Sustainable Development Verified Impact Standard

IMPROVED COOKSTOVES IN LIBERIA

CARBONIBUS

ENVIROFIT
SMARTER LIVING

Document Prepared by

CLIMATE SECURE

Project Title	IMPROVED COOKSTOVES IN LIBERIA
Version	2.0
Date of Issue	04-April-2023
Project Location	The Republic of Liberia
Project Proponent(s)	Carbonibus S.r.l Via Giacomo Leopardi 26 20123 Milan, Italy Email: info@carbonibus.org Website: https://www.carbonibus.org/
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Project Lifetime	01 March 2023 – 28 February 2044; 21-year lifetime
History of SD VISta Status	No previous attempts at SD VISta certification made to date
Other Certification Programs	VERRA Verified Carbon Standard (4219)
Expected Future Assessment Schedule	First verification anticipated in 2023-24

CONTENTS

1 SUMMARY OF SDG CONTRIBUTIONS

Table 1: Summary of Project SDG Contributions

Row number	Estimated Project Contribution by the End of Project Lifetime	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Section Reference	Claim, Asset or Label
1)	Household expenditures on purchased cooking fuel will get reduced with usage of project ICS owing to its increased efficiency. Thus, project ICS shall result in money savings in beneficiary households. The project will distribute in Liberia and will lead to providing access to basic services to the beneficiary households. Quantifiable contribution: 0.5 million ICS distributed	1.4	1.4.1 Proportion of population living in households with access to basic services	Increase	3.2 #1	Claim
2)	The indoor pollutants emissions attributed to inefficient burning of solid biomass fuels in the beneficiary households will be reduced. The project ICS shall aid improved combustion of solid biomass fuel thereby reducing smoke and Particulate matter (PM) emissions. The project will free the beneficiary households from exposure to smoke / PM associated with traditional cooking. Quantifiable contribution: >75% beneficiaries reporting reduced exposure to smoke / PM emission after switching to project ICS	3.9	3.9.1 - Mortality rate attributed to household and ambient air pollution	decrease	3.2 #2	Claim
3)	The project activity is targeting to provide formal and non-formal education and training to approx. 50 people under the project activity. Quantifiable contribution: 50 people provided with formal / non-formal education or training.	4.3	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by gender.	increase	3.2 #3	Claim
4)	The project ICS shall save time in	5.4	5.4.1 Proportion	decrease	3.2 #4	Claim

	cooking activities (by faster cooking) as well as save time in fuel procurement (reduced collection time or reduced fuel purchase trips to market) due to reduced fuel consumption. This shall save time spent by the women involved in these activities (unpaid work) to be utilized in more productive and income generating tasks. The project will lead to helping beneficiary households in saving time in cooking activities (by faster cooking) as well as fuel procurement (reduced collection time or reduced fuel purchase trips to market). Quantifiable contribution: up to 2-3 hours saved per day per household from cooking / fuel procurement activities		of time spent on unpaid domestic and care work, by sex, age, and location			
5)	The project activity by distributing ICS will provide access to clean cooking with primary reliance on clean fuels and technology. The project ICS will be made available free of cost to beneficiary households. The beneficiaries will, however, pay for part of the distribution charges for the ICS[1]. The project will lead to project households getting access to clean cookstoves (ICS) by the end of its lifetime. Quantifiable contribution: 0.5 million ICS distributed, >75% usage rate	7.1	7.1.2 Proportion of population with primary reliance on clean fuels and technology.	Increase	3.2 #5	Claim
6)	The project will create local employment opportunities in operational and management roles, as well as in manufacturing, distribution, and logistics. Quantifiable contribution: 25 jobs created	8.5	8.5.1 Average hourly earnings of female and male employees, by occupation, age, and persons with disabilities	Increase	3.2 #6	Claim
7	The project shall reduce fuel consumption (domestic material consumption) due to use of efficient	12.2	12.2.2 Domestic material consumption,	Decrease	3.2 #7	Claim

[1] This shall be paid directly by the project beneficiary to the external distribution partner / agency and is not received by Carbonibus / Envirofit. This shall ensure that the distribution partner /agencies remain incentivized and involved in the project. This does not generate any revenue for Carbonibus.

	stoves. Quantifiable contribution: average ~3.69 tonnes of fuel savings per HH/year.		domestic material consumption per capita, and domestic material consumption per GDP			
8)	The project by replacing the inefficient traditional stove with the energy-efficient ICS will reduce GHG emissions. Quantifiable contribution: 14,410,999 tCO_2e of GHG emissions over the crediting period of 7 years.	13.2	13.2.2 Total greenhouse gas emissions per year	Decrease	VCS validation report	SD VISta-labeled VCU
9)	The project will help in reduction of the use of non-renewable biomass from forests, thus assisting in conserving existing forest stock and the protection of natural forest eco-systems and wildlife habitats. Quantifiable contribution: average ~3.26 tonnes of non-renewable biomass saved per HH/year.	15.2	15.2.1 Progress towards sustainable forest management.	Increase	4.2 #2	Claim

2 PROJECT DESIGN

2.1 Project Objectives, Context and Long-term Viability

2.1.1 Summary of Project Sustainable Development Objective(s)

The purpose of this project is to disseminate energy-efficient improved cookstoves (ICS) to replace existing traditional cooking device in domestic households and communities in Liberia. The implementation of the project activity will result in the reduction of fuel consumption & consequent emissions from inefficient combustion of solid biomass fuel attributed to cooking on traditional Cookstoves.

