Voluntary PROGRAM ACTIVITY DESIGN DOCUMENT FORM
(VPA-DD)
Version 01

Qori Q'oncha - Improved Cookstoves Diffusion Programme in Peru
VPA 2008 - 2009

LPPs of the project	
Ancash	ADRA Perú
Cusco	ProPerú
La Libertad	Instituto Trabajo Y Familia

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Annexes

SECTION A. General description of Voluntary programme activity (VPA)

A.1. Title of the VPA:

Qori Q'oncha – Improved Cookstoves Diffusion Programme in Peru – VPA 2008-2009.
Version: 9.
Date: 11.01.2011 (DD/MM/YYYY)
Authors: Arthur Laurent (Microsol), Pol Raguénès (Microsol) and Martin Jenk (myclimate)

A.2. Description of the VPA:

➔ **INTRODUCTION**

This Program Activity is part of the PoA "Qori Q'oncha - Improved Cookstoves Diffusion Programme in Peru". The project activity is primarily designed for the long-term improvement of the living conditions of local people. This is being allowed by the use of improved stoves.

This VPA includes three different project activities in different regions of Peru implemented by three different LPPs (Local Project Participants). The project activities are the dissemination and transfer of 29'069 improved cook-stoves in Peru. Project activities will take place between 2008 and 2015 at least (the actual dissemination and transfer of technology was held in 2008 and 2009 but follow up and maintenance will last until 2015), in the three regions of Ancash, Cusco and La Libertad.

Five main actors are implementing the project activities:

- "Fondo Minero Antamina", financial fund of the mining company Antamina, dedicated to invest in social projects in the Ancash region. The "Fondo Minero Antamina" is financing a part of the initial investment of the project activities;
- ADRA Perú: Local Project Participant n°1 (LPP1) of this VPA, Peruvian branch of the international NGO ADRA. ADRA Perú is implementing Ancash project activities in the field;
- ProPeru: Local Project Participant n°2 (LPP2) of this VPA, Peruvian NGO. ProPeru is both financing a part of the initial investment of the project activities and implementing Cusco project activities in the field,
- Instituto Trabajo Y Familia (ITYF): Local Project Participant n°3 (LPP3) of this VPA. National NGO. ITYF is implementing the project activities of La Libertad region in the field.
- Microsol – Managing entity: French company dedicated to help local actors of Peru to implement voluntary actions of cook-stove diffusion. Microsol participates in the investment of project activities developing deep knowledge on social, cultural and environmental impact of cookstove, adequate dissemination mode of cookstove and carbon engineering. It also finances and organizes the writing of carbon market related documents, coordination of information production and monitoring activities, stakeholder's consultation, discussions with Gold Standard and DOEs.
- Myclimate- Credit buyer and account holder: Swiss foundation dedicated to develop and support carbon offset projects throughout the whole world. Myclimate carries out the carbon

market related processes: revision and submission of carbon market related documents, relation with carbon market counterparts, and finance and organization of a part of the carbon process (Gold Standard registration, validation, verification, VERs generation).

For the analysis of this project methodological tools used are:
- Gold Standard Cook stove Methodology: "Methodology for Improved Cook-stoves and Kitchen Regimes – V.01".
- CDM-SSC-CPA-DD form provided by the UNFCCC – Version 01.

➔ DETAIL OF PROJECT ACTIVITIES: IMPROVED COOK-STOVE DISSEMINATION

Peru is both an actor and a victim of climate change. Its urban fast-developing economy is chaotic and not accompanied with proper environmental improvement of technology. Its rural areas are drastically hit by deforestation, both the tropical forest and the mountainous one. It is considered the 43rd most vulnerable country to climate change[1]. Strong dramatic impacts are to come: Peru is counting with numerous tropical glaciers that are currently very rapidly melting, and expected to disappear within a century; desertification should soon be putting in danger the poorest inhabitants of the countries, including those in Andes mountainous areas, deforestation is threatening biomass reserves of the country.

Besides, the poorest populations of the country have a very low access to basic needs: drinking water, electricity, balanced alimentation, medicine. One of the most urgent issues is the health-related issue of cooking combustion habit. Cooking has remained very traditional, and makes a tremendous damage to poorest families' health.

Adequate sensitization, technology transfer and finance for improving these conditions has always been lacking even though the technology able to both limit deforestation and protect the health of the families initially appears quite simple. This VPA intends to be part of the solution. It aims at disseminating, within the defined processes of the PoA, improved cook-stove in three regions of Peru. It is also meant as the pilot activity of the "Qori Q'oncha – Improved Cookstoves diffusion Programme in Peru" program, and therefore designed to be massively replicated for responding the dramatic issues Peru is facing.

Project activities will take place in three regions:

- - Sub-project 1: Dissemination of 2,997 improved cook-stove in Ancash region, Peru. Implementation of activities in the field: ADRA Perú (LPP1). The improved cookstove diffusion activity is designed for families using a traditional cookstove and is part of the improved kitchen component of a wider project addressing children malnutrition that includes activities such as balanced alimentation, children early stimulation and children's growth follow up. The improved kitchen activity includes capacity building about hygiene and construction of ecological freezer, storage spaces etc.

[1] German Watch, Global Climate Risk index 2010, "Who is most vulnerable? Weather-related loss events since 1990 and how Copenhagen needs to Respond".

- Sub-project 2: Dissemination of 1'975 improved cook-stove in Cusco region, Peru to families using a traditional cookstove. Implementation of activities in the field: ProPeru (LPP2).
- Sub-project 3: Dissemination of 24'097 improved cook-stove in La Libertad region, Peru designed for families using a traditional cookstove. Implementation of activities in the field: ITYF (LPP3). This project has three components: improved stoves, latrine and vegetable garden as the center of a global strategy for reaching productive development for income generating and social development by fighting against children malnutrition.

➔ EXPECTED RESULTS

The expected results will be of three types:

- Quantitative results (number of improved stoves) announced for the project, and consequent positive impacts;

- Training of human resources within the LPP implementing the project activities on the ground: knowledge of the technology, consciousness-raising on health and environmental impacts, specific management of a project for the dissemination of improved cooking stoves, evaluation methods results.

- Training of participating families: the technology of improved stoves, environmental and health issues.

➔ THE TECHNOLOGY

Table A1: Technologies and cost repartition

	ADRA - LPP1	PROPERU - LPP2	ITYF - LPP3
Foto 1			
	Model under construction	Model under construction	Technical team revising stove

Foto 2

Beneficiary with her stove

Beneficiary with her stove

Beneficiary with her stove

Materials used and life expectancy

Life expectancy (year)	
Materials	
Steal chimney	3
Platform	15
Clay	2
Fine sand	15
Glass bottle pieces	15
Sugar	15
Salt	15
Adobes	15
Wild grass (ichu)	15
Aglutinating substance	15
Stove life exp.	**7**

Life expectancy (year)	
Materials	
2 Ceramic « C »s	3
1 ceramic « I »	3
Ceramic chimney	7
Ceramic blocks 12	7
2 Ceramic "pasteleros"	7
Used steal piece	7
Clay	2
Adobes	15
Stove life exp.	**7**

Life expectancy (year)	
Materials	
Ceramic rocket	5
Steal chimney	7
Platform	2
Platform for chimney	2
Chimney hat	7
Wood support for rocket	4
Clay	2
Packaging	5
Adobes	15
Stove life exp.	**7**

ADRA - LPP1	
Direct contribution PEN	**66**
Includes counterpart	0
Spare parts PEN	49
Total price PEN	242
Carbon subsidies PEN	**177**
Subsidies % total price	72,9%
Carbon subsidies USD	58,85

PROPERU - LPP2	
Direct contribution PEN	**62**
Includes counterpart	10
Spare parts	11,9
Total price	241,9
Carbon subsidies PEN	**179,9**
Subsidies % total price	74,4%
Carbon subsidies USD	59,97

ITYF - LPP3	
Direct contribution PEN	**25**
Includes counterpart	0
Spare parts PEN	69,26
Total price PEN	178,82
Carbon subsidies PEN	**153,82**
Subsidies % total price	86,0%
Carbon subsidies USD	51,27

All three LPPs evaluate their stove to last until the end of the first crediting period with some repairing and also some material replacement. This is a rough evaluation as no stove has been observed during such a long period of time. LPPs believe their stove could last three crediting periods but such estimation will be evaluated at the end of the first crediting period.

➔ SUSTAINABLE DEVELOPMENT ACHIEVEMENTS

The Sustainable Development Matrix is evaluated at VPA level and submitted to the judgment of stakeholders in the stakeholder's consultation event at LPP level and then documented in the VPA GS Passport. Results of the local stakeholder consultation can be seen in LSHC reports and the consolidated matrix ant its reports are detailed in the Passport.

➔ NO HARM ASSESSMENT

The no harm assessment is undertaken at PoA level and documented in the PoA. Compliance of the LPP with DNH is assessed in the Do Not Harm Declaration Form signed by each LPP and eventual indicators to be monitored are included in the monitoring plan.

➔ ELEGIILITY CRITERIA

The three LPPs respect all eligibility criteria.

