



DELAGUA CLEAN COOKING GROUPED PROJECT IN RWANDA



Project title	<i>DelAgua clean cooking grouped project in Rwanda</i>
Project ID	<i>4150</i>
Monitoring period	<i>01-March-2024 to 30-September-2024</i>
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Most recent date of issue	<i>30-January-2025</i>
Version	<i>3.0</i>
VCS Standard Version	<i>4.7</i>
Prepared by	<i>Ashutosh Tiwari - DelAgua</i>

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The grouped project involves dissemination of energy-efficient, improved cookstoves (ICS) to replace existing traditional cookstoves in domestic households of Rwanda. The grouped project has six project activity instances (PAI-1 to PAI-6) till the end of this monitoring period.

The distribution of the project ICSs begun on 11-October-2021 under the PAI-2. This date is also the start date of the grouped project and the start date of crediting period for this project. Till the end of current monitoring period, total 548,327 ICSs have been distributed throughout Rwanda. During the current monitoring period, the project has achieved GHG emission reduction of 1,400,322 tCO_{2e}.

Technology/ Measures

The ICSs disseminated under the grouped project are based on a “rocket stove” and designed to improve fuel combustion and heat transfer. The project stoves improve heat transfer to cooking pots through the insulated walls and design of the stove top when compared to traditional cooking methods over open- and three-stone fires. The ICS results in the reduction of fuel consumption and improvement in levels of Indoor air pollution for project users (reducing smoke, black soot, and particulate matter (PM) emissions). The reduction in consumption of cooking fuel also reduces equivalent greenhouse gas (GHG) emissions attributed to the use of non-renewable biomass.

For the current monitoring period, the PAI-1 to PAI-6 includes dissemination of Burn Kuniokoa G2 stoves, a tier 3 cooking devices with the following specification:

Name of the ICS	Kuniokoa Generation 2
Manufacturer	Burn
Type	Natural Draft
Material	Stainless Steel
Dimensions	32.1 cm Height, 28.2 cm Diameter
Thermal efficiency	With Pot skirt – 51.3%, Without pot skirt – 43.4%
Power Output	2.9 kW
Lifetime	10 Years
Photo	

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
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Validation	11-October-2021 to 10-October-2028	VCS	Earthood Services Pvt Ltd	1 st Crediting Period (7 Years)
Verification	11-October-2021 to 28-February-2023	VCS	Earthood Services Pvt Ltd	1.386 years (506 days)
Verification	1-March-2023 – 29-February-2024	VCS	SustainCERT SA	One Year
Verification	1-March-2024 – 30-September-2024	VCS	SustainCERT SA	0.584 Year (214 days)

1.3 Sectoral Scope and Project Type

Sectoral scope¹	03 – Energy demand
Project activity type	Type II – Energy efficiency improvement projects

1.4 Project Proponent

Organization name	DelAgua Health Rwanda (Voluntary) Limited (DHRV)
Contact person	David Kitt
Title	Director: Business Intelligence
Address	c/o Cafferata & Co., Poinciana & West Mall Drove, Freeport, Grand Bahama, P.O. Box F-42614, Commonwealth of the Bahamas
Telephone	+250-790002992
Email	vcsprojects@delagua.org

Organization name	DelAgua Projects Pte. Ltd.
Contact person	Neil Mcdougall
Title	Chairman, Director
Address	c/o c/o 38 Beach Road, South Beach Tower, #29-11, Singapore 189767
Telephone	+352 661 939 304
Email	Vcsprojects@delagua.org

1.5 Other Entities Involved in the Project

There are no other entities involved in this project.

1.6 Project Start Date

Project start date	11-October-2021
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¹ Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

	PAI #	Start Date
	PAI 1	24-January-2023
	PAI 2	11-October-2021
	PAI 3	14-May-2022
	PAI 4	11-January-2022
	PAI 5	22-March-2023
	PAI 6	19-May-2023
Justification	Date of the first distribution of ICS under each PAI.	

1.7 Project Crediting Period

Crediting period	☒ Seven years, twice renewable ☐ Ten years, fixed ☐ Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)
Start and end date of first or fixed crediting period	11-October-2021 to 10-October-2028

1.8 Project Location

Host Country: Rwanda

Province : All Provinces of Rwanda

District/Sector/Cell/Village etc.: All Districts; Sectors; Cells; and Village in Rwanda

Physical/Geographical location:

The project boundary for the grouped project is the geographic borders of Rwanda. The project boundary for each Project Activity Instance is the physical, geographical location of the ICS distributed within the geographical boundaries of Rwanda. The grouped project has six PAIs till the end of this monitoring period, which are within the geographical boundary of the grouped project.

Till MP3, PP has distributed the ICS in total of 18 districts: Burera, Gakenke, Gicumbi, Huye, Kamonyi, Karongi, Kirehe, Muhanga, Musanze, Ngoma, Nyabihu, Nyagatare, Nyamagabe, Nyamasheke, Nyaruguru, Rubavu, Rusizi, and Rwamagana. KML file covering all districts where distribution is planned or has taken place is uploaded on the Verra registry as supporting documents to demonstrate the extent and the geographical coverage of the PAIs within the GP. The KML file indicates the regions within the geographical boundaries of the host country Rwanda.

The project boundary is defined by the following GPS coordinates:

2° 50' 23.8992" S and 28° 51' 42.1452" E

1° 2' 50.82" N and 30° 53' 56.6592" E

The map of Rwanda, for reference purpose, is as follows:



Figure 1 Project Location

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VMR0006	VMR0006 - Energy Efficiency and Fuel Switch Measures In Thermal Application	1.1
Tool	CDM Tool:302	TOOL30: Calculation of the fraction of non-renewable biomass	Version 4.0
Guideline	-	Guideline: Sampling and surveys for CDM project activities and programmes of activities	Version 4.0
Standard	-	Standard: Sampling and surveys for CDM project activities and programmes of activities	Version 9.0

² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v4.0.pdf>

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☐ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, “Carbon credits may be issued through the Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities].”

☐ Yes

☐ No

If yes to all:

Provide evidence of the public statement. Evidence must be provided in this section or in an appendix.

1.12 Sustainable Development Contributions

The grouped project activity involves dissemination of energy-efficient, improved cookstoves (ICS) to replace existing traditional cookstoves in domestic households in Rwanda. The GP is contributing towards sustainability, which is also verifiable through the SDG indicators selected for the specific activities that are going to be monitored for their fulfilment.

The grouped project has six project activity instances (PAI-1 to PAI-6) till the end of this monitoring period. A summary of sustainable development contributions for all 6 PAIs is provided in the following table:

SDG Targeted	SDG Indicator	Sustainable Development Benefits	Nationally stated Sustainable Development Priority ³
SDG 1	1.4.1 Proportion of population living in households with access to basic services	Cooking is widely recognized as an essential service, given that food is a fundamental necessity for humans and other living beings. Therefore, improved access to cooking facilities is likewise deemed a basic need and essential. The project by distributing ICS provides access to basic services.	Yes
SDG 3	3.9.1 Mortality rate attributed to household and ambient air pollution	Evidence: ICS distribution Database monitoring survey results The indoor pollutants emissions attributed to inefficient burning of solid biomass fuels in the beneficiary households are reduced. The project ICS aids improved combustion of solid biomass fuel thereby reducing smoke and Particulate matter (PM) emissions. Evidence: ICS distribution Database monitoring survey results	Yes

³<https://www.minecofin.gov.rw/index.php?eID=dumpFile&t=f&f=15326&token=3f50e67804168295fc49c40ef03de1718f5bda>
f2

SDG 5	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age and location	The project ICS saves time in cooking activities (by faster cooking) as well as save time in fuel procurement (reduced collection time) due to reduced fuel consumption. The proportion of HHs confirming the reduction in amount of time spent on collection of firewood and cooking time during the survey, multiplies with the total number of households to get the total number of impacted HHs. Evidence: Monitoring Survey for VCS GP includes questions on time spent on collection of fuel.	Yes
SDG 7	7.1.2 Proportion of population with primary reliance on clean fuels and technology	The project activity by distributing ICS provides access to clean cooking with primary reliance on clean fuels and technology. Evidence: ICS distribution Database monitoring survey results	Yes
SDG 8	8.3.1 Proportion of informal employment in total employment, by sector and sex	As part of the project activities (distribution and education campaign) DelAgua employs local community members. Evidence: The salary slips for the CHWs act as the data source since these are not on DelAgua's payrolls. However, there are different data sources (number of mobile phones assigned to individuals during distribution, number of CHWs trained for a specific distribution event), which are used to total the CHWs working for DelAgua.	Yes
SDG 12	12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	The project activity educates and trains the team involved in the distribution of ICS and educates the end user HHs about sustainable cooking practices. With this, it can be said that the local population is learning sustainable practices and a healthy lifestyle without spending anything. Evidence: 1) Distribution Database 2) CHW training Data	Yes
SDG 13	13.0 Total greenhouse gas emissions per year	The project by replacing the inefficient traditional stove with the energy-efficient ICS shall reduce equivalent GHG emissions for meeting similar thermal energy needs as that in the baseline. Evidence: Monitoring report and ER Calculation Sheet	Yes
SDG 15	15.4.2 Mountain Green Cover Index	The implemented project activity leads to a decrease in deforestation in the mountainous forest ecosystem. This eventually leads to an increase in the mountain green cover index compared with the baseline. Evidence: Registered PD, MR and ER Sheet	Yes