This project activity will contribute to social, environmental, and economic benefits in the country. A summary of the Sustainable Development objectives is provided in the following table:

Impact Category	SDG Targeted	Sustainable Development Objectives
Economic Well-Being	SDG 1	Increase access to basic services (i.e. distribute ICS)
	SDG 8	Increase local employment opportunities in operational and management roles, as well as in manufacturing, distribution, and logistics.
Social Well-Being	SDG 4	Increase formal and non-formal education and training to individuals
	SDG 5	Decrease Proportion of time spent on unpaid domestic and care work for women in beneficiary households.
	SDG 7	Increase Proportion of population with primary reliance on clean fuels and technology (i.e. clean cooking via project ICS)

	SDG 12	Decrease gross domestic consumption (average reduction in fuel consumption)
Environmental well-being	SDG 3	Reduce mortality rate attributed to household and ambient air pollution by distributing ICS and thereby reducing exposure to smoke / PM attributed to inefficient traditional modes of cooking.
	SDG 13	Decrease greenhouse gas emissions per year
	SDG 15	Increase sustainable forest management (by reducing the consumption of non-renewable biomass fuel)

2.1.2 Description of the Project Activity

The purpose of this large scale project activity is to disseminate energy-efficient improved cookstoves (ICS) to replace existing traditional Cookstoves in domestic households and communities in Liberia.

Traditional cooking methods prevalent across Liberia, contribute to greenhouse gas (GHG) emissions due to inefficient combustion of unsustainably sourced, non-renewable biomass (NRB) fuel. The use of such fuels in host country is one of the major drivers of deforestation. In 2021 alone, Liberia lost 128kha of natural forests, widespread usage of NRB for meeting thermal energy needs reduces the ability of forests to sequester carbon, thereby causing GHG emissions.

Technology/Measure

The ICS disseminated under the project is designed to improve fuel combustion and heat transfer. It results in the reduction of fuel consumption and improvement in levels of indoor air pollution for project users (reducing smoke, black soot, and PM). The reduction in consumption of cooking fuel also reduces GHG emissions attributed to the use of non-renewable biomass.

The project activity includes dissemination of CH2200, CH5300, and M5000 improved stoves[2]. Specification of these example ICS is given below:

Stove Model	**CH2200 /EcoSaver Charcoal**	**CH5300/SuperSaver Charcoal**	**M5000/SuperSaver Wood**
Photo			
Thermal Efficiency	52.4%	56.2%	38.3%
Estimated Life[3]	7 Years	7 Years	7 Years

[2] Stoves are sold based on potential customer demands and preferences. Other models may be included in the PA subsequently, provided they meet the methodological requirements.

[3] In case of estimated life of project devices is less than the crediting period (7 years renewable twice), then either these devices will be replaced after the end of their expected lifetime span or otherwise, emission reductions will be claimed only till the end-of-life span of the project devices.

Unit Size (h x w x d)	15.4 x 31.3 x 22.9 cm	36.6x31.5x26 cm		28.0 x 26.5 x 26.5 cm
Unit Weight	2.3kg	5.0 kg	4.2 kg	
Fixed/Portable	Portable	Portable		Portable
Grate/Chimney	Grate	Grate		Grate

In the absence of this project activity, households would cook primarily using traditional inefficient stoves, perpetuating environmental and health degradation.

The project intends to access carbon finance to mitigate one of the main barriers (price) for end users towards adopting clean cookstoves.

Sustainable Development Benefits

Impact Category	SDG Indicator	Justification of achieving the Sustainable Development Benefits
Economic Well-Being	1.4.1 Proportion of population living in households with access to basic services	Household expenditures on purchased cooking fuel will get reduced with usage of project ICS owing to its increased efficiency. Thus, project ICS shall result in money savings in beneficiary households.
	8.5.1 Average hourly earnings of female and male employees, by occupation, age, and persons with disabilities	The project will create local employment opportunities in operational and management roles, as well as in manufacturing, distribution, and logistics.
Social Well-Being	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by gender.	The project activity is targeting to provide formal and non-formal education and training to local people under the project activity.
	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age, and location	The project ICS shall save time in cooking activities (by faster cooking) as well as save time in fuel procurement (reduced collection time or reduced fuel purchase trips to market) due to reduced fuel consumption.
		This shall save time spent by the women involved in these activities (unpaid work) to be utilized in more productive and income generating tasks.
	7.1.2 Proportion of population with primary reliance on clean fuels and technology.	The project activity by distributing ICS will provide access to clean cooking with primary reliance on clean fuels and technology. The project ICS will be made available free of cost to beneficiary households.
	12.2.2 - Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	The project shall reduce fuel consumption (domestic material consumption) due to use of efficient stoves.
Environmental well-being	3.9.1 - Mortality rate attributed to household and ambient air pollution	The indoor pollutants emissions attributed to inefficient burning of solid biomass fuels in the beneficiary households will be reduced. The