A.3. Entity/individual responsible for VPA:

MICROSOL S.A.R.L. – see detailed information in Annex 1
ADRA Perú – see detailed information in Annex 1
Antamina – see detailed information in Annex 1
ProPeru – see detailed information in Annex 1
Instituto Trabajo Y Familia ITYF – see detailed information in Annex 1

A.4. Technical description of the VPA:

A.4.1. Identification of the VPA:

The VPA consists in the diffusion of improved cookstoves in Peru's regions of Ancash, Cusco and La Libertad.

A.4.1.1. Host Party:

Peru.

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the VPA (maximum one page):

Peru is a 1'285'220 km^2 country with 24 regions. It is located on the occidental area of Latin America.

Table A2: Maps

Project activities take place in three regions: • Ancash region on the Pacific Coast; • Cusco region in the south-east mountainous area; • La Libertad region on the Pacific Coast.	
Ancash region ("Departamento") has 20 provinces ("provincias"). Project activities take place in 9 southern provinces: • Aija • Antonio Raymondi • Asuncion • Bolognesi • Carlos Fermin Fitzcarrald • Huari • Huarmey • Ocros • Recuay A small proportion of project activities takes place in Huamalies province of Huanuco region, bordering Ancash	

region to its eastern border.	
Cusco region has 13 provinces. Project activities take place in 4 central provinces of Cusco region: • Calca, • Urubamba, • Anta • Cusco.	
La Libertad region has 11 provinces. Project activities take place in 3 central provinces of La Libertad region: • Otuzco • Sánchez Carrión • Julcan	

A.4.2. Duration of the VPA:

A.4.2.1. Starting date of the VPA:

01.01.2008
The first stove implemented by an LPP in this VPA has been implemented during the month of January 2008 by ProPeru (Evidences of those installations in the form of community representative declarations have been provided to DOE).

A.4.2.2. Expected operational lifetime of the VPA:

21 years.
Some spare parts of the stove have a shorter life expectancy nevertheless, some repairing (clay cover for example) can be made by the family and others imply new spare parts provision. Anyway, LPPs are asked to define a replacement scheme (adequate follow-up or sustainable independent retailing scheme) so as to ensure the stove will be functioning during the 7 years of the first crediting period.

A precise analysis of the situation will be needed at the end of the crediting period for validating a new crediting period.

A.4.3. Choice of the crediting period and related information:

Renewable crediting period

A.4.3.1. Starting date of the crediting period:

First stove of first VPA has been built during the month of January 2008. Using a conservative approach, it is considered each stove starts saving wood at the beginning of the month after it's installation so that it is considered stoves started generating credits on February 1st 2008.
Nevertheless Gold Standard rule allow only for a two years retroactive crediting period so that not all the credit can be claimed.
Besides, the crediting period must be common for all three LPPs in the VPA.
So that the largest retroactive period allowed is used here for defining the common starting date of the crediting period, that is:

LPP	ADRA	PROPERU	ITYF
Starting date	18.01.2009	18.01.2009	18.01.2009

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

7 years.

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

Table A3: Estimated amount of emission reductions

[redacted]

ER_{09} (t)	14540
ER_{10} (t)	25746
ER_{11} (t)	25746
ER_{12} (t)	25746
ER_{13} (t)	25746
ER_{14} (t)	25746
ER_{15} (t)	25746
ER_{16} (t)	1199
ER_{09-16}(t)	170214
Annual average ER (t)	24316

A.4.5. Public funding of the VPA:

See ODA declarations in Annex 1 of GS Passport.

A.4.6. Confirmation that the VPA is neither registered as an individual voluntary project activity nor is part of another Registered PoA:

This VPA, nor any activity included in it, is not registered as an individual voluntary project activity nor is part of another registered PoA is not a de-bundled component of a larger project.

SECTION B. Eligibility of VPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which VPA is added:

"Qori Q'oncha – Improved Cookstoves Diffusion Programme in Peru"

B.2. Justification of the why the VPA is eligible to be included in the Registered PoA :

The VPA is eligible to be included in the considered PoA because it complies with all conditions presented in Annex 3 of the PoA (VPA LPP Eligibility Form).

Criteria	Sub-project ADRA Perú – Ancash	Sub-project ProPeru – Cusco	Sub.project ITYF – La Libertad
1. General framework and Technology			
1.1 Has a chimney	Yes, metal chimney. See section A.2 of VPA.	Yes, ceramic chimney. See section A.2 of VPA.	Yes, metal chimney. See section A.2 of VPA.
1.2 Favours local materials for the cookstove (isolating clay – *barro* – and traditional *adobe* in particular)	Yes, see section A.2 of VPA.		
1.3 LPP's activity corresponds to Sustainable development assessment validated through corresponding stakeholder consultation.	Yes, see VPA-Passport and SHC Reports.		
2. Additionality			
2.1 There is evidence that carbon funding was considered in the decision before project activities	Yes, see section B.3 of VPA.		

implementation.	
Alternative 2 (cooking with gas) and Alternative 3 (project activity without carbon funding) are not credible	
2.2 Beneficiaries cook with an unimproved stove	Yes, see section A.2 of VPA.
2.3 Stoves are distributed for free or at subsidized costs.	Yes, see section A.2 of VPA.
2.4 District of implementation pertain to the two poorest quintiles of population or evidence is provided that cookstoves are distributed to the poorest in selected district (evidence should be provided with basis on official data)	Yes, see file 'VPA 2008-2009 Beneficiares of cookstoves v3.xls"
Diference with commun practice is demonstrated	
2.5 The use of carbon funding for project activity is demonstrated.	Yes.
2.6 The volume of diffusion should be higher than 500 stoves.	Yes, see section A.2 of VPA.
2.7 Project activity includes multi thematic capacity building.	Yes.
3. Sustainability and no harm assessment	
No Harm Assessment	
3.1 The LPPs has signed the "Do Not Harm Declaration"	Yes, see Annex 2 of VPA Passport.

3.2 The LPPs will provide information in order to avoid corruption	Yes, see section B.6 of VPA.
Official Development Assistance	
3.31 The LPPs has signed the "Official Development Assistance Declaration"	Yes, see Annex 1 of VPA Passport.
4. Miscellaneous	
4.1 The project is a voluntary action decided and implemented by the project participants	See section A.2 of VPA.
4.2 The project activities is coordinated by MICROSOL in Peru.	See section A.3 of VPA.
4.3 The project is not registered as an individual voluntary project activity nor is part of another registered PoA and is not a de-bundled component of a larger project and has not been already presented in any VPA of this PoA.	Yes
4.4 The LPP shall implement a monitoring as stated in the PoA-DD that is following the step-wise approach of applied methodology to calculate emission reductions.	See section B.6 of VPA.
5. Similarities to previous registered VPAs	
5.1 Whenever there is a similarity between the activity of this LPP and a	No

previous activity of any VPA registered under the PoA 'Qori Q'oncha – Improved Cookstoves Diffusion Programme in Peru'	

B.3. Assessment and demonstration of additionality of the VPA, as per eligibility criteria listed in the Registered PoA:

The assessment and demonstration of additionality at VPA level should correspond to that presented in the A.4.3 section of the PoA-DD

All three LPPs comply with the criteria listed in the registered PoA.

The timeline for carbon consideration and project implementation is as follows:

Table A4: Timeline for carbon consideration

Date	Event
2007	
June 4th	LPP2 writes to LPP3 proposing to use carbon credits for stoves diffusion
June 5th	LPP3 writes back to LPP2 demonstrating interest
September	First contacts between MICROSOL and LPP2
October	First contacts between MICROSOL and LPP1
2008	
1st of January	Starting date of project activity
January	LPP2 first construction
May	Decision of LPP1s financing entity to finance stoves for generating carbon credits
May	LPP3's first construction
June	Proposal of LPP1 to its financing entity
4th of August	Formal agreement between LPP1 and its financing entity for constructing stove for generating carbon credits
August	First contacts between MICROSOL and LPP3
October	LPP1's first construction
2009	
February	Formal agreement between Microsol and LPP1

August	Formal agreement between Microsol and LPP2 and LPP3

In the case of LPP1, after having had first contacts with Microsol since September 2007 and having showed a great interest in using carbon finance for implementing a stove diffusion project, the LPP started discussion with its financing entity in order to implement such a project. The financing entity agreed with the idea in May 2008 and asked for a proposal of LPP that was presented in June and accepted in August. Installation started in October of the same year and formal agreement with Microsol happened in February 2009.
In the case of LPP2, interest of using carbon finance to finance project was shown in early 2007 and first contacts with Microsol were established in September then installation started and formal agreement was signed in August 2009.
In the case of LPP3, interest of using carbon finance to finance project was also shown in early 2007 and first stoves were installed in this perspective in May 2008 then first contacts were established with Microsol in August and the formal agreement was signed in August 2009.

B.4. Description of the sources and gases included in the project boundary and proof that the VPA is located within the geographical boundary of the registered PoA.

Assessment of the inclusion of green-house gases CO2, CH4 and N2O for this VPA:
The greenhouse gas emissions included in the VPA boundary are the three gases considered by the Gold Standard Methodology for Improved Cook-stoves and Kitchen Regimes V.01: CO2, CH4 and N20..
IPCC default values are used for the Emission factors.

