

Monitoring Report

Gold Standard VER, version 01



Project Name: Solar and efficient stoves in southwest Madagascar
Project ID: GS 464

Monitoring Period: 1st of January 2008 to 31st of December 2009

Version 1
15 May, 2010

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1. Introduction

The objective of this project is to locally produce and distribute solar and efficient cook stoves to people in Southwest Madagascar. The Swiss-Madagascan non-governmental organization ADES (Association pour le Développement de l'Energie Solaire) has increased its capacities since the project start in 2007 and today operates three cook-stove workshops in Tuléar, Ejeda and Morondava. In order to create awareness for new stove technologies and to convince people to buy a new stove, cooking demonstrations in villages and schools as well as training programs for solar cooking are conducted.

The last two years were difficult times for Madagascar. Three events hit Madagascar and its population very hard: the global economic crisis starting in 2008; the political crisis starting in early 2009; and severe droughts in 2009 in the already arid South of Madagascar. As a consequence of the political unrest many international organizations stopped their activities and donors ceased all non-humanitarian aid. The country has been suspended from regional bodies like the AU and SADC and the international community will only recognize Madagascar's government after fresh polls expected in late 2010. In addition to the political crisis, also the global economic crisis and droughts and cyclones showed their impact on the economy and the population. Local staple food production in Southwest Madagascar significantly declined and thus food prices drastically increased. Also during these difficult times ADES continued stove production and promotion in Madagascar. However, under such economic and political conditions it is very challenging to convince people to invest in new stove technologies.

As stated in the PDD, the project start was on 27 August 2007 when the wood treatment machines for stove construction were purchased. The start of the crediting period was on 01 January 2008 with the installation of the first project stoves. Since then stoves have been installed continuously in the project area.

As a result of the pre-feasibility assessment the Gold Standard declared the project eligible for retroactive GS registration. The validation as a Gold Standard VER (Version 1) project was conducted by TÜV Süd and successfully finished on 16 July 2009 by uploading the validation report to the Gold Standard registry. The registration as a Gold Standard project with the project ID GS 464 was realized on 23 December 2009.

The first verification covers the monitoring period from 01 January 2008 to 31 December 2009.

2. Monitoring Methodology and Monitoring Plan

The approved monitoring methodology applied to the project activity is included in the Gold Standard methodology for Improved Cook-stoves and Kitchen Regimes V.01.

The monitoring plan is defined in the validated and registered PDD version 5 dated 21.12.2009, Section D on pages 35-42.

3. Total Sales Record

The Total Sales Record is continuously populated with all sales of solar box, parabolic and efficient stoves since the crediting start date 01.01.2008.

The following data is recorded for every stove sold:

- Year of sale
- Date of sale
- Name (of stove purchaser)
- Region (location of stove sale)
- Sector
- Domicile: address and phone number required for all bulk purchasers, retailers and institutional users
- Mode of use: resale/onward retailing, institutional, domestic
- Type of stove: Solar box, Parabol, YoYo
- Stove No.
- Cluster inclusion: wood and charcoal
- Not counted: stoves that are not counted for emission reductions (sales to Blue Venture and sales to outside of the project area)
- Comment: why stove is not counted
- Kitchen Survey: date of Kitchen Survey
- Kitchen Test: date of Kitchen Test

The Total Sales Record with all stove sales from 01 January 2008 to 31 December 2009 is provided as an annex (“1005_ADES_Total_Sales_Record_0809.xls”)

3.1 Summary of Stove Sales

Year	Number of stoves sold				Cluster	
	Total	Box	Parabol	Yoyo	Wood	Charcoal
2008	1436	1365	53	18	806	630
2009	578	565	13	0	204	374
Total	2014	1930	66	18	1010	1004

In addition, during the verification period 185 solar and efficient stoves were sold to another organisation, and 80 were sold outside the project area. These 265 stoves and their emission reductions are not counted for this project.

References:

- Sales Record 2008-2009: “1005_ADES_Total_Sales_Record_0809.xls”

4. Detailed Customer Database

The Detailed Customer Database is filled with the results from the Kitchen Surveys and Kitchen Tests (both baseline and monitoring). It contains the household sample for Kitchen Surveys and Kitchen Test as well as the results of the statistical analysis.