		project ICS shall aid improved combustion of solid biomass fuel thereby reducing smoke and Particulate matter (PM) emissions.
	13.2.2 Total greenhouse gas emissions per year	The project by replacing the inefficient traditional stove with the energy-efficient ICS will reduce equivalent GHG emissions for meeting similar thermal energy needs as that in the baseline.
	15.2.1 Progress towards sustainable forest management	The project will help in reduction of the use of non-renewable biomass from forests, thus assisting in conserving existing forest stock and the protection of natural forest eco-systems and wildlife habitats.

The following Operational Plan and Implementation Framework will be used:

1. PP will coordinate with different manufacturers to produce ICSs. PP will provide guidelines for manufacturing including material and other specifications, serial identification, and quality standards of the cookstoves.
2. The distribution of the ICS will be managed via PP's own distribution network or with local distribution partners.
3. The PP shall communicate the project beneficiaries during distribution that PP retains exclusive and unconditional rights to the carbon credit generated by project ICS.
4. The PP shall maintain and update the ICS distribution database continuously. The required data collection includes, but is not limited to, the following.
    (a) Date of distribution,
    (b) Geographic area of distribution,
    (c) Model/type of project ICS distributed,
    (d) Quantity of project ICS distributed,
    (e) Name of the beneficiary, address, and telephone number (if available),
    (f) Unique serial number for each project ICS,
    (g) Primary Baseline fuel / technology being replaced.
5. The information collected will be stored in the ICS distribution database which will serve as the project database for ex-post project sampling and monitoring purposes. Also, this shall serve to avoid any double counting and duplicity of data.
6. The PP will coordinate ex-post monitoring activities as follows:
    (a) Implement the monitoring plan,
    (b) Determine the sample size as per sampling plan and identify the samples to be monitored (the sampling plan is detailed below)
    (c) Ex-post monitoring - the data will be collected using survey questionnaires designed by experts. The surveys will be carried out by external parties or by project implementer teams experience / trained to conduct such surveys. PP will be responsible for ensuring

that staff responsible for monitoring and reporting have received adequate training, as applicable.

(d) Ensure the quality of monitoring data (QA/QC) as per section 5.2 of VCS PD, the monitoring results and statistical robustness will be reviewed internally and approved by competent staff.

(e) Use the data collected for emissions reduction calculations.

The aforesaid plan shall ensure that the project is implemented and operated in a standardized manner.

2.1.3 Implementation Schedule

Date	Milestone(s) in the Project's Development and Implementation
February 2023	Local Stakeholder Consultation of SD VISta
01 March 2023	Start Date of Project Activity
March 2023	Initiation of Validation for VCS PD
March 2023	Pipeline Listing for SD VISta PD
March 2023	Validation for SD VISta PD
August 2023	Registration of project activity under SD VISta
January 2024	First Verification by assessor

2.1.4 Project Proponent

Organization Name	Carbonibus S.r.l
Role in the Project	Project Proponent
Contact Person	Ekaterina Bakal
Title	Head of Sales & Marketing
Address	Via Giacomo Leopardi 26 20123 Milan, Italy
Telephone	+231778441873
Email	info@carbonibus.org

2.1.5 Other Entities Involved in the Project

Organization name	Envirofit International
Role in the Project	Project Implementer
Contact person	Nathan Lorenz
Title	CTO
Address	19 Old Town Square, Suite 238, Fort Collins, Colorado, 80524, USA
Telephone	+1 9703722874
Email	info@envirofit.org

Organization name	Climate Secure
Role in the Project	Entity Completing this Document
Contact person	Rohit Lohia
Title	Director
Address	P.O. Box 515000, Sharjah Media City, Sharjah, UAE

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2.1.6 Project Type

This is a non-AFOLU (energy efficiency – demand side) project.

2.1.7 Project Location

The project location will be the geographical boundary of the Republic of Liberia. The geographical coordinates of Monrovia, capital of Liberia is 6°18'2.7864" N 10°47'49.7760" W[4]. The map of Liberia, for reference purpose, is as follows:

Geographical boundary: Liberia[5]

2.1.8 Baseline Scenario

In Liberia, the simplest of traditional cookstoves commonly feature open wood or charcoal fires underneath pots supported by steel rails or traditional charcoal clay pots and/or traditional 3-stone firewood.

In Liberia, 98.0% of households use solid fuel for cooking with firewood being the primary source of solid fuel (54.1% of household use)[6]. There is differential in cooking fuel use in between rural & urban areas of Liberia. The rural households have

[4] https://www.latlong.net/place/monrovia-liberia-444.html

[5] https://www.nationsonline.org/

[6] Liberia DHS 2019-20 published in April 2021, table 2.4, page 25, link: https://dhsprogram.com/publications/publication-FR362-DHS-Final-Reports.cfm

reported using wood as the primary cooking fuel, being used by 86.8% of households, followed by charcoal being used by 11.9% of households. On the other hand, urban households have reported using charcoal as the primary cooking fuel, being used by 73.6% of households, followed by wood being used by 20.5% of households.