Table A5: Assessment of the inclusion of GHG for Baseline

	Source	Gas	Included?	Justification / Explanation
Baseline	Cooking	CO2	Yes	Important source of emission. IPCC values are applied.
		CH4	Yes	Important source of emission. IPCC values are applied.
		N2O	Yes	Significant source of emission. IPCC values are applied.
	Transport of fuel	CO2	No	To have a conservative approach, emissions from transport of fuel are excluded.
		CH4	No	
		N2O	No	
	Production of fuel	CO2	No	To have a conservative approach, emissions from production of fuel are excluded.
		CH4	No	

			No	
	Transport of raw material	CO2	No	To have a conservative approach, emissions from transport of raw material to build the stoves are excluded.
		CH4	No	
		N2O	No	

Table A6: Assessment of the inclusion of GHG for Baseline

	Source	Gas	Included?	Justification / Explanation
Project Scenario	Cooking	CO2	Yes	Important source of emission. IPCC values are applied.
		CH4	Yes	Important source of emission. IPCC values are applied.
		N2O	Yes	Significant source of emission. IPCC values are applied.
	Transport of fuel	CO2	No	Excluded as in the Baseline. Conservative approach, because less fuel is used in the project scenario.
		CH4	No	
		N2O	No	
	Production of fuel	CO2	No	Excluded as in the Baseline. Conservative approach, because less fuel is used in the project scenario.
		CH4	No	
		N2O	No	
	Transport of raw material	CO2	Yes	See also Leakage L6. CO2 emissions for the transport of raw material to build the stoves are included.

The geographical boundary of the related PoA is Peru. This VPA is then located within this geographical boundary, as all project activities take place in Peru.

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

The following parameters are available at validation

B.5.1.1 Fixed parameters

(only presented in the VPA-DD form, not in Monitoring Reports, unless described specific case occur):

Data / Parameter:	**EFbl.bio,co2**
Data unit:	tCO2/t_biomass
Description:	CO2 emission factor arising from use of wood-fuel in baseline scenario
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Tables 1.2/1.4
Value applied:	1,7472 tCO2/t wood (=112.0 tCO2/TJ * 0.0156 TJ/ t)
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default IPCC values for wood / wood waste are applied
Any comment:	

Data / Parameter:	**EFpj.bio,co2**
Data unit:	tCO2/t_biomass
Description:	CO2 emission factor arising from use of wood-fuel in project scenario
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Tables 1.2/1.4
Value applied:	1,7472 tCO2/t wood (=112.0 tCO2/TJ * 0.0156 TJ/ t)
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default IPCC values for wood / wood waste are applied
Any comment:	

Data / Parameter:	**EFbl.bio,non-co2**
Data unit:	Data unit: tCO2/t_wood
Description:	Non-CO2 emission factor arising from use of wood-fuel in baseline scenario
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol.2 Energy, Chapter 2, Stationary Combustion, Table 2.5
Value applied:	**0.11762 tCO2eq/t wood** = (0.09828tCO2eq/t wood (CH4 emission) + 0.01934tCO2eq/t wood

	(N2O emission))
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default IPCC values for CH4 and N20 emissions for wood / wood waste are applied. The following GWP100 are applied: 21 for CH4, 310 for N20 NCV wood = 0.0156TJ/t_wood EF_wood_CH4= 0.3tCH4/TJ EF_wood_N2O = 0.004tN2O/TJ

Data / Parameter:	**EFpj.bio,non-co2**
Data unit:	Data unit: tCO2/t_wood
Description:	Non-CO2 emission factor arising from use of wood-fuel in baseline scenario
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol.2 Energy, Chapter 2, Stationary Combustion, Table 2.5
Value applied:	**0.11762 tCO2eq/t wood** = (0.09828tCO2eq/t wood (CH4 emission) + 0.01934tCO2eq/t wood (N2O emission))
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default IPCC values for CH4 and N20 emissions for wood / wood waste are applied. The following GWP100 are applied: 21 for CH4, 310 for N20 NCV wood = 0.0156TJ/t_wood EF_wood_CH4= 0.3tCH4/TJ EF_wood_N2O = 0.004tN2O/TJ

B.5.1.2 Parameters also being reported in the Monitoring Report

Data / Parameter:	**$B_{bl,y}$**
Data unit:	t_biomass/unit-year
Description:	Mass of woody biomass combusted per stove in the baseline in year y
Source of data to be used:	Measurements of sample of cluster population (KT).
Value applied:	Cluster ADRA Peru 4.201 t/year/stove Cluster PROPERU 3.242 t/year/stove Cluster ITYF 3.258 t/year/stove
Monitoring frequency	Fixed baseline is chosen at VPA level.
Description of measurement methods and procedures to be applied:	VPA implements the following procedures: 1°) The mass of the considered non renewable biomass is measured with one of the two following options: - Option 1: on a weekly basis, in order to reflect precisely the intra-week variations of cooking habits. - Option 2: on a 3-day basis, excluded Sunday when specific occasion may increase the consumption. The proportional extrapolation of results to the whole year will therefore be

	conservative as it will not consider Sunday's higher consumptions. 2°) The measurement is made directly with the considered customers, the balance used for the weighting must have a precision of no less than 50g, 3°) Information shall be presented in a monitoring report
QA/QC procedures to be applied:	1°) Monitored beneficiaries will be clearly identified for allowing further verifications. 2°) Sound capacity building will be made with surveys responsible including ethic dimensions of the process and adequate techniques for ensuring confidence of results. 3°) Any survey suspected to be biased or of low quality will be systematically removed. 4°) MICROSOL will realize quality control test in digitations of the surveys. 5°) A conservative approach and expert statistics guidelines will systematically followed.

Data / Parameter:	**$B_{pj,y}$**
Data unit:	t_biomass/year/stove
Description:	Mass of woody biomass combusted in the project in year y for one stove
Source of data to be used:	Measurements of sample of cluster population
Value applied:	Cluster ADRA Peru 4.405 t/year/stove Cluster PROPERU 2.374 t/year/stove Cluster ITYF 2.562 t/year/stove
Monitoring frequency	Bpj was defined for each cluster and will be biennial redefined in the 'Aging-Stove KT'.
Description of measurement methods and procedures to be applied:	See Description of measurement methods for the $B_{bl,y}$ parameter.
QA/QC procedures to be applied:	See Description of QA/QC procedures for the $B_{bl,y}$ parameter.

Data / Parameter:	**$X_{NRB,bl,y}$**
Data unit:	Fraction
Description:	Non-renewability status of woody biomass fuel in year y in baseline scenario
Source of data to be used:	See Annex 3
Value applied:	Cluster ADRA Peru: 0.717 Cluster PROPERU: 0.715 Cluster ITYF: 0.750
Description of measurement methods and procedures to be applied:	See the details of measurements processes in Annex 3
Monitoring frequency	A biennial monitoring will only be performed, independently from the results of KS.
QA/QC procedures to be applied:	See the details of QA/QC procedures to be applied in Annex 3

Data / Parameter:	$X_{NRB,pj,y}$
Data unit:	Fraction
Description:	Non-renewability status of woody biomass fuel in year y in project scenario
Source of data to be used:	Study See Annex 3
Value applied:	Cluster ADRA Peru: 0.717 Cluster PROPERU: 0.715 Cluster ITYF: 0.750
Monitoring frequency	Biennial
Description of measurement methods and procedures to be applied:	See the details of measurements processes in Annex 3
QA/QC procedures to be applied:	See the details of QA/QC procedures to be applied in Annex 3

Data / Parameter:	/
Data unit:	Stove installed
Description:	Represents the number of stoves installed by each LPP whose effective installation and date of installation can be evidenced. Date of installation shall be used for calculating each stove crediting period.
Source of data to be used:	Documents provided by LPPs at VPA level.
Value applied:	Will be defined at first verification level.
Monitoring frequency	Continuous.
Description of measurement methods and procedures to be applied:	Signed documents by community representative preferably with list of final beneficiaries. Whenever possible documents signed by each beneficiary should be preferred.
QA/QC procedures to be applied:	Data are collected by LPP and then verified, when possible and cost effective, with other means, by MICROSOL.

Data / Parameter:	$U_{i,y}$

Data unit:	Fraction (%)
Description:	Represents the drop-off rate in stove usage by each cluster each year.
Source of data to be used:	Data included in kitchen surveys (KS).
Monitoring frequency	Biennial
Description of measurement methods and procedures to be applied:	Surveys with beneficiaries
QA/QC procedures to be applied:	1°) Monitored beneficiaries will be clearly identified for allowing further verifications. 2°) Sound capacity building will be made with surveys responsible including ethic dimensions of the process and adequate techniques for ensuring confidence of results. 3°) Any survey suspected to be biased or of low quality will be systematically removed. 4°) MICROSOL will realize quality control test in digitations of the surveys. 5°) A conservative approach and expert statistics guidelines will systematically be followed.

Data / Parameter:	$O_{i,y}$
Data unit:	Fraction (%)
Description:	Represents the removal rate of old stove by each cluster each year.
Source of data to be used:	Data included in kitchen surveys.
Monitoring frequency	Biennial
Description of measurement methods and procedures to be applied:	Surveys with beneficiaries
QA/QC procedures to be applied:	1°) Monitored beneficiaries will be clearly identified for allowing further verifications. 2°) Sound capacity building will be made with surveys responsible including ethic dimensions of the process and adequate techniques for ensuring confidence of results. 3°) Any survey suspected to be biased or of low quality will be systematically removed. 4°) MICROSOL will realize quality control test in digitations of the surveys. 5°) A conservative approach and expert statistics guidelines will

	systematically be followed.

