Gold Standard for the Global Goals

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT **- TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

KEY PROJECT INFORMATION

This template has been revised to aid a consistent interpretation and to better support project developers submitting documentation for certification. Please read the accompanying guide to understand how to complete this template accurately.
TEMPLATE GUIDE Monitoring Report v. 1.1

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Key Project Information

GS ID (s) of Project (s)	GS 879
Title of the project (s) covered by monitoring report	Energy Efficient Cook Stoves for Siaya Communities, Kenya
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	V3_2_5
Version number of the monitoring report	V05
Completion date of the monitoring report	08/12/2021
Date of project design certification	1st CP 03/07/2012 2ND CP 27/03/2018
Date of Last Annual Report	19/06/2020
Monitoring period number	2nd CP-3rd Monitoring period
Duration of this monitoring period	01/01/2020-31/12/2020
Project Representative	Job Orina, Foundation myclimate Jared Buoga, Tembea
Host Country	Kenya
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	Gold Standard methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption v2.0 (24/04/2015).

Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13	Amount of CO2e emissions reduced by the project per year.	162,894	VERs
SDG 1	Time (hours) and money (KES) saved per household per year due to fuel savings achieved by project stoves	253 8747	Hours KES
SDG 3	Proportion (%) of positive comments from stove users on air quality improvement with project stove	100%	Positive feedback
SDG 4	Number of persons reached with awareness creation	327	People
SDG 5	Number of jobs offered by TYCSD to local female employees	65 45%	Women
SDG 7	Number of persons that benefit from efficient and clean cooking technologies	31415	People
SDG 8	Number of jobs offered by TYCSD to local employees at good conditions.	146	People
SDG 12	Fuel savings in % achieved by project technologies compared to baseline.	53.3%	Percentage

Table 2 – Product Vintages

		Amount Achieved
Start Dates	End Dates	Emission reduction (VERs)
01/01/2020	31/12/2020	162,894 VERs

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

1. The project disseminates a rocket-type improved cook stove to replace the use of open fires for cooking. The efficient cook stoves are constructed using locally available materials, such as mud, bricks, and sawdust. Local artisans are identified in the villages and trained in stove construction and household mobilization.
2. The employed technology is a fixed installed biomass rocket stove designed for burning wood and consisting of two cooking units that can be separately fired. The efficient cook stoves are constructed using locally available materials, such as mud, bricks and sawdust.

Installed project rocket stove with two cooking units.

A.2. Location of project

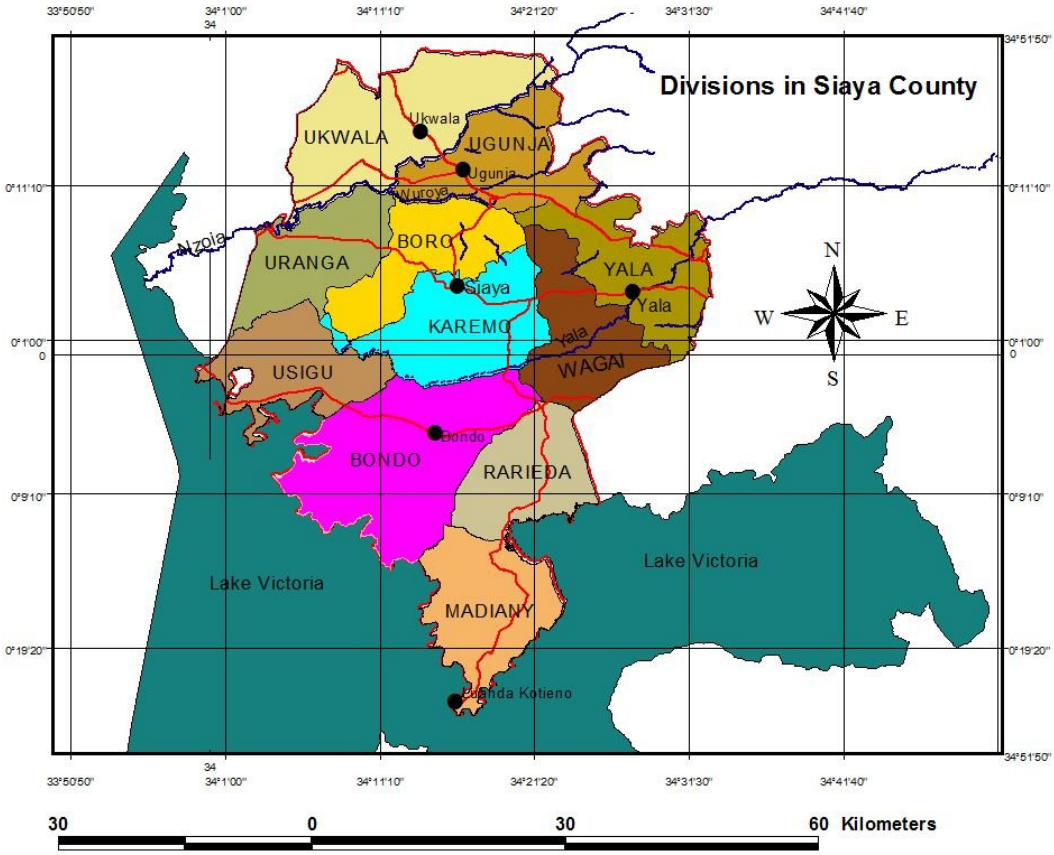
Country: Kenya

Provinces: Nyanza

County: Siaya

Coordinates: The County is located between the following coordinates: 0°24’08.52’’S, 34°17’24.05’’E to the south, 0°01’57’59’’S, 34°00’31.65’’E to the west, 0°19’04.01’’N, 34°16’52.80’’E to the north and 0°06’38.41’’N, 34°33’16.82’’E to the far east.

The coordinates of the town Ugunja, where the office of the project owner Tembea Youth Centre for Sustainable Development is located, are 00° 10’ 59.88” N and 34° 17’ 59.99” E.