Traditional cooking methods are prevalent across the host country. The use of these traditional inefficient biomass stoves is a significant driver of deforestation. Widespread usage of unsustainably sourced, non-renewable biomass (NRB) for cooking results in equivalent GHG emissions attributed to use of non-renewable biomass.

According to Global Forest Watch (database by World Resources Institute) [7], from 2001 to 2021, Liberia lost 2.05Mha of relative tree cover, equivalent to a 22% decrease since 2000 and 0.47% of the global total. In 2021 alone, Liberia lost 128kha of natural forest, equivalent to 75.3Mt of CO_2 emissions. Detailed description has been provided in section 3.1 and 4.1 below.

Thus, the ICS disseminated under the project is designed to improve fuel combustion and heat transfer. It results in the reduction of fuel consumption and improvement in levels of indoor air pollution for project users (reducing smoke / PM). The reduction in consumption of cooking fuel also reduces GHG emissions attributed to the use of non-renewable biomass.

2.1.9 Causal Chain(s)

Refer appendix A for the Causal Chain.

2.1.10 Threats to the Project

Nature-Induced threats

- Threat: Climate Crisis / Natural disasters triggers displacement and migration that leads to households getting relocated.

  Solution: ICS distributed under the project activity are portable and light weighted. Hence the project ICS can be carried by the ICS user easily, should the need to relocate arise.

- Threat: Climate change and deforestation can lead to biomass fuel scarcity and an untenable source of biomass.

  Solution: Increased fuel scarcity would support the use of the ICS technology due to its ability to reduce fuel consumption.

- Threat: Pandemics like COVID-19 etc. might affect the implementation and operation of the project in future.

[7] https://www.globalforestwatch.org/dashboards/country/LBR

Solution: In such cases, PP will operate as per the regulatory guidelines and mandates applicable to ensure that the project staff involved in implementation and operation are at reduced risk.

Human-Induced threats

- Threat: Carbon-finance sponsored stove distribution may result in poor household adoption rate post distribution.

  Solution: The PP will coordinate with local distribution partners to identify deserving beneficiaries to ensure that project stove usage rate remains significant. The target users will also be made aware on the benefits of using improved cookstoves for effective adoption rate.

- Threat: Many households cannot afford the new improved cookstoves because of financial constraints

  Solution: PP is distributing ICS free of cost to end-users to counter this threat.

2.1.11 Benefit Permanence

The purpose of this large scale project activity is to disseminate energy-efficient improved cookstoves (ICS) to replace existing traditional Cookstoves in domestic households and communities in Liberia.

The project ICS will consume less fuel to generate equivalent thermal energy as that in the baseline traditional inefficient stoves. Reduction in fuel consumption will help beneficiaries in reducing fuel expense and saving time in cooking activities (by faster cooking) as well as fuel procurement (reduced collection time or reduced fuel purchase trips to market). This shall free the women involved in these activities (unpaid work) to utilize the time saved in more productive and income generating tasks.

The project ICS shall aid improved combustion of fuel thereby reducing smoke and Particulate matter (PM) emissions. The project will have long-term positive influences on the health of end-users, especially the women and girls who mainly undertake the cooking in the households.

The forest saved by the project through the reduction of non-renewable biomass consumption will protect the environment and biodiversity for a long time. The understanding of these holistic benefits to the stakeholders helps in ensuring long-term sustenance and maintenance of project activities and achieving the intended outcomes.

Post project activity, the rural and urban households will continue to use improved cookstoves, due to the benefits associated with them, and thereby accrue significant environmental as well as socio-economic benefits even when the project activity ceases.

2.2 Stakeholder Engagement

2.2.1 Stakeholder Identification

Stakeholders have been identified as per the criteria mentioned in section 2.2. of SD VISta Standard and section 3.18.12 of VCS standard ver 4.4. The process of identifying stakeholders involves categorizing individuals or groups who are expected to have a direct or indirect impact on the project, or those who have an interest in it. These categories include:

1. Local people, communities and or representatives who are directly or indirectly affected (adversely affected or beneficiaries) by the project or may have an interest in the project
2. Stakeholders with land-tenure rights for any area directly affected by the implementation of the project (i.e., within the project boundary)
3. Local policy makers and representatives of local authorities
4. National government officials or National Focal bodies responsible for the project in the host country, for example, Designated National Authority (DNA)
5. Local non-governmental organisations (NGOs), Women Groups working on topics relevant to the project or working with communities who are likely to be affected by the project
6. Relevant international Non-Governmental Organizations (NGOs) supporters, with a representation in the region of the project.
7. Representatives from Verra

2.2.2 Stakeholder Description

The stakeholders identified through the process described in section 2.2.1 above can be generally grouped under two broad categories as follows:

A) Directly Affected Parties

1. Local people, communities and or representatives who are directly or indirectly affected (adversely affected or beneficiaries) by the project or may have an interest in the project: These are individuals or group of people who are directly impacted by the project, such as end-users, local communities' representative, ICS manufactures etc. Before the start of the project, users were cooking on traditional cookstoves (open wood or charcoal fires) and not aware about clean cooking technology.