B.5.2. Ex-ante calculation of emission reductions:

B 5.2.1 Test conditions:

No alternative fuels are considered in this VPA.
No emissions during production of the fuel are considered.

Table A7: Test Description

Test description			
BASELINE - BL KT	**ADRA**	**PROPERU**	**ITYF**
Sample size - BL KT	70	126	179
Test dates	November 09	June 09	Sept. 09
Duration of test (days)	3	3	3
PROJECT SCENARIO - PS KT	**ADRA**	**PROPERU**	**ITYF**
Sample size - PS KT	102	122	199
Test dates	November 09	June 09	Sept. 09
Duration of test (days)	3	3	3
TIPE OF SAMPLES RELATION	Unpaired	Unpaired	Unpaired

B 5.2.2. Baseline emission:

As described in the VPoA-DD the equation to calculate the baseline emissions is the following:

$$\begin{cases} BE_y = X_{NRB,bl,y} * B_{bl,y} * EF_{bl,bio,CO2} + \sum(AF_{bl,i,y} * EF_{af,CO2,i}) \\ \quad + \sum(Non-CO2\ emissions\ during\ cooking) \\ \quad + \sum(GHG\ emissions\ during\ production\ of\ the\ fuels) \\ \\ Non-CO2\ emissions\ during\ cooking = \sum(B_{bl,y} * EF_{bl.bio,non-co2,i}) \\ \quad + \sum(AF_{bl,i,y} * EF_{af.i,non-co2\,gas\,i}) \\ GHG\ emissions\ during\ production\ of\ the\ fuels = X_{NRB} * B_{bl,y} * EF_{bio,prod.CO2} \\ \quad + \sum(AF_{bl,i,y} * EF_{af,prod.CO2,i}) + \sum(B_{bl,y} * EF_{bio,prod.non-co2\,gas\,i}) \\ \quad + \sum(AF_{bl,i,y} * EF_{af,i,prod.non-co2\,gas\,i}) \end{cases}$$

In this VPA, we do not consider emissions during production of the fuel.
In this VPA we don't consider any alternative fuel as gas use is very negligible and not part of the project. Not considering it is conservative and in accordance with approach 3 described in the Gold Standard Methodology.

The simplified baseline equation used is:

$$BE_{y,per\ stove} = X_{nrb} * B_{bl,y} * EF_{bl.bio.CO2} + \sum B_{bl,y} * EF_{bl.bio.nonCO2}$$

In the calculation of baseline emission shown in table A8, the two parts of the equation above. are considered. Yet, in order to summarize the sum of both is directly included in the last row of the table A8.

Table A8: Baseline emissions

BASELINE EMISSIONS	ADRA	PROPERU	ITYF	TOTAL
Bbl,d Average (kg/day/stove)	12.33	9.32	9.29	
Standard deviation	5.27	3.88	3.77	
t value for 10% confidence interval (one side)	1.294	1.282	1.282	
Bbl,y Lower bound (kg/day/stove) **Bbl,y Lower bound (kg/day/stove)**	11.51	8.88	8.92	

Bbl,y Lower bound one-sided (t/year/stove)	4.20	3.24	3.26	
Xnrb	0.71	0.71	0.75	
2008 stove number	92	1174	7140	8406
2009 stove number	2905	801	16957	20663
2010-2015 stove number	2997	1975	24097	29069
EFbl.bio.CO2 (tCO2eq/twood)	1,7472			
EFbl.bio.nonCO2 (tCO2eq/twood)	0.11762			
BEy per stove (tCO2 eq)	**5.6**	**4.3**	**4.6**	

B 5.2.3 Project emission:
As described in the VPoA-DD the equation to calculate the project emissions is the following:

$$\boldsymbol{PE_y} = X_{NRB,pj,y} * B_{pj,y} * EF_{pj,bio,CO2} + \sum(AF_{pj,i,y} * EF_{af,CO2,i}) + \sum(Non-CO2\ emissions\ during\ cooking) + \sum(GHG\ emissions\ during\ production\ of\ the\ fuels)$$

$$\boldsymbol{Non-CO2\ emissions\ during\ cooking} = \sum(B_{pj,y} * EF_{pj.bio,non-co2,i}) + \sum(AF_{pj,i,y} * EF_{af.i,non-co2\ gas\ i})$$

$$\boldsymbol{GHG\ emissions\ during\ production\ of\ the\ fuels} = X_{NRB} * B_{pj,y} * EF_{bio,prod.CO2} + \sum(AF_{pj,i,y} * EF_{af,prod.CO2,i}) + \sum(B_{pj,y} * EF_{bio,prod.non-co2\ gas\ i}) + \sum(AF_{pj,i,y} * EF_{af,i,prod.non-co2\ gas\ i})$$

In this VPA, we do not consider emissions during production of the fuel.
In this VPA we don't consider any alternative fuel as gas use is very negligible and not part of the project. Not considering it is conservative and in accordance with approach 3 described in the Gold Standard Methodology.

The simplified project emission equation used is:

$$PE_{y\ per\ stove} = X_{nrb} * B_{pj,y} * EF_{pj.bio.CO2} + \sum B_{pj,y} * EF_{pj.bio.nonCO2}$$

In the calculation of baseline emission shown in table A9, the two parts of the equation above. are considered. Yet, in order to summarize the sum of both is directly included in the last row of the table A9.

Table A9: Project scenario emissions

PROJECT SCENARIO EMISSIONS	ADRA	PROPERU	ITYF	TOTAL
Bpj,d Average (kg/day/stove)	11.43	6.20	6.78	
Standard deviation	40.97	2.61	2.62	
t value for 10% confidence interval (one side)	1.290	1.282	1.282	
Bpj,d Upper bound one-sided (kg/day/stove)	12.07	6.51	7.02	
Bpj,y Average (t/year/stove)	4.41	2.37	2.56	
Xnrb	0.72	0.72	0.75	
2008 stove number	92	1174	7140	8406
2009 stove number	2905	801	16957	20663
2010-2015 stove number	2997	1975	24097	29069
EFpj.bio.CO2 (tCO2eq/twood)	1,7472			
EFpj.bio.nonCO2 (tCO2eq/twood)	0.11762			
PEy per stove (tCO2 eq)	**5.89**	**3.17**	**3.58**	

B 5.2.4 Estimated leakage:

All leakages are defined at PoA level equal to zero.

5.2.5. Emission reduction calculation

$$ERy = \sum BEi,y - \sum PEi,y - \sum LEi,y$$

$$= \sum Xnrb^* Bbl,y * EFbl.bio.CO2 + \sum Bbl,y * EFbl.bio.nonCO2$$
$$-\sum Xnrb^* Bpj,y * EFbl.bio.CO2 + \sum Bpj,y * EFbl.bio.nonCO2$$
$$- \sum LEi,y$$
$$= \sum Xnrb * (Bbl,y – Bpj,y) * EFbl.bio.CO2 + \sum(Bbl,y – Bpj,y) * EFbl.bio.nonCO2$$
$$- \sum LEi,y$$

According to the Methodology an expert statistical analysis is required to determine at a 90% confidence level. A t-test is performed. The lower limit of the confidence interval of the fuel saving (Bbl.y – Bpj,y) represents the value of emission reduction.

Table A10: Statistical analysis of emission reduction

In this VPA the test is performed with unpaired samples and unequal variance.
The result of this test is then compared to 10%, whenever it is under, then hypothesis H0 (Average difference = 0) is rejected.

BASELINE - Bl KT (*BE*)	**ADRA**	**PROPERU**	**ITYF**
Bbl,y Average (kg/day/stove)	12.33	9.32	9.29
Standard deviation (kg/day)	5.27	3.88	3.77
PROJECT SCENARIO - PS KT	**ADRA**	**PROPERU**	**ITYF**
Bpj,y Average (kg/day/stove)	11.43	6.20	6.78
Standard deviation (kg/day)	4.97	2.61	2.62
Bbl,y – Bpj,y Average diferences (kg/day)	0.89	3.12	2.51
Pooled standard deviation (kg/day)	0.390814334	0.211378176	0.165803547
Standard error of the difference between the means (kg/day)	0.312449345	0.088472271	0.055940709
The two samples are unpaired	YES	YES	YES
Do they have the same variance ?			
BL variance	27.768	15.028	14.213
PS variance	24.733	6.822	6.851
CONCLUSION	NO	NO	NO
So, as clusters are homogeneous, BOTH SAMPLE FOLLOW A NORMAL DISTRIBUTION, the adapted test is:			
TEST FOR NON PAIRED TWO-SAMPLE UNEQUAL VARIANCE			
T student, 2, 3	0.266008972	1.98116E-12	7.97299E-10
If the result is < 10%, hypothesis H0 (Average difference = 0) is rejected			
ANSWER	Ho not rejected	Ho rejected	Ho rejected

We can now calculate the difference between the two averages for clusters for which H0 has been rejected, with a 90% confidence level as defined by the GS methodology, using a one-sided interval as stipulated in foot-note 17, page 20 of the methodology. As we are in the case of un-paired samples, the one-sided confidence-interval has been applied below for baseline (lower one side bound) and above for project scenario (upper one side bound).

