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TEMPLATE

# MONITORING REPORT

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**VERSION** v. 1.1

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

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This document contains the following Sections

Key Project Information

Q - Description of project

Q - Implementation of project

Q - Description of monitoring system applied by the project

Q - Data and parameters

Q - Calculation of SDG Impacts

Q - Safeguards Reporting

Q - Stakeholder inputs and legal disputes

## 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)	NA
Title of the project (s) covered by monitoring report	Energy-efficient cooking stoves for KCU coffee smallholder farmers in Kagera Region, Tanzania
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	V 1.5
Version number of the monitoring report	2
Completion date of the monitoring report	22/04/2024
Date of project design certification	NA
Date of Last Annual Report	NA
Monitoring period number	1 <sup>st</sup> monitoring period
Duration of this monitoring period	17/11/2020- 16/11/2021
Project Representative	Kagera Cooperative Union Ltd.
Host Country	Tanzania
Activity Requirements applied	<input checked="" type="checkbox"/> Community Services Activities <input type="checkbox"/> Renewable Energy Activities <input type="checkbox"/> Land Use and Forestry Activities/Risks & Capacities <input type="checkbox"/> N/A
Methodology (ies) applied and version number	Gold Standard Simplified Methodology for Efficient Cookstoves', version 1.0 (February 2013).
Product Requirements applied	<input checked="" type="checkbox"/> GHG Emissions Reduction & Sequestration <input type="checkbox"/> Renewable Energy Label <input type="checkbox"/> N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13	Emission reductions	1,194	VERs
SDG 3	Proportion of stove users perceiving: <ul style="list-style-type: none"> <li>- Lower smoke levels</li> <li>- Lower incidence of coughing</li> <li>- Fewer incidences of respiratory illness</li> <li>- Fewer incidences of itchy eyes</li> </ul>	100% 100% 100% 100%	Percentage
SDG 5 (Social Empowerment Goals)- Rest and Leisure	Proportion of stove users perceiving: <ul style="list-style-type: none"> <li>- Less amount of time collecting wood</li> <li>- Less amount of money purchasing wood</li> </ul>	100% 100%	Percentage
SDG 7	Number of project stoves disseminated	559	Number

Table 2 – Product Vintages

		Amount Achieved
Start Dates	End Dates	VER
17/11/2020	16/11/2021	1,194

## SECTION A. DESCRIPTION OF PROJECT

### A.1. General description of project

The project aims to disseminate at least 550 improved cookstoves that are more efficient and use less firewood for household cooking than the traditional stoves/3-stone-fires in rural areas in the districts of Muleba, Bukoba and Missenyi; and to promote improved kitchen and firewood management practices like e.g. using a pot lid while cooking and soaking legumes (e.g. beans) before cooking, use smaller pieces of firewood and dry firewood, etc.

The project disseminates the portable, locally-made of clay Chitetezo Mbaula improved cookstoves (ICS). In the project region, the Chitetezo Mbaula stoves are better known under the name 'Majiko Sanifu' stoves. The Chitetezo reduces fuel consumption by improved combustion and improved heat transfer. The current Chitetezo design is the product of over 15 years research and development, mainly in Malawi, incorporating user feedback and local preferences.



Figure 1: Woman in Kabugaro PCS Using the improved Majiku Sanifu

Though no extra tools or moulds are actually needed for constructing the Chitetezo and the measurements can be checked simply using hands, a mechanical mould, known as the paddle mould can be used to facilitate standardization and to improve productivity. The ICS are currently manufactured locally by committee members under two Primary Cooperative Societies (PCS), Bujugo and Buhendangabo. These two PCS were trained by a Technical Officer and ICS expert from Malawi working at MUREA (Mulanje Renewable Energy Agency) in 2013.

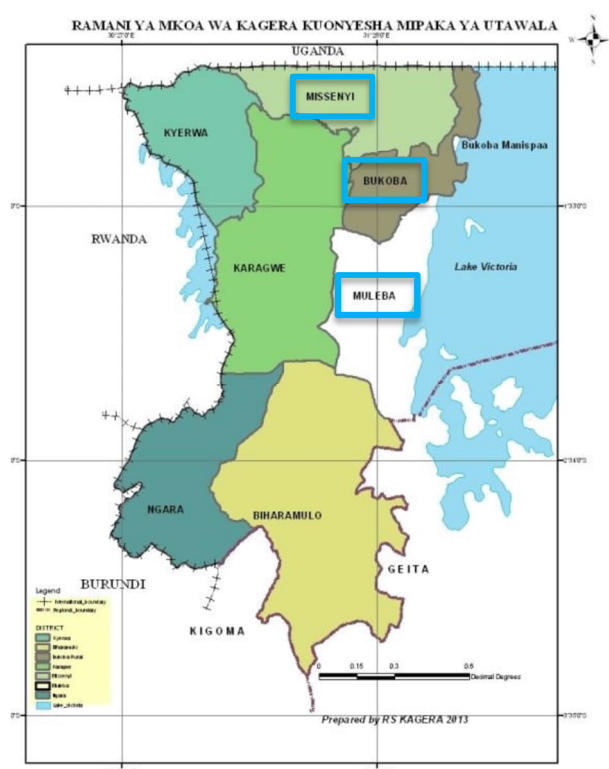
El Puente and GEPA (both trading partners of KCU) provided up-front finance to cover the costs of the project including amongst other staff and administration costs and expenses for capacity building of KCU personnel.