Table 1: Sustainable Development Contributions

Row nu	SDG targ	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	1.4	1.4.1 Proportion of population living in households with access to basic services	Implemented activities to increase	Cooking is widely recognized as an essential service, given that food is a fundamental necessity for humans and other living beings. Therefore, improved access to cooking facilities is likewise deemed a basic need and essential. Given, the total number of ICS distributed under the grouped project is 548,327 hence,, 548,327 HHs receiving the project ICS now have access to basic cooking services. PAI-1: 24,941 PAI-2: 250,019 PAI-3: 99,412 PAI-4: 24,641 PAI-5: 99,471 PAI-6: 49,843	Till the end of this monitoring period, 548,327 households now have access to basic cooking services when compared with the baseline.
2)	3.9	3.9.1 Mortality rate attributed to household and ambient air pollution	Implemented activities to decrease	Mortality rate attributed to HH and ambient pollution will decrease for those HHs using the DeAgua improved cookstove. The improved design specifications of the project ICS model(s) ensure there is much less pollution in the households as compared to the baseline. The survey results demonstrate that 95.92% of households confirmed reductions in the smoke level. So, a total of 525,982 households now have less risk towards respiratory ailments due to smoke inside their homes due to the implementation of this project	Till the end of this monitoring period, 525,982 households now have less risk towards respiratory ailments due to smoke inside their homes due to the implementation of this project as compared to the baseline.

3)	5.4	5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location	Implemented activities to decrease	Survey results show 93.79% of respondents stating that they have reduced the amount of time tending fire and collecting wood. Hence, 514,267 Households have reduced their time spent in fuel collection and cooking activities.	Till the end of this monitoring period, a total of 514,267 households were positively affected.
4)	7.1	7.1.2: Proportion of population with primary reliance on clean fuels and technology	Implemented activities to increase	The number of HHs with access to clean cooking has been increased with the implementation of this grouped project. A total of 548,327 HHs have received the ICS under the grouped project. During the surveys, 95.92% of HHs confirmed usage of ICS. Thus, till the end of MP3, 525,982 distributed ICS are operational (i.e., These HHs have access to clean cooking when compared with the baseline). PAI-1: 24,228 PAI-2: 242,343 PAI-3: 94,678 PAI-4: 23,820 PAI-5: 94,734 PAI-6: 46,178	Till the end of this monitoring period, 525,982 households now have access to clean cooking when compared with the baseline.
5)	8.3	8.3.1 Proportion of informal employment in total employment, by sector and sex	Implemented activities to increase	As part of the project activities (distribution and education campaign) DelAgua employs local community members. To manage activities up to this point have created 3,240 informal employments.	Till the end of MP3, a total of 3,240 informal employment has been created with the project activity.

6)	12	12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	Implemented activities to increase	The project activity educates and trains the team involved in the distribution of ICS and educates the end user HHs about sustainable cooking practices and awareness on climate change impacts. With this, it can be said that the local population is learning sustainable practices and a healthy lifestyle without spending anything. i) The number of CHWs that were educated (trained for distribution, 6-monthly household visits, surveys, and training on sustainable cooking practices to be disseminated to end user households) by the Grouped Project (for PAI-1 to PAI-6) by the end of M.P.-3 are 3,240. ii) The number of end users per household that are educated for stove usage and apply sustainable cooking practices are equal to the exact number of households where project ICS are distributed. Total Number of HHs educated are 548,327. PAI-1: 24,941 PAI-2: 250,019 PAI-3: 99,412 PAI-4: 24,641 PAI-5: 99,471 PAI-6: 49,843	Till the end of this monitoring period, 548,327 households were educated about stove usage and to apply sustainable cooking practices.
7)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	1,400,322 tCO ₂ e have been reduced during the current monitoring period for all PAIs 1-6.	Till the end of this monitoring period, a total of 5,262,281 CO ₂ e emissions have been reduced by the project activity considering previous MPs as well.

8)	15	15.4.2: Mountain Green Cover Index	Implemented activities to increase	<i>The implemented project activity leads to a decrease in deforestation in the mountainous forest ecosystem. This eventually leads to an increase in the mountain green cover index compared with the baseline.</i> <i>The amount of total firewood saved by the GP is 770,470 tons in MP3.</i> <i>PAI-1: 37,505 tons</i> <i>PAI-2: 352,685 tons</i> <i>PAI-3: 136,688 tons</i> <i>PAI-4: 31,588 tons</i> <i>PAI-5: 140,116 tons</i> <i>PAI-6: 71,889 tons</i>	<i>Till the end of this monitoring period, a total of 2,882,730 tons of firewood have been saved by the project activity considering previous MPs as well.</i>
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1.13 Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

The Stakeholder makeup has not changed since validation. Prior to the start of validation, PP conducted a comprehensive stakeholder consultation event as described in section 2.2 of registered VCS PD.

Stakeholder Identification	The Stakeholder makeup has not changed since validation. Prior to start of validation, hence this is not deemed applicable.
Legal or customary tenure/access rights	As the project is not a land use project, there are no legal or customary tenure issues or access rights that are impacted by the project.
Stakeholder diversity and changes over time	Refer section 2.2 of registered PD. No expected change has happened to the stakeholders' makeup
Expected changes in well-being	Household air pollution (HAP) is estimated to lead to 3.2 million ⁴ premature deaths globally each year, with the majority of those occurring in sub-Saharan Africa and Asia ⁵ . By providing improved cookstoves and education on the benefits of clean cooking, the project will see positive changes in health. In addition, clean cooking has been shown to contribute towards various SDGs, such as gender equality and zero hunger, meaning the project will produce positive changes in well-being beyond health.
Location of stakeholders	Primary stakeholders are located in rural communities across Rwanda. District government officials are located in rural areas across Rwanda, whilst the Ministry of Environment is headquartered in Kigali (capital city.)

⁴ <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health>

⁵ <https://ourworldindata.org/grapher/indoor-pollution-deaths-1990-2017>

Location of resources	As this is not a land use project, this is not applicable.
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2.1.2 Stakeholder Consultation and Ongoing Communication

Prior to the start of validation, PP conducted a comprehensive stakeholder consultation event as described in section 2.2 of registered VCS PD. The PP has already established a grievance mechanism / ongoing communication for stakeholders to raise any concerns about potential negative impacts of the project during project implementation.

Ongoing consultation	The stakeholders are informed about the grievance register which is maintained at the local office locations of the PP. Local people employed as field staff, and resource persons also serve as medium to escalate grievances received from the project beneficiaries in their respective zones to PP. Further, Delagua has a toll-free helpline for the relevant stakeholders to connect with them in case they require any assistance. Any relevant concern received during operation of project activity is addressed according to its merit.
Date(s) of stakeholder consultation	The stakeholder consultation was conducted prior to validation. Refer section 2.2 of the registered PD for details of consultation conducted prior to validation. Alongside this national level LSC, PP conducts local stakeholder meetings with before distribution of stoves in each sector/district or sign a collaboration agreement with the districts. Attendees in such meetings include local government officials, alongside traditional local leaders from communities. This ensures the project is clearly communicated at all levels.
Communication of monitored results	The government stakeholders have been informed through the preparation and submission of a Monitoring Report.
Consultation records	Refer section 2.2 of the registered PD for details of consultation conducted prior to validation and records of local meetings conducted before distribution in monitoring period.
Stakeholder input	Stakeholder input

2.1.3 Free, Prior, and Informed Consent

Consent	Prior to commencing the project, DelAgua signed a Memorandum of Understanding with Ministry of Environment to distribute improved cookstoves to rural households across Rwanda. Following this, DelAgua has signed Collaboration Agreements with the districts that the project has been delivered in (to date.) These agreements
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	help the population in protecting the environment by scaling down firewood consumption while reducing indoor air pollution leading to improved respiratory health. Prior to distribution all potential ICS recipients are gathered to introduce the project. They are invited to receive a ICS free of charge. All recipients must consent to receive an ICS by attending a distribution day and signing the agreement on the bottom of the DelAgua poster.
Outcome of FPIC	Not applicable, the project activity involves distribution of improved cookstoves to individual households and hence any possibility of forced eviction/physical relocation of people due to the project is not applicable. There are no legal or customary tenure/access rights to territories and resources, including collective and conflicting rights, held by stakeholders, indigenous people (IPs), local communities (LCs), or customary rights holders. It is a completely voluntary activity and households participating are free to choose whether they take part or not. The PP collaborates with the local entrepreneurs for fabrication as well as installation of project ICS thereby empowering them economically rather than relocation / threat.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
No major grievances have been received during the monitoring period.	Not applicable
DelAgua maintains a grievance register for the project to capture any grievances raised in order to redress them. Please see submitted grievance register and appendix 4 for record of minor grievances raised during this MP. Further, the DelAgua has a toll-free helpline for the relevant stakeholders to connect with them in case they require any assistance.	