As stated in the applied methodology “Improved Cook-stoves and Kitchen Regimes V.01” (page 23, “Projects generating baseline information for application to retrospective emission reductions do not need to add retrospective monitoring KS’s to a baseline KS.”) there is no need to conduct Kitchen Surveys for the retroactive monitoring periods. Since the project has only been registered with the Gold Standard on 23 December 2009, there is no need to provide Kitchen Survey results for the indicated monitoring period covering the first two years.

Kitchen Tests are conducted every two years and thus the next Kitchen Test is due in 2010.

The validated Detailed Customer Database with the results of the baseline Kitchen Surveys and Kitchen Tests is provided as an annex (“1004_ADES_customer_database_0809.xls”).

5. Project Database

The Project Database contains the following information:

- Description of the outcome of the newest Kitchen Surveys and Kitchen Tests regarding clustering and emission reduction calculation
- The newest available definitions of clusters
- List for each cluster containing all stove users from the Total Sales Record belonging to this cluster
- List of all stove users not belonging to any defined cluster
- Emission reduction calculations

As stated in the applied methodology “Improved Cook-stoves and Kitchen Regimes V.01” (page 23, “Projects generating baseline information for application to retrospective emission reductions do not need to add retrospective monitoring KS’s to a baseline KS.”) there is no need to conduct Kitchen Surveys for the retroactive monitoring periods. Since the project has only been registered with the Gold Standard on 23 December 2009, there is no need to provide Kitchen Survey results for the indicated monitoring period covering the first two years.

Kitchen Tests are conducted every two years and thus the next Kitchen Test is due in 2010.

The Project Database with the results of the baseline Kitchen Surveys and Kitchen Tests and the clustering for the monitoring period as well as emission reduction calculations is provided as an annex (“1005_ADES_Project_Database_0809.xls”).

6. Monitoring of Parameter Values

Since a fixed baseline was chosen only project parameters but no baseline parameters are monitored. Most parameter values remain the same as in the validated and registered PDD because the project is retroactive and most parameters need to be re-assessed only every two years. More details on each parameter are discussed following the table below.

As stated in the applied methodology “Improved Cook-stoves and Kitchen Regimes V.01” (page 23, “Projects generating baseline information for application to retrospective emission reductions do not need to add retrospective monitoring KS’s to a baseline KS.”) there is no need to conduct Kitchen Surveys for the retroactive monitoring periods.

6.1 Data to monitor project emissions

The table below shows data to be collected in order to monitor emissions from the project activity (copied from section D.2.1, page 37 in the PDD).

ID number (Please use numbers to ease cross-referencing to D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1) Non-renewability of woody biomass fuel in the project in year y	Xnrb,pj.y	Study	Fraction	c/e	Every two years	100%	electronic	Reassess the non-renewability of the fuelwood used in the project area and adjust the non-renewable biomass fraction used for the calculation of emission reductions
2) Mass of woody biomass combusted in the project in year y	Bpj,y	Kitchen Test	t_biomass/stove and year	m	Every two years	Measurement of sample of cluster population	electronic	Repetition of the Kitchen Test in order to control fuel savings with the improved stoves and adjust figures used for emission reduction calculation if needed.
3) The mass of alternative fuel i combusted in the project in year y	AFpj,i,y	Kitchen Test	t_fuel/unit-year	m	Every two years	Measurement of sample of cluster population	electronic	In case the Kitchen Surveys reveal the use of alternative fuels.
4) Percentage of stoves of age z remaining in use in year y	Usage,z,y	Kitchen Survey	Fraction	m	Every two years	Measurement of sample of cluster population	electronic	Kitchen Survey of stoves sold in the first year in order to establish the drop-off rate in stove usage over time.
5) Adjustment to values of Bpj,y and AFpj,i,y for stoves of age x	Age, z	Kitchen Test	Fraction	m	Every two years	Measurement of sample of cluster population	electronic	Aging-stove kitchen test is undertaken for sales made in the first year to measure fuel reduction performance in successive years of stoves of Age x, Age y,...
6) Adjustment to values of Bpj,y and AFpj,i,y for new stove models	New Stove	New-Stove-Kitchen Test	Fraction	m	When new models or designs are introduced and then every two years	Measurement of sample of cluster population	electronic	A “New-Stove KT” is to measure fuel consumption of new models and designs when they are launched and will be repeated every two years.