### A.2. Location of project

This project will take place in the districts of Muleba, Bukoba and Missenyi, Kagera region, United Republic of Tanzania.

This link provides a clear delineation of the district boundaries:  
<http://www.citypopulation.de/php/tanzania-admin.php?adm1id=18>

Kagera region	
Districts	UTM Coordinates
Muleba	Zone 36M E: 331058.86 N: 9783830.1
Bukoba	Zone 36M E: 347609.78 N: 9837663.79
Missenyi	Zone 36M E: 345858.15 N: 9873840.75



**A.3. Reference of applied methodology**

Gold Standard Simplified Methodology for Efficient Cookstoves’, version 1.0 (February 2013).

**A.4. Crediting period of project**

17/11/2020-16/12/2027

**SECTION B. IMPLEMENTATION OF PROJECT**

**B.1. Description of implemented project**

The project activities have served 464 households with Majiko Sanifu cookstoves. The stoves were distributed between 17<sup>th</sup> of November 2020 and 31<sup>st</sup> March 2021 in Buhendangabo and between 17<sup>th</sup> November 2020 and 24<sup>th</sup> of November 2020 in Bujugo. The distribution dates can be found in the project database, called "KCU\_ICS Project database\_MP1\_v1.0".

B.1.1 Forward Action Requests

Not Applicable

**B.2.** Post-Design Certification changes

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

Not Applicable

B.2.2. Corrections

Not Applicable

B.2.3. Changes to start date of crediting period

The start date of the crediting period has been changed from 1/1/2019 to 17/11/2020.

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

Not Applicable

B.2.5. Changes to project design of approved project

There is no unique identification number for each stove.

## SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

Sales of the Majiko Sanifu cookstoves were recorded in the project records database, containing the date of sale and of distribution, number of cookstoves per household, geographic area of sale and the name and telephone number (if available) of the buyer. Using this database, a random sample of 60 households was taken and these households were visited.

Monitoring surveys were done using the KoboCollect software on smartphones with necessary pictures and GPS coordinates. Monitoring data are extracted to Microsoft Excel for analysis. Records will be kept for two years after the project activity is completed.

The monitoring survey consisted of seven different subjects as described in the table below. The complete survey can be found in document "*KCU Monitoring\_SurveyQuestions\_v1.0*"

Subject of question set	Description
a) Confirmation of suitability interviewee	To check if interviewee is part of the target group of this survey and whether the interviewee participates willingly

b) Respondent contact information and ICS information	<ul style="list-style-type: none"> <li>- Questions about the location of the household</li> <li>- season at the time of interview</li> <li>- name, ID number and telephone number of interviewee</li> <li>- starting date of using Majiku Sanifu</li> </ul>
c) Number of meals eaten by household	Number of people in household, split per age category as described by the Kitchen Performance test <sup>1</sup>
d) Habits concerning the use of the Majiku Sanifu cookstove	<ul style="list-style-type: none"> <li>- How many cookstoves does the household have?</li> <li>- Is the cookstove in use (questions + controls by surveyor)</li> </ul>
e) Condition of the project stove	Observations by surveyor on condition cookstove(s), including descriptions and pictures. Based on the questions in section 3 and 4, the usage rate is determined
f) Usage survey of Majiku Sanifu and other cooking devices	To determine whether traditional cookstove is still in use and if so, why and how often is it still used. Based on these questions the discount factor for baseline stove use.
g) Sustainable development impact	Questions surrounding SDG 3, Good Health and Well-Being, and 5, Gender Equality.

Based on question set four of the monitoring survey, the Majiku Sanifu cookstoves are evaluated with the following statuses:

- Green: the construction norms<sup>2</sup> have been respected and the Majiku Sanifu cookstove doesn't need any maintenance action. It means that the outer surface of the Majiku Sanifu is not cracked and no visible damage is done to the stove.
- Orange: the construction norms have been respected, but the efficient cookstove has not well been maintained. It concerns Majiku Sanifu cookstoves that have some cracks, but which are external and do not affect the quality of the combustion of the wood.

