



IMPROVED COOKSTOVE PROGRAMME BY SDG13 IN INDIA

Document Prepared by SDG13 Ventures Pte Ltd

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The proposed grouped project seeks to increase access of households and communities to improved cookstoves in the rural and semi-urban households of Madhya Pradesh. As per 2021 data of Madhya Pradesh, the state has a population of 84.5 million, constituting approximately 8.2% of India's population, while the rural population is 60.8 million, and the urban population is 23.6 million.¹ Madhya Pradesh ranks 31 out of 34 in the Human Development Index, with a value of 0.596, according to HDI estimates made by Global Data Lab in 2021.²

The proposed grouped project activity will help in reducing the GHG emissions. The old and traditional cookstoves having low thermal efficiency and emitting high amounts of greenhouse gases will be replaced with new and efficient cookstove technologies, viz., Improved Cookstoves (ICS). Implementation of the proposed grouped project activity will also help in the reduction of consumption of firewood, and contribute to reduction of greenhouse gases being emitted into the atmosphere. Additionally, it would enable conserving forests and also improving the quality of health of the ICS users. This is complimented by better indoor air quality as well as drudgery reduction in everyday cooking for women involved.



Figure 1. Beneficiary with the ICS

The Project Proponent (PP) has distributed single pot Greenway Jumbo cookstoves. As of end of current monitoring period a total of 201,315 ICS has been distributed to individual

¹ https://main.mohfw.gov.in/sites/default/files/Population%20Projection%20Report%202011-2036%20-%20upload_compressed_0.pdf

² <https://globaldatalab.org/shdi/table/shdi/IND/?levels=1+4&interpolation=0&extrapolation=0>

households in various districts of the state of Madhya Pradesh in India. The ICS deployed under project activity are manufactured and supplied by Greenway Grameen Infra Pvt Ltd. The project proponent works with local partners to identify and supply stoves, conduct awareness programs, and collect data.

Table 1. Distribution record of ICS in Madhya Pradesh

Sl. No.	District Name	Number of ICS
1	Alirajpur	2713
2	Balaghat	32012
3	Barwani	13421
4	Betul	3160
5	Bhopal	985
6	Chhatarpur	790
7	Chhindwara	20080
8	Damoh	6126
9	Dewas	1211
10	Dhar	3524
11	Indore	3423
12	Jabalpur	8964
13	Jhabua	7371
14	Katni	12457
15	Khargone	232
16	Mandla	15560
17	Narsinghpur	1241
18	Panna	7340
19	Ratlam	508
20	Rewa	12150
21	Sagar	2302
22	Satna	15884
23	Sehore	1060
24	Seoni	13745
25	Sidhi	7748
26	Singrauli	2288
27	Ujjain	1278
28	Umaria	2015
29	West Nimar	1250
30	Others	477
	Total	201,315

The distribution of ICS started from 9th October 2021 and the first batch of commissioning is 1st January, 2022, which is also the start date of the crediting period for the project activity. Onwards, the daily basis number of ICS distributed is considered as a batch for calculation of

emission reduction. All the data is recorded during stove registration and captured through a mobile application. The collected information is then transferred to the project database.

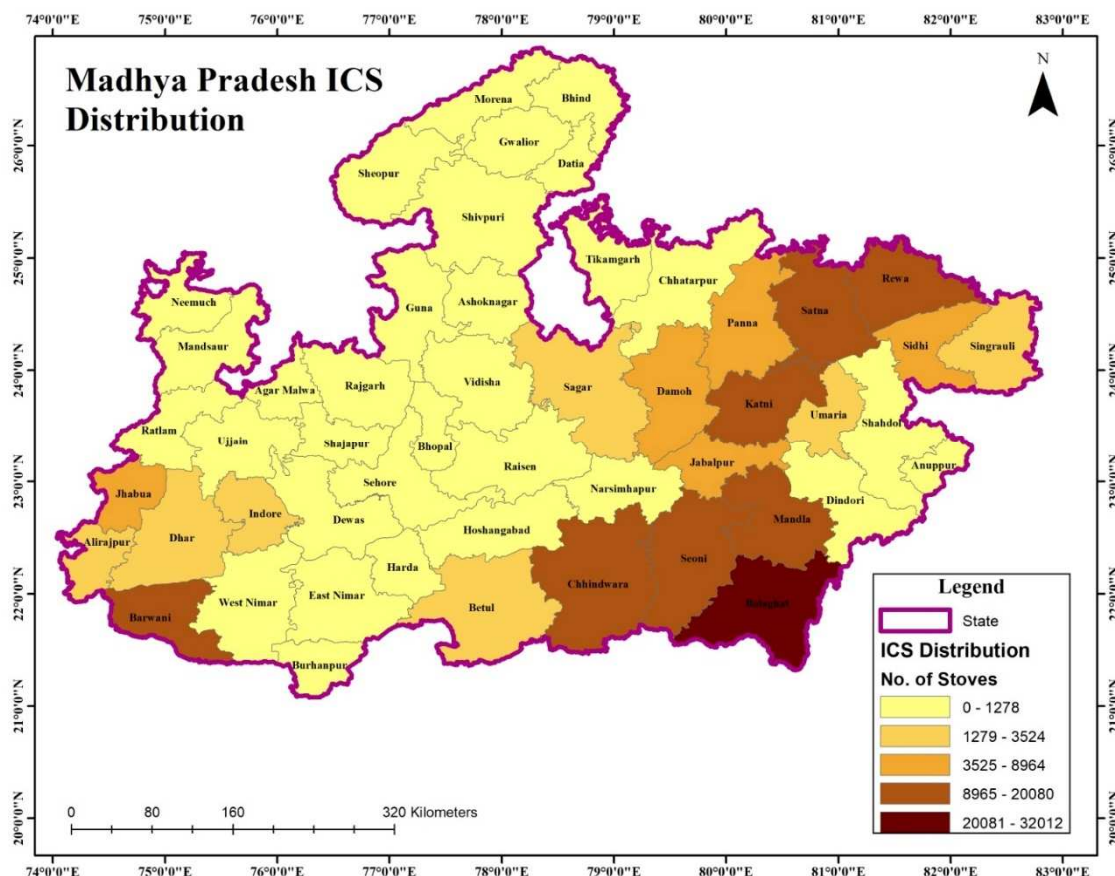


Figure 2. Madhya Pradesh Improved cookstove distribution record

The survey to collect information on the number of project ICS operational, any additional cookstove or baseline cookstove usage along with project ICS was conducted from 14th July, 2023 to 24th July, 2023. During the survey, all the project ICS was found to be operational. It was seen the there was a slight usage of baseline stove during current monitoring period.

During the current monitoring period i.e., from 1st January, 2023 to 30th June, 2023, a total of 62,154 ICS were distributed leading to a cumulative number of 201,315 as of end of 30 June 2023. Overall, 201,315 ICS were operational and resulted in 490,281 tCO₂e of emission reductions. Conservatively, the PP opted to claim 479,895 tCO₂e of emission reductions instead. The reasons have been described in the section 5.4 of MR.

Table 2: Audit history of the project

Audit Type	Period	Program	VVB Name	Number of years
Validation	3 June 2021 to 29 October 2021	VCS	KBS Certification Services Pvt. Ltd.	0.41

Monitoring Period 1 (Verification)	1 January 2022 to 30 April 2022	VCS	Applus+ Certification	0.33
Monitoring Period 2 (Verification)	1 May 2022 to 31 December 2022	VCS	Applus+ Certification	0.66
Monitoring Period 3 (Verification)	1 January 2023 to 30 June 2023	VCS	Applus+ Certification	0.50
Total	03/06/2021 to 30/06/2023-	-	-	1.9 years

1.2 Sectoral Scope and Project Type

Sectoral Scope: 03 (Energy Demand)

Project Type: Type II – Energy Efficiency Improvement Project

Grouped Project: Yes

1.3 Project Proponent

Organization name	SDG13 Ventures Pte Ltd
Contact person	Mr Ankit Mathur
Title	Director
Address	100 Peck Seah Street #10-18 PS100 Singapore 079333
Telephone	+65 6962 0655
Email	sdg13ventures@gmail.com

1.4 Other Entities Involved in this Project

Organization name	Not applicable
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Role in the project	Not applicable
Contact Person	Not applicable
Title	Not applicable
Address	Not applicable
Telephone	Not applicable
Email	Not applicable

1.5 Project Start Date

The start date of the project activity is 1st January, 2022, which is the date of commissioning of the first batch of ICS.

1.6 Project Crediting Period

The project proponent has chosen a fixed crediting period of ten years. The crediting period of the project activity is from 1st January, 2022 to 31st December, 2031

1.7 Project Location

The grouped project will be implemented in Madhya Pradesh, a state in the Republic of India. The project boundary is defined by the following GPS coordinates:

North – 34° 27' 56" N & 75° 43' 54" E.

South – 08° 06' 21" N & 77° 32' 30" E

West – 22° 15' 58" N & 69° 02' 05" E

East – 26° 16' 20" N & 94° 58' 04" E

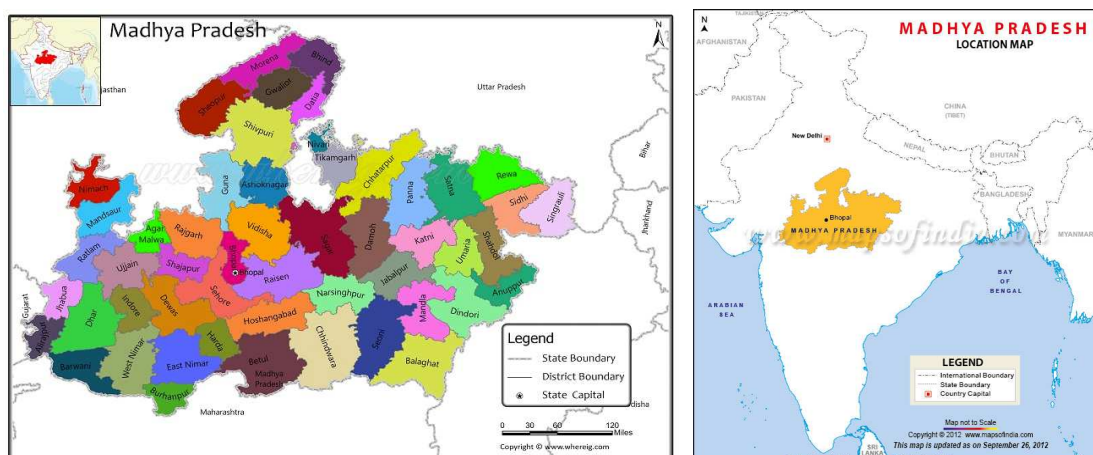


Figure 3: Location of Madhya Pradesh in India.