   The project ICS will consume less fuel to generate equivalent thermal energy as that in the baseline. Reduction in fuel consumption will help beneficiaries in reducing fuel expense and saving time in cooking activities (by faster cooking) as well as fuel procurement (reduced collection time or reduced fuel purchase trips to market). This shall free the women involved in these activities (unpaid work) to utilize the time saved in more productive and income generating tasks.

The project ICS shall aid improved combustion of fuel thereby reducing smoke and Particulate matter (PM) emissions and reducing exposure to IAP to the primary cook in the beneficiary household.

The project shall generate employment opportunities for those involved in the distribution and logistics of the stoves as well as monitoring activities ex-post.

Stakeholders with land-tenure rights for any area directly affected by the implementation of the project (i.e., within the project boundary): The project activity involves distribution of improved cookstoves to individual households and communities and it does

B) Indirectly Affected Parties

1. Local policy makers and representatives of local authorities: The project is expected to have indirect benefits for local authorities by improving the livelihoods of the people in the project area and reducing deforestation, thereby promoting overall development and better living conditions in the region.

2. National government officials or National Focal bodies responsible for the project in the host country, for example, Designated National Authority (DNA), Department of Forest Department, Focal Point of EPA, Rural and Renewable Energy Agency etc.

3. Local non-governmental organisations (NGOs), Women Groups working on topics relevant to the project or working with communities who are likely to be affected by the project: These organizations operate within the same geographical areas as PP's projects and may have similar sectoral projects. Their involvement would include identifying beneficiaries, managing distribution and logistics, as well as providing training, education, and capacity building.

4. Relevant international Non-Governmental Organizations (NGOs) supporters, with a representation in the region of the project: These organizations are comparable to those described in point 3, but they are international NGOs with a presence in the host region and may participate in the project in a similar capacity.

5. Representatives from Verra.

2.2.3 Stakeholder Consultation

The local stakeholder consultation (LSC) meeting for "IMPROVED COOKSTOVES IN LIBERIA" was held on 27th February 2023. The overall objective of the consultation process was to disseminate information about the project to relevant stakeholders and obtain their views regarding the project.

The stakeholders were invited through various means such as email invitations, newspaper advertisement, etc. to ensure the maximum participation in the Local Stakeholder Consultation meeting. Email invitations were sent to various stakeholders (Local Communities, Government officials, NGOs, local association leaders etc.) and an invitation letter was also published in the local newspaper to invite local stakeholders who are affected and interested in the project. In general, the proposed project was praised by the stakeholders in attendance, and no objections were voiced.

Stakeholders present during meeting were provided with a non-technical summary of the project and a brief about the project and its components (including costs, risks, and benefits). To seek feedback from participants on the project design and implementation, there was a Questions and Answers session to address their concerns.

People are allowed to submit their feedback 30 days from the start of the meeting through the feedback form provided.

As a part of on-going communication with local stakeholders, end users were informed about the grievance register which is maintained at the office locations of the PP. Thus, it was explained during the meeting that end users/stakeholders are free to voice grievances regarding the project activity in the grievance register. Any relevant concern received during operation of project activity, will be addressed according to its merit.

In general, the stakeholders were appreciative of the project and its features and acknowledged the reduction in Indoor air pollution / GHG and employment generation features of the project. No negative comments were raised during the Question session and feedback round.

2.2.4 Continued Consultation and Adaptive Management

As a part of on-going communication with local stakeholders, the grievance register will be maintained at the local office locations of the PP for any grievances regarding the project activity. Any relevant concern received during operation of project activity, will be addressed according to its merit.

Local people employed as field staff and resource persons will also serve as medium to escalate grievances received from the project beneficiaries in their respective zones to PP. Any grievances will be addressed according to its merit.

2.2.5 Anti-Discrimination

PP fosters an environment of mutual respect where employees and business partners can work together without fear of harassment, discrimination, or infringement on human rights. The project activity does not endorse any form of discrimination based on gender, sexual orientation, religion, race etc. ICS under the project activity will be distributed to deserving beneficiaries within the project boundary without any discrimination. The project will have positive impact on beneficiary households considering that they will spend less money / time on fuel procurement and cooking.

2.2.6 Worker Training

Training will be provided to the employees involved in distribution, maintenance, operation and monitoring activities of the project. Further, education camps / sessions will be also held to educate the beneficiaries about the project technology and benefits.

2.2.7 Equal Work Opportunities

PP is dedicated to make sure that all stakeholders, will be given equal opportunity to contribute both in volunteer and working positions. All the workers under the project activity will be treated equally. The workers will be selected based on their merit (Education, skills, and experience). Women unions may be used in distribution and capacity building activities.

2.2.8 Workers' Rights

The host country is a member of the ILO (International Labour Organization) convention. PP and its local partners comply with all national and local labour laws.