<sup>1</sup> <http://cleancooking.org/binary-data/DOCUMENT/file/000/000/83-1.pdf> p20

<sup>2</sup> <https://cepa.rmpportal.net/Library/climate-change/Chitetezo%20Mbaula%20Guidelines.pdf> p12

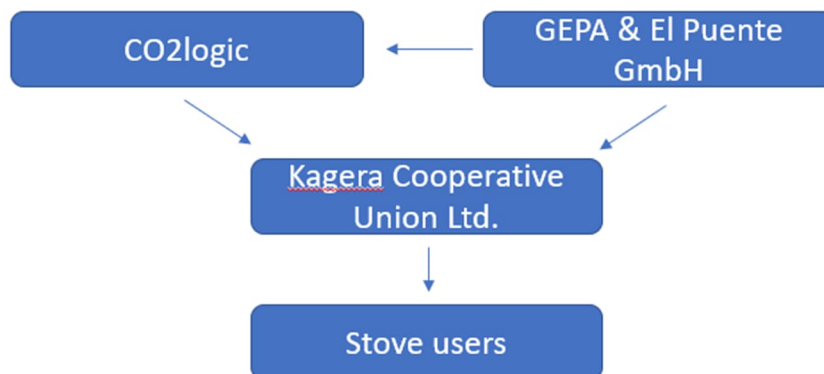
- Red: the construction norms are not respected, or the Majiku Sanifu cookstoves have not been well maintained or used in a proper way. If the Majiku Sanifu cookstove has not been well constructed, the cookstove will not be registered in the initial database. An example of poor usage is sitting before the entrance of the stove. The combustion will not happen in an appropriate way and the risk that the cookstove will crack at the level of the entrance is high. A red cookstove needs to be reconstructed.

### Diagram of Responsibilities

As there are several entities involved in initial data collection and project monitoring. It is important to clearly designate the relationships between and responsibilities of entities.

The Kagera Cooperative Union Ltd. (KCU) is a cooperative of smaller coffee producer cooperatives. The KCU is responsible for the distribution of the cookstoves and the effectuation of the monitoring survey. They are consulted by CO2logic for the technical aspects of the survey, the data processing and the writing of the report.

El Puente GmbH and GEPA (both trading partners of KCU) provide up-front finance to cover the costs of the project including amongst other staff and administration costs and expenses for capacity building of KCU personnel.



## SECTION D. DATA AND PARAMETERS

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

Relevant SDG Indicator	SDG 13, Climate Action
Data/parameter:	EF <sub>b,fuel,CO2</sub>
Unit	tCO <sub>2</sub> /ton of firewood
Description	CO <sub>2</sub> emission factor arising from use of firewood in baseline scenario
Source of data	IPCC default value, table 1.4 of chapter 1 of Vol.2, 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied)	1.747 tCO <sub>2</sub> /ton of firewood



Choice of data or measurement methods and procedures	As defined under the Gold Standard Simplified Methodology for Efficient Cookstoves
Purpose of data	Calculation of emission reductions
Additional comments	N/A

<b>Relevant SDG Indicator</b>	<b>SDG 13, Climate Action</b>
Data / Parameter:	$EF_{b,fuel,non-CO2}$
Data unit:	tCO <sub>2</sub> /tonne of firewood
Description:	Non-CO <sub>2</sub> emission factor arising from use of firewood in baseline scenario
Source of data used:	2014; IPCC Fifth Assessment Report: Climate Change
Value applied:	0.581
Justification of the choice of data or description of measurement methods and procedures actually applied:	The default value mentioned in the applied methodology (page 8) was updated considering the Global Warming Potential (GWP) values for the second commitment period. An updated GWP value for methane of 28 and for N <sub>2</sub> O of 265 has been applied in the ER calculation.
Any comment:	Fixed for entire crediting period

<b>Relevant SDG Indicator</b>	<b>SDG 13, Climate Action</b>
Data / Parameter:	$\eta_b$
Data unit:	Percentage
Description:	Efficiency of the cookstove being used in the baseline scenario
Source of data used:	Default value of the applied methodology
Value applied:	10%
Justification of the choice of data or description of measurement methods and procedures actually applied:	Default value of 10% is deemed valid by the applied methodology as the baseline stoves are three stone fires: "A default value of 10% shall be used if the replaced cookstoves is a three-stone fire, or a conventional device without a grate or a chimney i.e. with no improved combustion air supply or flue gas ventilation." (section 4.1. of the methodology)
Any comment:	Fixed for entire crediting period