2.1.5 Public Comments

Summary of comments received	Actions taken
No comments were received.	Not applicable

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

DelAgua has been delivering cookstove projects for over 10-years and has several active projects listed under VERRA. DelAgua does not sub-contract any of the implementation of this project to non-DelAgua entities. Thus, DelAgua management teams have expertise or experience in implementing similar project activities and engaging communities.

The operational management team for this project are Rwandan nationals with deep experience of rural delivery of services and government engagement.

Senior management of DelAgua manage multiple projects across multiple jurisdictions with deep experience in Carbon Methodologies, Research, Data Analysis and management of large scale development projects. DelAgua staff are well-trained, with prior experience in distribution and monitoring. They received training on the questionnaire before conducting the surveys.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	Natural Threat: The climate crisis and natural disasters can precipitate displacement and migration, resulting in the relocation of households.	The grouped project involves distribution of ICS that are portable and lightweight. Consequently, users of the project's ICS can easily carry them in case relocation becomes necessary.
Risks to stakeholder participation	N/A	N/A
Working conditions	DelAgua staff at risk from working in remote locations	DelAgua maintains a health, safety & security policy for all staff in Rwanda. In addition, DelAgua maintains a risk register (as part of an overall risk management policy) that tracks all risk types (in addition to safety and security.) This is updated on a quarterly basis.
Safety of women and girls	Household visits result in Project representatives visiting households to conduct surveys.	DelAgua ensures all staff follow a clear Code of Conduct that they sign up to upon recruitment. This

		policy is regularly updated and enforced. Toll Free number exists within Rwanda and a clear whistleblowing policy is adhered to for any grievances raised. Training includes modules on safety and security. All surveys must first gain consent of the respondent. This individual must be above 18 or the survey is immediately ended.
Safety of minority and marginalized groups, including children	Children are recruited to deliver the project.	DeAgua maintains a policy on child labour which all staff, suppliers and vendors are required to adhere to. This policy is regularly updated and enforced.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified	N/A, the project does not involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous materials.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ⁶	Mitigation or preventative measure(s) taken
Discrimination	Risk of discrimination based on gender, race, religion, sexual orientation or other habits	DeAgua maintains several HR policies for staff as well as a safeguarding policy for

⁶ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

		beneficiaries. These policies are maintained, monitored and implemented by DelAgua's HR unit. No instances of discrimination were record during this monitoring period.
Sexual harassment	Risk of sexual harassment	DelAgua maintains several HR policies for staff as well as a safeguarding policy for beneficiaries. These policies are maintained, monitored and implemented by DelAgua's HR unit. No instances of sexual harassment were record during this monitoring period.
Gender equity in labor and work	Risk of gender inequalities in recruitment process	DelAgua maintains recruitment policies that specifically commit the organization towards gender equity. Where possible, DelAgua works to try to increase female recruitment into the organization
Forced labor	Risk of illegal act of recruiting, transporting, harboring, or receiving people through force, fraud.	DelAgua maintains policies on forced labour and requires that all staff, suppliers and vendors agree to adhere to these policies.
Child labor	Children are recruited to deliver the project.	DelAgua maintains policies on child labour and requires that all staff, suppliers and vendors agree to adhere to these policies.
Human trafficking	Risk of illegal act of recruiting, transporting, harboring, or receiving people through force, fraud.	DelAgua maintains policies on forced and child labour and requires that all staff, suppliers and vendors agree to adhere to these policies..

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The project involves the distribution of improved cookstoves to individual households. In the context of this project, there are no legal or customary tenure/access rights to territories and resources,

including collective and conflicting rights held by stakeholders, indigenous people (IPs), local communities (LCs), or customary rights holders. The primary stakeholders are given the opportunity to provide their details if they wish to receive a free improved cookstove. It is entirely their choice whether to sign up or to decline. Once they have signed up, stoves are distributed irrespective of tribal, ethnic, religious or political backgrounds of the beneficiaries. Beneficiaries are not forced or coerced to use the stoves during ongoing monitoring work.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified	As the project is focused exclusively on the free provision of improved cookstoves, there is no impact on cultural heritage as part of project activities. Primary stakeholders are invited to give their name during the beneficiary data collection progress if they wish to receive an improved cookstove. They are not compelled to do so, nor are they told to change their traditional practices beyond being encouraged to use their improved cookstove for future cooking events.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The GP and its PAIs involves distribution of improved cookstove to households and communities in Rwanda and it does not require acquisition of property, hence no impact on any property rights. Hence, this is not applicable.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	Not applicable. The project activity involves distribution of improved cookstoves to individual households and it does not require acquisition of property.
Benefit sharing during the monitoring period	Not applicable.

2.4 Ecosystem Health

Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
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Impacts on biodiversity and ecosystems	No risk identified.	The ICS reduces GHG emissions through its better design and improved performance as compared to traditional stove, without changing the baseline fuel or introducing additional pollutants. Therefore, the project has no impact on biodiversity and ecosystems.
Soil degradation and soil erosion	No risk identified.	The project stoves directly decrease wood fuel demand and reduce the pressure from wood cutting within the project boundary. Thus, project activity will indirectly avoid erosion associated with tree cutting/ felling.
Water consumption and stress	No risk identified.	The by-products (ash and smoke) of the project's ICS match the baseline scenario, as there's no fuel change. This prevents any additional impact on natural watercourses, groundwater, or watersheds, including seasonal flow variations, flooding risks, aquatic connectivity issues, or water scarcity.

2.4.1 Rare, Threatened, and Endangered species

Not applicable, the project is not located in, or adjacent to habitats for rare, threatened, or endangered species.

2.4.2 Introduction of species

Not applicable, the project does not involve introduction of any species.

2.4.3 Ecosystem conversion

Not applicable, the project is not an ARR, ALM, WRC or ACoGS project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The first ICS under the grouped project has started distribution from 11 October 2021. Till the end of current monitoring period, the grouped project includes dissemination of Burn Kuniokoa G2 stoves (referred as Tubeho Neza/Live-well stove locally) in all 6 PAIs. The implementation status of the project activity instances (PAI1-PAI6) at the end of the monitoring period is as follows:

ICS Type	2021	2022	2023	Total (Number)
PAI -1	-	-	24,941	24,941
PAI -2	499	249,455	65	250,019
PAI -3	-	99,412	-	99,412
PAI -4	-	24,626	15	24,641
PAI -5	-	-	99,471	99,471
PAI -6	-	-	49,843	49,843
Total	499	373,493	174,335	548,327

The stoves are deemed under continuous operation since their installation. In total 548,327 ICS have been installed since the beginning of the project. No events occurred during the monitoring period that could impact the GHG emission reductions.

3.2 Deviations

3.2.1 Methodology Deviations

There are no methodological deviations in this monitoring period.

3.2.2 Project Description Deviations

There are no project description deviations in this monitoring period.

3.3 Grouped Projects

No new project activity instances have been added in this monitoring period.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	Bold
Data unit	tons/annum
Description	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices
Source of data	Baseline KPTs, conducted according to KPT Version 4.0
Value applied	4.4092
Justification of choice of data or description of measurement methods and procedures applied	This parameter has been fixed ex-ante. Refer registered PD
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	η_p
Data unit	Fraction
Description	Efficiency of project stove at the start of project activity
Source of data	Certification by the Centre for Research in Energy and Energy Conservation (CREEC) lab. CREEC is a certifying agent recognized by the Rwandan Standards Bureau (RSB).
Value applied	1) Kuniokoa Generation 2: 0.4340 for project stove without skirting 0.513 for project stove with pot skirting 2) SSM S32X: 0.501 for project stove with skirting 0.457 for project stove without skirting
Justification of choice of data or description of measurement methods and procedures applied	This data is fixed ex-ante as per applied methodology VMR0006 ver. 1.1. Refer registered PD.
Purpose of Data	Calculation of emission reductions
Comments	A pot-skirt is distributed along with the project stove. If at the time of monitoring, the pot skirt is identified as not being used, then the parameter will be calculated as a weighted average of the efficiency of a skirted stove and a non-skirt stove for the number of ICS with (and without) skirt.