Table A11: Emission reduction calculation

Emission reduction calculation	ADRA	PROPERU	ITYF
BEy per stove (tCO2 eq)	X	4.32	4.56
PEy per stove (tCO2 eq)	X	3.17	3.58
ER per stove (tCO2 eq/year)	**0**	**1.16**	**0,97**

B.5.3. Summary of the ex-ante estimation of emission reductions:

The calculation of emission reductions is carried out taking into account the following date for the crediting period: the month of construction of cookstove + (plus) 1, corresponding to an additional month so as to be conservative considering all stoves start generating emission reduction at the end of the month of their installation.
The following table shows the month of start of crediting period, the total of those stoves and calculates the general factor (weighted average crediting period) that takes into account the adequate crediting period for each stove starting from the month after their installation to December the 31th 2009.
Then, this factor can be multiplied for each LPP by the unitary emission reduction: ER(C02/year/stove).

Table A11: Potential[2] crediting period starting date for each LPPs stove (stoves were implemented month during the previous month)

	ADRA	PROPERU	ITYF	TOTAL
2008 stove number	**92**	**1174**	**7140**	**8406**
(I=1) jan-08				
(I=2) feb-08		276		276
(I=3) mar-08				
apr-08				
may-08			4612	4612

[2] Even though the crediting period may be shortened because of limitation in retroactivity, here are presented the "potential" crediting perio. In the next table,, considering the real crediting period, the LPPs start generating at crediting period starting date

jun-08		77		77
jul-08		200	2528	2728
ago-08		391		
sep-08		141		141
oct-08		18		18
nov-08	41	71		112
dic-08	51			
2009 stove number	**2905**	**801**	**16957**	**20663**
jan-09	411			411
feb-09		51		51
mar-09	1012	59		1071
apr-09	293	101		394
may-09	951	77		1028
jun-09	148	76		224
jul-09	90	201	1545	1836
ago-09		132	6626	6758
sep-09		45	5649	5694
oct-09		59	2183	2242
nov-09			886	886
dic-09			68	68
TOTAL	**2997**	**1975**	**24097**	**29069**

$CWCP_y$= Cumulated Weighted Crediting Period in year y. (year)

$CWCP_y = \sum N_{m,y} * (12 - I_m)/12$

Where:

$N_{m,y}$ = Number of stoves implemented during the month m of year y.

I_m = Codification of the crediting period starting month for a stove implemented in month *m*.

Table A12: Cumulated Weighted crediting period

	ADRA	PROPERU	ITYF
$CWCP_{2009}$	2,335	1,588	13,047
$CWCP_{2010-2015}$	2,997	1,975	24,097
$CWCP_{2016}$	140	92	1,122

The results of emission reduction are shown in the table below taking into account the month of construction of the cookstove.

Table A13: Emission Reduction Summary

$ERi,y = CWCP_{i,y} * ER_{i\ (t/year/stove)}$:

$ERi_{,y}$= Total Emission Reduction for cluster i in year y in tones.

$CWCP_{i,y}$= Cumulated Weighted Crediting Period in year y for cluster i. (fraction of year for an average stove)

$ER_{i\ (t/year/stove)}$= Emission Reduction per year per cookstove in tones.

Emission reduction summary				
	ADRA	PROPERU	ITYF	TOTAL
ER_{2009} (t/year)	0	1837	12702	14540
ER_{2010} (t/year)	0	2285	23461	25746
ER_{2011} (t/year)	0	2285	23461	25746
ER_{2012} (t/year)	0	2285	23461	25746
ER_{2013} (t/year)	0	2285	23461	25746
ER_{2014} (t/year)	0	2285	23461	25746
ER_{2015} (t/year)	0	2285	23461	25746
ER_{2016} (t/year)		106	1093	1199
TOTAL CUMULATED ER	0	15656	154558	170214

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

The monitoring plan follows the PoA's requisites:

1 – Continuously monitoring

Four times a year a continuous monitoring of 25 always different randomly chosen families will be conducted. This continuous monitoring will include a similar Kitchen Survey as described above, with additional question about the usage of the stoves to calculate drop-off rates.

Kitchen Tests will be implemented before the bi-annual ageing KTs only if Continuously Monitoring Kitchen Surveys show significant changes from the Project Scenario Kitchen Surveys.

Furthermore the continuously monitoring includes:
- Maintenance of the total beneficiaries list
- General data base with results of tests (results and analysis of KSs and KTs)

2 – Periodically monitoring

Every two years (in addition to the continuously monitoring) an Ageing Kitchen Test (on other families than in the baseline but for sales made in the first year) will be carried out anyway (regardless the results of continuous monitoring). This will allow extrapolating the evolution of project emissions in function of ageing.

Kitchen Test for re-evaluation of the baseline will only be implemented if Monitoring Kitchen Surveys show that a significant change in the baseline may have occurred. If this is not the case a fixed baseline is assumed.

If new stoves with a different new design will be introduced in any VPA a "new stove KT" has to be conducted, yet, this VPA does not consider initially new stove implementation.

Furthermore the periodically monitoring includes:
- Re-asses NRB
- Check leakage.
- Update project data base with results of 'Aging-stove KT'
- Investigate the wider social and economic impact according to GS Sustainability Monitoring.

The following data will be monitored in addition to the Parameters under 5.1.2:

Data / Parameter:	**DNH parameter – Corruption**
Data unit:	% of carbon incomes subject to corruption or suspicion of corruption
Description:	As corruption influence of the project has been defined Carbon revenues

Source of data to be used:	Carbon revenues use report by LPPs, one year after receiving carbon revenues
Monitoring frequency	Biennial
Description of measurement methods and procedures to be applied:	LPPs provide a detailed report on how they use carbon revenues with references to evidences available for consultation.
QA/QC procedures to be applied:	Microsol revises LPPs reports and correspondence with evidences as well as the validity of those.

No		1
Indicator		**Air quality**
Mitigation measure		N.A.
Chosen parameter		*Presence of smoke in the household*
Current situation of parameter		Some advances due to project activity
Estimation of baseline situation of parameter		90%
Future target for parameter		Reduce severely the presence of smoke in the household
Way of monitoring	How	Asking for the perception of change in presence of smoke.
	When	Biennially
	By who	LPPs pollsters

No		2
Indicator		**Quality of employment**
Mitigation measure		N.A.
Chosen parameter		Number of employment
Current situation of parameter		Some advances due to project activity
Estimation of baseline situation of parameter		N.A.
Future target for parameter		Generation of job positions thanks to the implementation of the project.
Way of monitoring	How	Check project personal contracting list or any other proof of personal contracting.
	When	Biennially
	By who	Microsol/Auditor

No	3
Indicator	**Livelihood of the poor**
Mitigation measure	N.A.
Chosen parameter	Presence ofimproved stove with chimney
Current situation of parameter	Some advances due to project activity
Estimation of baseline situation of parameter	0

Future target for parameter		Generate a better quality of live with the use of ICS.
Way of monitoring	How	Asking for occurrence of health impact change
	When	Biennially
	By who	LPPs pollsters

No		4
Indicator		**Access to affordable and clean energy services**
Mitigation measure		N.A.
Chosen parameter		Presence of an improved cookstove
Current situation of parameter		Some advances due to project activity
Estimation of baseline situation of parameter		0
Future target for parameter		Generate an access to clean energy with the use of ICS.
Way of monitoring	How	Asking for the presence of the improved cookstove
	When	Biennially
	By who	LPPs pollsters

No		5
Indicator		**Human and institutional capacity**
Mitigation measure		N.A.
Chosen parameter		Capacity Building for beneficiaries
Current situation of parameter		No capacity building on health and environment dimensions
Estimation of baseline situation of parameter		0
Future target for parameter		Participation of beneficiaries in capacity building session that impulse the knowledge about ICS in beneficiaries
Way of monitoring	How	Verifying realization of capacity building sessions
	When	Biennially
	By who	Microsol/Auditor

No		6
Indicator		**Quantitative employment and income generation**
Mitigation measure		N.A.
Chosen parameter		Number of people contracted for the project
Current situation of parameter		Some advances due to project activity
Estimation of baseline situation of parameter		0
Future target for parameter		Generation of jobs with good working conditions thanks to the implementation of the project
Way of monitoring	How	Check project personal contracting list or any other proof of personal contracting.

	When	Biennially
	By who	Microsol/Auditor

No		7
Indicator		**Technology transfer and technological self-reliance**
Mitigation measure		N.A.
Chosen parameter		Capacity building of beneficiaries
Current situation of parameter		Some advances due to project activity
Estimation of baseline situation of parameter		0
Future target for parameter		Build knowledge in beneficiaries so as to impulse the self-construction on ICS.
Way of monitoring	How	Asking for beneficiaries or beneficiaries' community members' capacity to replicate the stove construction.
	When	Biennially
	By who	LPPs pollsters

SECTION C. Environmental Analysis

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

The SD matrix has to be adapted for each project including the beneficiaries' comments done during the stakeholder consultation so that SD monitoring parameters are defined at VPA level. (See VPA Passport). Nevertheless, the SD matrix consolidated at PoA level is used as a basis for assessment of the adapted matrix at VPA level.

DNH assessment is done at PoA level (See PoA Passport) as context is know by PP who was able to identify the main risk that is corruption which shall be monitored at VPA level. Yet, as not all LPPs are know at the moment of presenting the PoA, it is necessary they sign, at VPA level of for all activities they may implement in this PoA, a DNH declaration so as to ensure they are committed with the corresponding principles (See VPA Passport).

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Requisites of the Gold Standard are followed here with the Sustainable Development Matrix.