1.8 Title and Reference of Methodology

The following approved baseline & monitoring methodology has been applied.

Methodology: VMR0006- Methodology for Installation of High Efficiency Firewood Cookstoves

Version: 1.1

Sectoral Scope: 03

Tools:

TOOL01: "Tool for the demonstration and assessment of additionality"; Version-07, EB70

TOOL30: "Calculation of the fraction of non-renewable biomass"; Version-03, EB 108, Annex 11"

Standard:

Sampling and surveys for CDM project activities and programmes of activities, Version-09

1.9 Participation under other GHG Programs

The project activity has not been registered or is not currently seeking registration under any other GHG programs. The project has not participated in any other GHG program.

1.10 Other Forms of Credit and Supply Chain (Scope 3) Emissions

- This project activity is a voluntary initiative and it is not required to meet any local laws or regulatory compliances. An undertaking has been submitted that the PP shall not claim GHG emission reduction credits for the given crediting period under any other emissions-trading program or GHG binding limits.
- The PP declares that emission reductions generated from the project activity will not be double-counted (i.e., issuance of other forms of environmental credit like under CDM) for the particular crediting period, which is being claimed under VCS mechanism. PP has submitted an undertaking to the Validation/Verification Body (VVB) that they shall not claim for GHG emission reduction credits for the given period under any other emission-trading program.

1.11 Sustainable Development Contributions

The project activity includes distribution of improved cookstoves amongst the beneficiaries in the rural and semi-urban areas of Madhya Pradesh, India, who were using the traditional cookstoves in the pre-project scenario, thereby replacing the baseline inefficient cookstoves. The observed impacts of the project across social, environmental, economic and technological spheres, have been discussed below. The project's contribution towards sustainable development is established in line with the sustainable development indicators framed by India's stated sustainable development priorities, as set out in the SDG India Index Report 2021.

Social benefits

A typical project instance replaces the low efficiency conventional firewood stoves with higher efficiency ICS models, through carbon finance, which enables the provision of clean cooking as basic service to the beneficiary households (SDG 1.4.1). The project ICS generates less smoke during cooking, which reduces household air pollution (HAP). As a result, there has been a decrease in the risk of pulmonary health diseases among the women, elderly and children of the households (SDG 3.4.1) and a lowered mortality rate in the households (SDG 3.9.1). Through the use of the project ICS, women have spent a lesser amount of time on cooking and fuelwood collection, and have been able to spend more time on other economic opportunities and their education (SDG 5.4.1).

Environmental benefits

The project ICS is fuel-efficient, which has resulted in lower usage of fuelwood vis-à-vis traditional cookstoves. This has reduced greenhouse gas emissions to the atmosphere (SDG 13.2.2).

Economic benefits

The households who benefit from the project ICS belong to the lower income bracket of the rural and semi-urban population of Madhya Pradesh. These households rely on low efficiency traditional firewood stoves in the pre-project scenario. The local communities are employed in the project implementation (SDG 8.3.1) such as sales, distribution, monitoring, user training, maintenance and replacement services, which has resulted in their income growth (SDG 10.1.1). The local women are also involved in the project implementation processes, thereby increasing opportunities for female participation in the workforce (SDG 10.2.1).

Technological benefits

The project implementation's success depends on the transfer of knowledge and skills to the local employees and the end-users. Such knowledge and skill transfer have been duly provided by the project proponent throughout the year, in the form of training programmes for its employees and demonstration and awareness events conducted for the beneficiaries (SDG 8.2.1) from time to time. This has also increased the proportion of the population that uses clean cooking technology (SDG 7.1.2).



Figure 4. Beneficiary cooking on the ICS

Thus, the project activity contributes towards sustainable development of the region as well as of the nation, showing action on at least 7 different SDGs:



Figure 5: Sustainable development contributions under different SDGs by the project activity

The sustainable development contributions of the project activity under different SDG targets and indicators have been given in Table 3. Evidence of the project's sustainable development contributions have been added in *Appendix I*.

Table 3: Sustainable Development Contributions

Row Number	SDG Target	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 activity to increase access of households to clean cooking as a basic service through increased investment	Increased investment in clean cooking technology by the PP has enabled greater access to this basic service to 201,315 rural and semi-urban households within the project boundary, during the current monitoring period.	Increased investment in clean cooking technology by the PP has enabled greater access to basic clean cooking service to 201,315 rural and semi-urban households within the project boundary, over the lifetime of the project.
2)	3.4	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	Implemented activity to decrease the mortality rates associated with chronic respiratory disease	The project activity reduced the risk of mortality attributed to chronic respiratory disease of beneficiaries, through decreasing household air pollution owing to the use of the distributed ICS for cooking.	The project activity has reduced the risk of mortality attributed to chronic respiratory disease of beneficiaries, through decreasing the household air pollution owing to the use of the distributed ICS for cooking.
3)	3.9	3.9.1 Mortality rate attributed to household and ambient air pollution	Implemented activity to decrease household air pollution through use of ICS among the beneficiary households	Till the current monitoring period, distribution of ICS has resulted in reduction of household air pollution in 201,315 households, and thereby mortality	The project has reduced indoor air pollution in 201,315 households by facilitating access and use of ICS.

				rate attributed to household air pollution has also decreased.	
4)	5.4	5.4.1 Proportion of time spent on unpaid domestics and care work, by sex, age and location	Implemented activity to decrease time spent on cooking by women members of the households under the project	During the current monitoring period, women members of the beneficiary households have experienced a reduction in time spent on cooking and fuelwood collection due to lesser amount of fuelwood requirement for cooking on ICS. They have saved an average of 1.53 hours daily from spending on cooking and 2.87 hours per week in fuelwood collection, and have been able to engage in other employment opportunities.	Women members of the households under the project have seen a massive reduction in both the amount of fuelwood required for cooking (which resulted in lesser time spent on collecting fuelwood), and the amount of time taken for cooking. An average of 1.53 hours daily from spending on cooking and 2.87 hours per week in fuelwood collection was saved. As a result of this, they also have time to engage in other employment opportunities.
5)	7.1	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Implemented activity to increase the proportion of population with primary reliance on clean technology	Till the current monitoring period, 201,315 numbers of ICS have been distributed, thereby replacing the use of baseline inefficient cookstoves. It has resulted in an increase in population with reliance on clean technology (201,315 beneficiary households).	The project has benefitted 201,315 households by making clean ICS available, through distribution of 201,315 improved cookstoves
6)	8.3	8.3.1 Proportion of informal unemployment in total employment, by sector and sex	Implemented activity to increase the proportion of informal employment	For the smooth implementation of the various phases of the project, a total of 126 people based in and around the project areas have been employed, thus generating employment within the local communities.	The project has generated employment within the local communities in and around the project areas. A total of 126 local people have been employed.
7)	10.1	10.1.1 Growth rates in household	Implemented activity to increase income	Access to and use of project ICS among the households	Access to and use of project ICS among the target

		expenditure or income per capita among the bottom 40 percent of the population	per capita amongst the beneficiary households through financial and time savings	(201,315), till the current monitoring period, has increased the financial savings through reduction in fuelwood purchase and time savings through reduction in time spent for fuelwood collection	households (201,315) has increased the financial savings through reduction in fuelwood purchase and time savings through reduction in time spent for fuelwood collection. Via targeted selection of recipient households, the project activity enables income growth for the lower income brackets.
8)	10.2	10.2.1 Proportion of people living below 50 percent of median income, by sex, age and persons with disabilities	Implemented activity to increase employment	During the current monitoring period, 35 number of local female partners have been employed in the project implementation	35 local female partners have been employed in the project implementation, which has increased the opportunity for female participation in the workforce and achieved income growth.
9)	13.2	13.2.2 Total greenhouse gas emissions avoided or removed per year	Implemented activity to result in decrease of greenhouse gas emissions	Through distribution of 201,315 number of ICS thereby replacing the use of baseline inefficient cookstoves, the project has prevented release of 479,895 tonnes of CO ₂ in the atmosphere during the monitoring period.	The project has prevented the release of 821,402 tonnes of CO ₂ into the atmosphere up to the current monitoring period.

2 SAFEGUARDS

2.1 No Net Harm

No potential negative environmental or socio-economic impacts have been identified during the current monitoring period due to the usage of the project ICS. Rather, the feedback received during the monitoring surveys have highlighted its positive impacts.

2.2 Local Stakeholder Consultation

Pre-project local stakeholder consultation

The local stakeholder consultation (LSC) for the grouped project activity was organised on 03/05/2021 at Mahua Vann Resort, in Kuppitola Village, Seoni district, Madhya Pradesh, from 11am to 2pm. The stakeholder consultation was conducted at the group project activity level as the technology and its impact will be similar for all the project activities implemented in this grouped project activity. All interested stakeholders from the group including traditional cookstove users, NGO representatives, field assistants working on the project, and local leaders attended the meeting.

The stakeholders present were informed about the objectives of the meeting and were requested to raise any concerns regarding the technology or programme anytime, during and after the meeting. A continuous grievance mechanism has also been established which was communicated to the local stakeholders, along with the contact information of the project representatives.

All questions raised by stakeholders were answered and documented by the PP and their representatives. No negative comments or suggestions on the proposed project activity were raised by any stakeholders during the meeting which could have any significant modification in the project description or its design. All the stakeholders expressed their satisfaction with the project activity and appreciated the societal and environmental benefits associated with it. The operations team members on the ground conduct local stakeholder consultations with the beneficiaries round the year, diligently recording the feedback given by the beneficiaries and addressing grievances as and when they arise, forming the continuous grievance redressal mechanism.

The representative of the PP has again taken feedback during the surveys, from the selected households under sample survey. No issues were raised by any surveyed household during the current monitoring period till the completion of the survey, and hence no action was needed to be taken by the PP.

Continuous monitoring and stakeholder engagements

In addition to the pre-project local stakeholder consultations, community outreach events, product demonstrations and monitoring exercises are organised periodically. There is a continuous monitoring of the distributed stoves to assess their efficiency and performance, and to establish and maintain a rapport with the end beneficiaries.





Figure 6 Pictures of stakeholder engagements and product demonstrations conducted periodically

This is done by the ground operations team members from the PP with the help of questionnaires and the continued rapport building allows the beneficiaries to feel more comfortable while genuinely expressing their concerns regarding the usage of the ICS and any issues they might be facing. This leads to continuous feedback generation from the end beneficiaries and thereby, the PP can incorporate the received feedback and swiftly resolve the grievances on a regular basis.