Map 1: Divisions in Siaya County

A.3. Reference of applied methodology

The approved monitoring methodology applied to the project activity is Gold Standard methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption V2.0 (24/04/2015)." The reference is http://www.cdmgoldstandard.org/project-certification/gs-methodologies

GS Usage Rate guidelines ver2.0 (27/10/2020)

A.4. Crediting period of project

The start date of the first crediting period is 01/01/2011-31/12/2017.

The start date of the second crediting period is 01/01/2018-31/12/2024.

The crediting period of the project was renewed for another 7 years starting January 2018.

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The project continuously installed efficient cook stoves since the start of project implementation. Since then, a total of 74,422 project stoves have been installed. In this way the project could provide clean and efficient cooking to 394,405 persons. The project also continuously trained community members in the Community Savings and Loaning Methodology (CSL) and established to date a total of 2025 groups with 74,499 participants: of it there are 1779 supervised groups with 70,201 participants. In 2020, 147 CSL groups were formed, with 5795 women and 791 men members with 6586 having efficient stoves.

Table 1: Annual stove installations

Year	number of stoves
2011	4,662
2012	5,139
2013	5,187
2014	6,840
2015	14,186
2016	7,819
2017	8,360
2018	7,885
2019	7758
2020	6586
TOTAL	**74422**

Furthermore, the project trained 21 artisans in the monitoring period in efficient stove construction and conducted awareness and education events on efficient cooking and climate change. The trainings are conducted by lead artisans with support from Tembea field officers. The trainings are on stove construction, maintenance, data collection, stove usage, and customer support. The trainings are field based with both theory and practical content. The trainings were conducted on 1st /09/2020 to 12th/09/2020.
The project's awareness creation activities reached a total number of 327 people in 2020.

Relevant dates for the project activity:

Start date of the project: 04 October 2010

Date of first stove sale: 04 October 2010

Date of registration: 03 July 2012

Start date of the first crediting period: 01 January 2010

- First monitoring period: 01 January 2011 – 02 July 2012
- Second monitoring period: 03 July 2012 to 31 Dec 2013
- Third monitoring period: 01 Jan 2014 to 31 Dec 2014
- Fourth monitoring period: 01 Jan 2015 to 31 Dec 2015
- Fifth monitoring period: 01 Jan 2016 to 31 Dec 2016
- Sixth monitoring period: 01 Jan 2017to 31 Dec 2017

Start date of the second crediting period: 01 January 2018

- 1st monitoring period: 01 January 2018 – 31 December 2018
- 2nd monitoring period: 01 January 2019 – 31 December 2019
- 3rd monitoring period: 01 January 2020 – 31 December 2020

Project is in continuous operation.

4. Total emission reductions achieved in this monitoring period are **162,894tCO2e**

B.1.1 Forward Action Requests

N/A

B.2. Post-Design Certification changes

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B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

N/A

B.2.2. Corrections

N/A

B.2.3. Changes to start date of crediting period

N/A

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

N/A

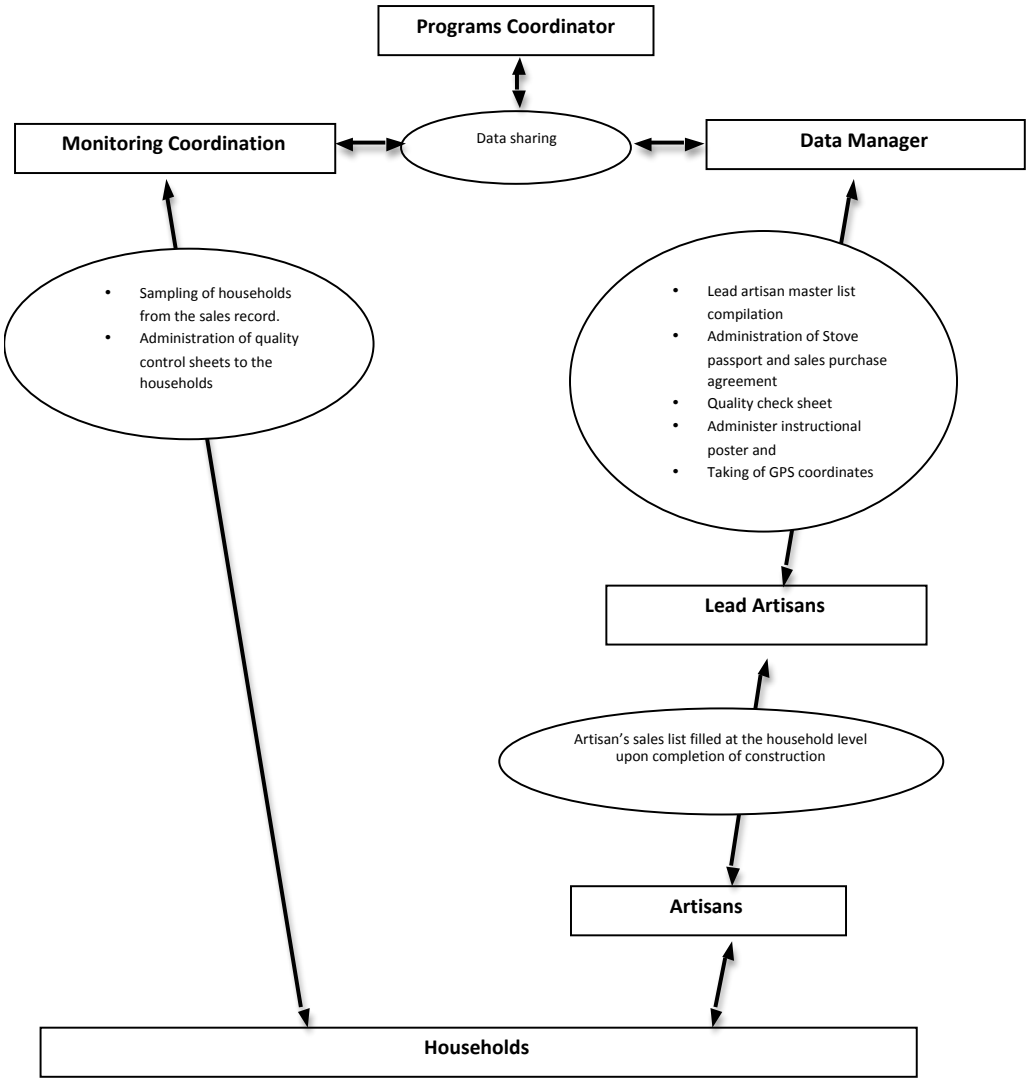
B.2.5. Changes to project design of approved project

N/A

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

A detailed description of the monitoring system can be found in the latest version of the Monitoring Manual provided as a separate document. This includes roles and responsibilities, organizational structure, etc.