Data / Parameter	$NCV_{biomass}$
Data unit	TJ/ton
Description	Net calorific value of the non-renewable woody biomass
Source of data	IPCC
Value applied	0.0156 TJ/tonne
Justification of choice of data or description of	N/A

measurement methods and procedures applied	
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	$EF_{wf\ CO2}$
Data unit	ton CO ₂ /TJ
Description	CO ₂ emission factor for woody biomass
Source of data	IPCC
Value applied:	112 tCO ₂ /TJ
Justification of choice of data or description of measurement methods and procedures applied	Default value as per VMR0006, V1.1
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	$EF_{wf\ non-CO2}$
Data unit	ton CO ₂ /TJ
Description	Non-CO ₂ emission factor for woody biomass
Source of data	IPCC
Value applied	26.23 tCO ₂ /TJ
Justification of choice of data or description of measurement methods and procedures applied	Default value as per VMR0006, V1.1
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	Leakage Factor
Data unit	Fraction
Description	net to gross adjustment factor to account for the leakage
Source of data	Default as per VMR0006, ver. 1.1, Section 8.3
Value applied	0.95
Justification of choice of data or description of measurement methods and procedures applied	In-line with the applied methodology VMR0006, ver. 1.1 Section 8.3.
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	$f_{NRB,y}$
Data unit	Fraction
Description	Fraction of woody biomass that can be established as non-renewable biomass
Source of data	Third party report in line with TOOL 30 Version 4.0

Value applied	0.8872
Justification of choice of data or description of measurement methods and procedures applied	This parameter has been fixed ex-ante. Refer registered PD
Purpose of Data	Calculation of emission reductions
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	$N_{y,i,j}$																
Data unit	Number																
Description	Number of project devices of type i and batch j operating during monitoring period y																
Source of data	Monitoring surveys																
Description of measurement methods and procedures applied	PP maintains a database of all ICS distributed. The usage rate of installed ICS has been measured based on a representative sample. PP has applied the latest version of Standard for sampling and surveys for CDM project activities and program of activities for determining the sample size.																
Frequency of monitoring/recording	At least once every two years																
Value monitored	<table border="1"> <thead> <tr> <th>PAI #</th><th>$N_{y,i,j}$</th></tr> </thead> <tbody> <tr> <td>PAI 1</td><td>24,228</td></tr> <tr> <td>PAI 2</td><td>242,343</td></tr> <tr> <td>PAI 3</td><td>94,678</td></tr> <tr> <td>PAI 4</td><td>23,820</td></tr> <tr> <td>PAI 5</td><td>94,734</td></tr> <tr> <td>PAI 6</td><td>46,178</td></tr> <tr> <td>Total</td><td>525,982</td></tr> </tbody> </table>	PAI #	$N_{y,i,j}$	PAI 1	24,228	PAI 2	242,343	PAI 3	94,678	PAI 4	23,820	PAI 5	94,734	PAI 6	46,178	Total	525,982
PAI #	$N_{y,i,j}$																
PAI 1	24,228																
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PAI 3	94,678																
PAI 4	23,820																
PAI 5	94,734																
PAI 6	46,178																
Total	525,982																
Monitoring equipment	Monitoring Surveys																
QA/QC procedures to be applied	N/A																
Purpose of data	Calculation of emission reductions																
Calculation method	This parameter is calculated by multiplying the proportion of operational stove identified during monitoring surveys with the total number of ICS distributed under the project activity.																
Comments	This parameter only accounts for the number of project ICS that are operating in the monitoring period, and rest of the factors such as discount on non-usage of project ICS, usage of pre-project device, and drop-off are accounted separately, and hence are not reflected with the values provided for this parameter. Here, the batch j is not segregated in a PAI. Every distribution under a PAI may be considered as a separate batch.																

Data / Parameter	η_{old}
Data unit	Fraction

Description	Efficiency of baseline stove														
Source of data	Calculated using the Default value as specified in VMR0006 methodology and the data obtained through the distribution surveys														
Description of measurement methods and procedures applied	If the device is a three stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney, a default value of 0.1 is used as per the applied methodology; for other types of devices, a default value of 0.2 is used.														
Frequency of monitoring/recording	Fixed for each individual household at first HH visit														
Value monitored	<table> <tr> <th>PAI #</th><th>η_{old}</th></tr> <tr> <td>PAI 1</td><td>0.10</td></tr> <tr> <td>PAI 2</td><td>0.10</td></tr> <tr> <td>PAI 3</td><td>0.10</td></tr> <tr> <td>PAI 4</td><td>0.10</td></tr> <tr> <td>PAI 5</td><td>0.10</td></tr> <tr> <td>PAI 6</td><td>0.10</td></tr> </table>	PAI #	η_{old}	PAI 1	0.10	PAI 2	0.10	PAI 3	0.10	PAI 4	0.10	PAI 5	0.10	PAI 6	0.10
PAI #	η_{old}														
PAI 1	0.10														
PAI 2	0.10														
PAI 3	0.10														
PAI 4	0.10														
PAI 5	0.10														
PAI 6	0.10														
Monitoring equipment	N/A														
QA/QC procedures to be applied	N/A														
Purpose of data	Calculation of emission reductions.														
Calculation method	N/A														
Comments	Refer to registered project PD														

Data / Parameter	$\eta_{new,i,j}$		
Data unit	Fraction		
Description	Efficiency of the device of each type i and batch j		
Source of data	Calculated as per the equation 5 of the applied methodology		
Description of measurement methods and procedures applied	Efficiency of the improved cookstoves was estimated using equation (5) above where loss in efficiency per year is calculated, and therefore, no direct measurement is involved.		
Frequency of monitoring/recording	Annually		
Value monitored	Vintage of ICS Distributed		Kuniokoa Efficiency value
			With pot skirt
			Without pot skirt
	Age 3		0.4726
	Age 2		0.4774
	Age 1		0.4822
			0.3998
			0.4039
			0.4080
PAI #	Monitored Utilization of Pot-skirt	Final Weighted Average $\eta_{new,i,j}$	
PAI 1	89.07%	0.4694	
PAI 2	86.64%	0.4642	
PAI 3	82.92%	0.4602	
PAI 4	80.70%	0.4612	

	PAI 5	85.24%	0.4665
	PAI 6	92.27%	0.4717
	<i>For detailed calculation, refer tab “$\eta_{new,i,j}$ Calculation” in the ER sheet.</i>		
Monitoring equipment	N/A		
QA/QC procedures to be applied	N/A		
Purpose of data	Calculation of emission reductions		
Calculation method	As per equation (5) of the applied methodology VMR0006 ver 1.1		
Comments	As the stove has different efficiencies based on the usage of the pot skirt. Surveys were conducted to determine the number of cooking events that occur with and without a pot skirt. The final value of efficiency was calculated as a weighted average of the efficiency of a skirted stove and a non-skirted stove, taking into consideration the usage of pot skirt.		

Data / Parameter	μ_y														
Data unit	Fraction														
Description	Adjustment to account for any continued use of pre-project devices during the year y														
Source of data	Monitoring														
Description of measurement methods and procedures applied	PP has applied the latest version of Standard for sampling and surveys for CDM project activities and program of activities for determining the sample size. This parameter was monitored using the following methods: The sampled households were checked for presence of baseline stove and if it was being used along with project ICS for cooking. For samples where baseline cookstoves are decommissioned and no longer used, $\mu_y = 0$, and $B_{old, adjusted}$ is equal to B_{old}. For samples where the baseline stove is found to be in use, the value of μ_y was determined by taking average of ratio of frequency of usage.														
Frequency of monitoring/recording	At least once every two years														
Value monitored	<table> <tr> <th>PAI #</th><th>Adjustment to account for any continued use of pre-project devices μ_y</th></tr> <tr> <td>PAI 1</td><td>0.24</td></tr> <tr> <td>PAI 2</td><td>0.28</td></tr> <tr> <td>PAI 3</td><td>0.29</td></tr> <tr> <td>PAI 4</td><td>0.35</td></tr> <tr> <td>PAI 5</td><td>0.27</td></tr> <tr> <td>PAI 6</td><td>0.24</td></tr> </table>	PAI #	Adjustment to account for any continued use of pre-project devices μ_y	PAI 1	0.24	PAI 2	0.28	PAI 3	0.29	PAI 4	0.35	PAI 5	0.27	PAI 6	0.24
PAI #	Adjustment to account for any continued use of pre-project devices μ_y														
PAI 1	0.24														
PAI 2	0.28														
PAI 3	0.29														
PAI 4	0.35														
PAI 5	0.27														
PAI 6	0.24														

Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of emission reductions
Calculation method	N/A
Comments	For all PAI's, the utilisation of Uy was higher than expected in the sample size calculation. And as such across all PAI's the margin or error was not met. In line with methodology these results are therefore at the lower bound confidence value for conservatism. For full calculations and details please see tab: Sample Size Cal & Results' within the ER sheet.