The version presented here is the version after SHCs (stakeholder consultation) and FBRs (feedback round) at LPP level, called "Consolidated" Matrix.
The consolidated Matrix is the same for the three LPPs as a result of the stakeholder consultation process. As a matter of fact, because all three LPPs have activities in different regions, three different stakeholder consultations have been done. Nevertheless, if comments and dynamics have been quite different, final consolidated Matrix is the same and is presented in the corresponding VPA Passport (See VPA Passport).

All non neutral impacts in final consolidated Matrix shall be documented and followed up in the framework of the biennial Monitoring Reports, see

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical VPA, included in the programme of activities (PoA),:

An environmental impact assessment is not required for this VPA. There are no laws/regulations in Peru that request environmental impact assessment for this type of activities.

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

As defined in the PoA, Stakeholder consultations have to be organized at VPA level. In case of this VPA, activities are implemented in three regions that correspond to three different projects of three LPPs so that three events have been implemented.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

All types of stakeholders in the region were invited to each LSC. Beneficiaries' presence and participation was promoted and highly valued. In the 3 events (Recuay for ADRAPERU, Urubamba for PROPERU and Agallpampa for ITYF), an average of 50% of attendants was beneficiaries.

Only in the case of La Libertad, feedback formats with three questions each were handed out, and we received a total of 178, meaning 246 opinions (not every stakeholder fill out the whole feedback format made of three sections) about the project. These are tabulated and analysed in Part B section ii of the corresponding LSC report.

In the two other LSC events, no feedback formats were handed out as most beneficiaries are illiterate and it might have been seen as a sign of disrespect when asking to write down their opinions. Nevertheless, all oral interventions were counted, even in their mother tongue (quechua, with different variants as is spoken in Cuzco and Ancash). As LPP members speak quechua and it was no problem to receive and reply this comments.

Both oral and written comments were categorised in the reports and answered.

D.3. Summary of the comments received:

In all the three cases the population agreed that the project activities would benefit them all.

In Ancash, positive comments about health impact and influence in changing hygiene behaviours were stressed by participants and the project brought job opportunities that allow buying food and medicine they were not able to buy before. In general a positive impact on environment was seen and indicators about biodiversity, soil condition and water availability were considered positive.

In Cusco, positive comments were made about health impact also, doubts were raised about biodiversity as in a local belief, guinea pig get feed by smoke so the fear was that they would die, and in general forest related points were considered as positive.

In La Libertad, positive comments were made for all indicators, doubts surged about some rotten parts of the cookstoves and the necessity of planting trees in the region.

D.4. Report on how due account was taken of any comments received:

All comments were summarized and assessed in the SHC reports.

In general, for indicators related to forest and considered positive that is biodiversity, soil condition and water availability, the statement was answered back in the assessment, stage at which we argued that no sufficient proof were at hand to support the positive impact about these indicators.

In la Libertad, ITYF representative noted the problem in some spare parts and reinforced presence on the field so as to replace rotten parts and reinforce capacity building and made contact with the national forestry entity so as to answer the comment about the necessity of reforestation. In Cusco, PROPERUs representative committed themselves to reinforce sensitization so as to improve beneficiaries' information on benefits of stoves.

Annex 1

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ANNEX 2

Analysis of the fraction of non-renewable woody biomass

As Described on the PoA methodology, this VPA follows the directives given in the PoA, developing the most accurate approach: the quantitative one. The quantitative approach features some options for each of the Data required. Collection Area is determined by estimation based on field survey; the MAI and Harvest data is from official sources.

Data Search

During the search of official data MICROSOL consulted:

1. FAO – Food and Agriculture Organization
2. MINAM – *Ministerio del Ambiente* (Ministry of Environment)
3. MINEM – *Ministerio de Energia y Minas* (Ministry of Mining and Energy)
4. AGRORURAL (MINAG – *Ministerio de Agricultura*)
5. SERNANP – *Servicio Nacional de Areas Naturales Protegidas por el Estado* (State Protected Nautaral Areas National Service)
6. ECOAN – *Asociacion de Ecosistemas Andinos*
7. UNALM – *Universidad Nacional Agraria La Molina* (La Molina National Agrarian University)

E-mail, telephone and meetings were made in order to take contact with the people in charge.

More information is provided in the *NRB Follow up Document*.

Available Data

MAI - Mean Annual Increment

Table B1: Mean Annual Increment for Ancash provinces

Ancash Province	MAI (m3/ha/year)
Huaraz	18
Recuay	***14***
Aija	***14***
Bolognesi	***14***
Ocros	***12***

Huari	***22***
Antonio Raymondi	***14***
Carlos Fermin Fitzcarrald	***18***
M. Luzuriaga	22
Pomabamba	22
Sihuas	22
Corongo	16
Pallasca	22
Huaylas	20
Yungay	22
Carhuaz	22
Asuncion	***N.a.***
Huarmey	***N.a.***
Ancash Average	18,375

Provinces that are not part of the project and ***Provinces that are part of it.***

Table B2: Mean Annual Increment for Cusco provinces

Cusco Province	**MAI (m3/ha/year)**
Anta	10,43
Urubamba	40,3
Calca	N.a.
Cusco	N.a.
Cusco Average	25,365

Source: AGRORURAL

N.a: Not available

For the missing information, following the recommendations of Eng. Barrena (UNALM), the MAI data was selected taking in consideration the closest district with available data. For Huamalies province (bordering province with Huari in Ancash) belonging to Huánuco department the data was taken from the closest district in Ancash.

In the case of La Libertad department, as there is no data available, the calculations were made with Ancash data: the average MAI, since Ancash and La Libertad are adjacent departments, and because the MAI data for Ancash is more conservative for Ancash than for Cusco..

Table B3: Correspondence for Not Available Data

Location	Justification	Assumed MAI
Asuncion – Ancash	It is next to Huari, Antonio Raymondi y C.F. Fitzcarrald	19
Huarmey – Ancash	It is next to Aija and Recuay	14
Huamalies - Huánuco	it is next to HUARI	22
Calca - Cusco	It is closer to Urubamba	40,3
Cusco - Cusco	It is closer to Anta	10,43
LA LIBERTAD	It is closer to Ancash	18,375

Harvest

Firewood Consumption:
The only official data available is the Forest Inventory (INRENA).

Table B4: Firewood consumption

Per Capita Consumption (m^3)	1.1

Wood harvest:
Departmental data

Source: Forest inventory 2007

Methodology

The framework methodology is explained in the PoA, however locations in Peru differ from each other therefore the methodology can be adjusted.

The reference levels for information source are the following: (starting by the most precise)

1. Community – District
2. Provincial
3. Departmental
4. Regional
5. *National*
6. *International*

Most of the calculation was made with the most precise level: community-district; the data not available at this level was estimated or interpolated from Provincial, departmental or regional level.

Forest area percentage

Table B5: Table of forest area percentage

Department	Land Area (ha)	Reforested area by 2007 (ha)	Forest Area %
Ancash	3630831	73630.87	2.027934376
Cusco	7622489	109035.53	1.430445226
La Libertad	2324132	42091.61	1.81106796

Source: Forest Inventory 2007
Methodology as used by official entities.

Community Collection Area

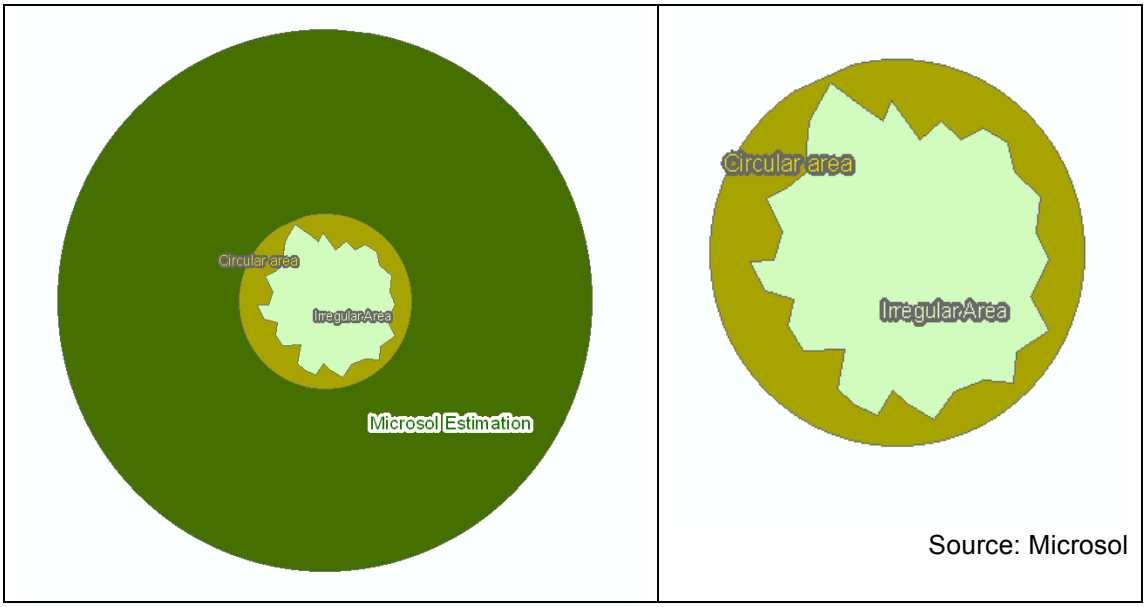
There is no data available about collection area, that's why MICROSOL has to estimate the collection area based on conservative postulations.