Monitoring coordination



Specific Personnel and Qualifications

Name	Designation	qualification
Job Orina	Internal monitoring manager	Bsc In Disaster Mitigation and Sustainable development, certificate in Low Carbon development (WBI) and monitoring & evaluation (UNPAN), long experience in data collection, analysis and report preparation as well long experience in the climate change sector.

Victor John Mondi	Data Manager/deputy manager	Bsc In Disaster Mitigation and sustainable development, long experience in data management
Nicholas Ngesa	Project officer in charge of construction	Bachelor of Commerce
Joshua Omondi	Project officer in charge of CSL	Certificate in project design and development and Certificate in Community saving and loaning
Erick Otieno	Field officer csl/stove construction	Certificate in Community Saving and Loaning
Sarah Sophy	Finance officer	Diploma in Community development and social work, certificate in Accounting
Vincent Odour	Lead artisan	Long experience in stove construction, Kenya secondary school certificate

General Summary of Monitoring System:

Data management and storage
Tembea has developed internal mechanisms to ensure availability of data within and beyond the project period. All data used for monitoring is stored in soft and hard copies. Tembea uses cloud storage, backup systems as well as file cabins in the office to ensure safe keeping of the data.

Monitoring data collection tools and methodologies
The following approaches are used in collecting data for monitoring;

1. Office based

1. Sales record: this is an excel file that is used to enter details about the stoves. The file enable entry on the data of sale, name of stove owner, location, postal address, telephone number, GPS coordinates, mode of use, stove type, stove number and other monitoring details.
2. CSL database: this is a customized excel file that is used to analyze and store data on the community savings and loaning approach that is used to facilitate

local communities to acquire cook stoves. The file capture the names of the groups, names and sex of the members, dates of formation, asset based information, loan information amongst others.
3. Excel sheet for monitoring data: this is a template that is used to enter and store all the data collected from the field for monitoring surveys. The file captures the questions in the questionnaires and their varying responses. This is used to capture the sustainable development indicators that the project is promoting.

b) Field based

1. Artisan Data sheet: this is a tool used by the artisan involved in the construction of the stoves in the field. They capture the following details; date of construction, name of stove user, sub-location, village, address and phone number.
2. Lead Artisan construction summary sheet: This is a tool that has been developed to help lead artisans collect information on the stoves constructed. The template collects the date of construction, the constructing artisan information, stove owner name, contacts, stove number, mode of purchase, initial amount, GPS coordinates and lead artisans remarks.
3. Transaction books for CSL: these are books that are used by the CSL groups to record their transactions. The book collect the details of the groups including, date of formation, group name, names of members, transaction procedures, loans information and meetings dates.
4. Questionnaires: there are many questionnaires that are administered to monitor project progress. The Questionnaires include the one for monitoring and usage survey. They are all attached in the monitoring manual.

C) Data flow consistency and intervals

1. Sales Record: the sales records is updated once a month. Every other Monday of the week the data manager receives data from the field and throughout the month QA/QC procedures are administered on the data.
2. CSL database: is updated once a month. Throughout the month field officer and the project officer are involved in collecting and verifying data from the groups.
3. Excel sheet for monitoring data: this is done once a year as is agreed upon with the project partners.

D) QA/QC measures

Tembea is responsible for ensuring data quality, the following measures are

undertaken for the information described above;

1. Tracking of data
2. Use of SP/SPA
3. Counter checking with field officer documents
4. Review of group transaction books
5. Review of financial records
6. Counter checking of data

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

SDG 13 Climate Action

Data/parameter:	**$P_{b,y}$**
Unit	Tons/stove/year
Description	Quantity of woody biomass consumed in the baseline scenario in year y and per day in year y.
Source of data	Baseline and Project Field Performance Tests 2017.
Value(s) applied)	2.7375 t/stove/year and 0.0075 t/stove/day
Choice of data or measurement methods and procedures	Kitchen performance test
Purpose of data	Baseline emission calculation
Additional comments	Parameter also used to calculate values for SDG 12

Data/parameter:	**$EF_{b,co2}$**
Unit	tCO2/t_fuel
Description	CO2 emission factor arising from use of fuel in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Tables 1.2/1.4 Default IPCC values for wood / wood waste are applied.
Value(s) applied)	1.7472 tCO2/t wood (=112.0 tCO2/TJ * 0.0156 TJ/ t)
Choice of data or measurement methods and procedures	Default values
Purpose of data	Baseline emissions calculations
Additional comments	

Data/parameter:	$EF_{b,non-co2}$
Unit	tCO2/t_fuel
Description	Non-CO2 emission factor arising from use of wood-fuel in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Table 2.5
Value(s) applied)	0.1356 tCO2eq/t wood (from 01.01.2013 on)

Choice of data or measurement methods and procedures	Default values
Purpose of data	Project emissions calculations
Additional comments	

Data/parameter:	**$EF_{p,co2}$**
Unit	tCO2/t_fuel
Description	CO2 emission factor arising from use of fuel in project scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Tables 1.2/2.5 Default IPCC values for wood / wood waste are applied
Value(s) applied)	1.7472 tCO2/t wood (=112.0 tCO2/TJ * 0.0156 TJ/ t)
Choice of data or measurement methods and procedures	Default values
Purpose of data	Project emissions calculations
Additional comments	

Data/parameter:	**$EF_{p,non-co2}$**
Unit	Data unit: tCO2/t_fuel
Description	Description: Non-CO2 emission factor arising from use of wood-fuel in project scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Table 2.5 Default IPCC values for CH4 and N20 emissions for wood / wood waste are applied. The following GWP100 are applied: 25 for CH4, 298 for N20.
Value(s) applied)	0.1356 tCO2eq/t wood
Choice of data or measurement methods and procedures	Default values
Purpose of data	Project emissions calculation
Additional comments	GWP for second commitment period are applied.