7) Similar new project activity in the project area	New project activity	Different sources	Number of projects		annually		electronic	ADES will report and monitor any similar new project activity in the project area in order to avoid double counting.
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1) *Non-renewability of woody biomass fuel in the project in year y*

Assessment of NRB-fraction was done for the PDD and revised and re-assessed during validation and registration in late 2009. This parameter is recorded every two years. Thus, a re-assessment is due in 2011.

The value of this parameter remains the same as in the PDD:

NRB fraction =	49.26%
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References:

- PDD (version 5), Annex 5, page 60: "0912_ADES_GS_VER_PDD_v5.pdf"

2) *Mass of woody biomass combusted in the project in year y*

Kitchen Tests to measure baseline and project fuel consumption were conducted in 2008. Re-assessment of this parameter is done with monitoring Kitchen Tests every two years. The next Kitchen Tests are thus due in 2010.

Values for this parameter remain the same as in the validated and registered PDD:

CHARCOAL CLUSTER		
	t/(year*stove)	
Mean before	1.909	
Mean after	0.929	
Mean change	0.980	
Standard deviation change	0.353	
Upper confidence limit of change 90%	1.06	108.0% of mean
Lower confidence limit of change 90%	0.90	92.0% of mean

WOOD CLUSTER		
	t/(year*stove)	
Mean before	6.642	
Mean after	3.188	
Mean change	3.453	
Standard deviation change	1.299	
Upper confidence limit 90%	3.80	110.1% of mean
Lower confidence limit 90%	3.10	89.9% of mean

References:

- Project Database: "1005_ADES_Project_Database_0809.xls"

3) *The mass of alternative fuel i combusted in the project in year y*

This parameter is assessed with the help of a Kitchen Test in case Kitchen Surveys reveal the use of alternative fuels. So far, there is no indication for the use of alternative fuels, thus there is no need to conduct a Kitchen Test to measure this parameter.

References:

- Detailed Customer Database: “1004_ADES_customer_database_0809.xls”
- Project Database: “1005_ADES_Project_Database_0809.xls”

4) Percentage of stoves of age z remaining in use in year y

This parameter is monitored every two years with Kitchen Surveys of stoves sold in the year 2008 in order to establish the drop-off rate in stove usage over time. The Stove Usage Kitchen Survey is due in 2010.

Values for this parameter remain the same as in the validated and registered PDD (page 12): A drop-off rate of 10% per year is assumed. This means that after one year of operation 90% of stoves are still in use.

5) Adjustment to values of $B_{pj,y}$ and $AF_{pj,i,y}$ for stoves of age x

Aging-Stove Kitchen Tests are undertaken every two years. A re-assessment of this parameter is due in 2010. Values for this parameter remain the same as in the validated and registered PDD (see above: 2) Mass of woody biomass combusted in the project in year y). The stove-aging multiplier for project emissions was defined in the PDD to have the value “1” for the first 2 project years (PDD, page 22).

References:

- PDD (version 5), page 22: “0912_ADES_GS_VER_PDD_v5.pdf”

6) Adjustment to values of $B_{pj,y}$ and $AF_{pj,i,y}$ for new stove models

No new stove models were introduced in the years 2008 and 2009.

7) Similar new project activity in the project area

This monitoring parameter was added only during registration process in late 2009 and was thus not specifically monitored during the first two years. Currently known similar project activities in the project area are described in the PDD on pages 4 and 31. Similar new project activities in the project area will be monitored annually from 2010 on.

Regarding Blue Ventures:

Blue Ventures (www.blueventures.org) is a British non-governmental marine conservation organisation that operates since 2001 an information and education centre in Andavadoaka, a fishermen settlement about 120 km north of Tuléar, in Madagascar. The main goal of this organization is conserving the coral reef in southwest Madagascar. Deforestation in the inland also poses a threat to the reef and thus needs to be combated. For this reason, Blue Ventures buys solar and efficient cook stoves from ADES and distributes them to the local population. Blue Ventures (BV) organizes volunteer activities and mainly funds itself through the contribution from their volunteers most of them coming from Europe. As a request by BV volunteers must offset the emissions resulting from their flights to Madagascar. Thus they pay a certain amount to Blue Ventures Carbon Offset (www.bvco.org.uk) in England. This money is then used to purchase stoves from ADES. Blue Ventures’ activities are currently very limited because of lack of volunteers due to the political crisis in Madagascar.