<b>Relevant SDG Indicator</b>	<b>SDG 13, Climate Action</b>
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Data / Parameter:	$\eta_p$
Data unit:	Percentage
Description:	Efficiency of the cookstove being used in the project scenario
Source of data used:	Water Boiling test (WBT)
Value applied:	30.6%
Justification of the choice of data or description of measurement methods and procedures actually applied:	<p>Efficiency test made in accordance with section 4.3 of the applied methodology (test conducted by independent expert, following the Water Boiling Test protocol)<sup>3</sup></p> <p>CREEC carried out 3 sample runs on 3 randomly sampled Chitetezo Mbaula stoves in line with section 4.3 of the applied methodology. The methodology further mentions that the average of the nine results shall be taken as the efficiency for the project cookstove. The average of the nine results would lead to a thermal efficiency of 32.26% (if including the simmering tests) and 33.11% (if excluding the simmering tests). However, in order to demonstrate conservativeness, the project proponent decided to apply the lowest average value resulting from any of these 9 tests, namely 30.6%. This is in line with what has been approved in the CDM registered PoA 'Biomass Energy Conservation Programme'<sup>4</sup>. Page 9 of this PoA mentions the following: 'Independently tested laboratory efficiency of the PoA's ceramic stove is 30.6% (the most conservative of the test results) at 90% confidence level, having conducted 3 full tests (consisting of 3 parts) for each of the 3 stoves submitted'.</p> <p>Additionally, the applied value of 30.6% is lower than the average value indicated in the Catalog of Clean Cookstoves<sup>27</sup>, hence considered to be conservative. Details on the average thermal efficiency calculation can be found in tab Chitetezo Mbaula efficiency/ER_calculation_tool_cookstove_meth_v2.00_KCU project. WBT results can be found in the pdf file 'CREEC WBT Results Chitetezo Mbaula'.</p>
Any comment:	Fixed for entire crediting period

<sup>3</sup> Tests were carried out in August 2012 by the Regional Stove Testing Centre, Centre for Research in Energy and Energy Conservation (CREEC), at College of Engineering, Design, Art and Technology, Makerere University, Kampala, Uganda (creec@tech.mak.ac.ug).

<sup>4</sup> [https://cdm.unfccc.int/ProgrammeOfActivities/poa\\_db/4A2PCYSNBTWG81Z3L5FUH9RMJKQDV6/view](https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/4A2PCYSNBTWG81Z3L5FUH9RMJKQDV6/view)

Relevant SDG Indicator	SDG 13, Climate Action
Data / Parameter:	f <sub>NRB,y</sub>
Data unit:	Percentage
Description:	Fraction of biomass used that can be established as non-renewable biomass
Source of data used:	Default value for Tanzania as specified in Annex 22 of the EB 67 Report : <a href="https://cdm.unfccc.int/Reference/Notes/meth/meth_note12.pdf">https://cdm.unfccc.int/Reference/Notes/meth/meth_note12.pdf</a>
Value applied:	96%
Justification of the choice of data or description of measurement methods and procedures actually applied:	<p>The GS in a rule update in June 201228 decided the following: It was decided to allow the use in the context of Gold Standard projects of the default NRB fractions approved by CDM EB as published in Annex 22 of the EB 67 meeting report, provided the DNA of the project host country has formally approved the corresponding NRB fraction. Approval of the use of a default NRB fraction can be sought on a case-by-case basis where these have not been approved by DNAs, after feedback has been collected by project developers on the appropriateness of this NRB fraction through stakeholder consultation. These default NRB fractions can be used irrespective of the scale of the Gold Standard project. In case of formal rejection or revision of these default NRB fractions at a later stage, following decisions by DNAs, Gold Standard project developers shall revise these accordingly.</p> <p>As the default value has not been officially approved by Tanzania's DNA, relevant stakeholders (WWF, IUCN and DNA in Tanzania) were contacted by project <a href="https://mer.markit.com/br-reg/public/master-project.jsp?project_id=103000000004445">https://mer.markit.com/br-reg/public/master-project.jsp?project_id=103000000004445</a>. None of the organizations rejects the suggested default value and hence it will be used in this project. Since this approach and the project was approved by the GS Secretariat, no further stakeholder consultation in this regard is necessary and the f<sub>NRB</sub> value of 96% can be applied in this project.</p>
Any comment:	<p>Fixed for entire crediting period</p> <p>The project proponent may however choose to update the f<sub>NRB</sub> during the crediting period.</p>

Relevant SDG Indicator	SDG 13, Climate Action
Data / Parameter:	B <sub>b,y</sub>
Data unit:	Tonnes firewood per household per year (tons/hh/year)