Data/parameter:	**$f_{NRB,i,y}$**
Unit	Fractional non-renewability (%)
Description	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data	Official CDM default value is applied. This value was accepted by the DNA of Kenya on 19 September 2012 and it is the latest available official value for fNRB. http://cdm.unfccc.int/DNA/fNRB/index.html
Value(s) applied)	92%
Choice of data or measurement methods and procedures	Default value
Purpose of data	Baseline and project emissions calculation
Additional comments	This value is fixed for the duration of the crediting period. However, the PP can at any time chose to reassess and adjust the NRB value.

Data/parameter:	**$P_{p,b,y}$**
Unit	Tons/stove/year
Description	Quantity of woody biomass consumed in the project scenario in year y and per day in year y.
Source of data	Project Field Performance Tests 2017.
Value(s) applied)	1.241 t/stove/year and 0.0034 t/stove/day
Choice of data or measurement methods and procedures	Kitchen performance test
Purpose of data	For SDG 12 and SDG 13 contribution
Additional comments	Parameter also used to calculate values for SDG 12

D.2 Data and parameters monitored

SDG 1: No Poverty

Data / Parameter	Time and monetary savings
Unit	Hours / KES per household per year
Description	Time (hours) and money (KES) saved per household per year due to fuel savings achieved by project stoves
Measured/calculated/default	Calculated
Source of data	Monitoring Survey 210719_Monitoring_Usage_Survey_2020_analysis_V01.xlsx (worksheet Monitoring survey_AH442/AH459)
Value(s) of monitored parameter	253 hours' time saved per households per year KES 8,747 saved per household per year
Monitoring Equipment	Monitoring usage survey data tool
Measuring/reading/recording frequency	Annual
Calculation method (if applicable)	1. Annual time expenditures (hours) in the baseline minus annual time expenditures in the project 2. Annual monetary (KES) expenditures in the baseline minus annual monetary expenditures in the project
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of Project scenario
Additional comment	NA.

Summary:
The BS estimated an expenditure of KES 12,906 on fuel per year and 404 hours used in fuel gathering per year for the baseline scenario. The monitoring survey 2020 showed average annual expenditures of KES 4159 on fuel and 151 hours for fuel collection. This results in average annual savings of KES 8747 and 253 hours per household.

SDG 3: Good health and well-being

Data / Parameter	Air quality improvement
Unit	% of stove users stating improved air quality
Description	Proportion (%) of positive comments from stove users on air quality improvement with project stove
Measured/calculated/default	Calculated
Source of data	Monitoring Survey 210719_Monitoring_Usage_Survey_analysis_V01.xlsx (Monitoring Survey_2020_CB350)
Value(s) of monitored parameter	100%
Monitoring equipment	Monitoring and usage survey questionnaire
Measuring/reading/recording frequency	Annual
Calculation method (if applicable)	Number of stove users stating air quality improvement with project stove divided by total users interviewed.
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of Project scenario
Additional comment	NA.

SDG 4: Quality Education

Data / Parameter	Awareness creation in the community
Unit	Number of schools and persons
Description	Number of persons reached with awareness creation
Measured/calculated/default	Measured
Source of data	Activity registers 210119_List of awareness activities.xls (awareness creation 2020_C22)
Value(s) of monitored parameter	327 persons
Monitoring Equipment	Awareness creation activity register
Measuring/reading/recording Frequency	Annual
Calculation method (if applicable)	Counting number of schools visited and number of participants in awareness creation activities
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of Project scenario
Additional comment	NA.

SDG 5:Gender Equality

Data / Parameter	Number of female employees Atleast 30% of employees are female.
Unit	Number of female employees
Description	Number of jobs offered by TYCSD to local female employees.
Measured/calculated/default	Measured
Source of data	TYCSD employment records 210119_list of project staff_2020.xlsx (Project staff 2020)
Value(s) of monitored parameter	32% Female community mobilizers earning income 58% Female artisans earning income 50% women project staff earning income 23 female community mobilizers, 7 office staff and 35 artisans
Monitoring Equipment	Employment register
Measuring/reading/recording frequency	Annual
calculation method (if applicable)	1. Counting number of female employees 2. Number of female employees divided by total number of employees.
Monitoring frequency	Annual
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of Project scenario
Additional comment	NA.

SDG 7: Affordable and clean Energy

Data / Parameter	Number of persons that benefit from efficient and clean cooking technologies
Unit	Number of beneficiaries
Description	Number of persons that benefit from efficient and clean cooking technologies
Measured/calculated/default	Measured
Source of data	Project database, Monitoring survey 211027_Tembea_Cook Stove _ER Spreadsheet_V02.xlsx (SDG 7 sheet_B15) and 210719_Monitoring_Usage_Survey_analysis_V01.xlsx (Monitoring Survey_2020_AB341)
Value(s) of monitored parameter	31415
Monitoring equipment	Not applicable
Measuring/reading/recording	Annual
Calculation method (if applicable)	Total number of stoves sold multiplied with usage rates multiplied with average household size
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of Project scenario
Additional comment	NA

Summary:
This is calculated by multiplying the number of cook stoves installed in the monitoring period by the usage rate and average household size. This is 6586*0.9*5.3, take note of decimal point round down effect, refer to 211027_Tembea_Cook Stove _ER Spreadsheet_.xlsx (SDG 7 sheet_B15)

SDG 8: Decent work and economic growth

Data / Parameter	Number of jobs offered
Unit	Number of employees
Description	Number of jobs offered by TYSCD to local employees at good conditions
Measured/calculated/default	Measured
Source of data	TYCSD employment records 210719_list of project staff_2020.xlsx (project staff 2020)
Value(s) of monitored parameter	1. 14 Project staff Others on contract include 2. 60 Artisans worked during the monitoring period 3. 72 community mobilizers
Monitoring equipment	Staff register
Measuring/reading/**re**recording frequency	Annual
calculation method (if applicable)	Total number of employees
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of Project scenario
Additional comment	NA

SDG 12: Sustainable consumption and production

Data/parameter:	**Fuel savings achieved**
Unit	%
Description	Fuel savings in % achieved by project technologies compared to baseline.
Measured/calculated/default	Calculated
Source of data	project database 211027_Tembea_Cook Stove _ER Spreadsheet_V02.xlsx (Sheet_SDG12_C12)
Value(s) of monitored parameter	Average: 53.3% fuel saving achieved by project technology compared to baseline.