The project proponent (PP) ensures that their ground operations team members are well-trained, equipped with the necessary knowledge and skills to effectively address any quality issues that may arise during the operation of the Improved Cookstoves (ICS) by the beneficiaries. The team also conducts periodic awareness and product demonstration events for the local communities. During these events, they showcase the proper usage of the ICS, highlight its benefits, and emphasize the positive environmental impacts it brings. The PP conducts regular training sessions, both online and in the field, to ensure efficient knowledge transfer and skill development. Table 4 below lists all the trainings that have been undertaken in the project location, i.e., Madhya Pradesh, from January to June. These trainings were provided in Hindi.

Table. 4: Trainings and events that have been conducted in Madhya Pradesh from January to June, 2023

Category	Venue	Date of Training
Data Training	Seoni, Madhya Pradesh	04-01-2023
	Damoh, Madhya Pradesh	06-01-2023
	Indore, Madhya Pradesh	06-01-2023
	Balaghat, Madhya Pradesh	07-01-2023
	Mandla, Madhya Pradesh	07-01-2023
	Chindwara, Madhya Pradesh	09-01-2023
	Megnagar, Madhya Pradesh	09-01-2023

Category	Venue	Date of Training
	Jabalpur, Madhya Pradesh	10-01-2023
	Parasiya, Madhya Pradesh	10-01-2023
	Rewa, Madhya Pradesh	12-01-2023
	Kuksi, Madhya Pradesh	13-01-2023
	Satna, Madhya Pradesh	18-01-2023
	Kanda, Madhya Pradesh	24-01-2023
	Niwas, Madhya Pradesh	24-01-2023
	Bela, Madhya Pradesh	04-02-2023
	Tirodi, Madhya Pradesh	09-02-2023
	Katni, Madhya Pradesh	10-02-2023
	Niwas, Madhya Pradesh	20-02-2023
	Jhobhat, Madhya Pradesh	06-03-2023
	Patan, Madhya Pradesh	13-03-2023
	Mp, Madhya Pradesh	18-03-2023
	Indore, Madhya Pradesh	01-04-2023
	Ranapur, Madhya Pradesh	07-04-2023
	Kalariya, Madhya Pradesh	11-04-2023
	Megnagar, Madhya Pradesh	20-04-2023
	Satna, Madhya Pradesh	22-04-2023
	Kukshi, Madhya Pradesh	24-04-2023
	Narayanganj, Madhya Pradesh	25-04-2023
	Mandla [Bichhiya], Madhya Pradesh	02-05-2023
	Damoh, Madhya Pradesh	06-05-2023
	Google Meet, Madhya Pradesh	08-05-2023
	Bargwan, Madhya Pradesh	10-05-2023
	Warla, Madhya Pradesh	16-05-2023
	Kurai, Madhya Pradesh	19-05-2023
	Khairlanji, Madhya Pradesh	20-05-2023
	Baihar, Madhya Pradesh	22-05-2023
	Barwani, Madhya Pradesh	24-05-2023
	Udaigarg, Madhya Pradesh	25-05-2023
	Waraseoni, Madhya Pradesh	27-05-2023
	Lalburra, Madhya Pradesh	30-05-2023
	Jabalpur, Madhya Pradesh	01-06-2023
	Megnagar , Madhya Pradesh	02-06-2023
	Niwas, Madhya Pradesh	05-06-2023
	Mandla , Madhya Pradesh	07-06-2023
	Dahi, Madhya Pradesh	08-06-2023
	Katangi , Madhya Pradesh	09-06-2023
	Katni , Madhya Pradesh	10-06-2023
	Damoh, Madhya Pradesh	19-06-2023
	Pansemal , Madhya Pradesh	20-06-2023
	Alirajpur , Madhya Pradesh	21-06-2023
	Satna , Madhya Pradesh	27-06-2023
Distribution Training	Tamia, Madhya Pradesh	03-03-2023

Category	Venue	Date of Training
	Barwani, Madhya Pradesh	02-01-2023
	Waraseoni balaghat, Madhya Pradesh	11-01-2023
	Bhabra, Madhya Pradesh	17-01-2023
	Balaghat, Madhya Pradesh	18-01-2023
	Katangi, Madhya Pradesh	19-01-2023
	Panna, Madhya Pradesh	01-02-2023
	Chhatrpur, Madhya Pradesh	08-02-2023
	Manawar, Madhya Pradesh	20-03-2023
	Kukshi ruler area, Madhya Pradesh	04-04-2023
	Katangi, Madhya Pradesh	05-04-2023
	Singrouli, Madhya Pradesh	06-04-2023
	Bijadandi , Madhya Pradesh	23-04-2023
	Sidhi, Madhya Pradesh	27-04-2023
	Rameswar, Madhya Pradesh	03-05-2023
	Alirajpur, Madhya Pradesh	04-05-2023
	Tangi, Madhya Pradesh	04-05-2023
	Gangeo, Madhya Pradesh	05-05-2023
	Nuagan, Madhya Pradesh	05-05-2023
	Nagoud, Madhya Pradesh	06-05-2023
	Nayagarh, Madhya Pradesh	06-05-2023
	Ranapur, Madhya Pradesh	12-05-2023
	Gania, Madhya Pradesh	15-05-2023
	Badamba, Madhya Pradesh	16-05-2023
	Dhenkanal, Madhya Pradesh	23-05-2023
	Huzur, Madhya Pradesh	26-05-2023
	Rajsunakhala, Madhya Pradesh	29-05-2023
	Kothi, Madhya Pradesh	17-06-2023
	Rampurbaghelan, Madhya Pradesh	28-06-2023
	Rampurbaghelan, Madhya Pradesh	29-06-2023
Others (Road & Safety / Grooming & Etiquettes)	Waraseoni, Madhya Pradesh	22-02-2023
	Jabera, Madhya Pradesh	06-03-2023
	Pansemal, Madhya Pradesh	09-03-2023
	Indor, Madhya Pradesh	15-03-2023
	Dharamपुरi, Madhya Pradesh	20-03-2023
	Jhobat, Madhya Pradesh	21-03-2023
	Chindwara, Madhya Pradesh	24-03-2023
	Barghat, Madhya Pradesh	07-04-2023
	Sendhwa, Madhya Pradesh	13-04-2023
	Jambua, Madhya Pradesh	08-05-2023
	Meg nagar, Madhya Pradesh	11-03-2023
Product Demonstrations	Kukshi, Madhya Pradesh	01-01-2023
	Pitgara, Madhya Pradesh	10-01-2023
	Gopalpura block manawar, Madhya Pradesh	11-01-2023
	Kohiwaw, Madhya Pradesh	12-01-2023

Category	Venue	Date of Training
	Village Bhuryakua, Madhya Pradesh	18-01-2023
	Avalda, Madhya Pradesh	19-01-2023
	Jaitwara, Madhya Pradesh	21-01-2023
	Bargawan, Madhya Pradesh	23-01-2023
	Devser, Madhya Pradesh	24-01-2023
	Lalaburra, Madhya Pradesh	06-02-2023
	Barhi, Madhya Pradesh	11-02-2023
	Katni, Madhya Pradesh	12-02-2023
	Padla, Madhya Pradesh	15-02-2023
	Sidhi, Madhya Pradesh	15-02-2023
	Baghwar, Madhya Pradesh	16-02-2023
	Jabalpur, Madhya Pradesh	17-02-2023
	Gounor, Madhya Pradesh	21-02-2023
	Bela, Madhya Pradesh	24-02-2023
	Kamsul, Madhya Pradesh	25-02-2023
	Majhgan, Madhya Pradesh	25-02-2023
	Deoser, Madhya Pradesh	05-03-2023
	Naigarhi, Madhya Pradesh	14-03-2023
	Amarpatan, Madhya Pradesh	17-03-2023
	Mandla, Madhya Pradesh	18-03-2023
	Rewa, Madhya Pradesh	23-03-2023
	Jawa, Madhya Pradesh	24-03-2023
	Parasiya, Madhya Pradesh	25-03-2023
	Rau Indore, Madhya Pradesh	12-04-2023
	Kukshi ruler, Madhya Pradesh	18-04-2023
	Kurai, Madhya Pradesh	19-04-2023
	Sawer, Madhya Pradesh	26-04-2023
	Patera, Madhya Pradesh	27-04-2023
	Pulsud, Madhya Pradesh	27-04-2023
	Mauganj, Madhya Pradesh	03-05-2023
	Khumari (Majholi), Madhya Pradesh	04-05-2023
	Damoh [Jhinna], Madhya Pradesh	05-05-2023
	Katni [Barhi-Manpur], Madhya Pradesh	09-05-2023
	Deoser, Madhya Pradesh	11-05-2023
	Majhauri, Madhya Pradesh	12-05-2023
	Rampur baghelan, Madhya Pradesh	13-05-2023
	Jabalpur (Barela), Madhya Pradesh	16-05-2023
	Gunour, Madhya Pradesh	19-05-2023
	Jabalpur (Khari), Madhya Pradesh	22-05-2023
	Dahi block, Madhya Pradesh	23-05-2023
	Panna, Madhya Pradesh	23-05-2023
	Patan (Sundradehi), Madhya Pradesh	23-05-2023
	Patan (Belkheda), Madhya Pradesh	24-05-2023

Category	Venue	Date of Training
	Java, Madhya Pradesh	25-05-2023
	Majhigwan, Madhya Pradesh	27-05-2023
	Bichhiya (Mandla), Madhya Pradesh	06-06-2023
	Bela, Madhya Pradesh	13-06-2023
	Sidhi, Madhya Pradesh	14-06-2023
	Deosar, Madhya Pradesh	15-06-2023
	Katni, Madhya Pradesh	16-06-2023
	Mandla, Madhya Pradesh	22-06-2023

2.3 AFOLU-Specific Safeguards

The proposed grouped project activity is a non-AFOLU project. Hence, this section is not applicable.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project implementation involves distribution and continuous monitoring of the improved cookstoves (Greenway Jumbo Cookstoves) in various districts of Madhya Pradesh. Specifications of the stove are mentioned in Table 5. Local people from the communities in and around the project areas, have been engaged as ground operations team members for the implementation of the project. From 9th October, 2021 to 30th June, 2023 a total of 201,315 Greenway Jumbo cookstoves have been distributed to the beneficiary households by the ground operations team members. The distribution team has used software to record data and unique ID along with user details and end user agreement uploaded for storage, which can be accessed and verified as and when needed. The staff were trained to execute the distribution plan including data collection and training the end users for proper usage of the ICS. The end users were also provided with contact details of the support team person to connect with in cases of any complaints or feedback. During the current monitoring period, no other entity was involved unlike the previous monitoring periods where the consultant was involved.