Description:	Firewood consumption for cooking in the baseline
Source of data used:	Calculated based on default value of "Minimum service level" of the applied methodology
Value applied:	2.55
Justification of the choice of data or description of measurement methods and procedures actually applied:	<p>Default value baseline biomass consumption of 0.5 tons/person/year is deemed valid by the applied methodology (see the page 6 of the methodology). Moreover, in accordance with the methodology (page 6) the household size shall be determined by using credible references/literature or target population specific survey. The justification of the household size (5.1 persons/household) determination is described in section B.6.1.</p> <p>According the above the average annual consumption of firewood per household can be estimated to be 2.55 tons/year (0.5 tons/person/year * 5.1 persons/household = 2.55 tons/household/year).</p>
Any comment:	Fixed for entire crediting period

## D.2 Data and parameters monitored

Relevant SDG Indicator	SDG 3, Good health and well-being
Data / Parameter:	Smoke level reduction Incidence of coughing reduction Incidence of respiratory illness reduction Incidence of itchy eyes reduction
Data unit:	Fraction
Description:	Proportion of households perceiving less often smoke levels, incidence of coughing, incidence of respiratory illness, incidence of itchy eyes since the implementation of Majika Sanifu project stoves
Source of data used:	Monitoring survey – See document 'KCU_MS_2021_MP1_Analysis' tab 'Analysis'
Value of data	Smoke level reduction: 100% Incidence of coughing reduction: 100% Incidence of respiratory illness reduction: 100% Incidence of itchy eyes reduction: 100%
Description of measurement methods and procedures to be applied, inc. frequency:	The measurement of the parameter is based on qualitative information collected during Monitoring surveys. The end users are asked whether, since they have the Majika Sanifu project stoves, smoke level occurs for each more often, less often among the family members or the situation has not changed. The same is asked for coughing, respiratory illnesses and itchy eyes.

QA/QC procedures to be applied	Transparent data analysis and reporting
Any comment:	N/A

Relevant SDG Indicator	SDG 5, Gender equality
Data / Parameter:	Proportion of stove users perceiving reduced amount of time spent on wood fuel collection and/or reduced amount of money spent on wood fuel purchase
Data unit:	Fraction
Description:	Proportion of stove users perceiving reduced time spent on wood fuel collection and/or reduced money spent on wood fuel purchase since the implementation of the Majiku Sanifu project stoves
Source of data used:	Monitoring survey – See document ' <i>KCU_MS_2021_MP1_Analysis</i> ' tab ' <i>Analysis</i> '
Value of data	Reduced amount of time spent on wood fuel collection: 100% Reduced amount of money spent on wood fuel purchase: 100%
Description of measurement methods and procedures to be applied, inc. frequency:	The measurement of the parameter is based on qualitative information collected during Monitoring surveys. The end users are asked whether, since they have the F3PA efficient cookstoves, they spent more, less time to collect the wood or the situation has not changed. In case of purchase wood fuel, the end users are asked they spent more, less money on the purchase of wood fuel or the situation has not changed.
QA/QC procedures to be applied	Transparent data analysis and reporting
Any comment:	N/A

Relevant SDG Indicator	SDG 7, Affordable and clean energy
Data / Parameter:	Number of Majika Sanifu project stoves disseminated
Data unit:	Fraction
Description:	Number of Majika Sanifu project stoves included in the project database for project scenario p
Source of data used:	Project database– See document ' <i>KCU_ICS Project database_MP1</i> ' tab ' <i>Total Project Database</i> '
Value of data	559
Description of measurement methods and procedures to be	The project database provides a list of end-users with number of Majika Sanifu project stoves per end-user.

applied, inc. frequency:	
QA/QC procedures to be applied	Transparent data analysis and reporting
Any comment:	N/A

<b>Relevant SDG Indicator</b>	<b>SDG 13, Climate Action</b>
Data / Parameter:	$U_{p,0-1}$
Data unit:	Percentage
Description:	Usage rate in project scenario p during year 1
Source of data used:	Monitoring survey – See document ' <i>KCU_MS_2021_MP1_Analysis</i> ' tab ' <i>Analysis</i> ' cell B25
Value of data	94.83%
Description of measurement methods and procedures to be applied, inc. frequency:	The usage survey is carried out annually as described in the PDD section B.7.2
QA/QC procedures to be applied	Transparent data analysis and reporting
Any comment:	A usage parameter is derived for each group of project cookstoves being credited