Data / Parameter	Life span
Data unit	Years
Description	The operational lifetime of the project device
Source of data	Manufacturer's specifications
Description of measurement methods and procedures applied	The operational life of cookstove is sourced from manufacturer specification.
Frequency of monitoring/recording	Yearly
Value monitored	Burn Kuniokoa Generation 2 = 10 years
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of emission reductions
Calculation method	N/A
Comments	The emission reduction from each project stove will be claimed till 10 years operational lifetime of the project stove from the date of commissioning. For onward if PP willing to claim emission reduction, PP may replace project stove with new improved cookstoves subject to baseline applicability at the time of replacement.

Data / Parameter	Date of commissioning of batch j
Data unit	Date
Description	To establish the date of commissioning, the Project Participant may opt to group the devices in "batches" and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch.
Source of data	Project database
Description of measurement methods and procedures applied	Fixed and recorded at the time of commissioning/distribution of the last project device in the batch
Frequency of monitoring/recording	Once
Value monitored	11-October-2021 (date of commissioning of first batch of stove)

Monitoring equipment	Not applicable
QA/QC procedures to be applied	Not applicable
Purpose of data	Calculation of emission reduction
Calculation method	Not applicable
Comments	--

4.3 Monitoring Plan

This Grouped Project in *Rwanda* follows VCS standard requirements applicable, along with the methodological requirements on monitoring a grouped non-AFOLU large project activity. The Monitoring Plan is elaborated in multiple sub-sections for the sake of clarity.

1. Monitoring Plan:

The monitoring plan consists of checking a representative sample of all ICS units distributed at every monitoring period to ensure that they are still operating or are replaced by an equivalent in-service unit. A project database was populated during the distribution of each initial cookstove issued. The database is accessible to the project proponent, appropriate partners, and the verification VVB. The database includes, at minimum, the following:

- Unique project identification number
- Installation date
- Family name
- Contact details of user (when available)
- Location by administrative division
- Baseline cooking fuel source
- Baseline stove type
- Date of replacement of cook stove, if applicable

The database is used to select a random, representative sample for monitoring and verification purposes. Monitoring surveys includes examination of the cookstove installations and verification that they are in an operational condition. Units that have been damaged or aged beyond expected operational condition were replaced, if applicable.

2. Roles and Responsibility

The DelAgua team involved in the GHG operations management is the local staff based in *Rwanda* along with the senior management.

The key responsibilities are shared by the team as follows:

Chairman – Supervises the overall programme at strategy and financial side.

COO – Acts as central point of strategy, programme management, finance, and technical domains

Director Business Intelligence – Manages the programme at implementation level, and acts as an internal technical reviewer for the programme documents and procedures.

Carbon Operations Manager – Manages the operations for GHG emission mitigation programme, from planning to implementation stage. Additionally, manages the Sustainability aspects of the programme.

Country Director – Supports programme in the operations and management at the host country level and acting as point of communication between DelAgua and government of *Rwanda*.

The collective responsibilities of DelAgua as the Project Participant is following:

- Acts as the project managing entity
- Development of PD
- Registration of the project with VERRA
- Inclusion of new PAIs upon satisfaction of the eligibility criteria stipulated in the PD
- Authorized entity for any official communication with the VERRA and VVB
- Manage and archive the database for all appliances
- QA/QC of database during distribution & data collection
- Maintain local repair/replacement facilities
- Education and public awareness raising during initial distribution as well as periodic education campaigns.
- Data collection during distribution & delivery of data to database
- QA/QC of data collection
- Conduct ongoing monitoring, as required to ascertain monitored parameters.

3. Quality Assurance and Quality Control

Spot checks of the database are conducted during the distribution, and monitoring activities. Distributors are trained in the proper installation, use, and maintenance of the devices, and are provided with training sufficient to introduce recipient households to the proper operation and maintenance of the devices, as well as contact information for DelAgua. Supervisors receive similar training, as well as supervisory training in monitoring of distributor's activities. Supervisors are responsible for approximately 10 distributors. During the campaign, DelAgua staff spot-checks distributor quality, by revisiting 2 households per distributor, to verify that the stoves are in place, and that the recipient can show proper operation of the units. The results of

this spot check are recorded electronically and compared against the initial distribution logs.. The data collected in the database is verified and controlled in the following way:

- Surveys are conducted by staff trained by DelAgua.
- Supervisors are separately trained by DelAgua to spot-check surveyor results.
- All ex-ante and monitored data parameters are collected on smart phone-based surveys and are uniform across all surveyors for any given survey activity.
- Unknown to the surveyors, the database analysis includes verification of “valid” surveys including by a.) verifying household consent is received and b.) that the survey duration, as recorded by Internet time, is no shorter or longer than a reasonable value.
- Data validation is conducted on the database to ensure that values are numerically consistent, i.e. multiple-choice values add up to 100% of respondents.

4. Training and maintenance procedures:

DelAgua is responsible for training any contractors used during distribution, education and monitoring activities. DelAgua ensures training of all on-site staff with respect to adherence to the Monitoring Plan of the project activity. Records of the training will be kept. Internal audit of all the records of the distribution, monitoring and education activities are performed on an annual basis, and will be carried out once (or twice, based on the requirements and plans) a year. Training records are saved for such training programs, where step-by-step training is provided to the surveyors for a quality data collection process, where they are expected to not impact the materially, degree of conservativeness, and perform the surveys in an unbiased manner. The surveyors are trained on a periodic basis, and refresher trainings are also provided to improve the quality of surveys from time to time. During these audits all the data and parameters that need to be monitored as per the monitoring plan will be checked and shortcomings if any will be reported and addresses. Since the surveys are electronic in format, recording of responses and the record keeping procedure for these surveys are conveyed to the team through rigorous trainings.

5. Calculation of Emission Reductions:

Emission reductions were calculated using the results of the most recent survey data. The updated parameters adjust all emission reduction results for the year monitored.

6. Sampling Plan:

The sampling plan is intended to enable the discovery of unbiased and reliable estimates of monitored parameter values used in the GHG emission reduction calculations. The sampling plan design is based on the CDM Guideline: Sampling and surveys for CDM project activities and programmes of activities, version 4.

STEP 1: Monitoring Objectives

The objective was to obtain an unbiased and reliable estimate of the proportion or mean value of the following key variables over the course of monitoring period.

- a) $N_{y,i,j}$ Number of project devices of type i and batch j operating during year y (Annual/biennial)
- b) μ_y Adjustment to account for any continued use of pre-project devices during the year y

As per Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 9.0, 95/10 confidence/precision has been adopted as this is a large-scale project for both the parameters.

STEP 2: Target Population

PAI-1: 24,941

PAI-2: 250,019

PAI-3: 99,412

PAI-4: 24,641

PAI-5: 99,471

PAI-6: 49,843

STEP 3: Sampling Frame

The sampling frame referred to all the information sources on the database. PP collected all the information sources on monitoring data through physical visit. The monitoring survey data was collected through physical survey which is the primary mechanism in place for the data collection of the newly distributed ICS and the Monitoring Survey (which includes a household questionnaire and visual inspection of ICSs) which is used in the current monitoring period.

The following information was recorded during the monitoring survey.

- a. Product based Unique Identification number.
- b. Contact information, geographical location or other relevant information of the end user
- c. Sampling frame was representative of the entire population.
- d. No elements from outside the population of interest is present for the current monitoring period. Wherever information miss-match is observed, it is corrected in the database and conservative assumptions is applied.

STEP 4: Sample Method

Sampling was conducted using stratified random sampling technique over the sampling frame, and detailed calculations are provided below as per CDM guidelines “Sampling and surveys for CDM project activities and programmes of activities” v 9.0.

To undertake random sample selection in a manner that accommodates the logistical challenge posed by the potential inclusion of ~ 100 distinct villages and sectors, a simple random sampling method is deemed impractical. Therefore, a stratified random selection approach is employed. Initially, villages are randomly selected with the number required achieved by dividing the sample size by 5, where 5 corresponds to the anticipated number of monitoring surveys achievable in a day by a DelAgua staff member. This choice is based on the operational feasibility of one staff member being able to conduct surveys in one village per day.

This is randomly selected through the excel formula as follows:

=INDEX (SORTBY (data,RANDARRAY(ROWS(data))),SEQUENCE(#villagesrequired))

Where first dataset is the list of villages. This gives a list of random villages.

After the identification of random villages, all stoves distributed within the villages are compiled into a singular document. Each stove is assigned a unique identifier, following which, using the =randbetween function, five stoves (households) are randomly selected from each of the chosen villages. This process gives the final sample set.

To determine the parameters, sampling involves the following approaches.

$N_{y,i,j}$: Visual inspection of the premises to see if ICS is operational and in use. Interview with end user if required to verify that ICS is still in use (Yes/No)

$\mu_{y,i,j}$: Pre project device only is in use then fraction to be used to calculate total number, however if pre project device is used along with project ICS, proportion of usage of each was determined by cooking habits evaluated by survey questionnaire during the monitoring period.