In order to avoid double counting and not to constrain BV’s efforts and activities, the solar and efficient stoves that were sold to BV by ADES are not used to generate carbon credits for

this Gold Standard project. All stove sales are also listed in the Total Sales Record and thus labelled accordingly with “not counted”. A complete list with all stoves sold to Blue Ventures is found in the Project Database or can be filtered in the Total Sales Record.

In the year 2008 ADES has sold 73 solar box, 13 parabol and 99 efficient stoves to BV (in 2009 no stoves were sold to BV). Emissions reductions of these stoves are not counted for this project.

References:

- Project Database: “1005_ADES_Project_Database_0809.xls”
- PDD (version 5), pages 4&31: “0912_ADES_GS_VER_PDD_v5.pdf”

6.2 Data to monitor leakage effects

The table below shows data and information to be collected in order to monitor leakage effects of the project activity (copied from section D.2.3.1, page 40 in the PDD).

ID number (Please use numbers to ease cross-referencing to table D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1) Leakage (wood cluster)	LEy (wood)	Survey	Fraction	e	Every two years	n/a	electronic/ paper	Percentage of saved wood used for another purpose is estimated Retailers on the market are asked if the supply of wood has risen in the last months or years as consequence of stove appliance
2) Leakage (charcoal cluster)	LEy (charcoal)	Survey	Fraction	e	Every two years	n/a	electronic/ paper	Percentage of saved charcoal used for another purpose is estimated Retailers on the market are asked if the supply of charcoal has risen in the last months or years as consequence of stove appliance

1) Leakage (wood cluster)

Assessment of leakage effects was discussed in the PDD for validation and registration. Leakage effects are assessed every two years. This information is therefore not updated for this monitoring report and re-assessment is due in 2010.

2) Leakage (charcoal cluster)

Assessment of leakage effects was discussed in the PDD for validation and registration. Leakage effects are assessed every two years. This information is therefore not updated for this monitoring report and re-assessment is due in 2010.

7. Quality Assurance

Sales Record

All stove sales are carefully documented and recorded in the Total Sales Record, an Excel-file that is managed by “ADES CO2-manager” at the ADES production center in Tuléar. The ADES CO2-manager is responsible for all monitoring activities in Madagascar. ADES has three stove production centers in Tuléar, Ejeda and Morondava from where also the sale of stoves is promoted. A stove passport (containing information such as stove number, date of sale, name of stove buyer) created for every stove sold is kept as paper record at the corresponding stove production center. Further, sales records are compiled in electronic format at every production center and reported to the ADES CO2-manager in Tuléar on a weekly basis. In Tuléar the sales records from the different production centers are checked and compiled in the Total Sales Record of the project activity. During monitoring activities the ADES CO2-manager checks stove sales in the three production centers and compares paper records with electronic sales records. The Total Sales Record is submitted to the ADES CO2-manager in Switzerland, where data is checked on its accuracy and consistency. For final check and for statistical analysis, the Total Sales Record is submitted to myclimate.

Furthermore, also stoves sold to other organizations or sold outside of the project area are listed in the sales record and marked accordingly with “not counted”. For these stoves no emission reductions are counted (see Project Database). This careful tracking of stove sales is a strict measure to avoid double counting.

Initially, the numbering of stoves was done in every production center separately starting with the number one. In 2009 the production center in Tuléar was closed for some months and thus stoves produced in Ejeda were transported to Tuléar for sale. In order to allow for traceability in the production process, these stoves received a different stove number starting with an “E” (for Ejeda) followed by the actual stove number. In order to avoid confusion, from 2010 on all stoves are numbered according to the new numbering system always indicating the stoves’ production center with the Initials such as “T” for Tuléar, “E” for Ejeda and “M” for Morondava.

From 2010 on a certified independent auditor from Antananarivo, Madagascar, will verify the Sales Record together with the financial audit of ADES Madagascar.

In the future it is also foreseen to replace the Excel-file used for the Sales Record with a database and customer relationship management system (CRM).

Monitoring activities

A monitoring manual has been compiled, where all necessary steps and procedures (organization, responsibilities, and tasks) are described in details for all monitoring activities. This manual is applied for all activities conducted from 2010 on and allows for quality assurance at the different levels.

The ADES CO2-manager in Madagascar is responsible for all monitoring activities in the entire project area and is not involved in sales activities to guarantee an independent appraisal. For Kitchen Surveys, Kitchen Tests and other surveys paper records are kept with the ADES CO2-manager in Tuléar, Madagascar. Surveys are conducted by the CO2-manager in collaboration with a representative from the corresponding production center. The CO2-manager conducts household visits, fills in the questionnaires and transforms paper data into electronic data. The electronic data from the monitoring activities is then submitted to the

ADES CO2-manager in Switzerland, where it is checked on its accuracy and consistency. Final check and statistical analysis of the monitoring data is conducted by myclimate.

This organizational separation of data generation and data analysis combined with a two level data check guarantees for accurate and consistent results. The Project Database and the Customer Database are compiled and managed by myclimate.

8. Emission Reductions

8.1 Values for emission reductions

1) Emission reduction per stove year

Values for emission reductions per stove year are as in the registered PDD (page 54):

Cluster	Emissions reductions tCO ₂ e per stove year (lower bound 90% confidence interval) and including seasonal/weekly variation
Wood	2.119 tCO ₂ e
Charcoal	2.694 tCO ₂ e

References:

- Project Database: "1005_ADES_Project_Database_0809.xls"
- PDD (version 5), page 54: "0912_ADES_GS_VER_PDD_v5.pdf"

2) Stove years and overall emissions reduction

The overall emissions reduction of GHG achieved by the project are calculated as set out in the PDD (pages 26&54).

	WOOD Cluster		CHARCOAL Cluster		Leakage	TOTAL	
Year	Stove years	ERs	Stove years	ERs		Stove years	ERs
2008	380	804	278	749	0	658	1553
2009	895	1897	656	1767	0	1551	3664
TOTAL	1275	2701	934	2516	0	2209	5217

References:

- PDD (version 5), pages 26&54: "0912_ADES_GS_VER_PDD_v5.pdf"

3) Explanations of emissions reduction calculation

Emission reductions are calculated separately for each cluster by multiplying the number of stove years (including the drop-off rate) with the values for emission reductions per stove years (including seasonal and weekly variations in fuel consumption).

For every stove, the number of stove days is calculated by counting the number of days from the sale date until the end of the respective year (see worksheet "Analysis_wood" and "Analysis_charcoal" in the Project Database). For this the formula "=TAGE360(x;y)" is applied.

The drop-off rate of 10% for stove sales in 2008 is considered in the following way: For every stove being in operation for more than one year, the stove days in its second operational year are reduced by 10%. This provides for every stove the corrected number of stove days in its second year of operation.

Stove years of a specific year are then calculated by adding up all corrected stove days of all stoves sold in a specific year divided by 360 (days).

Stove-aging is assumed to have no influence on emission reductions in the first 2 years as discussed in the validated and registered PDD (page 22).

References:

- Project Database: "1005_ADES_Project_Database_0809.xls"

9. Sustainable Development Indicators

As stated in Section D in the PDD (page 38), the following sustainability indicators are monitored. Although these indicators are only monitored every two years, first results have already been compiled for this monitoring report.

Sustainable Development Indicator	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency
SD1) Jobs created by ADES	Economic impact	Annual report ADES	#	measured	Every two years
SD2) Schools visited by ADES	Social impact	Annual report ADES	#	measured	Every two years
SD3) Expenses for wood and charcoal	Social impact	Kitchen Survey	Time/financial expenses	measured	Every two years

9.1 SD 1: Jobs created by ADES

Since the project start in 2007, ADES has continuously increased its activities and also the number of employees from 22 in 2007 to 45 by the end of 2009 (see Table below). ADES offers positions for a variety of qualifications: director, management, secretary, education & training, carpenter, sales animator, CO₂-monitoring, gardener, driver, guard.

Number of people employed by ADES

Location	31.12.2007	31.12.2008	31.12.2009
Coordination	-	5	8
Tuléar	15	16	15
Ejeda	7	8	8
Morondava	-	8	9
Andavadoaka	-	6	5
Total	22	43	45

References:

- List of employees 2007: "ADES_employees_2007.xlsx"
- List of employees 2008: "ADES_employees_2008.xlsx"
- List of employees 2009: "ADES_employees_2009.xlsx"

9.2 SD 2: Schools visited by ADES

In order to create awareness for the problem of deforestation and for new, clean and more efficient stove technologies cooking demonstrations and animations in schools and villages are performed. In the years 2008 and 2009 a total of 196 events were conducted reaching 15,860 people in the project area.

Number of schools visited and number of people reached by these activities in 2008 and 2009

Location	Number of schools	Number of attendees
Tuléar	22	3409
Ejeda	2	60

Morondava	9	15
Total	33	3484

Number of cooking demonstrations in villages and number of people reached by these activities in 2008 and 2009

Location	Number of cooking demonstrations	Number of attendees
Tuléar	61	6710
Ejeda	35	1340
Morondava	67	4326
Total	163	12376

References:

- List with schools visited: "1004_list_schools_visited_0809.xlsx"
- List with cooking demonstrations: "1004_list_cooking_demonstrations_0809.xlsx"

9.3 SD 3: Expenses for wood and charcoal

Kitchen Surveys (required from 2010) provide information on a household's monthly expenses for purchasing charcoal/wood and the time spent on fuel wood collection.

Market surveys with charcoal and wood retailers, which will be performed in 2010 to monitor leakage effects (see 6.2) will allow to reliably quantify the amount of money household save due to fuel savings.

Charcoal cluster

Households report to spend on average Ariary 9,900 (ca. 3.67 EUR) per month to purchase charcoal.

Wood cluster

From the current Kitchen Survey it is known that only 10% of households in the wood cluster purchase fuel wood, whereas 90% collect fuel wood.

Households report to spend on average 18 hours per month for fuel wood collection.

Households that do purchase fuel wood spend on average Ariary 18,667 (ca. 6.91 EUR).

More significant statements on the indicator will be possible once a greater number of Kitchen Surveys are available, which will allow for comparison of these values over time.

References:

- Kitchen Survey wood cluster 2010: "1004_KS_wood_1Q2010.xlsx"
- Kitchen Survey charcoal cluster 2010: "1004_KS_charcoal_1Q2010.xlsx"

10. Appended Files and References

No.	Ref. to Chapter	Description	File name
1	8. Sustainable Development Indicators, SD 1: Jobs created by ADES	List of employees 2007	ADES_employees_2007.xlsx
2	8. Sustainable Development Indicators, SD 1: Jobs created by ADES	List of employees 2008	ADES_employees_2008.xlsx
3	8. Sustainable Development Indicators, SD 1: Jobs created by ADES	List of employees 2009	ADES_employees_2009.xlsx
4	3. Total Sales Record	Stove Sales from 01 January 2008 to 31 December 2009	1005_ADES_Total_Sales_Record_0809.xls
5	4. Detailed Customer Database	Results and sample from baseline Kitchen Surveys and Kitchen Tests	1004_ADES_customer_database_0809.xls
6	5. Project Database	Outcome of baseline Kitchen Surveys and Kitchen Test and clustering, and ER calculations	1005_ADES_Project_Database_0809.xls
7	6. Monitoring of Parameter Values	Validated and registered PDD, version 5, dated 21.12.2009	0912_ADES_GS_VER_PDD_v5.pdf
8	8. Sustainable Development Indicators, SD 2: Schools visited by ADES	List of schools visited in 2008 and 2009	1004_list_schools_visited_0809.xlsx
9	8. Sustainable Development Indicators, SD 2: Schools visited by ADES	List of cooking demonstrations conducted in 2008 and 2009	1004_list_cooking_demonstrations_0809.xlsx
10	8. Sustainable Development Indicators, SD 3: Expenses for	Kitchen Survey wood cluster 2010	1004_KS_wood_1Q2010.xlsx

	wood and charcoal		
11	8. Sustainable Development Indicators, SD 3: Expenses for wood and charcoal	Kitchen Survey charcoal cluster 2010	1004_KS_charcoal_1Q2010.xlsx