<b>Relevant SDG Indicator</b>	<b>SDG 13, Climate Action</b>
Data / Parameter:	$N_{p,0-1}$
Data unit:	Number of households included in the project (Units), based on days of usage of age group 0-1 during the monitoring period related to one year.
Description:	Household in the project database for project scenario p through year 1 for which all baseline cookstove(s) (traditional three stone cookstoves for domestic use) have been replaced by project cookstove(s)
Source of data used:	Project database – See document ' <i>KCU_ICS Project database_MP1</i> '
Value of data	383
Description of measurement methods and procedures to be applied, inc. frequency:	Continuous monitoring. The number of project cook stoves is recorded in the total sales record which is maintained as described in the PDD section B.7.2

QA/QC procedures to be applied	Transparent data analysis and reporting
Any comment:	The total sales record is divided based on project scenario to create the project database

<b>Relevant SDG Indicator</b>	<b>SDG 13, Climate Action</b>
Data / Parameter:	$DF_n$
Data unit:	Fraction
Description:	Discount factor to account for efficiency loss of project cookstoves
Source of data used:	Default value of the applied methodology
Value of data	0.99
Description of measurement methods and procedures to be applied, inc. frequency:	Annual monitoring. The physical conditions of the cookstoves is monitored as described in section B.7.2.
QA/QC procedures to be applied	Transparent data analysis and reporting
Any comment:	<p>This default value can be used if stoves are found in good condition during annual surveys. For each year, the stoves of the age-group x-y should be physically verified. In the case of progressive installations, stove of age-group 0-1 shall also be physically verified each year through a random sampling approach. The survey format B (Annex A of the applied methodology) will be followed to capture the required information. Minimum number of sample size shall be selected following the guidelines provided in section 4.2, option (b) of the applied methodology.</p> <p>During annual survey if it is found that the project cookstoves are not in working conditions, the proportionate population of project cookstoves should be excluded from the project database, until these cookstoves are replaced with new cookstoves.</p>

<b>Relevant SDG Indicator</b>	<b>SDG 13, Climate Action</b>
Data / Parameter:	$DF_{p, stove, 0-1}$
Data unit:	Fraction
Description:	Discount factor to account for the baseline stove use in project scenario p during the year 1



Source of data used:	Monitoring survey – See document 'KCU_MS_2021_MP1_Analysis' tab 'Analysis' cell B259
Value of data	12.44%
Description of measurement methods and procedures to be applied, inc. frequency:	Annual monitoring. The use of baseline stove in the project activity is monitored as described in the PDD section B.7.2.
QA/QC procedures to be applied	Transparent data analysis and reporting
Any comment:	The discount factor for baseline-stove use may be determined based on number of meals cooked using the baseline stoves. The required information shall be captured through sample-surveys carried out following a random sampling approach for each age-group of the project stove. The minimum number of samples sizes shall be selected following the guidelines provided in section 4.2, option (b) of the applied methodology. The survey format B (Annex A of the applied methodology) will be followed to capture the required information. The impact of seasonal variations on use of baseline stove should be considered as part of the monitoring survey.

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

Not applicable since this is the first monitoring period.

**D.4. Implementation of sampling plan**

During the distribution of the Majika Sanifu project stoves, the project database was continuously updated to include all sales and distributions. This way, a distribution record was established to track all households having the project cookstove(s).

A monitoring survey was performed between 29/11/2021 and 1/12/2021. This is meant to establish the usage rate of all age groups currently in the project. For now, there is only one age group, namely 0-1. The monitoring survey will also determine the discount factor to account for the baseline stove use. Lastly, this monitoring survey will measure the parameters regarding SDG 3 and 5.

The number of households of which the main stove user of the household has received the Majika Sanifu project stove which should replace the traditional three stones cookstoves for domestic use, is recorded in the project database (see document 'KCU\_ICS Project database\_MP1'). Only the households recorded in the database are part of the project activity.



Since the project activities started in November 2020, there is only one age group, i.e. 0-1. The start of the crediting period of each household is considered as the first installation date of all stoves within the household. For each household the number of technology-days during MP1 are calculated per age group, ie age group 0-1. The number of households per age-group are determined after cumulation of the technology-days per age group of the households in the project database divided by the number of days in a year, i.e. 365 days.

The minimum household sample size of each age group is determined according the following guidelines (according the Gold Standard Simplified Methodology for Efficient Cookstoves):

- Project target population < 300: Minimum sample size 30;
- Project target population 300 to 1000: Minimum sample size 10% of group size;
- Project target population > 1000: Minimum sample size 100.

As the number of recorded household is between 300 to 1000, namely 464 households, the minimum sample size is 47 households. It was decided to sample 60 households.