STEP 5: Desired Precision / Expected Variance and Sample Size

To estimate the number of premises to be surveyed with a 10% margin of error at desired confidence level of 95%, the optimal sample size n is given by:

1. For proportional parameter

$$n \geq \frac{1.96^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.96^2 p(1-p)}$$

Here,

Parameter	Description
n	Sample Size
N	Total number of cookstoves (ICS) distributed
p	Expected proportion
1.96	Represents the 95% confidence required
0.1	Represent the 10% relative precision

2. For mean-based parameter

$$n \geq \frac{1.96^2 NV}{(N-1) \times 0.1^2 + 1.96^2 V}$$

Here,

Parameter	Description
n	Sample Size
N	Total number of cookstoves (ICS) distributed
SD	Standard deviation
V	(SD/mean) ²
1.96	Represents the 95% confidence required
0.1	Represent the 10% relative precision

Requirements of Guideline for Sampling and surveys for CDM project activities and program of activities, version 4.0 has been followed.

STEP 6: Minimum Sample Size⁷

As per the CDM guideline for Sampling and survey, ver 4.0⁸, if the sample size calculation returns a value of less than 30 samples, a minimum sample size of 30 shall be chosen. PP has calculated the sample size for each PAIs (PAI-1 to PAI-6) separately. The sample size calculation and monitoring results of the monitoring parameters for PAI-1 has been shown below for reference. For other PAIs (2-6), details are provided in Annex 3 resulting in a total 394 surveys being completed.

Sampling Constants	Values
Monitoring period start	01-03-2024
Monitoring period end	30-09-2024
Level of Sampling	Project Level
Monitoring Frequency	Annual
Confidence (%) (90 or 95)	95%
Margin of Error (%)	10%
Z value	1.960

- Parameter (N_{PAI})

⁷ Detailed sample size calculation of PAI-1 can be found in the ER Calculation sheet.

⁸ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20151023152925068/Meth_GC48_%28ver04.0%29.pdf

PAI-1			
1			
Monitoring parameter(s)		Stove Operating Fraction for determination of $N_{y,i,j}$	
Sampling frame(s)		Given stove model and vintage population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected operational proportion (SoF)	Calculated Minimum Sample Size (n)
2021	0		
2022	0		
2023	24941	0.90	43
Sample size determination			
Estimated SOF (p)			0.90
Estimated Standard Deviation of SOF (SD)			0.30
$V_{SOF} = (SD/p)^2$			0.11
Sample Size required (SOF)			43
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size ($n_{i,j,total}$)	Monitored Operating Fraction ($n_{i,j,operation}/n_{i,j,total}$)
2021	0		
2022	0		
2023	24941	70	0.97
Reliability Check			
Samples Monitored			70
SoF Measured			97.14%
Standard Error of SoF			1.988%
Relative precision (Margin of error)			4.01%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

As per the sample size calculation, 43 samples were calculated to be surveyed, However, 70 samples were considered to compensate for any outliers or non-responses associated with samples and to get accurate results. The sample size and precision calculations were performed in line with the CDM guideline for sampling and survey, ver 4.0. The snapshots above demonstrate that required precision is met i.e., the parameter is within the 95/10 confidence/precision. For detailed calculation of the standard error and relative precision of the parameter $N_{y,i,j}$, refer tab “Sample Size Cal & Results” of the ER sheet.

- Parameter (μ_y)

Monitoring parameter(s)		Utilization of Project stoves - for μ_y	
Sampling frame(s)		Given stove model population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected value	Calculated Sample Size (n)
2021	0		
2022	0		
2023	24941	0.88	53
Estimated results based sample size determination			
Estimated utilization (p)			0.88
Expected Standard Deviation (SD)			0.32
$V_{Utilization} = (SD/p)^{1/2}$			0.14
Sample Size required (Utilization)			52
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Utilization
2021	0		
2022	0		
2023	24941	70	0.85
Reliability Check			
Samples Monitored			70
Utilization Measured			84.55%
Standard Error of Utilization			4.314%
Relative precision (Margin of error)			10.00%
Result			Use Lower Bound Value
Lower Bound confidence value			76.09%

As per the sample size calculation, 53 samples were calculated as per CDM sampling standard, However, 70 samples were considered for surveys. There were two reasons- firstly, common survey was conducted for $N_{y,i,j}$ and μ_y and secondly, to compensate for any outliers or non-responses associated with samples. The sample size and precision calculations were performed in line with the CDM guideline for sampling and survey, ver 4.0. The snapshots above demonstrate that required precision is met i.e., the parameter is within the 95/10 confidence/precision. For detailed calculation of the standard error and relative precision of the parameter μ_y , refer tab "Sample Size Cal & Results" of the ER sheet.

Similarly, 63-70 samples were monitored for each PAI separately. For the sample size calculation and monitoring results of the monitoring parameters for PAI 1-6 refer Appendix 3 below.

6. Quality Assurance/Quality Control

The project proponent applied a confidence/precision of 95/10 for each monitored parameter allowing for non-response and the possible removal of outliers from the sample, as part of a Quality Control/Quality Assurance system. The choice of measure applied to both parameters i.e. number of operational cookstoves, and adjustment factors. The project proponent monitored a particular parameter till the required level of confidence/precision has been reached, as long as the calculated minimum number of samples has been achieved.

The monitoring plan followed procedures in place to ensure good quality data. The project proponent ensured that field personnel have reviewed, understood and have agreed to follow the monitoring plan procedures, including provisions for maximizing response rates, documenting out-of-population cases, refusals and other sources of non-response. A quality control and assurance strategy were audited and documented. The monitoring plan explained how to properly survey households to prevent bias from interviewer. In the case a household refuses to participate, another household is chosen at random. To reduce interviewer bias, good questionnaire design and well-tested questionnaires was developed.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The methodology does not account for baseline emissions separately, but instead quantifies net emission reductions achieved by the project. Please refer to Section 5.4. below.

5.2 Project Emissions

The methodology does not account for project emissions separately, but instead quantifies net emission reductions achieved by the project. Please refer to Section 5.4. below.

5.3 Leakage Emissions

The value of Leakage has been considered as default of 0.95 in accordance with methodology.

5.4 GHG Emission Reductions and Carbon Dioxide Removals

The improved cookstove is introduced as energy efficiency measure in the project, therefore equations 1 and 2 of the methodology is applied to calculate the net GHG emission reductions.

$$ER_y = \sum_i \sum_j ER_{y,i,j} \quad \text{Equation (1)}$$

Where:

- i = Indices for the situation where more than one type/model of improved cookstove is introduced to replace three-stone fire
- j = Indices for the situation where there is more than one batch of improved cookstove of type i
- ER_y = Emission reductions during year y in t CO₂e

$ER_{y,i,j}$ = Emission reductions by improved cookstove of type i and batch j during year y in t CO₂e

$$ER_{y,i,j} = B_{y,savings,i,j} \times NCV_{wood\ fuel} \times f_{NRB,y} \times (EF_{wf,CO_2} + EF_{wf,non\ CO_2}) \times N_{y,i,j} \times 0.95 \quad \text{Equation (2)}$$

Where:

- $B_{y,savings,i,j}$ = Quantity of woody biomass that is saved in tonnes per improved cookstove of type i and batch j during year y
- $f_{NRB,y}$ = Fraction of woody biomass that can be established as non-renewable biomass (f_{NRB})
- $NCV_{wood\ fuel}$ = Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne)⁹
- EF_{wf,CO_2} = CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO₂/TJ)¹⁰
- $EF_{wf,non\ CO_2}$ = Non-CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO₂/TJ)¹¹
- $N_{y,i,j}$ = Number of improved cookstoves of type i and batch j operating during year y
- 0.95 = Discount factor to account for leakage

To calculate $B_{y,savings,i,j}$, Option 1 of the applied methodology¹² has been used;

$$B_{y,savings,i,j} = B_{old} \times \left(1 - \frac{\eta_{old}}{\eta_{new,i,j}}\right)$$

Where:

B_{old} = Annual quantity of woody biomass that would have been used in the absence of the project activity (in tonnes per device) to generate useful thermal energy equivalent to that provided by the improved cook stove. The value of B_{old} has been sourced from baseline field surveys.

η_{old} = Efficiency of baseline cookstove

$\eta_{new,i,j}$ = Efficiency of the improved cook stove type i and batch j determined through water boiling test (WBT).

⁹ 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 1 Introduction

¹⁰ 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion

¹¹ 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion

¹² Equation 3 of methodology VMR 0006

Efficiency of the improved cookstove is calculated as per equation 5 of applied methodology as below:

$$\eta_{\text{new},i,y} = \eta_p \times (DF_n)^{y-1} \times 0.94$$

Where:

η_p = Efficiency of project stove (fraction) at the start of project activity

DF_n^{y-1} = Discount factor to account for efficiency loss of project cookstove per year of operation (fraction). This value may be based on actual monitoring or based on manufacturer's declaration on expected loss in efficiency or through publicly available literature on relevant industry standards. Alternatively default value of 0.99 efficiency loss per year can be considered.