Table 5: Specifications of ICS (Greenway Jumbo Cookstoves)

Size:	12" x 11.4" x 11.6"
Net weight:	3.75 kg
Loading capacity:	40 kg
Primary raw materials:	Stainless steel and aluminium



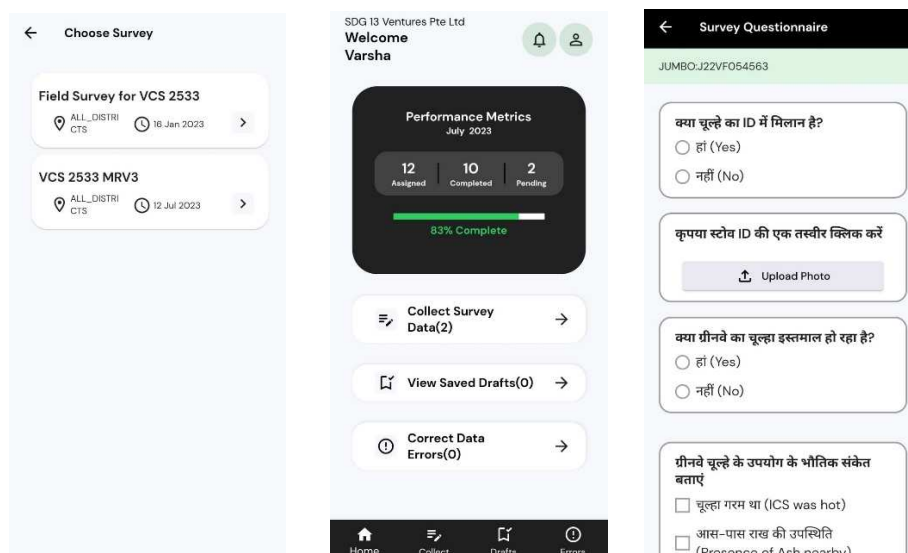


Figure. 7 Screenshots of the TRACE application mobile application used for monitoring survey

No incidents were observed during the current monitoring period which would negatively impact the emissions reduction calculation. All the ICSs were operational, and no breakdown of the stoves was observed.

The project activity has been implemented and operated as per the registered PD. The project team is structured as per the functions that are carried out viz. Project Management, Ground Operations, Data Management and Carbon Compliance (figure 8). The team members part of these functions and their roles have been elaborated in Table 5.

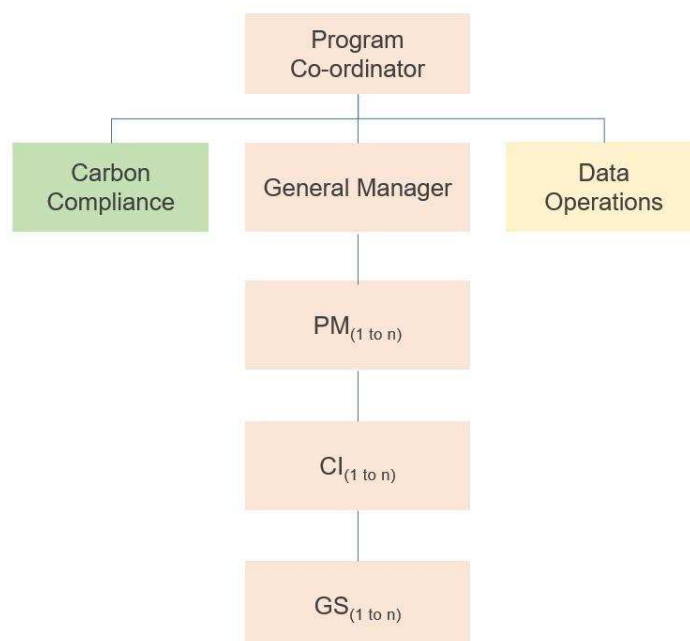


Figure 8: Project structure and the associated hierarchy

Table 5: Project team members and their roles as per the project structure

Project division	Team member(s)	Responsibility
Project Management	Program Coordinator	- Supervises the overall implementation of the project, while ensuring that the necessary compliances are being met - Works with internal and external stakeholders involved in the project.
	General Manager (GM)	- Oversees the distribution plans of the Project Managers (PMs) in the entire project boundary - Ensures that Cluster Incharges (CIs) and Grameen Sahayaks (GSs) are efficiently trained to deliver on the requirements of the project - Supervises all the operational and carbon compliance activities for the project.
Ground Operations	Project Manager (PM)	- Supervises distribution and monitoring campaigns across multiple districts under the project boundary - Prepares a distribution plan with the CIs and demarcates the distribution area for each GS.
	Cluster In-charge (CI)	- Manages the GSs for supervised execution of the project implementation process - Communicates and coordinates between the PMs and CIs - Involved in awareness generation and monitoring activities along with the GSs - Verify and pass on (to the Data team) the end-user information, carbon-waiver agreements and other documents collected by the GSs.
	Grameen Sahayak (GS)	- Primary link to the customers - Distribute and monitor the stoves, collect the end-user information and train the users to use the stoves efficiently - Address the customer grievances as and when they arise.
Data Management	Data team Manager & Data verification officers	- Oversees proper functioning of the data systems and database - Ensures that the user data record is updated and verified.
Carbon Compliance	Project Consultant & Carbon Associates	Ensure that the project complies to the methodological requirements of the carbon registry under which the project is listed.


Figure 9: Steps involved in the distribution process

The distribution system of the PP is mapped out in a number of steps which starts with outreach conducted to the identified beneficiaries/ end users of the ICS, followed by placement of stove orders upon receiving them and recording them in the database. Baseline conformity checks

are conducted as required on the households and project locations, which is followed by deployment of ICS from the factory to the households. A database is maintained to ensure streamlining; quality and integrity of the data that is being collected on the beneficiary households and deployed stoves. The steps involved in the distribution process of the project implementation are elaborated in *Appendix I*.

3.2 Deviations

3.2.1 Methodology Deviations

There have been no deviations from the methodology during the current monitoring period.

3.2.2 Project Description Deviations

There have been no deviations from project description during the current monitoring period.

3.3 Grouped Projects

The current instance under verification is already covered during validation and registration of the project activity and meets all the eligibility requirements.

Table 6: Eligibility criteria for grouped projects

Sl. No.	Eligibility criterion-Category	Eligibility criterion-Required condition	Supporting evidence for inclusion
1.	The geographical boundary of the project instances including any time- induced boundary consistent with the geographical boundary set in the Project Description.	The project boundary corresponds to the boundaries of the host country India. All the distributed ICS in a project instance shall be located within the geographical boundary of India.	In the project, ICS has been distributed in various districts of the state of Madhya Pradesh, India. The same can be checked through distribution records and end user agreements. Hence, eligibility criteria are met.
2.	Conditions that avoid double counting of emission reductions like unique identification of product and end user locations.	A unique numbering system for the ICS will be applied in each project instance, assigning a unique number to each ICS and allowing for clear identification for each ICS to which project instance/cluster it belongs.	Each ICS distributed has a unique identity and corresponding end user details (name, address, etc.) are duly recorded. Additionally, unique ID of the ICS is displayed on the stove itself. The unique identification of the ICS can be verified and hence, eligibility criteria is met.
3.	The specifications of the technology/measure, including the level and type of service, performance specifications including compliance with testing/certifications.	Project will consist of the distribution of ICS with a thermal efficiency of at least 25%, as per Water Boiling Test or compliance with Tier II and above as per ISO, to household users cooking with non-renewable biomass in the	The PP has distributed single pot Greenway Jumbo cookstoves having a certified efficiency of 38%. Hence, eligibility criteria are met.

		baseline scenario. The project instances will involve replacement of conventional firewood cookstoves for biomass fired ICS as defined in the VCS PD. Stove types replaced and implemented is defined in the VCS PD, and hence appliances will involve the efficiency improvements in the thermal applications of non-renewable biomass as per VMR006.	
4.	The conditions that ensure that the project instances meet the requirements pertaining to the demonstration of additionality.	The project must have characteristics with respect to the additionality requirements that are consistent with the initial instances for the specified project activity and geographical area.	The additionality is determined using the financial barrier option in line with the applied approved methodology, VMR006. Step 1: The project implementation is not mandated by any government policy or regulation in the host country, India. Step 2: Not applicable Step 3: As the PP has sold ICS at more than 60% subsidy, hence the return from the project is negative and sale of VERs will help in funding gap. Hence, project activity is additional. Hence, eligibility criteria are met.
5.	Where applicable, the conditions related to sampling requirements for the project in accordance with the “Standard for sampling and surveys for CDM project activities and Programme of Activities”.	Monitoring will adhere to all the requirements related to sampling for a project instance, in accordance with the sampling guidelines including all the annexes and amendments till EB 86 Annex 04 and “Sampling and surveys for CDM project activities and Programme of Activities”, version 09.0	Specification of the sampling methods applied and compliance with the sampling requirements are established in the PD. The sampling has been undertaken as per the sampling plan in the PD. Hence, eligibility criteria are met.
6.	VER ownership	End users receiving ICS under the specific project instances contractually cede their rights to claim and own emission reductions under the VCS of the PP of the project.	A default distribution agreement for end users including the provision that emission reductions generated from the use of the ICS are owned by the PP is duly informed to and signed by each individual end user. The same can be checked by the VVB.
7.	Where a capacity limit applies to a	The grouped project does	Not applicable.