The method of selecting households for the sample list for the monitoring survey is random sampling using the random functionality in excel (see document '*KCU\_ICS Project database\_MP1\_sampling*'). For all parameters that are monitored via sampling it is understood that only the age of the project cookstove has an influence. Therefore, no geographic representativeness is deemed necessary for the selection of users participating in the sample groups. The monitoring surveys are performed by user interviews. Only people older than 18 years are interviewed. The surveyors have been trained based on the monitoring protocol (see document '*KCU monitoring\_Monitoring Survey Guidelines and Instructions*').

The questions used during the survey are presented in the document '*KCU Monitoring\_SurveyQuestions\_v1.0*'. Apart from information for the sustainable development indicators, the survey has been built up in order to collect reliable data to calculate the usage rate  $Up,y$  per age group and the discount factor to account for the baseline stove use  $DFb,stove,y$  per age group.

All the 60 sampled households have been surveyed, but for 2 households there were some issues with the synchronization with the data collection tool. Hence the analysis has been performed on 58 survey results.

The following points were considered when evaluating the usage rate  $Up,y$ :

- All project cookstoves within the sample are assessed if they are still operational. If one stove user doesn't use any of its project cookstoves, the corresponding household is considered as drop-off;
- The working conditions of project cookstoves are evaluated on the status (i) *Green*: the stove is in good working conditions, (ii) *Orange*: the stove is in acceptable working conditions, but needs some maintenance activities; and (iii) *Red*: the stove is not working well, and needs to be reconstructed (see section

C for more details). A household with only red project cookstove is considered as a drop-off;

- If a stove-user migrated even for a temporary period, the corresponding household is considered as a drop-off;

Based on the collected data during the survey for this monitoring period the usage rate  $Up,1$  of age group 0-1 is evaluated at 94.83%. In total 3 households out of the 58 households surveyed had an usage rate of 0% because of too bad condition of the Majika Sanifu project stove.

The discount factor to account for the baseline stove use is calculated based on the number of meals that have been cooked with the baseline stove during the monitoring period. The impact of dry and wet season on the baseline stove use has been evaluated. The following points were considered when evaluating the discount factor to account for the baseline stove use  $DF_{b, stove, y}$ :

- Usage of baseline stove during wet and dry season has been surveyed, as well as the number of meals cooked during dry and wet season;
- Based on the number of meals cooked with the baseline cookstove compared to the number of cooked meals, the baseline usage fraction is calculated per stove user;
- The discount factor for the baseline stove use is based on the average baseline stove use fraction of all the households within the sample;
- If a household has dropped off when evaluating the usage rate, it is not considered when calculating the average baseline stove use fraction;
- A conservative approach has been considered when evaluating the number of meals cooked with the baseline stove.

Based on the collected data during the survey, the baseline stove usage fractions have been evaluated at 12.44% for age group 0-1. This means that, on average, approximately 13 meal out of 100 meals are cooked with the baseline stove.

## SECTION E. CALCULATION OF SDG IMPACTS

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

- a) SDG 3, Good health and well-being  
Not applicable, the direct outcome is calculated, see section E.3.
- b) SDG 5, Gender equality  
Not applicable, the direct outcome is calculated, see section E.3.
- c) SDG 7, Affordable and Clean energy  
Not applicable, the direct outcome is calculated, see section E.3.
- d) SDG 13, Climate Action  
The methodology directly provides equation for emission reductions (without separate baseline, project or leakage emission reduction equations). See section E.3. for the calculation of the emission reductions.

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

- a) SDG 3, Good health and well-being  
Not applicable, the direct outcome is calculated, see section E.3.
- b) SDG 5, Gender equality  
Not applicable, the direct outcome is calculated, see section E.3.
- c) SDG 7, Affordable and Clean energy  
Not applicable, the direct outcome is calculated, see section E.3.
- d) SDG 13, Climate Action  
The methodology directly provides equation for emission reductions (without separate baseline, project or leakage emission reduction equations). See section E.3. for the calculation of the emission reductions.

### E.3. Calculation of leakage

In accordance with the applied methodology leakage related to non-renewable biomass saved by the project activity is not considered as the proposed project is a stand-alone micro-scale project activity.

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Number of tCO2e reduced by the project			
	Proportion of households perceiving:			
3	- smoke level reduction:			100%
	- incidence of coughing reduction:			100%
	- incidence of respiratory illness reduction:			100%

	- incidence of itchy eyes reduction:	100%
5	Proportion of stove users perceiving reduced amount of time spent on wood fuel collection	100%
	and/or reduced amount of money spent on wood fuel purchase	100%
7		

a) SDG 3, Good health and well-being

Smoke level reduction = (Number of stove users perceiving less smoke since the implementation of Majiko Sanifu cookstoves) / (Number of respondents)

Incidence of coughing reduction = (Number of stove users perceiving less incidence of coughing since the implementation of Majiko Sanifu cookstoves) / (Number of respondents)