0.94 = Adjustment factor to account for uncertainty related to project cookstove efficiency test.

As some of the project households continue to use baseline cookstoves along with improved cookstoves, B_{old} has been adjusted ex-post based on the percentage of project households found to continue such practice according to the Equation 6 of applied methodology as follows:

$$B_{old,adjusted} = B_{old} \times (1 - \mu_y)$$

Where:

$B_{old,adjusted}$	=	Adjusted B_{old} to account the ex-post usage of firewood in baseline cookstove(s) by project households in addition to improved cookstove (in tonnes per device)
μ_y	=	Baseline stove usage factor to account for use of baseline cookstoves along with improved cookstoves.

The calculation of ERs for MP-3 is as follows:

Parameter	PAI-1	PAI-2	PAI-3	PAI-4	PAI-5	PAI-6	Unit	Formula
f_{NRB}	0.8872	0.8872	0.8872	0.8872	0.8872	0.8872	Fraction	-
$NCV_{biomass}$	0.0156	0.0156	0.0156	0.0156	0.0156	0.0156	TJ/tonne	-
$EF_{wf,CO2}$	112	112	112	112	112	112	tCO ₂ e/TJ	-
$EF_{wf,non-CO2}$	26.23	26.23	26.23	26.23	26.23	26.23	tCO ₂ e/TJ	-
LE	0.95	0.95	0.95	0.95	0.95	0.95	Fraction	-
η_{old}	0.10	0.10	0.10	0.10	0.10	0.10	Fraction	-
% usage of pot-skirt	0.8907	0.8664	0.8292	0.8070	0.8524	0.9227	Fraction	-
$\eta_{new,i,j}$	0.4694	0.4642	0.4602	0.4612	0.4665	0.4717	Fraction	-
Usage Rate	0.9714	0.9693	0.9524	0.9667	0.9524	0.9265	Fraction	-
B_{old}	4.41	4.41	4.41	4.41	4.41	4.41	Tonnes / household / year	-
μ_y	0.24	0.28	0.29	0.35	0.27	0.24	Fraction	-
$B_{old,adjusted}$	3.36	3.16	3.15	2.89	3.21	3.37	Tonnes / household / year	$B_{old,adjusted} = B_{old} * (1 - \mu_y)$
$B_{y,savings}$	2.64	2.48	2.46	2.26	2.52	2.66	tonnes	$B_{y,savings,i,j} = B_{old,adjusted} * (1 - (\eta_{old} / \eta_{new,i,j}))$
-	24,941	250,019	99,412	24,641	99,471	49,843	Number	-
-	0.59	0.59	0.59	0.59	0.59	0.59	Fraction	-
$N_{y,i,j}$	24,228	242,343	94,678	23,820	94,734	46,178	Number	-
-	14,205	142,086	55,510	13,966	55,543	27,074	Number	-
ER_y	68,164.55	641,002.25	248,429.63	57,410.03	254,659.36	130,656.65	tCO ₂ e	$ER_y = B_{y,savings,i,j} * f_{NRB} * NCV_{biomass} * (EF_{wf,CO2} + EF_{wf,non-CO2}) * N_{y,i,j} * 0.95$
Total ERs						1,400,322	tCO₂e	

For detailed calculations, refer ER sheet.

Below table illustrates of emission reductions achieved over the crediting period till MP3.

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU (tCO ₂ e)	Removal VCU (tCO ₂ e)	Total VCUs (tCO ₂ e)
11-October-2021 - 31-December-2021	0	0	0	421	0	421
01-January-2022 - 31-December-2022	0	0	0	989,019	0	989,019
01-January-2023 - 28-February-2023	0	0	0	378,483	0	378,483
01-March-2023 - 31-December-2023	0	0	0	2,085,178	0	2,085,178
01-January-2024 - 29-February-2024	0	0	0	408,858	0	408,858
01-March-2024 - 30-September-2024	0	0	0	1,400,322	0	1,400,322
Total	0	0	0	5,262,281	0	5,262,281

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-March-2024 - 30-September-2024	1,217,534	1,400,322	15.01% higher	The primary reason for higher VCUs in the current monitoring period attributed to higher ICS distribution than envisaged ex-ante during current monitoring period. The number of ICS units mentioned ex-ante were only an indicative number for ex-ante calculations and may differ from actual implementation which depends upon market demand and user preferences, deemed outside the control of PP.
Total	1,217,534	1,400,322	15.01% higher	

APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

No information presented in the monitoring report is deemed commercially sensitive.

APPENDIX 2: EVIDENCE OF PROJECT SD CONTRIBUTIONS

The SDG contributions for SDGs 1, 3, 5, 7, and 15 are calculated directly in the ER sheet based on survey data. Screenshot showing these calculations is attached here as evidence. For detailed information on how these contributions are calculated, please refer to the 'Ex-post Survey Results' tab in the ER sheet.

SDG Contributions									
SDG Indicator	Monitoring Parameter	Result							
1.4.1 Proportion of population living in households with access to basic services	Number of ICS distributed	24,941	2,50,019	99,412	24,641	99,471	49,843	5,48,327	
3.9.1 Mortality rate attributed to household and ambient air pollution	The proportion of HHs confirming the reduction in smoke after using the project ICS (%)	97.14%	96.93%	95.24%	96.67%	95.24%	92.65%	95.92%	5,25,982
	The proportion of HHs confirming the reduction in amount of time spent on collection of firewood and cooking time (%)	97.14%	92.54%	95.24%	96.67%	95.24%	91.18%	93.79%	5,14,267
5.4 Proportion of time spent on unpaid domestic and care work, by sex, age and location	Number of HHs with access to clean cooking technology	24,228	2,42,343	94,678	23,820	94,734	46,178	5,25,982	
7.1.2 Proportion of population with primary reliance on clean fuels and technology	Amount of firewood saved by the project (tons)	37,505	3,52,685	1,36,688	31,588	1,40,116	71,889	7,70,470	28,82,730
15.4.2 Mountain Green Cover Index									

Evidence for SDG 8 (employment list) and SDG 12 (training records) is shared directly with the VVB, which involves numerous pages. Including them here would add at least 50-60 pages to the MR, so to keep the document manageable, this information is shared separately.

APPENDIX 3: SAMPLE SIZE CALCULATIONS AND MONITORING RESULTS

1. PAI-1

- Parameter ($N_{y,i,j}$):

PAI-1			
1			
Monitoring parameter(s)		Stove Operating Fraction for determination of $N_{v,i,j}$	
Sampling frame(s)		Given stove model and vintage population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected operational proportion (SoF)	Calculated Minimum Sample Size (n)
2021	0		
2022	0		
2023	24941	0.90	43
Sample size determination			
Estimated SOF (p)			0.90
Estimated Standard Deviation of SOF (SD)			0.30
$V_{SOF} = (SD/p)^2$			0.11
Sample Size required (SOF)			43
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size ($n_{v,i,j,total}$)	Monitored Operating Fraction ($n_{v,i,j,operationao}/n_{v,i,j,total}$)
2021	0		
2022	0		
2023	24941	70	0.97
Reliability Check			
Samples Monitored			70
SoF Measured			97.14%
Standard Error of SoF			1.988%
Relative precision (Margin of error)			4.01%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

- Parameter (μ_y):

Monitoring parameter(s)		Utilization of Project stoves - for μ	
Sampling frame(s)		Given stove model population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected value	Calculated Sample Size (n)
2021	0		
2022	0		
2023	24941	0.88	53
Estimated results based sample size determination			
Estimated utilization (p)			0.88
Expected Standard Deviation (SD)			0.32
$V_{Utilization} = (SD/p)^2$			0.14
Sample Size required (Utilization)			52
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Utilization
2021	0		
2022	0		
2023	24941	70	0.85
Reliability Check			
Samples Monitored			70
Utilization Measured			84.55%
Standard Error of Utilization			4.314%
Relative precision (Margin of error)			10.00%
Result			Use Lower Bound Value
Lower Bound confidence value			76.09%

2. PAI-2

- Parameter ($N_{y,i,j}$):

PAI-2			
2			
Monitoring parameter(s)		Stove Operating Fraction for determination of $N_{y,i,j}$	
Sampling frame(s)		Given stove model and vintage population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected operational proportion (SoF)	Calculated Minimum Sample Size (n)
2021	499	0.90	1
2022	249455	0.90	43
2023	65	0.90	1
Sample size determination			
Estimated SOF (p)			0.90
Estimated Standard Deviation of SOF (SD)			0.30
$V_{SOF} = (SD/p)^2$			0.11
Sample Size required (SOF)			43
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size ($n_{y,i,j,total}$)	Monitored Operating Fraction ($n_{y,i,j,operationao}/n_{y,i,j,total}$)
2021	499	1	1.00
2022	249455	65	0.97
2023	65	1	1.00
Reliability Check			
Samples Monitored			67
SoF Measured			96.93%
Standard Error of SoF			2.137%
Relative precision (Margin of error)			4.32%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