	project activity included in the project, no Project instance shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows: a) Each project activity instance that exceeds one percent of the capacity limit shall be identified. b) Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance is within one kilometre of at least one other instance in the cluster. Instances that are not within one kilometre of any other instance shall not be assigned to clusters. c) None of the clusters shall exceed the capacity limit and no further project activity instances shall be added to the project that would cause any of the clusters to exceed the capacity limit	not have any specified capacity limits applicable, since there are no capacity limits defined within the applied methodology, VMR0006, ver. 1.1. Therefore, this eligibility criteria is not applicable.	
8.	Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance	The new project instance shall be required to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance	For this instance, no funding from Annex-1 parties is received and hence, no ODA declaration is required.
9.	The Grouped project- specific requirements stipulated by the project proponent including any conditions related to undertaking local stakeholder consultations and environmental impact analysis, have been met	The local stakeholder consultation was conducted at a group project. Each new project instance/project will be implemented in a similar social economic context. The key stakeholders of the program both at group project activity and new project instance level is the same. To check for actions needed at the new project instance level for satisfying this eligibility criteria.	The local stakeholder consultation was done at grouped project level and was validated at registration. Therefore, no further action is needed in this regard. The project instance under current periodic verification is validated as the first actual instance. It is therefore having the same socio-economic context and target stakeholders. Hence, no further actions are needed at the new project instance level to satisfy the eligibility criteria.
10.	Have a start date that is the same as or later than the grouped project start date	All future instances shall have the start date after the date of first instance.	The project instance under verification is first instance and start date of this project instance is same as start date of grouped project.
11.	Applicability of VCS methodology	All future instances shall	The project instance under

		fulfil all-applicability criteria of VCS methodology VMR0006, v1.1.	verification is first instance and meets all the applicability condition of VMR0006 V1.1, the same is being validated during registration of grouped project activity.
12.	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area	The new instance shall adhere the baseline requirements of the VMR0006, v1.1.	The project instance under verification is first instance and baseline is already established in line with VMR0006 V1.1 as use of wood based traditional stoves, the same is being validated during registration of grouped project activity.
13.	Be eligible for crediting from the start date of the project activity instance through to the end of the project crediting period (only).	The project instance will be only eligible for the crediting from its start date through to the end of the project crediting period (only).	The crediting period of project instance under verification is start date of project instance.
14.	Not be or have been enrolled in another VCS project	No project instance to be included which is part of another grouped or standalone VCS project	The project instance under verification is first instance included under grouped project and is not registered under any other grouped or standalone VCS project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	NCV _{woodfuel}
Data unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted or reduced
Source of data	Default value as per applied approved methodology VMR0006, v1.1
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	Default value as per applied approved methodology
Purpose of Data	Calculation of baseline emissions
Comments	The value is fixed ex-ante

Data / Parameter	EF _{wf,CO2}
Data unit	tCO ₂ /TJ
Description	CO ₂ emission factor for the use of wood fuel in baseline scenario
Source of data	Default value as per applied approved methodology VMR0006, v1.1
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	Default as per applied approved methodology VMR0006, v1.1
Purpose of Data	Calculation of baseline emissions
Comments	The value is fixed ex-ante

Data / Parameter	EF _{wf,non CO2}
Data unit	tCO ₂ /TJ
Description	The non-CO ₂ emission factor for the use of wood fuel in baseline scenario
Source of data	Default value as per applied approved methodology VMR0006, v1.1
Value applied	26.23
Justification of choice of data or description of measurement methods and procedures applied	Default as per applied approved methodology VMR0006, v1.1

Purpose of Data	Calculation of baseline emissions
Comments	The value is fixed ex-ante

Data / Parameter	η_{old}
Data unit	Fraction
Description	Efficiency of baseline cookstove
Source of data	Default value as per applied approved methodology VMR0006, v1.1
Value applied	10%
Justification of choice of data or description of measurement methods and procedures applied	A default value of 0.1 shall be used if baseline 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
Purpose of Data	Calculation of baseline emissions
Comments	The value is fixed ex-ante

Data / Parameter	η_P
Data unit	Fraction
Description	Efficiency of project stove at the start of project activity
Source of data	Manufacturer specification
Value applied	0.38
Justification of choice of data or description of measurement methods and procedures applied	The parameter shall be determined ex-ante
Purpose of Data	Calculation of $\eta_{y,i,j}$
Comments	The value is fixed ex-ante

Data / Parameter	f_{NRB}
Data unit	Fraction
Description	Fraction of woody biomass saved by the project activity in year y, that can be established as non-renewable biomass
Source of data	Calculated as per TOOL30 "Calculation of the fraction of non-renewable biomass", Version-04
Value applied	0.901
Justification of choice of data or description of measurement methods and procedures applied	The value established using the latest information available in the public domain is implemented and will be fixed ex-ante. The f_{NRB} value is established using as per the methodological tool 30 "calculation of fraction of non-renewable biomass" V04.0
Purpose of Data	Calculation of baseline emissions

Comments	The value is fixed ex-ante
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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 year y
Source of data	Monitoring
Description of measurement methods and procedures to be applied	Monitored based on a representative sample through a survey. Sampling standard has been used for determining the sample size to achieve 95/10 confidence precision according to the latest version of Standard for sampling and surveys for CDM project activities and programme of activities. The sample size calculated as per required confidence and precision level is 21 (rounded up value), however PP has considered 202 samples, which is conservative. The project achieves the required precision level with 100% devices in use.
Frequency of monitoring/recording	At least once every two years
Value monitored	201,315
Monitoring equipment	Monitoring survey
QA/QC procedures to be applied	The project implementer shall maintain a distribution record to calculate this parameter. The survey conducted during the current monitoring period reveals 100% ICS were operational.
Purpose of data	Calculation of baseline emissions
Calculation method	Proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value
Comments	–

Data / Parameter	$B_{y=1,new,i,j,survey}$
Data unit	Tonnes/household/year
Description	Annual quantity of woody biomass used by improved cookstoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey
Source of data	Monitoring survey
Description of measurement methods and procedures to be applied	Kitchen Performance Test (KPT) was conducted in line with the Standard for sampling and surveys for CDM project activities and programme of activities or guidelines provided in methodology Section 8.4 Option (b).
Frequency of monitoring/recording	Determined in the first year of project implementation
Value monitored	1.245 (first KPT conducted in 2022) and,

	1.368 (second KPT conducted in 2023)
Monitoring equipment	Monitoring survey
QA/QC procedures to be applied	Not applicable
Purpose of data	Calculation of baseline emissions
Calculation method	In 2022, Kitchen Performance Test was conducted across 20 sample households to record the daily fuelwood consumption in kg/household/day. The average consumption value across the 20 households were converted to tonnes/household/year. While in 2023, another KPT was conducted across 24 samples to account for seasonal variations and efficacy of project proponent initiatives.
Comments	--

Data / Parameter	$\eta_{new,i,j}$
Data unit	Fraction
Description	Efficiency of the device of each type i and batch j implemented as part of the project activity
Source of data	Manufacturer specification or Certification by a national standards body or an appropriate certifying agent recognized by that body
Description of measurement methods and procedures to be applied	To adopt Option V given in the methodology: “Efficiency of the improved cookstoves to be estimated using equation 5 of applied approved methodology where loss in efficiency per year is calculated, and therefore this parameter does not need to be monitored”
Frequency of monitoring/recording	Annual
Value monitored	0.38 at start of operation Year 1= 0.357 Year 2=0.354 Year 3=0.350 Year 4=0.347 Year 5=0.343 Year 6= 0.340 Year 7= 0.336 Year 8= 0.332 Year 9= 0.329 Year 10= 0.326
Monitoring equipment	Not applicable
QA/QC procedures to be applied	Not applicable
Purpose of data	Calculation of baseline emissions
Calculation method	As per equation (5) of VMR0006, v1.1

	$\eta_{new,i,j} = \eta_P \times (DF_n)^{y-1} \times 0.94$
Comments	For the current monitoring period, a weighted average efficiency of 35.62% has been used as there are 143, 167 stoves in age group 0-1 and 58,148 stoves in age group 1-2, having efficiencies of 35.72% and 35.36% respectively.

Data / Parameter	Life Span
Data unit	Years
Description	The operating lifetime of the project device. The lifespan should be reported if the methodology equation 5 is adopted to determine the project stove efficiency
Source of data	Manufacturer specification
Description of measurement methods and procedures to be applied	The data source as per manufacturer specification
Frequency of monitoring/recording	Once at the time of installation of batch of type of stove
Value monitored	7
Monitoring equipment	Not applicable
QA/QC procedures to be applied	Not applicable
Purpose of data	Calculation of baseline emissions
Calculation method	Not applicable
Comments	--

Data / Parameter	Date of commissioning of batch j
Data unit	Date
Description	To establish the date of commissioning, the PP 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 to be applied	Fixed and recorded at the time of commissioning/distribution of the last project device in the batch
Frequency of monitoring/recording	Fixed and recorded at the time of commissioning/distribution of the last project device in the batch
Value monitored	1 st January, 2022
Monitoring equipment	Not applicable
QA/QC procedures to be applied	Not applicable

Purpose of data	Calculation of emission reduction
Calculation method	Not applicable
Comments	--

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 survey
Description of measurement methods and procedures to be applied	It was seen the there was a slight usage of baseline stove during current monitoring period observed, which was not significant.
Frequency of monitoring/recording	At least once in 2 years
Value monitored	0.891
Monitoring equipment	Monitoring survey
QA/QC procedures to be applied	Monitoring based on a representative sample through a survey. Sampling standard is being used for determining the sample size to achieve 95/10 confidence precision according to the latest version of Standard for sampling and surveys for CDM project activities and programme of activities. The project activity has achieved the required precision levels (at 95/10) when it comes to the value of $\mu_{y,i,j}$. This is because there has been a 100% use of project devices.
Purpose of data	Calculation of baseline emissions
Calculation method	Not applicable
Comments	--

4.3 Monitoring Plan

After the stoves have been deployed to the households, the devices are regularly monitored and feedbacks are procured from the households using questionnaires and surveys. Any grievances, such as issues regarding stove hardware and performances, raised by the beneficiaries are addressed, as and when they arise. The monitoring system goes through the steps as illustrated in figure 10, and the whole monitoring cycle is repeated in multiple rounds. The steps involved in the monitoring process have been elaborated and provided in *Appendix II*.

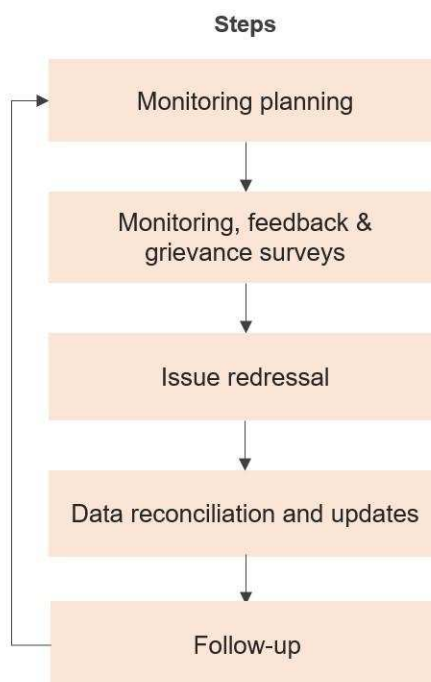


Figure 10: Steps involved in the monitoring process

Sample Plan:

The monitoring plan is designed to monitor the parameters listed in the monitoring plan of the registered PD, which are required for calculation of the actual GHG emission reductions achieved by the project activity using ex post sampling survey. The share of the operating stoves and the continued use of pre-project devices is being determined based on sampling procedures.

No monitoring for leakage through competitive uses of biomass is required, as the parameter 'wood usage' is multiplied by 95% to account for leakage.