Monitoring equipment	Hand-held spring weight scales to measure wood weight with accuracy to kilogram; scales checked just prior to measurements using items (bag of sugar purchased from national supermarket) with known and standardized weights (Kenya Bureau of Standards Certified); the scales were tested for their individual accuracy and between scale consistency. In combination with water boiling tests which were used to calculate baseline fuel consumption.
Measuring/reading/recording frequency:	Every two years
Calculation method (if applicable):	Fuel savings divided by baseline fuel consumption expressed in %
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Calculation of Project scenario
Additional comments:	None

SDG 13: Climate action

Data/parameter:	**CO_{2e} emissions reductions**
Unit	t CO_{2e}
Description	Amount of CO_{2e} reduced by the project per year
Measured/calculated/default	Calculated
Source of data	Project database 211027_Tembea_Cook Stove _ER Spreadsheet_.xlsx (ER_calculation_2020_C24)
Value(s) of monitored parameter	162,894 tCO2e
Monitoring equipment	N.A.
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	According to applied methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC) and as outlined in the PDD V8, section E.
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Calculation of Project scenario
Additional comments:	None

Data/parameter:	**$P_{p1,y}$**
Unit	t_biomass/unit-year and t_biomass/unit-day

Description	Quantity of woody biomass consumed in the project scenario during year y
Measured/calculated/default	Measured
Source of data	Performance Field Tests 2019 190821_Project_FT_Update_V01.doc (page 6 para 6)
Value(s) of monitored parameter	1.2776 t wood/year and 0.0035 t wood/day
Monitoring equipment	Hand-held spring weight scales to measure wood weight with accuracy to kilogram; scales checked just prior to measurements using items (bag of sugar purchased from national supermarket) with known and standardized weights (Kenya Bureau of Standards Certified); the scales were tested for their individual accuracy and between scale consistency.
Measuring/reading/recording frequency:	Every two years
Calculation method (if applicable):	Mean (90/30 rule applicable) of wood biomass use of all selected households was calculated
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Calculation of Project scenario
Additional comments:	None

Data/parameter:	**Usage** ($U_{p,2}$)
Unit	Proportion (percentage)
Description	Usage rate in project scenario during year y
Measured/calculated/default	Calculated
Source of data	Usage survey 2020 210719_Monitoring_Usage_Survey_analysis_V01.xlsx (Usage Survey_2020_Y362-AB366)

Value(s) of monitored parameter	<table><tr><th>Age</th><th>Usage for MP</th><th>Stove representation per age</th></tr><tr><td>age 0-1</td><td>90(93.6)%</td><td>6.30%</td></tr><tr><td>age 1-2</td><td>90(90)%</td><td>6.90%</td></tr><tr><td>age 2-3</td><td>90(90.9)%</td><td>7.00%</td></tr><tr><td>age 3-4</td><td>90(90)%</td><td>9.20%</td></tr><tr><td>age 4-5</td><td>90(100)%</td><td>19.10%</td></tr><tr><td>age 5-6</td><td>90(96.7)%</td><td>10.50%</td></tr><tr><td>age 6-7</td><td>90(97.8)%</td><td>11.20%</td></tr><tr><td>age 7-8</td><td>90(97.8)%</td><td>10.60%</td></tr><tr><td>age 8-9</td><td>90(100)%</td><td>10.40%</td></tr><tr><td>age 9-10</td><td>90(100)%</td><td>8.80%</td></tr><tr><td>weighted single usage rate</td><td>90(96.3)%</td><td>100%</td></tr></table> Usage rate for monitoring period is capped at 90% In the file 210719_Monitoring_Usage_Survey_analysis_V01.xlsx (Usage Survey_2020_Y362-AS366). Also consider annex 1 for more details. Calculation is provided for this parameter. To arrive at the weighted usage rate, the single usage rate for each age category was capped at 90% then multiplied by the percentage stove per age group, after which all the usage rates are summed to find the weighted usage rate.
Monitoring equipment	Survey questionnaires
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	A single usage parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario. See Project Database for details.
QA/QC procedures:	Random sampling of population. Transparent data analysis and reporting
Purpose of data:	Calculation of Project scenario
Additional comments:	None

Data/parameter:	Project Technology Days ($N_{p,1}$)
Unit	Number of days
Description	Cumulative number of technology days in the project database for project scenario

Measured/calculated/default	Calculated
Source of data	Project database 211027_Tembea_Cook Stove _ER Spreadsheet_.xlsx (Project_technology_days_I7)
Value(s) of monitored parameter	25,959,790
Monitoring equipment	N.A.
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	The number of days between the installation date of each stove and the end of monitoring period was calculated then adjusted for the 21 days time period between date of sale and start of stove usage for households.
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Calculation of Project scenario
Additional comments:	None

Data/parameter:	Leakage ($LE_{p,y}$)
Unit	t_CO2eq per year
Description	Leakage in project scenario during year y
Measured/calculated/default	Calculated
Source of data	Monitoring survey 2020
Value(s) of monitored parameter	0 Potential leakage effects were assessed at the stage of Revalidation in 2017 and were considered insignificant. Further, results from Monitoring/Usage Survey conducted in 2020 showed no leakage effects.
Monitoring equipment	N/A
Measuring/reading/recording frequency:	Every other year
Calculation method (if applicable):	N/A
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Calculation of leakage
Additional comments:	None

Data/parameter:	Similar new project activity in the project area
Unit	Number of new project activities
Description	List of similar cook stove projects and an assessment of how (e.g. target population, cook stove type, etc.) and to what degree overlap occurs
Measured/calculated/default	Reported
Source of data	Gold Standard registry, CDM Pipeline and local field observations.
Value(s) of monitored parameter	0 (no similar project activity was identified)
Monitoring equipment	N.A.
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	N.A.
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	Calculation of leakage
Additional comments:	None