- Parameter (μ_y):

Monitoring parameter(s)		Utilization of Project stoves - for μ_y	
Sampling frame(s)		Given stove model population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected value	Calculated Sample Size (n)
2021	499	0.88	1
2022	249455	0.88	53
2023	65	0.88	1
Estimated results based sample size determination			
Estimated utilization (p)			0.88
Expected Standard Deviation (SD)			0.32
$V_{Utilization} = (SD/p)^2$			0.14
Sample Size required (Utilization)			52
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Utilization
2021	499	1	0.86
2022	249455	65	0.81
2023	65	1	0.79
Reliability Check			
Samples Monitored			67
Utilization Measured			81.23%
Standard Error of Utilization			4.833%
Relative precision (Margin of error)			11.66%
Result			Use Lower Bound Value
Lower Bound confidence value			71.75%

3. PAI-3

- Parameter ($N_{y,i,j}$):

PAI-3			
3			
Monitoring parameter(s)		Stove Operating Fraction for determination of $N_{y,i,j}$	
Sampling frame(s)		Given stove model and vintage population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected operational proportion (SoF)	Calculated Minimum Sample Size (n)
2021	0		
2022	99412	0.90	43
2023	0		
Sample size determination			
Estimated SOF (p)			0.90
Estimated Standard Deviation of SOF (SD)			0.30
$V_{SOF} = (SD/p)^2$			0.11
Sample Size required (SOF)			43
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size ($n_{i,j,total}$)	Monitored Operating Fraction ($n_{i,j,operation}/n_{i,j,total}$)
2021	0		
2022	99412	63	0.95
2023	0		
Reliability Check			
Samples Monitored			63
SoF Measured			95.24%
Standard Error of SoF			2.682%
Relative precision (Margin of error)			5.52%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

- Parameter (μ_y):

Monitoring parameter(s)		Utilization of Project stoves - for μ_y	
Sampling frame(s)		Given stove model population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected value	Calculated Sample Size (n)
2021	0		
2022	99412	0.88	53
2023	0		
Estimated results based sample size determination			
Estimated utilization (p)			0.88
Expected Standard Deviation (SD)			0.32
$V_{Utilization} = (SD/p)^2$			0.14
Sample Size required (Utilization)			52
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Utilization
2021	0		
2022	99412	63	0.81
2023	0		
Reliability Check			
Samples Monitored			63
Utilization Measured			81.03%
Standard Error of Utilization			4.938%
Relative precision (Margin of error)			11.94%
Result			Use Lower Bound Value
Lower Bound confidence value			71.35%

4. PAI-4

- Parameter ($N_{v,i,j}$):

PAI-4			
4			
Monitoring parameter(s)		Stove Operating Fraction for determination of $N_{v,i,j}$	
Sampling frame(s)		Given stove model and vintage population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected operational proportion (SoF)	Calculated Minimum Sample Size (n)
2021	0		
2022	24626	0.90	43
2023	15	0.90	1
Sample size determination			
Estimated SOF (p)			0.90
Estimated Standard Deviation of SOF (SD)			0.30
$V_{SOF} = (SD/p)^2$			0.11
Sample Size required (SOF)			43
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size ($n_{v,i,j,total}$)	Monitored Operating Fraction ($n_{v,i,j,operation}/n_{v,i,j,total}$)
2021	0		
2022	24626	60	0.97
2023	15	3	1.00
Reliability Check			
Samples Monitored			63
SoF Measured			96.67%
Standard Error of SoF			2.313%
Relative precision (Margin of error)			4.69%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

- Parameter (μ_v):

Monitoring parameter(s)		Utilization of Project stoves - for μ_v	
Sampling frame(s)		Given stove model population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected value	Calculated Sample Size (n)
2021	0		
2022	24626	0.88	53
2023	15	0.88	1
Estimated results based sample size determination			
Estimated utilization (p)			0.88
Expected Standard Deviation (SD)			0.32
$V_{Utilization} = (SD/p)^2$			0.14
Sample Size required (Utilization)			52
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Utilization
2021	0		
2022	24626	60	0.76
2023	15	3	0.92
Reliability Check			
Samples Monitored			63
Utilization Measured			76.25%
Standard Error of Utilization			5.485%
Relative precision (Margin of error)			14.10%
Result			Use Lower Bound Value
Lower Bound confidence value			65.50%

5. PAI-5

- Parameter ($N_{y,i,j}$):

PAI-5			
5			
Monitoring parameter(s)		Stove Operating Fraction for determination of $N_{y,i,j}$	
Sampling frame(s)		Given stove model and vintage population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected operational proportion (SoF)	Calculated Minimum Sample Size (n)
2021	0		
2022	0		
2023	99471	0.90	43
Sample size determination			
Estimated SOF (p)			0.90
Estimated Standard Deviation of SOF (SD)			0.30
$V_{SOF} = (SD/p)^2$			0.11
Sample Size required (SOF)			43
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size ($n_{y,i,j,total}$)	Monitored Operating Fraction ($n_{y,i,j,operationaol}/n_{y,i,j,total}$)
2021	0		
2022	0		
2023	99471	63	0.95
Reliability Check			
Samples Monitored			63
SoF Measured			95.24%
Standard Error of SoF			2.682%
Relative precision (Margin of error)			5.52%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

- Parameter (μ_y):

Monitoring parameter(s)		Utilization of Project stoves - for μ_y	
Sampling frame(s)		Given stove model population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected value	Calculated Sample Size (n)
2021	0		
2022	0		
2023	99471	0.88	53
Estimated results based sample size determination			
Estimated utilization (p)			0.88
Expected Standard Deviation (SD)			0.32
$V_{Utilization} = (SD/p)^2$			0.14
Sample Size required (Utilization)			52
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Utilization
2021	0		
2022	0		
2023	99471	63	0.82
Reliability Check			
Samples Monitored			63
Utilization Measured			82.25%
Standard Error of Utilization			4.812%
Relative precision (Margin of error)			11.47%
Result			Use Lower Bound Value
Lower Bound confidence value			72.82%

6. PAI-6

- Parameter ($N_{v,i,j}$):

PAI-6			
6			
Monitoring parameter(s)		Stove Operating Fraction for determination of $N_{v,i,j}$	
Sampling frame(s)		Given stove model and vintage population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected operational proportion (SoF)	Calculated Minimum Sample Size (n)
2021	0		
2022	0		
2023	49843	0.90	43
Sample size determination			
Estimated SOF (p)			0.90
Estimated Standard Deviation of SOF (SD)			0.30
$V_{SOF} = (SD/p)^2$			0.11
Sample Size required (SOF)			43
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size ($n_{i,j,total}$)	Monitored Operating Fraction ($n_{i,j,operation}/n_{i,j,total}$)
2021	0		
2022	0		
2023	49843	68	0.93
Reliability Check			
Samples Monitored			68
SoF Measured			92.65%
Standard Error of SoF			3.163%
Relative precision (Margin of error)			6.69%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

- Parameter (μ_v):

Monitoring parameter(s)		Utilization of Project stoves - for μ_v	
Sampling frame(s)		Given stove model population	
Sampling approach		Stratified random sampling	
Sampling Population	Sampling frame size	Expected value	Calculated Sample Size (n)
2021	0		
2022	0		
2023	49843	0.88	53
Estimated results based sample size determination			
Estimated utilization (p)			0.88
Expected Standard Deviation (SD)			0.32
$V_{Utilization} = (SD/p)^2$			0.14
Sample Size required (Utilization)			52
Monitoring results			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Utilization
2021	0		
2022	0		
2023	49843	68	0.85
Reliability Check			
Samples Monitored			68
Utilization Measured			84.92%
Standard Error of Utilization			4.337%
Relative precision (Margin of error)			10.01%
Result			Use Lower Bound Value
Lower Bound confidence value			76.42%

APPENDIX 4: LIST OF GRIEVANCES RECEIVED IN MP3

DeIAGua - Project 4150							
Grievance Redress Mechanism							
Date Raised	Current Status	Issue Raised	Raised by	Mechanism raised via.	Owner	DeIAGua Response to Issue raised	Date response given
13-05-2024	Closed	Households said he has migrated from Huye-Kinazi and heard that the stoves are being visited. He was wondered how his stove will receive HHV.	HH-Kayanza, Mwili	DeIAGua Staff	Project Co-ordinator	District Manager in the area where they migrated traced the Household and made sure they receive their visit.	27-05-2024
05-08-2024	Closed	Household has requested a second stove	HH- Nyaruguru-Nyabimata	CHW	Project Co-ordinator	Current Project design only allows the distribution of 1 ICS per household. DeIAGua was not able to feedback due to the anonymous nature of the feedback.	05-08-2024