2.2.9 Occupational Safety Assessment

The project follows all relevant local and national laws. The Project does not threaten human health or environment and does not adversely affect the health of the workers and the community. The employment opportunities generated through this project, or the use of the project stoves do not increase the safety risks that are already present in the landscape of the country. Moreover, accurate care is taken to mitigate the unintended potential occupational safety hazards by contracting workers who have lived in the community for several years and have experienced for the work assigned.

2.2.10 Feedback and Grievance Redress Procedure

The project participant has a grievance mechanism in place, and the same has been explained to the stakeholders during consultation process. The users of ICS can register any complain through local representative involved in distribution and responsible for operation and maintenance of ICS or also through grievance register placed at the local offices.

2.2.11 Feedback and Grievance Redress Procedure Accessibility

The contact details for the grievance redressal procedure are announced to all stakeholders during the stakeholder consultation and information is available at the local offices of each project activity site. The same has also been communicated to the distribution team to convey to the user as the time of distribution and post distribution visits (if any).

2.2.12 Stakeholder Access to Project Documentation

During stakeholder consultation a non-technical summary of the project along with the feedback form was circulated. During the meeting, the project details were explained, and stakeholders were requested to give their feedback on any concern related to project. The project documentation will be uploaded on VERRA

website and the same has been informed to stakeholders. The details on project have also been shared with them during stakeholder consultation.

2.2.13 Information to Stakeholders on Assessment Process

The detailed process for registration under VCS (GHG programme) and SD VISta was explained to the stakeholders during local stakeholder consultation meeting. During the ex-post monitoring, the project ICS user shall have an option to provide feedback on the project if any, to the surveyor. Also, the assessor visit timing shall be informed[8] to the identified stakeholders and interviews will be facilitated between assessors and stakeholders during validation audits.

2.3 Project Management

2.3.1 Avoidance of Corruption

The project participant and its distribution partners are neither involved nor complicit in any form of corruption, such as bribery, embezzlement, fraud, favouritism, cronyism, nepotism, extortion, and collusion.

2.3.2 Statutory and Customary Rights

Not Applicable. The project activity involves distribution of improved cookstoves to individual households and communities and it does not involve rights to lands, territories and/ or resources.

2.3.3 Recognition of Property Rights

Not Applicable. The project activity involves distribution of improved cookstoves to individual households and communities and it does not require acquisition of property, hence no impact on any property rights.

2.3.4 Free, Prior and Informed Consent

The project activity involves distribution of improved cookstoves to individual households and communities and it does not require acquisition of property. It is a completely voluntary activity and households participating are free to choose whether they take part or not. The beneficiaries transfer their right on ownership of credits arising out of use of the product at the time of ICS distribution.

2.3.5 Restitution and/or Compensation for Affected Resources

Installation of an ICS does not affect any party's access to resources or their lands; no negative effects have been identified.

2.3.6 Property Rights Removal/Relocation of Property Rights Holders

[8] The Evidence will be provided to the validating entity.

Not Applicable. The project activities do not involve the removal or relocation of property rights holders from lands or territories, nor do they force rights holders to relocate activities.

2.3.7 Identification of Illegal Activities

The project activity involves distribution of improved cookstoves to individual households. The distribution of the ICS will be monitored and recorded by the Project Participant and no illegal activities have been identified in project implementation and operation.

2.3.8 Ongoing Conflicts or Disputes

Not Applicable. The project activity involves distribution of ICSs to individual households only and it does not require acquisition of property. There is no ongoing or unresolved conflicts or disputes over rights to lands, territories and resources and any disputes that were resolved during the last twenty years.

2.3.9 National and Local Laws and Regulations

The project activity is not mandated by any enforced law, statute, or other regulatory framework.

There are no enforced laws, statutes and/or regulatory framework in Liberia that mandate / stipulate the use / distribution of improved biomass stoves.

Thus, the project is a voluntary effort by the project proponent.

2.3.10 Project Ownership

For each PAI, the ownership of the instance shall be clearly demonstrated by virtue of the following:

- Declaration / agreement with end users transferring the ownership rights of the carbon credits generated from the project ICS to the project proponent.

Thus, all VCUs generated from the project instances shall be owned by the Project Proponent.

2.3.11 Grouped Projects

The proposed project is being developed as a large-scale project and not a grouped project; hence this is not applicable.

3 BENEFITS FOR PEOPLE AND PROSPERITY

3.1 Condition of Stakeholders at Project Start

The pre-project scenario in Liberia is the use of simplest of traditional biomass cookstove commonly feature traditional 3-stone fires and/or traditional charcoal stoves.