As per the Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities, the sampling plan is the following:

(a) Sampling Design

Due to the large number of ICS distributed as part of the project activity, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling is undertaken as part of a project instance-wide Sampling Plan (by grouping and sampling across project activities) that is designed in line with the requirements of the "Sampling and Surveys for CDM Project Activities and Programme of Activities", version 04.

(i) Objective and Reliability Requirements:

The objective is to obtain an unbiased and reliable estimate of the proportion or mean value of the following key variables over the course of the crediting period. As per CDM Methodology AMS II.G, 90/10 confidence/precision shall be applied for annual sampling requirement and 95/10 for biennial sampling inspection. As per Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, Version 9.0, 90/10 confidence/precision is to be adopted for small-scale projects and 95/10 confidence/precision for large-scale projects. Given that the size of the project is under the category of large projects, hence 95/10

confidence/precision is adopted for all parameters unless the average annual emission reductions of the project are below the threshold.

Table 7: Monitored parameter- its description and frequency of monitoring

Parameter	Description	Parameter type/ frequency
$N_{y,i,j}$	Number of project devices of type i and batch j operating during year y	Proportion/ Biennial
$\mu_{y,i,j}$	Adjustment to account for any continued use of pre-project devices during the year y	Proportion/ Biennial
$B_{y=1,new,i,j,survey}$	Quantity of woody biomass used by project devices in tonnes per device of type i and batch j	Mean value / once in 2 years

(ii) Target Populations:

The target population ($N_{y,i,j}$) of this project are all the households in the project database which are using fuelwood in the Improved Cookstove (ICS) distributed under this project to meet their cooking needs, which are still in operation.

(iii) Sampling Frame

To ensure the homogeneity of the project instances included for a single sampling plan, two sampling frames shall be defined. Overall, all project instances will have the same group of end users, which is from households from rural and semi-urban areas, and thus, it is also expected that the geographical locations do not have influence on the parameter of interest. Therefore, all above mentioned parameters can be assumed to be highly homogeneous for each ICS model regardless of how the end user group and distribution/installation location is defined.

(b) Sampling frame for proportion of ICS in operation ($N_{y,i,j}$)

The sample frame refers to all the information sources on the Database. There are two primary mechanisms for data collection: the Registration Process for newly distributed/installed ICS and the Monitoring Survey (which includes a household questionnaire and visual inspection of ICSs) that will be used throughout the lifetime of the ICS. The detailed information collected from the Registration Process is used to populate the stoves Database and the Monitoring Survey follows “Sampling and Surveys for CDM Project Activities and Programme of Activities”, version 04.

As explained below (in section “Sampling Method”), to take the different characteristics of different project instances Implemented and ICS models into consideration, Project instances shall be grouped together to create a Primary Sampling Unit, which is homogenous. As per EB 86 Annex 04, Appendix-2, paragraph 1, for the use of a single sampling plan covering a group of projects, provided the homogeneity of population can be demonstrated, or differences are taken into account in the sample size calculation, a 95/5 confidence/precision is applied for biennial sampling.

The first step is to identify the Primary Sampling Units. Primary sampling units are project instances qualifying the following criteria:

(i) The same ICS models

Projects with the same ICS model can be grouped together to form a Primary Sampling Unit. In case the project has two different ICS models being implemented –then these will form two Primary Sampling Units. This is justified by the fact that the project might vary in terms of performance and it is important for the PP to collect and monitor accurate data for each stove model.

(ii) Adjustment to account for any continued use of pre-project devices during the year($\mu_{y,i,j}$)

In line with applied approved VMR0006 v1.1: “If both the improved cookstove and baseline cookstoves are used together then surveys shall be conducted to record the average continued operation of baseline cookstoves in a sample of households”.

There will be two situations: 1) project ICS are completely discarded 2) the old stoves are used along with project ICS.

Hence in the first case, it will be a simple multiplication of fraction of total number of project ICS displaced by old cookstoves by total number of cookstoves in project. In order to achieve precise results based on survey result, sample size calculation can be repeated.

However, for the second case, surveys may be conducted. The surveys should be designed to capture the cooking habits and stove usage of households in the region, including quantification of use of baseline devices, by formulating questions and/or collecting evidence to determine the frequency of usage of both the project devices and baseline devices. If there is a pre-project device in a household and it was determined during the survey that its use continues during the crediting period then a conservative adjustment factor **is** applied for the relevant monitoring period. For example, would be the case where there was only one pre-project device per household and its use during the project period continues along with the project stove to meet 25% of the cooking needs of the household in which case the adjustment factor will be 0.75. Where more precise data is available i.e., the thermal capacity of the project and pre-project devices and respective utilization hours are available, a weighted average adjustment factor may be used.

(iii) Quantity of woody biomass used by project devices in tonnes per device of type i and batch j ($B_{y=1,new,i,j,survey}$)

As mentioned above, either separate sampling can be done for this parameter or can be clubbed with sampling of above parameters, wherein additional questions may be included to determine the average fuelwood used by the project device. For this monitoring period, a KPT was conducted on 24 beneficiary households in line with the KPT Protocol provided by Clean Cooking Alliance.³ The KPT revealed that the average consumption of wood per household per day is 3.75 kg. Accordingly, the average yearly consumption of wood per household per year is $(3.75 \times 365) / 1000 = 1.368$ tonnes. We conducted the KPT to understand the seasonal variations and assess the impact of awareness campaigns to get beneficiaries to stop using baseline stoves. However, we have used the average yearly consumption of wood per household per year as per the last KPT value also used in the previous monitoring periods i.e. 1.245 tonnes/household/year (conducted in 2022).

³ [KPT Version 3.0](#), Clean Cooking Alliance

(iv) Sampling Method

The sampling method for monitored parameters $N_{y,i,j}$ and $\mu_{y,i,j}$ is Simple Random Sampling and samples are randomly selected from the primary sampling units. To ensure a random selection of ICS, a random number generator is applied. Each ICS in the target population is uniquely identifiable by its unique ID number. Each ICS can thus be allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of ICS in the Database for that pre-defined sampling frame. Applying the random number generator, the ICS can then be randomly chosen from the defined population up to the required sample size as calculated by the PP.

To determine the parameters, sampling involves the following approaches (outcome in brackets):

$N_{y,i,j}$: 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 will be determined by cooking habits evaluated by survey questionnaire during the monitoring period.

(v) Sample Size

For the estimation of the proportion or mean value of the parameters investigated, the minimum sample size for each sample frame has to achieve the 95/10 confidence/precision for annual and 95/5 confidence/precision for biennial sampling.

There are three parameters that will be estimated through sampling: the number of stoves still in operation during the monitoring period as determined by the monitoring survey ($N_{y,i,j}$), Quantity of woody biomass used by project devices in tonnes per device ($By=1,new,i,j,survey$) and the continued use of old stoves, ($\mu_{y,i,j}$).

In line with sampling guidelines, all can be sampled in a single survey with a random sample of households using the above-described confidence/precision levels. The $N_{y,i,j}$ and $\mu_{y,i,j}$ require proportion/percentage parameters, however the wood consumption by ICS may have variation and is a mean value.

In order to calculate the required sample size estimates, values for the proportions, mean values, and standard deviations are required. As per Guidelines for Sampling and surveys for CDM project activities and programmes of activities, version 04.0 Appendix 1 paragraph 5, there are different ways available to obtain the estimates of the parameter of interest:

- (a) Refer to the result of previous studies and use these results;
- (b) In a situation where information from previous studies is not available, a preliminary sample as a pilot could be conducted and use that sample is used to provide the estimates;
- (c) Use best guesses based on the researcher's own experiences.

The final sample size for the project activity is calculated based on the sample survey.

To estimate the sample size for parameters $N_{y,i,j}$ and $\mu_{y,i,j}$ the following equation is used:

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

Where,

n= sample size

N= population size (201,315)

p= expected proportion (95%)

1.96= represents the 95% confidence required

0.1= represents the 10% relative precision

Sample size calculation:

Parameter $N_{y,i,j}$: Based on the above values, the resulting sample size for a 95/10 confidence/precision is calculated as:

$$n \geq \frac{1.96^2 \times 201,315 \times 0.95 (1-0.95)}{(201,315 -1) \times 0.1^2 \times 0.95^2 + 1.96^2 \times 0.95 (1-0.95)}$$

Which comes out to be $n \geq 20.21627$.

Thus, $n = 21$.

Therefore, in this case, a sample size of 21 is to be sampled from each primary sampling unit. As the resulting sample size to achieve the desired confidence/precision levels is smaller than 30 ICSs, a minimum sample size of 30 is to be considered. This is when the parameter of interest is a proportion parameter as has been described in paragraph 14 of Standard: Sampling and surveys for CDM project activities and programmes of activities, Version 09. However, the PP has considered 202 samples conservatively. The samples for the monitoring survey were obtained through randomly selecting 252 samples using the Research Randomizer (<https://www.randomizer.org/>). The screenshot of the randomized serial numbers of the stoves is attached in Figure 11. A 20% buffer has been considered for the samples considering the possibility of no responses.

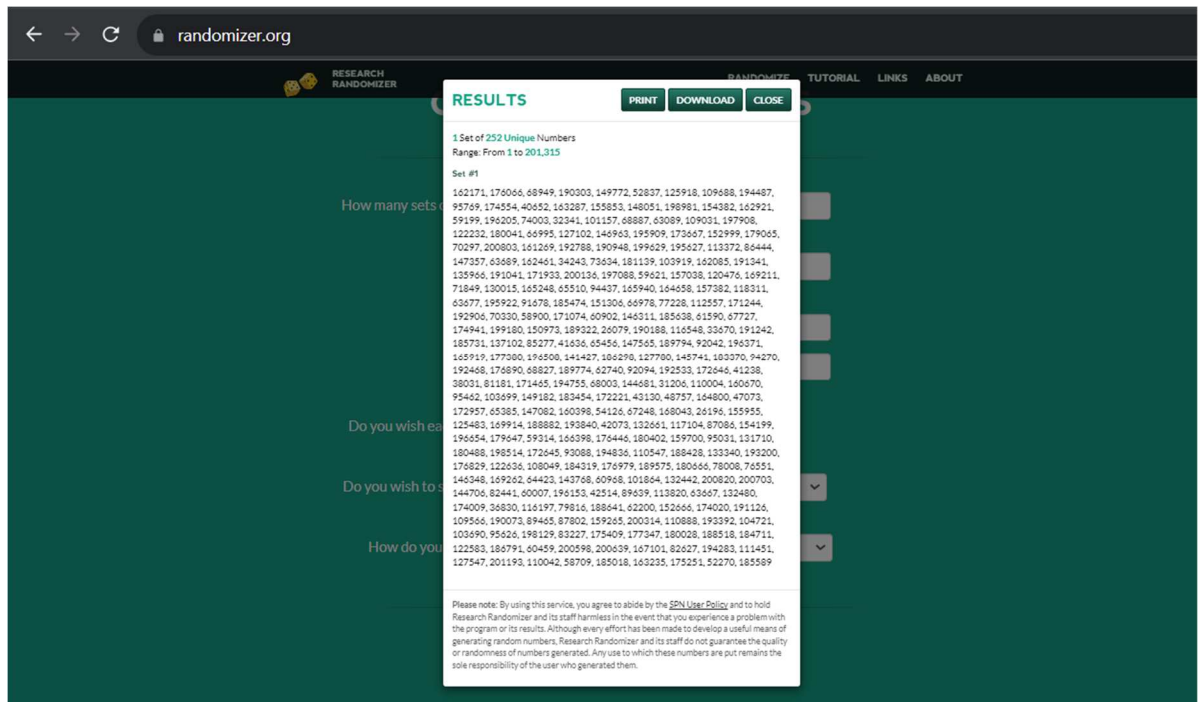


Figure 11: Screenshot of the randomizer tool used for generating 252 random serial numbers

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The project activity has disseminated improved cookstoves to individual households as an energy efficiency measure in the project, therefore equations 1 and 2 of the methodology VMRO06 “Methodology for Installation of High Efficiency Firewood Cookstoves”, V 1.1, is applied to calculate the net GHG emission reductions.