The project aims at maintaining a close and continued contact with the stove users to ensure stove usage. This is important to receive feedback from the stove users and to advise on appropriate project stove application. One main instrument for this is the Community Savings & Loaning groups (CSL) approach. In addition, also community mobilizers and environmental clubs in schools are crucial to reach out to households:
- The CSL groups play a very important role for the successful adoption and use of the project stove and discontinuation of the baseline technology. CSL groups meet on a weekly basis and provide a perfect framework for peer-to-peer support and knowhow exchange amongst stove users thus increasing use and adoption of the Tembea stoves. Further, Tembea staff attends CSL meetings of each group on a monthly basis. This is a good opportunity to get regular feedback from households on their experience with the project stove, to advise on appropriate stove usage and to discourage the use of the three stone fire.
- A network of community mobilizers visits stove users on a random basis to provide accompaniment/solidarity in decommissioning the traditional stoves. Regular reporting/feedback from the community mobilizers to lead artisans/project staff helps in gauging the level of discontinuation by stove users.
The project monitors the use of baseline technology through monitoring/usage surveys.

D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
SDG 13	162894 VERs	145,500 VERs

SDG1	253 hours 8747 KES	242 hours 8482 KES
SDG 3	100% Of users	100% of users
SDG 4	327 persons reached	1211 persons reached
SDG 5	45% of project staff women	48% of project staff women
SDG 7	31415 persons benefitted from efficient and clean cooking	35614 persons benefitted from efficient and clean cooking
SDG 8	146 receiving income from the project	160 receiving income from the project
SDG 12	53.3% fuel saving compared to baseline	53.3% fuel saving compared to baseline

Explanation for achieved values
SDG 1-As schools were closed much of 2020 it is anticipated many households had children/mother/house-girl to fetch firewood possibly rather than buying therefore saving more money compared to previous MP. Same argument applies for time saved.
SDG 4-due to COVID 19 related restrictions fewer people were reached by project awareness/training activities
SDG 5- fewer women worked in the year 2020 due to reduced project activities (45% vs 48%)
SDG7- Less stoves were installed mainly due to reduce activity as per COVID 19 guidelines (6586 vs 7758)
SDG 8- the project scaled down activities due to COVID 19 thus reduced project employees/beneficiaries (146 vs 160)
SDG 13- More ERs achieved as more stoves were in use and more stove days recorded.

D.4. Implementation of sampling plan

We conducted the sampling for all surveys and tests according to the methodologies outlined in Technologies and Practices to Displace Decentralized Energy Consumption V3.1 (8/2017).

A.1. Description of implemented sampling design

- Date for monitoring usage survey data collection was determined
- The sales record was prepared to allow for calculation of stoves ages

- Stove age categories were determined
- Using simple random sampling 40 samples were selected per age group

A.2. Collected data

The survey collected data on the following;

-

Analysis of collected data

- Excel functions were used for data analysis.

Demonstration that required confidence/precision level has been met

- As per the applicable methodology monitoring and usage survey values are not subject to confidence/precision calculation. This assessment is subjected to PFT values.

Demonstration that the samples were randomly selected and are representative of the population

- Simple random excel function was used to sample 40 samples per age group
- 40 samples were selected per age group but as per the methodology guidelines a minimum of 30 samples is considered for successful survey analysis

The following parameters that are required for emission calculation were surveyed

- Households using the project stove
- Households reporting improvement in air quality
- Household time and money savings by using project stove

Additional information collected is used by the PD to design campaigns and related activities.

The sample was developed on 26/11/2020 follow up with the monitoring survey that happened from 01/12/2020-31/12/2020.

Calculation of age groups

In preparing sample groups the PD calculate age groups by subtracting the date of construction from the anticipated date of the survey. In this monitoring period there are 10 age groups as indicated in the table below.
Summary of age groups, sample sizes. As per the methodology a minimums of 30 surveys are conducted per age group and simple random sampling function of excel is used.

Age group	Successful samples	Sampled	stoves per yr
0-1 yrs	31	37	4662
1-2yrs	31	36	5139
2-3yr	33	37	5187
3-4yrs	30	39	6840
4-5yr	35	34	14186
5-6yrs	30	36	7819
6-7yrs	31	35	8360
7-8yrs	31	37	7885
8-9yrs	33	34	7758
9-10yrs	31	36	6586
	316	361	74422

Successful samples are households that were reached for the monitoring survey and answered all questions.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

SDG 1: No poverty

Baseline surveys conducted in 2017 for the renewal of the crediting period provided the baseline values for time expenditures for fuel acquisition per household per year. These values were calculated as the statistical average value of a representative sample from household interviews.

= 404 hours & KES12906

SDG 3: Good health and well-being

Without the project stoves, no air quality improvements are achieved. Thus, the baseline value is 0% of households stating air quality improvement with project stove.

SDG 4: Quality education

Without the project, no training activities are conducted. Thus, the baseline value is 0 (zero) persons

SDG 5: Gender equality

Without the project, no women receive training or income from the project activity. Thus, the baseline value is 0 (zero) women receiving training or income from the project activity.

SDG 7: Affordable and clean energy

Without the project, no persons benefit from efficient and clean cooking. Thus, the baseline value is 0 (zero) persons that benefit from efficient and clean cooking technologies.

SDG 8: Decent work and economic growth

Without the project, no persons would receive income from the project activity. Thus, the baseline value is 0 (zero) persons receiving an income from project activity, 0 (zero) persons receiving an income in excess of what they were earning prior to project, and 0 (zero) persons employed by the project with salaries at par with or above host country standards.

SDG 12: Sustainable consumption and production

Quantity of woody biomass consumed in the baseline scenario in year and per day were obtained using equation: $B_{fuel} = \eta_{project}/\eta_{baseline} * P_{fuel}$. Thermal efficiencies (ŋ) from water boiling tests (Project technology) and default value for baseline (from

methodology page 23 footnote). The data for project KPTs fulfils the 90/30 rule, thus the statistical mean value can be applied.