Despite efforts to increase global access to clean cooking, the Tracking SDG 7: Energy Progress Report 2022, Chapter-2[9] points to 2.4 billion people still without access to clean cooking as of 2020. Further, as per the same report, the number of people without access to clean cooking in Sub-Saharan Africa is set to increase by almost 20 million every year this decade, rising from 923 million in 2020 to over 1.1 billion in 2030, as small gains in the percentage of people with clean cooking fail to keep pace with population growth and *Liberia alone, has more than 5 million people that access deficit toward clean cooking fuels and technologies.*

In Liberia, 98.0% of households use solid fuel for cooking with firewood being the primary source of solid fuel (54.1% of household use). There is differential in cooking fuel use in between rural & urban areas of Liberia. The rural households have reported using wood as the primary cooking fuel, being used by 86.8% of households, followed by charcoal being used by 11.9% of households. On the other hand, urban households have reported using charcoal as the primary cooking fuel, being used by 73.6% of households, followed by wood being used by 20.5% of households[10].

Furthermore, the use of solid biomass fuels (e.g., wood) and charcoal in inefficient traditional stoves and/or open fires releases large amounts of particulate matter (PM), creating hazardous levels of indoor air pollution (IAP). For the year 2019, Liberia has reported 2,714 deaths that are attributed to Household air pollution from solid fuels. The smoke that emanates from cooking contributes to several chronic illnesses and acute health impacts such as early childhood pneumonia, emphysema, lung cancer, bronchitis, cardiovascular disease, and low birth weight.

Thus, traditional cooking methods are prevalent across the host country. The use of these traditional inefficient biomass stoves is a significant driver of deforestation. Widespread usage of unsustainably sourced, non-renewable biomass (NRB) for cooking results in equivalent GHG emissions attributed to use of non-renewable biomass.

Additionally, the use of solid biomass fuels (e.g., wood) in inefficient traditional stoves and/or open fires releases large amounts of particulate matter (PM), creating hazardous levels of indoor air pollution (IAP). IAP generated by inefficient and poorly ventilated stoves burning biomass fuels is responsible for the deaths of an estimated 3.2 million people annually. Almost half of these deaths occur among children under five years of age. Exposure is high among women and children, who spend the most time near the domestic hearth. Reliance on polluting fuels and technologies also requires significant time for cooking on an inefficient device and gathering and preparing fuel. In developing countries with high mortality rates

[9] https://trackingsdg7.esmap.org/downloads

[10] https://dhsprogram.com/pubs/pdf/FR362/FR362.pdf

overall, indoor air pollution ranks fourth in terms of the risk factors that contribute to disease and death (World Health Organization)[11].

Directly Affected Parties

These are individuals or group of people who are directly impacted by the project, such as end-users, local communities' representative, ICS manufactures etc. Before the start of the project, users were cooking on traditional cookstoves (open wood or charcoal fires) and not aware about clean cooking technology.

The project ICS will consume less fuel to generate equivalent thermal energy as that in the baseline. Reduction in fuel consumption will help beneficiaries in reducing fuel expense and saving time in cooking activities (by faster cooking) as well as fuel procurement (reduced collection time or reduced fuel purchase trips to market). This shall free the women involved in these activities (unpaid work) to utilize the time saved in more productive and income generating tasks.

The project ICS shall aid improved combustion of fuel thereby reducing smoke and Particulate matter (PM) emissions and reducing exposure to IAP to the primary cook in the beneficiary household.

The project shall generate employment opportunities for those involved in the distribution and logistics of the stoves as well as monitoring activities ex-post.

Indirectly Affected Parties

These are the individuals or groups of people who are indirectly involved such as NGOs, local authorities, etc.

NGOs: The NGOS would be involved in the beneficiary identification, distribution, and logistics. NGOs will also be involved in training, education, and capacity building.

Local authorities: The local authorities shall be indirectly benefited as the project shall help improve the livelihood conditions in the project area, reduced deforestation in the project area resulting in overall development of the living conditions in the area.

3.2 Expected Impacts on Stakeholders

Impact #1	Average household money savings due to decrease in expenditure on basic services such as purchased fuel after shifting to project technology.
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	End user households

[11] https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health

Resulting Change in Well-being	Household expenditures on purchased cooking fuel will be reduced with the use of the ICS as it shall reduce the fuel consumption by virtue of its increased efficiency. Thus, project ICS shall result in money savings in beneficiary households.

Impact #2	% Users reporting reduction in smoke/PM after shifting to ICS in project.
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	End user households, especially women and children
Resulting Change in Well-being	The emission of indoor pollutants from inefficient burning of solid biomass fuels in the beneficiary households will be reduced. The project ICS shall aid improved combustion of fuel thereby reducing smoke and Particulate matter (PM) emissions.

Impact #3	Number of people receiving formal and non-formal education and training.
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	End user households, especially children and adults
Resulting Change in Well-being	The project activity is targeting to provide formal and non-formal education and training to local people under the project activity. This will lead to ensure equal access for all women and men to affordable, quality technical, vocational, and tertiary education.

Impact #4	The average time saving associated with cooking and fuel collection time due to adoption of project technology / measures.
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	End user households, especially women and children

Resulting Change in Well-being	The project ICS shall save time in cooking activities (by faster cooking) as well as save time in fuel procurement (reduced collection time or reduced purchase trips to market) due to reduced fuel consumption. This shall free the women involved in these activities (unpaid work) and utilize the same in more productive and income generating tasks.