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

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 tCO₂e

$ER_{y,i,j}$ = Emission reductions by improved cookstove of type i and batch j during year y in tCO₂e

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

Where,

$B_{y,savings,i,j}$ = Quantity of woody biomass that is saved in tonnes per improved cook stove If type i and batch j during year y

$NCV_{wood\ fuel}$ = Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne)

f_{NRB} = Fraction of woody biomass that can be established as non-renewable biomass (0.901)

EF_{wf,CO_2} = CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO₂/TJ)

$EF_{wf,non\ CO_2}$ = Non-CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO₂/TJ)

$N_{y,i,j}$ = Number of improved cook stoves of type i and batch j operating during year y

0.95 = Discount factor to account for leakage

The quantity of woody biomass saved, $B_{y,savings,i,j}$, due to implementation of improved cookstoves is estimated by the following equations-

$$B_{y,savings,i,j} = B_{y=1, new,i,survey} \times ((\eta_{new,i,j,(weighted\ average)})/(\eta_{old})-1) \dots \dots \dots \text{Equation (4)}$$

Where,

η_{old} = efficiency of baseline cookstove (fraction)

$\eta_{new,i,j}$ = efficiency determined using equation 5 of applied approved methodology (%)

$B_{y=1, new,i,survey}$ = annual quantity of woody biomass used by improved cookstove in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey (tonnes/year/stove)

The efficiency of the project stoves can be estimated using the equation below.

$$\eta_{new,i,j} = \eta_P \times (DF_n)^{y-1} \times 0.94 \dots \dots \dots \text{Equation (5)}$$

Where,

η_P = efficiency of project stove (fraction) at the start of the project activity

$(DF_n)^{y-1}$ = 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

Where the project households continue to use baseline cookstoves along with improved cook stoves, **B_{old}** shall be adjusted ex-post based on the percentage of project households found to continue such practice according to the following equation.

$$B_{old,adjusted} = B_{old} \times (1 - \mu_y) \dots \dots \dots \text{Equation (6)}$$

Where,

B_{old,adjusted}= adjusted **B_{old}** to account for 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 project activity involves distribution of only one type of ICS i.e. Greenway Jumbo Cookstove and all ICS under project consideration for emission reduction calculation has been distributed from 1st January 2023 to 30th June 2023.

Table 8: List of parameters used for emission reduction calculation, along with their values

Parameter	Unit	Value	Source
$N_{y,i,j}$	Number	201,315	Distribution record maintained by PP from 1 January 2023 to 30 June 2023
$NCV_{wood\ fuel}$	TJ/tonne	0.0156	IPCC default value for wood fuel
f_{NRB}	fraction	0.901	As per registered PD
$EF_{wf,non\ CO_2}$	tCO ₂ e/TJ	26.23	IPCC default value for wood fuel
EF_{wf,CO_2}	tCO ₂ e/TJ	112	IPCC default value for wood fuel
η_{old}	fraction	0.1	Default value as per VMR006

$\eta_{\text{new},i,j}$	fraction	0.38	As per WBT test report
$B_{y=1, \text{ new},i,\text{survey}} (2022)$	tonne/household/year	1.245; i.e. $(3.41 \times 365) / 1000 = 1.245$	As per KPT conducted from 28 June 2022 to 31 August 2022.
$B_{y=1, \text{ new},i,\text{survey}} (2023)$	tonne/household/year	1.368; i.e. $(3.75 \times 365) / 1000 = 1.368$	As per KPT conducted from 19 Feb to 10 March 2023
$B_{y,\text{savings},i,j} (2022)$	tonne/household/year	3.189	Calculated based on 2022 KPT values
$B_{y,\text{savings},i,j} (2023)$	tonne/household/year	3.505	Calculated based on 2023 KPT values

The emission reduction is calculated as below for ICS installed from 1st January, 2022, which is considered the commissioning date of the first batch. The ICS installed from that date, on daily basis, is considered as a batch and emission reduction is calculated based on the number of days of operation. Following is the emission reduction for 1st January, 2022 for 5,650 Improved Cookstoves for 181 days of operation (which is the total number of days of this monitoring period, i.e., from 1st January, 2023 to 30th June, 2023).

For example, if we assume that 5,650 stoves had been distributed on the 1st day of commissioning (i.e., 1st January, 2022), then the ER will be calculated as follows:

$$\begin{aligned}
 ER_{y,i,j} &= B_{y,\text{savings},i,j} \times NCV_{\text{wood fuel}} \times f_{\text{NRB}} \times (EF_{\text{wf},\text{CO}_2} + EF_{\text{wf},\text{non CO}_2}) \times N_{y,i,j} \times 0.95 \times (181/365) \\
 &= 3.189 \times 0.0156 \times 0.901 \times (112 + 26.23) \times 5,650 \times 0.95 \times (181/365) \\
 &= 16,493 \text{ tCO}_2\text{e}
 \end{aligned}$$

5.2 Project Emissions

The methodology does not account for baseline emissions and project emissions separately but instead quantifies net emissions reduction achieved by the project.

5.3 Leakage

Leakage is already accounted for in the calculation of emissions reduction by adjusting with the default value of 0.95.

5.4 Net GHG Emission Reductions and Removals

Table 9: Net GHG emissions reductions/removals in tCO₂e

Year	Baseline emissions reduction or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emissions reduction or removals (tCO ₂ e)
2023 (01-01-2023 to 30-06-2023)	479,895	0	0	479,895

Total	479,895	0	0	479,895
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Monitoring Period	Ex-ante estimated reductions	Achieved reductions	Percent difference	Justification for the difference
01-01-2023 to 30-06-2023	531,631	479,895	-9.7%	Please refer the justification below this table.

The emission reduction during the current monitoring period (1st January, 2023 to 30th June, 2023) is computed at 490,281 tCO₂e or 7.8% lower than the estimated ex-ante emission reduction (of 531,631 tCO₂e) based on the parameters provided in the registered PD. The PP opts to conservatively claim 479,895 tCO₂e (9.7% lower than ex-ante) instead of 490,281 tCO₂e. The value of 479,895 tCO₂e was conservatively computed using the most recent KPT value (to reflect seasonal variations and PPs efforts in stopping baseline stove use) and an additional discount of μ . As per the methodology, PP is not required to follow this approach as the PP uses equation 4 ($B_y=1$, survey method) to compute $B_{y,savings}$. The fair estimation of emission reduction is 490,281 tCO₂e (as per Methodology), but despite this PP opts to conservatively claim 479,895 tCO₂e.

APPENDIX I: EVIDENCES OF SUSTAINABLE DEVELOPMENT CONTRIBUTIONS

SDG 1: No Poverty

Till the current monitoring period, a total of 201,315 households have been enabled access to clean cooking technology through increased investment (SDG 1.4.1). The same number can be verified through the distribution record provided in the ER sheet.

SDG 3: Good Health and Well Being

The households participating in the project have reported benefits in their respiratory health, along with other benefits especially relating to lessening of coughing, difficulty in breathing and irritation of the eyes. All of the households have reported the above-mentioned benefits; thus, the project contributes to fulfilment of SDG 3.4.1. 100% of the households reported a reduction of smoke in the cooking area, which means that the indoor air pollution has reduced (SDG 3.9.1). The same details can be verified through accessing the data recorded on the survey responses provided in the ER sheet.

SDG 5: Gender Equality

The women members of the beneficiary households have experienced a significant reduction in the time spent on cooking and fuelwood collection. This is owing to the higher thermal efficiency of the ICS and the lesser amount of fuelwood it consumes (vis-a-vis baseline stoves). The resultant daily time savings were 3 hours, averaging across the samples, for fuelwood collection and cooking respectively. The same is the time available for these women to engage in other economic opportunities. In this way, the project is helping to achieve SDG 5.4.1.



Figure 12: Time saved in fuelwood collection by members of the beneficiary households (vis-à-vis baseline cookstoves)

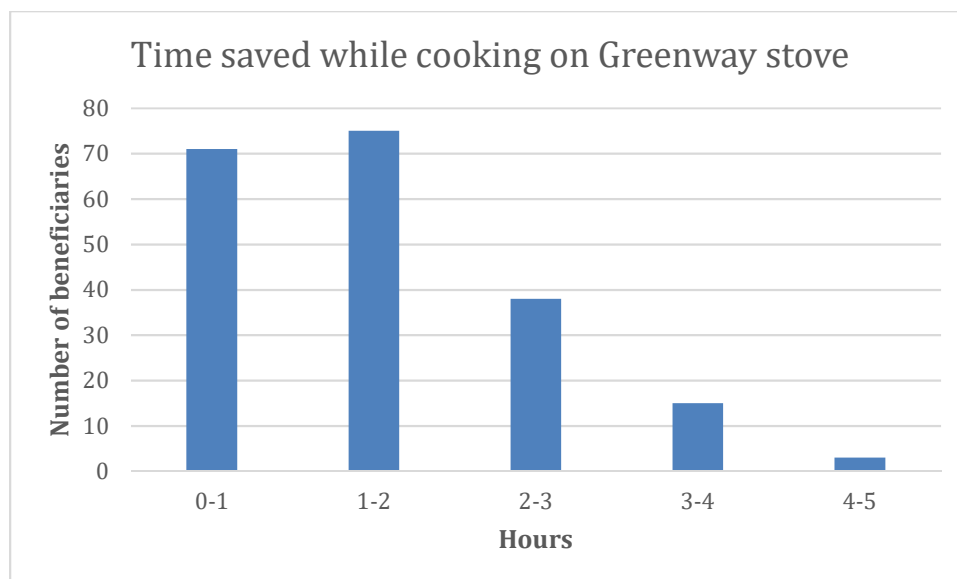


Figure 13. Time saved by cooking on Greenway Jumbo ICS by the women members of the beneficiary households (vis-à-vis baseline cookstoves)

SDG 7: Affordable and Clean Energy

Till the current monitoring period, a total of 201,315 ICS has been distributed, thereby reducing the use of inefficient baseline traditional stoves. The project increases the access to cleaner cooking energy options for the participating households (SDG 7.1.2).