SDG 12 =0.0075 t wood/ day/ stove

Baseline stove consumption

SDG 13: Climate Action

According to the applied methodology, there is no need to calculate baseline emissions separately. When the baseline fuel and the project fuel are the same and the baseline emission factor and project emission factor are considered the same, overall GHG reductions achieved by the project activity are calculated as follows (see applied methodology, page 14):

$ERy = \Sigma_{b,y} (N_{p,y} * U_{p,y} * P_{p,b,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,\ nonCO2})) - LE_{p,y}$

Where:

$\Sigma_{b,y}$ = sum over all relevant (baseline b/project p) couples

$N_{p,y}$ = cumulative number of project technology days included in the project database for project scenario p against the baseline scenario b in year y.

$U_{p,y}$ = cumulative usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate revealed by usage surveys (fraction)

$P_{p,b,y}$ = Specific fuel savings for an individual technology of project p against an individual technology of baseline b in year y, in tons/day, as derived from the statistical analysis of the data collected from field tests.

$NCV_{b,fuel}$ = Net calorific value of the fuel that is substituted or reduced ((IPCC default for wood fuel, 0.015 TJ/ton)

$f_{NRB,b,y}$ = fraction of biomass used in year y for baseline scenario b that can be established as non-renewable biomass

$EF_{fuel,CO2}$ = CO2 emission factor of the fuel that is substituted or reduced. 112 tCO2/TJ for wood/wood waste.

$EF_{fuel,\ nonCO2}$ = Non-CO2 emission factor of the fuel that is reduced

$LE_{p,y}$ = leakage for project scenario p in year y (tCO2eq/yr)

The parameters $NCV_{b,fuel}$ and $NCV_{p,fuel}$ are not applicable to this project since EF is in units of tCO2/t_fuel (see methodology page 21). Therefore, the formula applied is:

$ERy = \Sigma_{b,y} (N_{p,y} * U_{p,y} * P_{p,b,y} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,\ nonCO2})) - LE_{p,y}$

SDG 13 = 305,426 tCO_2e

E.2. Calculation of project value or estimation of project situation of each SDG Impact

SDG 1: No poverty

Annual household surveys provide data on time expenditures for fuel acquisition in the project scenario. The statistical average of a representative sample from household interviews is used.

SGD 1 = 151hours & KES 4159

SDG 3: Good health and well-being

Annual household surveys provide data on improvement of air quality with project stove. The statistical average of a representative sample from household interviews is used.

SDG 3 = 100% of stating improved air quality

SDG 4: Quality education

Tembea records number of persons reached in various training programmes, such as, Community Savings and Loaning, Stove construction, climate change awareness and education, and various other training activities.

SDG 4 = 327 persons reached with awareness creation

SDG 5: Gender equality

Tembea records number of women that receive income and training from the project. The share of female employees is calculated by dividing number of female employees by total number of employees.

SGD 5 = 45%

SDG 7: Affordable and clean energy

Number persons that benefit from efficient and clean cooking is calculated by counting total number of stoves installed as recorded in the total sales record multiplied with usage rates from latest usage surveys multiplied with average household size from latest monitoring surveys.

SGD 7 = 31,415 beneficiaries

SDG 8: Decent work and economic growth

Tembea records number of persons that receive income from the project activity, number of persons that receive an income in excess of what they were earning prior to project, and number of persons employed by the project with salaries at par with or above host country standards.

SDG 8 = 146 persons

SDG 12: Sustainable consumption and production

Quantity of woody biomass consumed in the projects scenario in year and per day are obtained from latest project KPTs. In case the data fulfils the 90/30 rule, then the statistical mean value can be applied.

SDG 12 =53.3% wood saved

0.0035 t wood/ day/ stove

Project stove consumption

SDG 13: Climate Action According to the applied methodology, there is no need to calculate project emissions separately. When the baseline fuel and the project fuel are the same and the baseline emission factor and project emission factor are considered the same, overall GHG reductions achieved by the project activity are calculated as follows (see applied methodology, page 14):

$$ERy = \Sigma_{b,y} (N_{p,y} * U_{p,y} * P_{p,b,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,\ nonCO2})) - LE_{p,y}$$

Where:

$\Sigma_{b,y}$ = sum over all relevant (baseline b/project p) couples

$N_{p,y}$ = cumulative number of project technology days included in the project database for project scenario p against the baseline scenario b in year y.

$U_{p,y}$ = cumulative usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate revealed by usage surveys (fraction)

$P_{p,b,y}$ = Specific fuel savings for an individual technology of project p against an individual technology of baseline b in year y, in tons/day, as derived from the statistical analysis of the data collected from field tests.

$NCV_{b,fuel}$ = Net calorific value of the fuel that is substituted or reduced ((IPCC default for wood fuel, 0.015 TJ/ton)

$f_{NRB,b,y}$ = fraction of biomass used in year y for baseline scenario b that can be established as non-renewable biomass

$EF_{fuel,CO2}$ = CO2 emission factor of the fuel that is substituted or reduced. 112 tCO2/TJ for wood/wood waste.

$EF_{fuel,\ nonCO2}$ = Non-CO2 emission factor of the fuel that is reduced

$LE_{p,y}$ = leakage for project scenario p in year y (tCO2eq/yr)

The parameters $NCV_{b,fuel}$ and $NCV_{p,fuel}$ are not applicable to this project since EF is in units of tCO2/t_fuel (see methodology page 21). Therefore the formula applied is:

$$ERy = \Sigma_{b,y} (N_{p,y} * U_{p,y} * P_{p,b,y} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,\ nonCO2})) - LE_{p,y}$$

The table below summarizes the values used in **2020**for the parameters of the applied formula:

Parameter	Project Scenario
Baseline wood use (tons/day)	0.0075
Project wood use (tons/day)	0.0035

$P_{p,b,1}$: Fuel savings (tons/day)	0.004
Fraction NRB	0.92
U_p	0.90
N_p	25,959,790
$EF_{fuel,CO2}$	1.7472
$EF_{fuel,\ nonCO2}$	0.1356
LE_p	0

The formula for emission reduction calculations including the values used for the parameters is:
ER_{2020} = 25959790*0.90 * 0.0040 * (0.92 * 1.7472 + 0.1356) – 0

SDG 13 = 162,894 tCO_2 e

E.3. Calculation of leakage

There is no leakage observed in the monitoring period.