Incidence of respiratory illness reduction = (Number of stove users perceiving less incidence of respiratory illnesses since the implementation of Majiko Sanifu cookstoves) / (Number of respondents)

Incidence of itchy eyes reduction = (Number of stove users perceiving less incidence of itchy eyes since the implementation of Majiko Sanifu cookstoves) / (Number of respondents)

b) SDG 5, Gender equality

Proportion of stove users perceiving reduced amount of time spent on fuel collection = (Number of stove users perceiving reduced amount of time spent on fuel collection) / (Number of respondents collecting wood fuel)

Proportion of stove users perceiving reduced amount of money spent on wood fuel purchase = (Number of stove users perceiving reduced amount of money spent on wood fuel purchase) / (Number of respondents purchasing fuel)

c) SDG 13, Climate Action

The methodology directly provides equation for emission reductions (without separate baseline, project or leakage emission reduction equations). The emission reduction for the project are calculated using the following equation.

$$ER_y = \sum_{0 \text{ to } 1}^x N_{p,y} * P_y * U_{p,y} * (f_{NRB,y} * EF_{b,fuel,CO2} + EF_{b,fuel,nonCO2}) * (1 - DF_{b,stove,y})$$

Where

$N_{p,y}$	Number of households with project cookstoves of each age group operational in the year y
$P_y$	Quantity of firewood that is saved in the year y (tonnes per household in year y)
$U_{p,y}$	Usage rate for project cookstoves in year y, based on adoption rate and drop off rate revealed by usage surveys (fraction)
$f_{NRB,y}$	Factional non-renewability status of wood fuel during year y
$EF_{b,fuel,CO2}$	CO2 emission factor of firewood that is substituted or reduced
$EF_{b,fuel,nonCO2}$	Non CO2 emission factor of firewood that is substituted or reduced
$DF_{b,stove,y}$	Usage of baseline cookstove during the year y (fraction) in project scenario
X	y-1
Y	Year of crediting period

Determination of quantity of biomass saved ( $P_y$ ):

Quantity of firewood that is saved ( $P_y$ ) is estimated using the following equation:

$$P_y = B_{b,y} * \left(1 - \frac{\eta_b}{\eta_{p,y}}\right)$$

Where:

$P_y$	Quantity of firewood that is saved in the year y (tonnes per household in year y)
$B_{b,y}$	Quantity of firewood consumed in baseline scenario during year y (tonnes per household per year)
$\eta_{p,y}$	Efficiency of project cookstove in year y (fraction)
$\eta_b$	Efficiency of the baseline cookstove being replaced (fraction). A default value of 10% shall be used if the replaced cookstove is a three stone fire, or a conventional device without a grate or a chimney i.e. with no improved combustion air supply or flue gas ventilation
y	Year of the crediting period

Determination of quantity of fire wood consumed in the baseline ( $B_{b,y}$ ):

The firewood consumed is the estimated average annual consumption of firewood per household (tonnes/year), which may be derived using option (c) of the methodology: minimum service level i.e. energy derived from the combustion of 0.5 tonnes per capita per year as the default baseline biomass consumption. The average household size per municipality is described in the PDD and is based on the Demographic and Health Survey (DHS) 2015-2016.

Determination of project cookstove efficiency ( $\eta_{p,y}$  and  $\eta_p$ ):

Efficiency of project cookstove in year y ( $\eta_{p,y}$ ) is estimated as follows:

$$\eta_{p,y} = \eta_p * (DF_{\eta})^{y-1} * 0.94$$

Where

- $\eta_{p,y}$  Efficiency of project cookstove in year y (fraction)
- $\eta_p$  Efficiency of project cookstove (fraction) determined at the start of the project activity
- $DF_{\eta}$  Discount factor to account for efficiency loss of project cookstove per year of operation (fraction)
- 0.94 Adjustment factor to account for uncertainty related to project cookstove efficiency test

**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 <sup>5</sup> achieved during this monitoring period
13	1726	1,194

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

The ex-ante calculations in the PDD were higher, as it was assumed that one household would only receive one project stove. The reductions are calculated at household level. It appears that 559 project stoves were disseminated to 464 households compared to the ex-ante calculations in which 550 households would have received a project stove. The usage factor and discount factor for baseline stove usage are very similar between ex-ante and ex-post calculations.

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

>> Not applicable

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<sup>5</sup> Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

## SECTION F. SAFEGUARDS REPORTING

Nothing to report on safeguarding principles

## 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.

No inputs/ grievances have been received for the project during the monitoring period

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

No official local stakeholder consultation has been conducted since the project activity will not be certified with the Gold Standard.

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

No legal contest has arisen

## Revision History

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