SDG 8: Decent Work and Economic Growth

The households reported saving a significant amount of time spent on cooking and fuelwood collection. The saved time was spent on pursuing other economic activities, which resulted in an increase in incomes of the households. The households reported saving INR 487.6 on an average per month. The project has given direct employment to 126 local community members from Madhya Pradesh (SDG 8.3.1), who engage in the process of awareness generation, distribution, logistics and monitoring. In addition to generating jobs locally, the project enables stable employment for operators and managers involved in the production of the project cookstoves.

SDG 10: Reduced Inequalities

All the households reported an increase in their monthly savings, after switching to the Greenway Jumbo stove (SDG 10.1.1). The saved amount per month ranged from Rs 100 to more than Rs 1000, with the average saving at INR 529.6 across the entire sample of 202 households surveyed during the current monitoring period. Majority of the households used their financial savings from using Greenway Jumbo ICS for buying groceries, followed by putting the same into their savings accounts (figure 14).

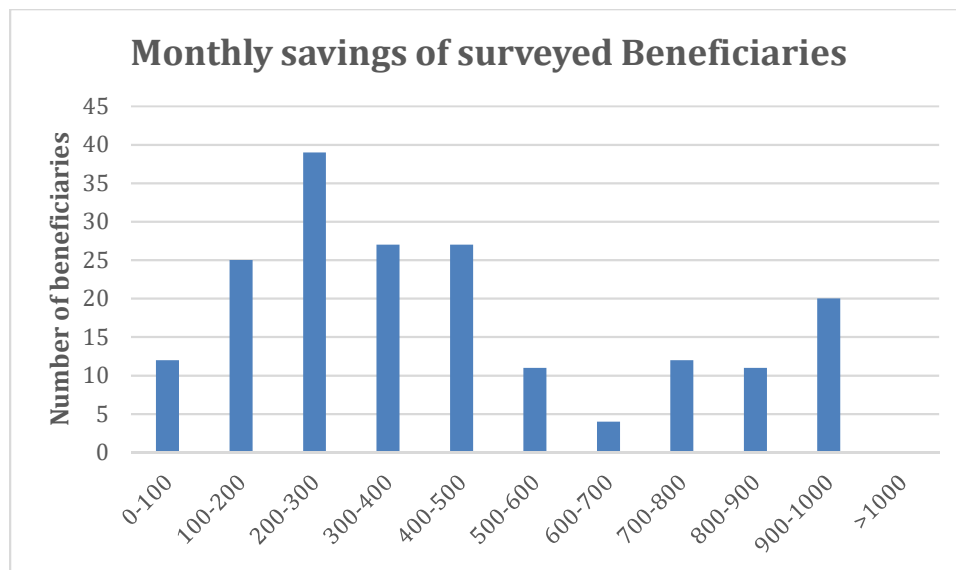


Figure 14. Monthly savings of the beneficiary households through the use of Greenway Jumbo ICS

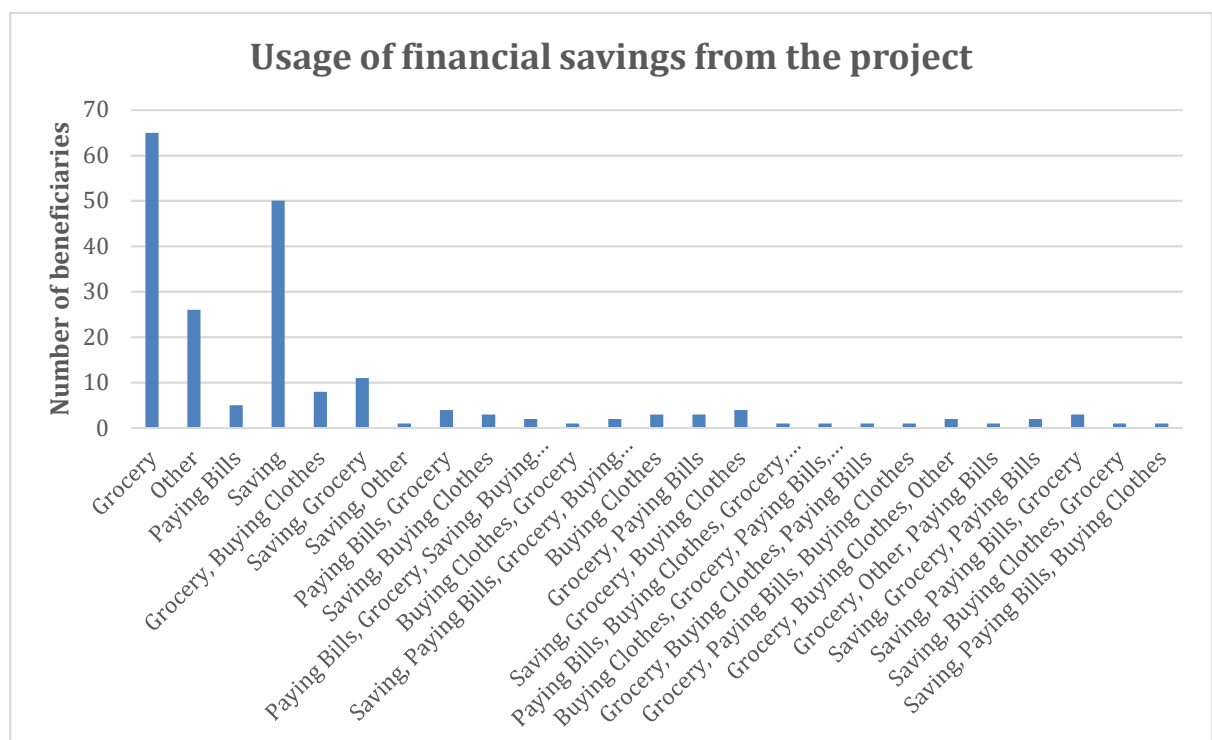


Figure 15. Type of ways the financial savings are used by the beneficiary households

The project has employed 35 local female partners during the current monitoring period (SDG 10.2.1). They engaged in the process of awareness generation, distribution, logistics and monitoring.

SDG 13: Climate Action

Through the distribution of improved cookstoves and thereby replacing the inefficient baseline cookstoves, the project has prevented the release of 490,281 tCO₂e into the atmosphere during the current monitoring period (SDG 13.2.2). This can be verified by accessing the ER sheet provided.

APPENDIX II: DISTRIBUTION SYSTEM

The distribution system of the Project Proponent is mapped out in Table 10:

Table 10: Description of the processes involved in the distribution system

Sl. No.	Distribution process	Description
1	Community outreach and demonstration	The PMs, CIs and GSs, plan and conduct product demonstrations to 20-30 households more than thrice a week. The households selected are notified of the demonstrations to be conducted through newspaper advertisements, outreach through local NGOs, etc. Product demonstration is done through Standard Operating Procedures (SOPs) and training is imparted to the end users to generate awareness regarding the use of the ICS. All the awareness generation events/ local stakeholder consultations conducted during the implementation of the project are recorded and these records serve as valid proofs during auditing/verification processes which help in substantiating greater or continued adoption of ICS.
2	Order placement	The GS, CI record orders from interested households on a mobile app made available to them for distribution & processes related to distribution.
3	Baseline check	The CIs conduct a preliminary baseline survey using SOP for baseline check of the households and the locations. To ensure the integrity and quality of the baseline data being recorded, the PM and CIs are trained on the same.
4	Dispatch and last-mile delivery	Upon the placement of the orders, the stove is dispatched from the warehouse. CI, PM, AV are entities involved in smoothly carrying out dispatch and last-mile delivery, making use of delivery vehicles for transportation of ICS to the end users. Logistics partners are also involved in the dispatch and last-mile delivery phase.
5	User data collection	The user data is recorded by the GS and data team when the ICS is passed to the household on a pre-set date. The tools employed in this process include usage of the mobile app by the GS and the data team for recording user data during distribution and survey. The people involved in this process are trained to operate the app and equipped with appropriate resources to fix bugs.
6	Data verification	Tele-verification is conducted by the data verification officers in the data team to ensure the integrity and quality of the database on the beneficiary households. The admin data console is made use of by the data verification officers to conduct the quality checks.

APPENDIX III: MONITORING SYSTEM

The monitoring process is repeated in multiple rounds, in which the steps tabulated in Table 11 are followed:

Table 11: Description of the steps involved in the monitoring process

Sl. No.	Monitoring process	Description
1	Monitoring planning	The PM, CI, GS are involved in planning the monitoring of households where stoves have been deployed and they make use of the information held within the database for this purpose. The households are monitored regularly once a week which helps keep the database up-to-date.
2	Monitoring, feedback and grievance surveys	The GS and CI use comprehensive surveys to monitor the frequency and pattern of usage, record feedback about product issues and other such grievances. The tools employed for this purpose include the mobile app for monitoring and training the GS and CI on how to use the mobile app and how to monitor.
3	Issue redressal	The PM, GS and CI work at addressing the grievances raised by the customers and it involves works such as stove repair, replacement use, maintenance. The GS/CI are trained to deliver such kinds of customer support and are equipped with spares for replacement, so that they can efficiently carry out the issue redressals as and when such situations arise.
4	Data reconciliation and updates	The members comprising the data team and carbon team oversee data reconciliation in case of stove ID mismatch, ownership change (wherein end users give away their stoves to another party such as their relatives or neighbours) or data quality issues. Data team and carbon team members make use of SOP for data access and data admin console for overseeing data reconciliation and updates.
5	Follow-up	All the team members involved in the project are involved in the follow-up process and see to the implementation of the feedback received. It feeds back into the monitoring planning and the monitoring process is duly followed all over again for subsequent rounds of project monitoring.