MICROSOL assumes a circular collection area based on the largest distance the beneficiaries travel to collect firewood, therefore the distance data is used as a radio and not as a perimeter.

For an average distance traveled to collect firewood, 5000 meters (5 kilometers), the collection areas following irregular and circular patrons are:

Table B6: Representation of community collection area

General view	Close up



Source: Microsol

This table is based on this assumptions:

Collection time: 2.5 hours
Average velocity: 2 km/hour (2000 m/hour)

Total distance (round trip): 5 km (5000 m.)
One way distance: 2.5 km. (2500 m.)

The total distance is used when a perimeter is assumed; the one way distance is used to estimate maximum area.

Table B7: Data of community collection area

Made by MICROSOL

AREA	Radio (m)	Approximate Perimeter (m)	Approximate Area (hectares)
Irregular Area*	-	***5001***	117.5227
Circular Area	796.17834	**5000**	199.0445
MICROSOL estimated	**2500**	15700	1962.5000

This table shows the MICROSOL estimated area is almost 10 times bigger than the circular area.

*The irregular area and perimeter are approximated, and taking in consideration the scale parameters.

The collection area is where the harvest and regeneration take place; it assumes one circular collection area per population unit, using a radio estimated based on survey fields referring to firewood collection time.

There are as many collection areas as population units, the community is the population unit used, although in some cases the collection area can be defined by politic geographic limits such districts. This information is provided by LPPs:

- For Cusco there is the exact number of communities for each district.
- As for Cusco, Ancash has the exact number of communities for each district.
- On La Libertad it is assumed 3 communities per district which is the average number of communities per district in Cusco and Ancash.

In order to maintain the conservative approach, MICROSOL assumed the same number of collection areas per district as communities.

Biomass Regeneration

Biomass regeneration calculus is at district level, and refers to the "re-growth" (MAI) in the collection area assigned to the district.

Harvest

The second part of harvest refers to the timber extraction in the collection area; as a whole, harvest includes the firewood consumption (p.56) and timber extraction in the district

NRB

As indicated on the PoA, the whole NRB assessment is guided by the Gold Standard Methodology and adopting a conservative approach.

NRB final results are Departmental; this is the result of the weighted average from the district NRB results.

Results

The full calculus sheet is available in the NRB-Calculus Document.

Table B8: Final NRB fraction data

Department	NRB Fraction
CUSCO	71.5289%
ANCASH	71.7330%
LA LIBERTAD	75.0243%

Sensitivity analysis

The calculation was made to assess an increase of 10% of the next variables: gathering time, gathering speed in km/h, mean annual increment of biomass, number of collection areas in the district, woody industrial production, district population consuming wood, biomass consumption per capita and district total population and its impact on X_{NRB}. Main variables variations are reasonable.

The full calculus sheet is available in the NRB excel sheet.

Table B9: Sensitivity analysis

An increase of 10% of the factor	Gathering time / Gathering speed in km.h	Mean Anual Increment of biomass / Number of collection areas in the district	Woody industrial production	District population consuming wood	Biomass consumption per capita / District total population
Induces X_{NRB} fraction change of:	-7.22%	-3.44%	0.18%	1.99%	2.97%

Conclusion

The data can be used in emission reduction calculation as such.

Annex 3

Baseline and project scenario information

Qori Q'oncha - Improved Cookstoves Diffusion Programme in Peru
Kitchen Test and Kitchen Survey Report

1. Introduction.

Cookstove installation period for this VPA is considered from January the 1st of 2008 to December the 31st of 2009.

Activities were implemented in three regions:

- Ancash by ADRAPERU
- Cusco by PROPERU.
- La Libertad by ITYF

Surveys were conducted during the year 2009 for all of the three institutions: June for ADRA (except baseline KT that was done in November 2008) and PROPERU and September for ITYF.

If the installation period is quite large, most installation have occurred in a small time period (2008 dry season and 2009 dry season) and evolving baseline is very unlikely in such a time period, so that a fixed baseline is initially considered for each cluster. Nevertheless, continuously monitoring addresses the issue of a potentially evolving baseline.

2. Methodology.

Initially, a one cluster per LPP hypothesis has been considered as previous analysis (survey conducted on the first place) and geographical dispersion showed no specific reason for dividing clusters inside the LPP's activities.

Besides, taking into consideration logistical aspects and economical implications, it has been decided to perform both KS and both KT at the same time. A large target sample size of 120 (220 in the case of ITYF because of the size of the population) has been defined for KS.

Whenever more clusters would have been identified, one might have had to do new surveys but the probability such a case to happen was considered very low). A large sample for KT has also been defined for having good precision in emission reduction calculation. So that, if all steps of the methodology have been realized, some liberty has been taken to modify the order mainly for logistical and economical reasons but always referring to the essence of the methodology.

In fact, the two BL and PS KS have been done during the same survey with the same persons as people having received their old stove have always a quite precise idea of the situation they were in before they had the stove as not a so long period has passed. That is to say BL and PS KS are all paired. Moreover, the comparison is useful in terms of survey methodology as variations due to external causes are reduced. Also, all PS KT have been realized in families where the BL-PS KS was applied. And, as KTs have been performed after the stoves had been installed, BL KTs have been realized in families not part of the project in the same community or in very similar communities of the same province so as to allow a good comparison.

With such an approach dedicated to produce the most precise information with the closest interpretation of the methodology while allowing taking into consideration the context, quite satisfying results in terms of information precision and conservativeness have been obtained.

2.1. Sample selection

No final beneficiary list was available at the time of the surveys but the general geographical repartition of the beneficiaries was known. A province level representativeness criteria has been used for sample selection asking LPPs to distribute surveys in provinces according to provinces' weight in the global population of beneficiaries.

At the moment of defining the sampling method, the context of high dispersion of population (hundreds of kms distant in a same project and difficulty of road access in mountainous areas) and the need for efficiency in monitoring has been taken into account and a multi-stage sampling methodology3 has been used. As the major source of differences in energetic profile is expected to be geography, the major criterion for representativeness chosen is proportionality survey/population at province level. Provinces have been chosen as primary units then, communities are considered as secondary units and inside each secondary units households are selected randomly so that:
- Proportion of project population is respected in province sample size.
- Communities are selected taking into consideration economical and logistical aspects.
- Families are chosen randomly on the field, on a presence basis.

This representativeness being ensured, the community can be chosen taking into consideration logistical aspects that is closeness to the road and high number of beneficiaries concentrated so as to be able to perform more surveys for more precision. All these aspects are detailed in the

[3]"General guidelines for sampling and survey for small-scale CDM project activities", Version 01.

corresponding CDM guidelines[4]. Such a method allows efficient monitoring work as well as good representativeness and good quality of data."

All interviews were conducted in the beneficiaries' homes.

Final representativeness performed by LPPs with basis on the methodology defined above is show in the tables below:

Table C1: LPPs sampling representativeness

ADRA

Province	Cookstoves	KS	BL KT	PS KT
Aija	3%	10%	7%	13%
Antonio Raymondi	9%	4%	16%	19%
Asunción	4%		8%	13%
Bolognesi	17%	19%	5%	
Carlos F. Fitzcarrald	5%		6%	9%
Huari	33%	46%	43%	35%
Huarmey	6%	8%	3%	11%
Ocros	4%		3%	
Recuay	11%	14%	4%	
Huamalies	9%		6%	
	100%	**100%**	**100%**	**100%**

PROPERU

Province	Cookstoves	KS	BL KT	PS KT
Anta	35%	10%	14%	15%
Calca	15%	17%	26%	30%
Cusco	10%	15%	4%	15%
Urubamba	40%	58%	56%	40%
	100%	**100%**	**100%**	**100%**

ITYF

Province	Cookstoves	KS	BL KT	PS KT

[4] Idem.

Julcán	73%	35%	30%	35%
Otuzco	15%	25%	26%	25%
Sánchez Carrión	13%	40%	44%	40%
	100%	**100%**	**100%**	**100%**

Cookstoves: Provinces' weight in general beneficiary population
KS: Representativeness of Kitchen Survey.
BL KT: Representativeness of Kitchen Tests made under baseline.
PS KT: Representativeness of Kitchen Tests made under project scenario.

2.2. Paired and unpaired tests

Due to survey implementation time, paired tests have been difficult to realize even though it shall be preferred in general. If all KS have been paired, two of the three samples for KTs are therefore unpaired and the third, the ADRA one, has been realized as paired but statistically treated as unpaired. This because it has been considered data precision results better when using more (much more) data baseline information than it would be when using a paired sample analysis.

2.3. Initial cluster differentiation

The project includes three subprojects of three LPPs. Each one has it's own cook stove model, they are quite different. Moreover each LPP has its' own diffusion model, works in a different context in a different region. That is why an initial approach of one cluster by LPP has been defined.

That being said, the KS have been used to determine whether another Cluster differentiation was needed inside the Cusco, Ancash and La Libertad clusters. Conclusion was no, we will explain why.

3. Inside cluster differentiation rejected

3.1. General description of population.

Table C2: Clusters description

Clusters description			
BL-PS KS SURVEYS	**ADRA**	**PROPERU**	**ITYF**
Survey dates	June 09	June 09	Sept. 09

Sample size	102	110	199
Family size average - Total – Dry	5.3	5.3	5.3
Children(<10)	2.0	1.9	1.5
Adults (>10)	3.3	3.4	3.8
Family size average - Total – Rainy	5.3	5.3	xxxx
Children(<10)	1.9	1.9	xxxx
Adults (>10)	3.3	3.4	xxxx
% rural population	80.39%	77.59%	85.43%
% 1st type of wood used Eucalyptus	40.20%	91.82%	97.96%
Gas price including transportation (PEN)	34.6	34.6	37.3
Total weighted average gas price (PEN)	36.9		
Weekly time spend for recollecting by wood collectors (minutes)	23.3	231.4	251.4
% of Wood buyers	0.00%	12.00%	2.02%

3.2. Differentiation factors assessment

Major differentiation factors were studied as follows and successively rejected.

Table C3: Cluster differentiation factors assessment

Cluster differentiation factors	Sub-factor	Information	Pre-definition	PS/BL	Season	LPP1: ADRA	LPP2: PROPERU	LPP3: ITYF
Stove use	Commercial use of stove	Number of people that use their stove for commercial purposes	>= 30% & <=70%	PS		5.88%	3.81%	0.50%
				BL		7.84%	6.67%	0.00%
	Heating function for stove	Number of people that use their stove for heating (dry season)	>= 30% & <=70%	PS	DRY	5.88%	2.73%	16.58%
				PS	RAINY	94.12%	1.06%	100.00 %
	Water sterilization use	Number of people that do not use their stove for water sterilization	>= 30% & <=70%	PS		0.00%	2.86%	18.09%
				BL		3.92%	4.04%	34.67%
	CONCLUSION					No significant stove use variations.		

Fuel use	Variation in fuel type use	Number of people that do not use wood as 1st fuel (ref: rainy seas.)	>= 30% & <=70%	PS		0.00%	3.64%	0.00%
				BL		0.00%	3.70%	0.50%
	Variation in fuel mix	Number of people with significant fuel mix	>= 30% & <=70%	PS	DRY	0.00%	27.52%	0.51%
	CONCLUSION					No significant fuel type variations.		
TOTAL FACTOR						1	1	1
CONCLUSION: Number of clusters						**1**	**1**	**1**

3.3. Final cluster recommendations for KT.

As defined in the table, the recommendation is one cluster per LPP and factor 1 for each one of them.

4. KT implementation.

4.1. Sampling for KTs

The same sampling methodology as for KSs has been used. For timing reasons (retroactive VPA), baseline have been realized in homes with old cook stove but that won't necessarily receive a new one.

4.2. KT description

We observe more use in rainy season so using dry season data in KTs comparison is conservative.

Table C4: Kitchen Tests description

Kitchen Tests description			
BASELINE - BL KT	**ADRA**	**PROPERU**	**ITYF**
Sample size	70	129	168
Test dates	November 09	June 09	Sept. 09
Duration of test (days)	3	3	3
PROJECT SCENARIO - PS KT	1	1	1
Sample size - PS KT	**ADRA**	**PROPERU**	**ITYF**
Test dates	102	122	199
Duration of test (days)	November 09	June 09	Sept. 09

TIPE OF SAMPLES RELATION	3	3	3

LPPs have been asked to realize the target number of 120 surveys each in reference to the 60 limit mentioned in the methodology in a strategy of doubling this limit whenever two clusters would be identified (considered as the worst case scenario in relation with the initial one cluster pre-assessment).

In the case of ITYF, the data of seasonal variation in fuel type and seasonal variation in fuel quantity comes from another evaluation of cookstoves made by ITYF and realized in December 2009.

Table C5: Emission reduction adjustment check

Emission reduction adjustment check	Sub-factor	Information	Pre-definition	PS/BL	Season	LPP1: ADRA	LPP2: PROPERU	LPP3: ITYF
Seasonal variation	Stove use for heating seasonal variation	Number of people that use their stove for heating	>= 30% & <=70%	PS	DRY	5.88%	2.73%	16.58%
				PS	RAINY	94.12%	1.06%	100.00 %
		CONCLUSION				More use in rainy season so using dry season data in KTs is conservative.		
	Seasonal variation in fuel type use	Number of people that change first fuel between seasons	>= 30% & <=70%	PS		26.96%	16.82%	1.64%
	Seasonal variation in fuel quantity use	Number of people that do not use the same amount of fuel between seasons	>= 30% & <=70%	PS		10.67%	23.76%	40.32%
		Average 1st fuel quantity seasonal variation (ref. non variation pop°)	>= 30% & <=70%	PS		74.01%	54.83%	34.86%
		Percentage who answered		PS		5.83%	20.91%	100%
		FACTOR PROPOSED (considering 5				1.03	1.05	1.06

		month of rainy season)			
		CONSEQUENCE OF USE OF FACTOR ON KTs	=> It seems a seasonal differentiation (more consumption in rainy season) does exist so ER figure should be adapted for each season.		
		DECISION FOR KTs	As we use dry season figures for the whole year results will be conservative. Too few data are available for calculating rainy season figures. In the future, whenever more evidence would be found, an adjustment could then be seriously considered.		
		USED FACTOR	1	1	1
	CONCLUSION		No significant fuel type seasonal variations. Regarding quantity, consumption seems to be higher in rainy season so using dry season figures is conservative.		
	TOTAL FACTOR		1	1	1
	CONCLUSION: Number of clusters		**1**	**1**	**1**

5. Baseline and project scenario emissions: defining emission reductions.

Now we have to find the average difference in consumption (in kilograms) of fuel between baseline and project scenario.
The test is performed for two non paired samples with unequal variances.
Whenever the result of this test is under 10%, then hypothesis H0 (Average difference = 0) is rejected. We can then calculate the difference between the two averages with a 90% confidence level as defined by the GS methodology.
According to the GS methodology, the lower bound of the 90% confidence level interval is the value of emission reduction that should be used for all stoves.
As stated before, all three gases are taken into account: CO_2, CH_4 and N_20 in terms of CO_2 equivalent as shown in the table.

Table C6: Statistical analysis of emission reduction

BASELINE - BI KT (*BE*)	ADRA	PROPERU	ITYF
Bbl,y Average (kg/day/stove)	12.33	9.32	9.29
Standard deviation (kg/day)	5.27	3.88	3.77
PROJECT SCENARIO - PS KT	**ADRA**	**PROPERU**	**ITYF**
Bpj,y Average (kg/day/stove)	11.43	6.20	6.78
Standard deviation (kg/day)	4.97	2.61	2.62
Bbl,y – Bpj,y Average diferences (kg/day)	0.89	3.12	2.51
Pooled standard deviation (kg/day)	0.390814334	0.211378176	0.165803547
Standard error of the difference between the means (kg/day)	0.312449345	0.088472271	0.055940709
The two samples are unpaired	YES	YES	YES
Do they have the same variance ?			
BL variance	27.768	15.028	14.213
PS variance	24.733	6.822	6.851
CONCLUSION	NO	NO	NO
So, as clusters are homogeneous, BOTH SAMPLE FOLLOW A NORMAL DISTRIBUTION, the adapted test is:			
TEST FOR NON PAIRED TWO-SAMPLE UNEQUAL VARIANCE			
T student, 2, 3	0.266008972	1.98116E-12	7.97299E-10
If the result is < 10%, hypothesis H0 (Average difference = 0) is rejected			
ANSWER	Ho not rejected	Ho rejected	Ho rejected

We can now calculate the difference between the two averages for clusters for which H0 has been rejected, with a 90% confidence level as defined by the GS methodology, using a one-sided interval as stipulated in foot-note 17, page 20 of the methodology. As we are in the case of un-paired samples, the one-sided confidence-interval has been applied below for baseline (lower one side bound) and above for project scenario (upper one side bound).

Table C7: Emission reduction calculation

Emission reduction calculation	ADRA	PROPERU	ITYF
BEy per stove (tCO2 eq)	X	4.32	4.56
PEy per stove (tCO2 eq)	X	3.17	3.58

ERy per stove (tCO2 eq)	**0**	**1.16**	**0,97**

Results are very conservative in comparison with qualitative data from the field. In the case of ADRA no ER can be claimed, level of wood consumption reduction for ADRA is quite compared to the two other LPP. When asking directly to the beneficiaries it is true that the saving is felt to be a little bit less in the ADRA case than in the others, nevertheless, this difference does not allow to explainsuch a low result for ADRA. Potential complementary explanations are bad quality in the survey process; inadequate use of the stove for recent users (particularly the chimney regulator - when not well used – can induce an increase in wood consumption!); new behaviors for example high fuel consumption for hygiene (sterilized water or hot water for cleaning, washing, take a shower).

Such results will be contrasted with other surveys results so as to identify the reason for such a difference and take corresponding measures.

6. Leakage

Table C8: Leakage analysis

Leakage analysis			
LEAKAGE	**ADRA**	**PROPERU**	**ITYF**
L1 - excessive fuel use due to savings	Defined 0 at PoA level		
L2 - GHG outside project boundary	Defined 0 at PoA level		
L3 - use of worst stove in project	Defined 0 at PoA level		
L4 - use of new device for heating	Defined 0 at PoA level		
L5 - old stove use	Defined 0 at PoA level		
L6 - transport	Defined 0 at PoA level		

7. Sustainable Development indicators

This information will be available for verification.