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Amount of CO2e emissions reduced by the project per year.	305426	142532	162,894 tCO_2 e
1	Time (hours) and money (KES) saved per household per year due to fuel savings achieved by project stoves	404 hours KES 12906	151 hours KES 4159	253 hours KES 8747
3	Proportion (%) of positive comments from stove users on air quality improvement with project stove	0%of stove users starting improved air quality	100% of stove users stating improved air quality	100% of stove users stating improved air quality
4	Number of persons reached with awareness creation	0 Persons reached with awareness creation	327 Persons reached with awareness creation	327 Persons reached with awareness creation
5	Number of jobs offered by TYCSD to local female employees	0 Number of female employees	45% of employees are women.	45% of employees are women

				65 women employees
7	Number of persons that benefit from efficient and clean cooking technologies	0 Beneficiaries	31,415 Beneficiaries	31,415 Beneficiaries
8	Number of jobs offered by TYCSD to local employees at good conditions.	0 Number of employees	146 Number of employees	146 employees
12	Fuel savings in % achieved by project technologies compared to baseline.	0.0075t wood/ day/ stove	0.0035t wood/ day/ stove	0.004 t wood/ day/ stove 53.3% fuel saving

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[1] achieved during this monitoring period
SDG 13	**146,050**	**162,894 tCO_2e**
SDG 1	No estimate available	253 hours KES 8747
SDG 3	Expect participants to respond that indoor air quality has improved over baseline.	100% of stove users stating improved air quality
SDG 4	No estimate available	327 persons reached with awareness creation
SDG 5	Project is expected to train and generate income for 300 women.	45% 65 women received income
SDG 7	No estimate available	31,415 beneficiaries
SDG 8	No estimate available	146 Persons
SDG 12	No estimate available	53.3% fuel savings

[1] Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

The ex ante values are based on the same methodology and assumption as the calculation for this monitoring period emission calculation. Below are assumption used in the exante estimation;

- 66,413 stoves implemented
- Fuel savings of 0.0041
- Baseline fuel consumption of 0.0075t/day/stove
- Project fuel consumption of 0.0034t/day/stove

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

There are more stoves in use than had been anticipated in the PDD (66413 vs 74422). Other assumptions that have changed are indicated in section E. 5.1.

SECTION F. SAFEGUARDS REPORTING

During the transition review no safeguarding principle was threatened by the project therefore no measures to be reported.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

The project has designated grievance book in the main office, a dedicated mobile number and means through the community savings and loaning groups to channel grievances to the organization.

In the monitoring period no grievance issue was reported.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

N/A

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

No legal issue was documented/communicated in this monitoring period.

Annex 1: Fulfillment of updated requirements and guidelines for carrying out usage survey for projects implementing improved cooking devices

The PP has undertaken measures to meet the update rules for conducting usage surveys for cook stove projects published on 23/08/2017.

A. Mandatory requirements

I. Definition of stove user vs non-user-The project defines non-user as households that use the baseline stove at least once a day. To imply that any household that reports to use the baseline stove, once, twice or thrice a day is considered not using the project stove. In the analysis of monitoring data in column BP of the usage sheet the above criteria has been applied.

II. Household observation
- Kitchen observation- The PP has in the past used this criterion to check stove usage and quality. However, during this monitoring, the enumerators were trained on other techniques of checking stove use. This include presence of ash- if the ash is there, and if hot, appearance of soot-could be on the cooking service, wall or firewood inlet.
- Interview with primary cook- The enumerators sought to interview the primary cook stove users.
- Photos of the cooking area-The PP took photos of all the households visited for monitoring activity. However, the PP notes that considering the size of some kitchens it was difficult to achieve very clear photos however what is presented here captures the requirement.it includes a date stamp. The photos have been submitted saved with name of the household and their respective stove number. The questionnaire was revised to seek consent from the household.
- GPS coordinates- GPS coordinates for all the households visited for the usage survey were collected and included in the monitoring data.

III. Verification checks- the monitoring team leader contacted 30 households out of 316 reached for the usage survey translating 9.5% which is within the 5-10% required by the guideline. The PP developed a template that was used to capture responses from the household compared to those in the questionnaire. The exercise was undertaken daily to also check the work of the enumerators.

B. Good Practice Monitoring requirements

1. Field team Training and supervision- The PP developed a training guide capturing the updated rules to train enumerators involved in collection of data for usage survey. The train guide and participants list has been uploaded. The PP used the verification check as required in Mandatory requirements of the updated rules to review the works by enumerators. Throughout the exercise there was support from the team leader to the field teams.
2. End user training and follow up- the PP uses the Community Saving and Loaning groups as a platform to train, monitor and promote stove use. The groups are made of between 15-20 members from same locality who form the group to save resources, to collectively guarantee each other to acquire cook stoves.100% of stoves sold to the community use this approach and hence was considered appropriate platform to train, monitor and promote stove use. The PP has trained and recruited community mobilizers who train community on stove use, economic empowerment and climate change. We have 91 mobilizers (list uploaded). We also use the stove artisan as earliest contact to train household on stove use immediately after stove construction. Due to budgetary constraints these activities are conducted alongside awareness creation events. List of events and dates have been uploaded.
3. Awareness campaign- from the start of the project in 2010 the PP has spent considerable resources to promote community awareness on climate change, its connection to witnessed impacts as well as why use of energy efficient cook stoves matters. In the initial years this included a school programme where children were

educated to encourage their parents or custodians to use Tembea cook stoves. This requirement has been met alongside number 2 (End user training and follow up)

Conclusion

The project seeks issuance using 90% usage rate as provided by the updated rules having taken measures to meet the stated requirements. The PP however notes the requirements for End user training and Awareness can be progressively realized to increase the numbers reached over time, considering its budgetary requirement.

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption