	47%	41	48%
High/Remote Hill	144	1%	2	1%
Terai	10,346	52%	46	51%
Total	19,927	100%	89	100%
CPA-3				
	Installed Biogas Plants		Sample Biogas Plants	
Ecological Belts	Number	Percentage	Number	Percentage
Hill	10,754	54%	47	53%
High/Remote Hill	161	1%	2	2%
Terai	9,044	45%	40	45%
Total	19,959	100%	89	100%
CPA-4				
	Installed Biogas Plants		Sample Biogas Plants	
Ecological Belts	Number	Percentage	Number	Percentage
Hill	10,720	53%	40	42%
High/Remote Hill	123	1%	9	12%
Terai	9,127	46%	40	46%
Total	19,970	100%	89	100%

The sample size of 89 biogas plants per CPA was taken for Monitoring Survey 2013/2014.



Table 8.1: Monitoring Results on Number of Operational Biogas Plants of CPA-1 during MP 2013/2014:

CPA-1	Terai	Hill	Remote Hill	Total
Number of biogas plants surveyed in sample	46	41	2	89
Number of biogas plants found <i>not operational</i> in sample	0	3	2	5
Number of <i>operational</i> biogas plants in sample = total number of households surveyed on SD indicators	46	38	0	84
Percentage of <i>operational</i> biogas plants as of survey sample	100%	93%	0%	94.4%

Source: Biogas Users' Survey 2013/2014.

Monitoring of CPA-1 found five out of 89 sampled biogas plants non-operational. Therefore 84 biogas plant users were asked about SD indicators (see section 4) during the Monitoring Survey. Since all sampled biogas plants in remote hill ecological zone (n=2) were found non-operational, this MR includes no monitoring results on SD indicators for remote hill locations during MP 2013/2014.

Table 8.2: Monitoring Results on Number of Operational Biogas Plants of CPA-2 during MP 2013/2014:

CPA-2	Terai	Hill	Remote Hill	Total
Number of biogas plants surveyed in sample	46	41	2	89
Number of biogas plants found <i>not operational</i> in sample	1	1	2	3
Number of <i>operational</i> biogas plants in sample = total number of households surveyed on SD indicators	44	42	0	86
Percentage of <i>operational</i> biogas plants as of survey sample	98%	98%	0%	95.5%

Source: Biogas users' survey 2013/2014.

Monitoring of CPA-2 found four out of 89 sampled biogas plants non-operational. Therefore 85 biogas plant users were asked about SD indicators (see section 4) during the Monitoring Survey. Since all sampled biogas plants in remote hill ecological zone (n=1) were found non-operational, this MR includes no monitoring results on SD indicators for remote hill locations during MP 2013/2014.

Table 8.3: Monitoring Results on Number of Operational Biogas Plants of CPA-3 during MP 2013/2014:

CPA-3	Terai	Hill	Remote Hill	Total
Number of biogas plants surveyed in sample	40	47	2	89
Number of biogas plants found <i>not operational</i> in sample	0	5	2	7
Number of <i>operational</i> biogas plants in sample = total number of households surveyed on SD indicators	40	42	0	82
Percentage of <i>operational</i> biogas plants as of survey sample	100%	89%	0%	92%

Source: Biogas Users' Survey 2013/2014.

Monitoring of CPA-3 found seven out of 89 sampled biogas plants non-operational. Therefore 82 biogas plant users were asked about SD indicators (see section 4) during the Monitoring Survey. Since all sampled biogas plants in remote hill ecological zone (n=2) were found non-operational, this MR includes no monitoring results on SD indicators for remote hill locations during MP 2013/2014.



Table 8.4: Monitoring Results on Number of Operational Biogas Plants of CPA-4 during MP 2013/2014:

CPA-4	Terai	Hill	Remote Hill	Total
Number of biogas plants surveyed in sample	40	40	9	89
Number of biogas plants found <i>not operational</i> in sample	1	0	7	8
Number of <i>operational</i> biogas plants in sample = <i>total number of households surveyed on SD indicators</i>	39	40	2	81
Percentage of <i>operational</i> biogas plants as of survey sample	98%	100%	22%	91%

Source: *Biogas Users' Survey 2013/2014*.

Monitoring of CPA-4 found eight out of 89 sampled biogas plants non-operational (seven in remote hill ecological zone, one in terai ecological zone). Therefore 81 biogas plant users were asked about SD indicators (see section 4) during the Monitoring Survey.



4. SD Monitoring:

The Monitoring of Sustainable Development Indicators was conducted in accordance with the GS CPA passport (CPA PP). A comprehensive survey (BUS) has been conducted during both site visits to assess a wide range of social, environmental and economic impacts and benefits of the PoA. All questions related to the relevant SD indicators are included in this survey.

According to requirements of the Gold Standard, the project activity must be assessed against a matrix of sustainable development indicators. Indicators that were not scored neutral must be monitored.

The SD Matrix can be found can be found in the GS passport .



MONITORING RESULTS:

ID 01: Air quality

Table as in the passport:

No		01
Indicator		Air quality
Mitigation measure		N/A
Chosen parameter		Users' perception on smoke.
Current situation of parameter		No usage of biogas units in the targeted households and therefore no reduction of harming indoor pollution.
Estimation of baseline situation of parameter		The use of open wood fire for cooking create harmful indoor smoke.
Future target for parameter		Improved perception of indoor air quality after installation of biogas digesters.
Way of monitoring	How	In a representative survey, randomly selected users will be asked about their perception on the level of indoor smoke after installation of the biogas plant.
	When	At least biennial
	By who	Dedicated Monitoring team under responsibility of the CME

Monitoring Method: The monitoring method consisted of a sampling survey of the statistically representative number of households. The sample was determined in accordance with the monitoring plan discussed in the CDM Project Design document registered with the CDM executive board. Stratified random sampling technique was adopted to survey households. In order to adjust the sample size for possible non-responses from the users, the sample size affixed in the PoA-DD (i.e. 54 samples per CPA (see page 37 of PoA-DD)) was enlarged. For more detail on the sampling please refer to the CDM monitoring report. Questionnaires were used to monitor users perception of air quality.

Monitoring Results: The surveyed households confirmed that the use of biogas digesters and biogas for cooking have reduced the prevalence of smoke and therefore have contributed to improvements in perceived air quality. The respondents were asked to state their perception towards air quality (with reference to indoor smoke) after the installation of the biogas digester. Their responses are summarized per CPA in the tables below:

BUS Question No. 5.1: "Do you think the smoke in your kitchen has reduced after the installation of biogas?"



Table 10.1: Household perception of reduction in smoke during of CPA-1 MP 2013/2014:

Response	Hills		Terai		Total	
	No	Perc.	No	Perc.	No	Perc.
<i>Sampled, operational biogas plants</i>	38	100%	46	100%	84	100%
Air Pollution Not reduced	2	5%	0	0%	2	3%
Air Pollution Reduced to some extent	21	55%	28	61%	49	58%
Air Pollution Reduced drastically	15	40%	18	39%	33	39%
Total	38	100%	46	100%	84	100%

Source: *Biogas Users' Survey 2013/2014 (General Report)*.

(Note that remote hills don't show in the monitoring data on air quality for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

97 percent of all sampled CPA-1 households with operational biogas plants asked during Monitoring Survey 2013/2014 perceived a reduction in smoke due to the biogas installation (39 percent perceived a drastic reduction and 58 percent perceived reduction to some extent).

Table 10.2: Household perception of reduction in smoke of CPA-2 during MP 2013/2014:

Response	Hills		Terai		Total	
	No	Perc.	No	Perc.	No	Perc.
<i>Sampled, operational biogas plants</i>	42	100%	44	100%	86	100%
Air Pollution Not reduced	4	5%	0	0%	4	5%
Air Pollution Reduced to some extent	26	62%	27	61%	53	62%
Air Pollution Reduced drastically	12	33%	17	39%	29	33%
Total	42	100%	44	100%	86	100%

Source: *Biogas Users' Survey 2013/2014 (General Report)*.

(Note that remote hills don't show in the monitoring data on air quality for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

95 percent of all sampled CPA-2 households with operational biogas plants asked during BUS 2013/2014 perceived a reduction in smoke due to the biogas installation (of which 33 percent perceived a drastic reduction and 62 percent perceived reduction to some extent).

Table 10.3: Household perception of reduction in smoke of CPA-3 during MP 2013/2014:

Response	Hills		Terai		Total	
	No	Perc.	No	Perc.	No	Perc.
<i>Sampled, operational biogas plants</i>	42	100%	40	100%	82	100%
Air Pollution Not reduced	1	2%	0	0%	1	1%
Air Pollution Reduced to some extent	26	62%	10	25%	36	44%
Air Pollution Reduced drastically	15	36%	30	75%	45	55%
Total	42	100%	40	100%	82	100%

Source: *Biogas Users' Survey 2013/2014 (General Report)*.

(Note that remote hills don't show in the monitoring data on air quality for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

99 percent of all sampled CPA-3 households with operational biogas plants asked during BUS 2013/2014 perceived a reduction in smoke due to the biogas installation (of which 55 percent perceived a drastic reduction and 44 percent perceived reduction to some extent).



Table 10.4: Household perception of reduction in smoke of CPA-4 during MP 2013/2014:

Response	Remote Hills		Hills		Terai		Total	
	No	Perc.	No	Perc.	No	Perc.	No	Perc.
<i>Sampled, operational biogas plants</i>	2	100%	40	100%	39	100%	81	100%
Air Pollution Not reduced	0	0%	0	0%	0	0%	0	0%
Air Pollution Reduced to some extent	1	50%	21	52%	19	49%	41	51%
Air Pollution Reduced drastically	1	50%	19	48%	20	51%	40	49%
Total	2	100%	40	100%	39	100%	81	100%

Source: Biogas Users' Survey 2013/2014 (General Report).

The entire sampled CPA-4 households with operational biogas plants asked during BUS 2013/2014 perceived a reduction in smoke due to the biogas installation in some way. Of this which 49 percent perceived a drastic reduction and 51 percent perceived reduction to some extent.

Evidence (submitted to DOE): Biogas users' survey 2013/2014 (General Report) for CPA-1 to CPA-4 submitted by M/s Square One Research and Training.



ID 02: Soil condition

Table as in the passport:

No		02
Indicator		Soil condition
Mitigation measure		N/A
Chosen parameter		Use of slurry as fertilizer.
Current situation of parameter		No or little fertilizer used, possibly chemical fertilizer. Evidence: BSP yearbook 2012, page 3.
Estimation of baseline situation of parameter		See above
Future target for parameter		An important share of biogas users make use of bio-slurry as fertilizer.
Way of monitoring	How	In a representative survey, randomly selected users will be asked about the use of slurry as fertilizer, by a dedicated monitoring team under responsibility of the CME.
	When	At least biennial
	By who	Dedicated Monitoring team under responsibility of the CME

Monitoring Method: The monitoring method consisted of a sampling survey of the statistically representative number of households. The sample was determined in accordance with the monitoring plan discussed in the CDM Project Design document registered with the CDM executive board. Stratified random sampling technique was adopted to survey households. In order to adjust the sample size for possible non-responses from the users, the sample size affixed in the PoA-DD (i.e. 54 samples per CPA (see page 37 of PoA-DD)) was enlarged. For more detail on the sampling please refer to the CDM monitoring report. Questionnaires were used to monitor users' perception of air quality.

Monitoring Results: The surveyed household confirmed the use of biogas slurry as fertilizer. Use of slurry as natural fertilizer results in improved fertility of the households' garden areas and could replace the use of chemical fertilizers by the households. Below survey results are listed per CPA.



BUS Question No. 5.8: Do you use the bio-slurry manure?

Table 11.1: Household responses of CPA-1 on use of bio slurry as manure during MP 2013/2014

	Terai		Hills		Total	
	No	Perc.	No	Perc.	No	Perc.
Sampled, operational biogas plants	46	100%	38	100%	84	100%
Use of bio slurry manure	46	100%	37	97%	83	99%

Source: Biogas Users' Survey 2013/2014 (General Report).

(Note that remote hills don't show in the monitoring data on soil quality for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

During MP 2013/2014, 99 percent of surveyed households of CPA-1 with operational biogas plants indicated that they use slurry as fertilizer (100% of households living in Terai ecological zone, 97% living in hills ecological zone.)

Table 11.2: Household responses of CPA-2 on use of bio slurry as manure during MP 2013/2014

	Terai		Hills		Total	
	No	Perc.	No	Perc.	No	Perc.
Sampled, operational biogas plants	44	100%	42	100%	86	100%
Use of bio slurry manure	44	100%	41	98%	85	99%

Source: Biogas Users' Survey 2013/2014 (General Report).

(Note that remote hills don't show in the monitoring data on soil quality for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

During MP 2013/2014 99 percent of surveyed households of CPA-2 with operational biogas plants indicated that they use slurry as fertilizer (100% of households living in terai ecological zone, 98% living in hills ecological zone.)

Table 11.3: Household responses of CPA-3 on use of bio slurry as manure during MP 2013/2014

	Terai		Hills		Total	
	No	Perc.	No	Perc.	No	Perc.
Sampled, operational biogas plants	40	100%	42	100%	82	100%
Use of bio slurry manure	39	98%	41	98%	80	98%

Source: Biogas Users' Survey 2013/2014 (General Report).

(Note that remote hills don't show in the monitoring data on soil quality for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

During MP 2013/2014 a 98 percent of surveyed households of CPA-3 with operational biogas plants indicated that they use slurry as fertilizer (98% of households living in terai ecological zone, 98% living in hills ecological zone.)

Table 11.4: Household responses of CPA-4 on use of bio slurry as manure during MP 2013/2014

	Terai		Hills		High Hills		Total	
	No	Perc.	No	Perc.	No	Perc.	No	Perc.
Sampled, operational biogas plants	39	100%	40	100%	2	100%	81	100%
Use of bio slurry manure	35	90%	38	95%	0	0%	73	90%

Source: Biogas Users' Survey 2013/2014 (General Report)

During MP 2013/2014 a 90 percent of surveyed households of CPA-4 with operational biogas plants indicated that they use slurry as fertilizer (90 percent of households living in terai ecological zone, 95 percent living in hills ecological zone.)

Evidence (submitted to DOE): Biogas users' survey 2013/2014 (General Report) for CPA-1 to CPA-4 submitted by M/s Square One Research and Training.



ID 03: Quality of employment

Table as in the passport:

No		03
Indicator		Quality of employment
Mitigation measure		As described under safeguarding principle 8, in order to avoid the risk of accidents, workers will receive proper training. Protective equipment will be distributed.
Chosen parameter		Trainings for masons.
Current situation of parameter		Although literacy and school enrolment rates in Nepal have increased during the last 40 years, access to education and capacity-building is still not universal or equal across income and gender groups, due to poverty and lack of quality public infrastructures, especially in rural areas. Evidence: http://unstats.un.org/unsd/mdg/Data.aspx , http://borgenproject.org/facts-about-education-in-nepal/
Estimation of baseline situation of parameter		See above
Future target for parameter		Masons involved in the programme receive trainings on biogas technology as well as its safe and sound installation.
Way of monitoring	How	Training reports and records, including types of trainings and, if available, pictures. <i>This shall be done exclusively for digesters of CPAs that do not fall under the retro-active registration. Digesters that were included retro-actively have already been built prior to GS registration, monitoring of this parameter can thus not be done.</i>
	When	At least biennial
	By who	Dedicated Monitoring team under responsibility of the CME

Monitoring Results: This parameter is not required to be monitored during Monitoring period 14/08/2013 until 31/07/2014, since the Monitoring Period falls completely under the retro-active registration period and all of the monitored biogas plants were already built before GS registration.



ID 04: Livelihood of the poor

Table as in the passport:

Table 45 in the passport:		
No	04	
Indicator	Livelihood of the poor	
Mitigation measure	N/A	
Chosen parameter	Improved access to sanitation services	
Current situation of parameter	No improved sanitation facilities available. Evidence: BSP yearbook 2012, page 3, showing that toilets are constructed together with biogas plants, which shows that there were no toilets before.	
Estimation of baseline situation of parameter	See above	
Future target for parameter	An important share of biogas plants counts with a connected toilet.	
Way of monitoring	How	In a representative survey, a dedicated monitoring team under responsibility of the CME will checked at randomly selected households of biogas users if toilets have been constructed as part of the digester.
	When	At least biennial
	By who	Dedicated Monitoring team under responsibility of the CME

Monitoring Method: The monitoring method consisted of a sampling survey of the statistically representative number of households. The sample was determined in accordance with the monitoring plan discussed in the CDM Project Design document registered with the CDM executive board. Stratified random sampling technique was adopted to survey households. In order to adjust the sample size for possible non-responses from the users, the sample size affixed in the PoA-DD (i.e. 54 samples per CPA (see page 37 of PoA-DD)) was enlarged. For more detail on the sampling please refer to the CDM monitoring report. Questionnaires were used to monitor users perception of air quality.

Monitoring Results: Monitoring showed that more 65% of surveyed households chose to use the opportunity of to have a toilet built at the same time of having the biogas constructed on their premises. More than 62% connected their toilets with the biogas plants, thus using faeces as feedstock for the biogas plant, which increases the volume of biogas produced and provides a clean sanitation solution. Constructing toilets along with the biogas plant is a voluntary decision by each household. Opting for a toilet therefore means that households actively want an improved sanitation situation at their home: e.g. replacing the former habit of open defecation with a private space for sanitation.

BUS Question No. 5.13: Do you have toilet at your house? (YES/NO)

BUS Question No. 5.14: When did you construct toilet? (Before/After biogas installation?)

BUS Question No. 5.15: Have you attached the toilet with your biogas plant? (YES/NO)

Table 12.1: Monitoring Responses on Sanitation Access for CPA-1 MP 2013/2014:

	Hills		Terai		Total	
	No	Perc.	No	Perc.	No	Perc.
<i>Sampled, operational biogas plants</i>	38	100%	46	100%	84	100%
Toilets in household	38	100%	44	96%	82	98%
Timing of toilet construction						
Before biogas installation	6	16%	23	52%	29	35%
After biogas installation	32	84%	21	48%	53	65%
Households having connected toilet to biogas	32	84%	19	43%	51	62%

Source: Biogas users' survey 2013/2014 (General Report).

(Note that remote hills don't show in the monitoring data on sanitation access for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)



During Monitoring Survey 2013/2014, 98 percent of surveyed households of CPA-1 with operational biogas plants were found to have a toilet constructed at their households. 65 percent confirmed that the toilet was constructed only after the installation of the biogas digesters. 62 percent of households with a toilet also have it attached to a biogas unit.

Table 12.2: Monitoring Responses on Sanitation Access for CPA-2 during MP 2013/2014:

	Hills		Terai		Total	
	No	Perc.	No	Perc.	No	Perc.
<i>Sampled, operational biogas plants</i>	42	100%	44	100%	86	100%
Toilets in household	42	100%	42	95%	84	98%
Timing of toilet construction						
Before biogas installation	5	12%	22	52%	27	32%
After biogas installation	37	88%	20	48%	57	68%
Households having connected toilet to biogas	42	100%	31	74%	73	87%

Source: *Biogas users' survey 2013/2014 (General Report)*.

(Note that remote hills don't show in the monitoring data on sanitation access for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

During Monitoring Survey 2013/2014 98 percent of households surveyed in CPA-2 with operational biogas plants were found to have toilet constructed at their households. 68 percent confirmed that the toilet was constructed only after the installation of the biogas digesters. 87 percent of households with a toilet also have it attached to a biogas unit.

Table 12.3: Monitoring Responses on Sanitation Access for CPA-3 during MP 2013/2014:

	Hills		Terai		Total	
	No	Perc.	No	Perc.	No	Perc.
<i>Sampled, operational biogas plants</i>	42	100%	40	100%	82	100%
Toilets in household	42	100%	39	98%	81	99%
Timing of toilet construction						
Before biogas installation	7	17%	16	41%	23	28%
After biogas installation	35	83%	23	59%	58	72%
Households having connected toilet to biogas	41	98%	37	95%	78	96%

Source: *Biogas users' survey 2013/2014 (General Report)*.

(Note that remote hills don't show in the monitoring data on sanitation access for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

During Monitoring Survey 2013/2014 a 99 percent of households surveyed in CPA-3 with operational biogas plants were found to have toilet constructed at their households. 72% confirmed that the toilet was constructed only after the installation of the biogas digesters. 96% of households with a toilet also have it attached to a biogas unit.



Table 12.4: Monitoring Responses on Sanitation Access for CPA-4 during MP 2013/2014:

	Remote Hill		Hills		Terai		Total	
	No	Perc.	No	Perc.	No	Perc.	No	Perc.
<i>Sampled, operational biogas plants</i>	2	100%	40	100%	39	100%	81	100%
Toilets in household	0	0%	38	95%	39	100%	77	95%
Timing of toilet construction								
Before biogas installation	0	0%	7	18%	8	21%	15	19%
After biogas installation	0	0%	31	82%	31	79%	62	81%
Households having connected toilet to biogas	0	0%	36	95%	35	90%	71	92%

Source: *Biogas users' survey 2013/2014 (General Report)*.

(Note that remote hills don't show in the monitoring data on sanitation access for MP2013/2014 due to the non-operational state of biogas plants at the sample households visited.)

During Monitoring Survey 2013/2014 95 percent of households surveyed in CPA-4 were found to have toilet constructed at their households. 81 percent confirmed that the toilet was constructed only after the installation of the biogas digesters. 92 percent of households with a toilet also have it attached to a biogas unit.

Evidence (submitted to DOE): Biogas users' survey 2013/2014 (General Report) for CPA-1 to CPA-4 submitted by M/s Square One Research and Training.



ID 05: Access to affordable and clean energy services

Table as in the passport:

No		05
Indicator		Access to affordable and clean energy services
Mitigation measure		N/A
Chosen parameter		Households using biogas plants
Current situation of parameter		Targeted households do not use clean energy; they cook with non-renewable biomass. Evidence: Baseline description in the PoA-DD section E.4, describing baseline scenario.
Estimation of baseline situation of parameter		See above
Future target for parameter		Biogas users cook with clean biogas and do not have to buy or collect firewood. Evidence: Monitored
Way of monitoring	How	Number of biogas plants installed and operating checked on a random sample.
	When	At least biennial
	By who	Dedicated Monitoring team under responsibility of the CME

Monitoring Method: The monitoring method consisted of a sampling survey of the statistically representative number of households. The sample was determined in accordance with the monitoring plan discussed in the CDM Project Design document registered with the CDM executive board. Stratified random sampling technique was adopted to survey households. In order to adjust the sample size for possible non-responses from the users, the sample size affixed in the PoA-DD (i.e. 54 samples per CPA (see page 37 of PoA-DD)) was enlarged. For more detail on the sampling please refer to the CDM monitoring report. Questionnaires were used to monitor users perception of air quality.

Monitoring Results:

BUS Question No. 1.2: Is your biogas plant still in operation? (YES/NO)

Table 13.1: Monitoring Responses on Number of Operational Biogas Plants of CPA-1:

Eco-Belts	TO TAL	Operational (Number)							Non-Operational (Number)						
		2m ³	4m ³	6m ³	8m ³	10m ³	TO-TAL	%	2m ³	4m ³	6m ³	8m ³	10m ³	TO-TAL	%
Tera	46	-	2	43	1	-	46	100 %	-	0	0	-	-	0	0%
Hills	41	-	15	22	1	-	38	93%	-	3	0	-	-	3	7%
Remote Hills	2	-	0	0	0	-	0	0%	-	-	2	-	-	2	100 %
TOTAL	89	-	17	65	2	-	84	94%	-	3	2	-	-	5	6%

Source: Biogas Users' Survey 2013/2014.

From the monitoring surveys it can be seen that 94% of surveyed digesters were operational calculated on weighted average basis, thus providing reliable and continuous access and service to clean (smoke-free) forms of cooking.

A total of 5 biogas digesters (6 percent) were found to be non-operational, three in hill zone, two in remote hill ecological zone. Reasons for why users abandoned the use of biogas digesters were failure of appliances, lack of cattle or fuel switch.



Table 13.2: Monitoring Responses on Number of Operational Biogas Plants of CPA-2:

Eco-Belts	TO TAL	Operational (Number)							Non-Operational (Number)						
		2m ³	4m ³	6m ³	8m ³	10m ³	TO- TAL	%	2m ³	4m ³	6m ³	8m ³	10m ³	TO- TAL	%
Terai	46	-	5	39	0	-	44	98%	-	0	1	-	-	1	2%
Hills	41	-	18	22	2	-	42	98%	-	1	0	-	-	1	2%
Remote Hills	2	-	0	0	0	-	0	0%	-	2	0	-	-	2	100%
TOTAL	89	-	23	61	2	-	86	97%	-	2	1	-	-	3	3%

Source: Biogas Users' Survey 2013/2014.

From the monitoring surveys it can be seen that 97% of surveyed digesters are operational calculated on weighted average basis, thus providing reliable and continuous access and service to clean (smoke-free) forms of cooking.

A total of 3 biogas digesters (3 percent) were found to be non-operational – one in each ecological zone. Reasons for why users abandoned the use of biogas digesters were failure of appliances, lack of cattle or fuel switch.

Table 13.3: Monitoring Responses on Number of Operational Biogas Plants of CPA-3:

Eco-Belts	TOTAL	Operational (Number)							Non-Operational (Number)						
		2m ³	4m ³	6m ³	8m ³	10m ³	TO- TAL	%	2m ³	4m ³	6m ³	8m ³	10m ³	TO- TAL	%
Terai	40	-	-	36	4	-	40	100%	-	-	-	-	-	0	0%
Hills	47	-	30	6	6	-	42	89%	1	4	-	-	-	5	11%
Remote Hills	2	-	-	-	-	-	-	0%	0	2	-	-	-	2	100%
TOTAL	89	-	30	42	10	-	82	92%	1	6	-	-	-	7	8%

Source: Biogas Users' Survey 2013/2014.

From the monitoring surveys it can be seen that 92% of surveyed digesters are operational calculated on weighted average basis, thus providing reliable and continuous access and service to clean (smoke-free) forms of cooking.

A total of 7 biogas digesters (8 percent) were found to be non-operational. Five of these non-operational plants are in Hills and two were in High Hills. None of the plants in Terai was found to be non-operational. Reasons for why users abandoned the use of biogas digesters were failure of appliances, physical damage of the digester, lack of cattle or fuel-switch.



Table 13.4: Monitoring Responses on Number of Operational Biogas Plants of CPA-4:

Eco-Belts	TOTAL	Operational (Number)							Non-Operational (Number)						
		2m ³	4m ³	6m ³	8m ³	10m ³	TO-TAL	%	2m ³	4m ³	6m ³	8m ³	10m ³	TO-TAL	%
Terai	40	-	2	37	-	-	39	97.5 %	-	-	1	-	-	1	2.5 %
Hills	40	-	22	18	-	-	40	100 %	-	-	-	-	-	0	0%
Remote Hills	9	2	-	-	-	-	2	22%	7	-	-	-	-	7	78 %
TOTAL	89	2	24	55	-	-	81	91%	7	-	1	-	-	8	9%

Source: Biogas Users' Survey 2013/2014.

From the monitoring surveys it can be seen that 91% of digesters are operational calculated on weighted average basis, thus providing reliable and continuous access and service to clean (smoke-free) forms of cooking.

A total of 8 biogas digesters (9 percent) were found to be non-operational. Seven of these non-operational plants were in Remote Hills and one was in Terai Ecological Zone. All plants in Hill ecological zones were found operational. Reasons for why users abandoned the use of biogas digesters are failure of appliances and physical damage of the digester.

Evidence (submitted to DOE): Biogas users' survey 2013/2014 for CPA-1 to CPA-4 submitted by M/s Square One Research and Training.



5. Continuous Grievance Mechanism

Stakeholders could and can provide comments and complaints on CPA-1 to CPA-4 (as on other CPAs included under PoA-3110) via the following means:

1. Telephone:
 - a. AEPC provides a toll free number (16600144566)
 - b. Nepal biogas promoters association can be reached via its Central Office in Kathmandu (01-5535116)
 - c. Nepal biogas promoters association regional offices can be reached via its branches in:
 - Pokhara: 061-526785
 - Butwal: 071-551514
 - Itahari: 025-5817745
 - Nepalgunj: 081-528066
 - Dhangadi: 091- 527379
 - Chitwan: 056- 521749
2. Internet/email:
 - a. AEPC's website : www.aepc.gov.np and online [contact](#)
 - b. Programme officer: Neelam.rijal@aepc.gov.np
3. Continuous Input / Grievance Expression Process Book:

All grievance input received was collected in a separate form, in which AEPC collected the following information of each grievance case (see attached excel file):

- Serial Number
- Complaint Date
- Owners' name and address
- Plant size (in m³)
- Problem Description
- Dom gas pipe number
- Construction Company
- Construction Completion
- Contact of Owner
- Issue resolved

All grievance cases have been resolved.



6. Additional remarks on monitoring

Design changes

No design changes applied during the monitoring period.

7. Contact

This Monitoring Report was prepared by:

Alternative Energy Promotion Centre (AEPC)

Mr. Neelam Sharma Rijal, Sr. Program Officer

Email: neelam.rijal@aepec.gov.np

Web: www.aepec.gov.np

Phone: +9771-5539390, 5539391

Fax: +9771-5542397, 5539392

Address: Khumaltar Heights, Lalitpur Sub Metropolitan City, Nepal, Post Box No.: 14364

atmosfair gGmbH

Ms. Julia Hoffmann, project manager

Email: hoffmann@atmosfair.de

Web: www.atmosfair.de/en

Phone: +49 (0)30 6273550-22

Fax: +49 (0)30 6273550-29

Address: Zossener Straße 55-58, 10961 Berlin, Germany