Impact #5	Proportion of population with primary reliance on clean fuels and technology
Type of Impact	Positive, Actual, Direct
Affected Stakeholder Group(s)	End user households
Resulting Change in Well-being	The project involves installation and dissemination of clean, modern technology for cooking. The project ICS shall be made available free of cost to beneficiary households.

Impact #6	Number of male / female employment created by project
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	Implementing partner staff
Resulting Change in Well-being	The project will create local employment opportunities in operational and management roles, as well as in manufacturing, distribution, and logistics.

Impact #7	Average fuel savings per household per year
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	End user households
Resulting Change in Well-being	The project will result in fuel savings (domestic material consumption) due to use of project stoves.

3.3 Stakeholder Monitoring Plan

Due to the large number of ICS envisaged to be distributed in the programme, it is not economically feasible to monitor each beneficiary household.

Therefore, representative sampling will be undertaken in line with the requirements of the methodology applied and the Standard: Sampling and surveys for CDM project activities and programmes of activities, version 9.0.

Sample sizes will be sufficient to ensure that the precision of the sample means/proportions are in accordance with the methodological / standard requirements. In cases where survey results indicate that desired precision is not achieved, the lower bound value of the corresponding confidence interval of the parameter value may be used as an alternative to repeating the survey.

During sampling, there may be non-response from the target population. Over-sampling may be used to avoid non-response; however, sampling may be ceased once required confidence/precision is met.

The sampling methodology will be in accordance with the representative sampling methods provided by the sampling guidelines and standards as indicated along this section, with the applied methodology having precedence.

Sampling Methodology

Sampling Objective – The sampling objective for each parameter is to determine, via sampling survey, Sustainable Development (SD) impacts will be monitored for SDG 1, SDG3, SDG4, SDG 5, SDG 7, SDG 8, SDG 13, and SDG 15 which are quantifiable and monitored. Target population and sampling frame – The target population is the total population served under the project, and the sampling frame consists of aggregated data of end-users of the ICS as recorded in the PA Databases.

Sample method –Sampling will be conducted using stratified random sampling techniques 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" the ICS in the sampling frame shall be stratified by ICS model type *i* (model) and batch *j* (year of installation).

Stratified Random Sampling will be used to select samples from the Project Database for monitoring parameters. Optionally, other sampling approaches may be used in accordance with Standard "Sampling and surveys for CDM project activities and programmes of activities" and Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities when sampling techniques or statistical analysis necessitates it.

Alternatively, a simplified approach proposed in option (b) under Section 8.4 of methodology may be used for determining the minimum sample size in which case compliance with required confidence/precision is not obligatory.

The following table summarizes the monitoring approach and monitoring frequency for each SDG (other than SDG 13 and 15 which are discussed in next section):

Impact#	SDG Indicator	Monitoring parameters	Monitoring Approach	Monitoring frequency
Impact #1	1.4.1	Average household money savings due to decrease in expenditure on basic services such as purchased fuel after	Monitoring survey	Annual / Biennial

		shifting to project technology.		
Impact #2	3.9.1	% Users reporting reduction in smoke/PM after shifting to ICS in project.	Monitoring survey	Annual / Biennial
Impact #3	4.3.1	Number of people receiving formal and non-formal education and training.	Education & Training Records	Annual / Biennial
Impact #4	5.4.1	Average time saving associated with cooking and fuel collection time due to adoption of project technology / measures.	Monitoring survey	Annual / Biennial
Impact #5	7.1.2	Number of Beneficiaries under the project i.e., Number of ICS distributed under the project.	Sales database record	Annual / Biennial
Impact #5	7.1.2	% Users reporting operational project stove	This parameter will be monitored under VCS program. No separate sampling or monitoring will be undertaken under SD VISta program.	Annual / Biennial
Impact #6	8.5.1	Number of male / female employment created by project	HR records	Annual / Biennial
Impact #7	12.2.2	Average fuel savings per household per year	Monitoring survey	Annual / Biennial

3.4 Net Positive Stakeholder Well-being Impacts

Improved cookstove is a necessity for a healthy and productive life. The project activity will replace the traditional inefficient cook stoves with the higher efficient project ICS technology in Liberia. The emission of indoor pollutants from inefficient burning of solid biomass fuels in the beneficiary households will be reduced. The project ICS shall aid improved combustion of fuel thereby reducing smoke and Particulate matter (PM) emissions.

The project ICS shall reduce the household expenditures on purchased cooking fuel and save time in cooking activities (by faster cooking) as well as save time in fuel procurement (reduced collection time or reduced purchase trips to market) due to reduced fuel consumption.

This shall free the women involved in these activities (unpaid work) and utilize the same in more productive and income generating tasks.

The implementation of the project will also create local employment opportunities in operational and management roles, as well as in manufacturing, distribution, and logistics. The distribution of ICS under project activity will lead to the following net positive impact:

	Target beneficiary	SDG Indicator	Parameter	Impact
Economic Well-Being	End user households	1.4.1	Household money savings due to decrease in expenditure on basic service due to adoption of project technology/ measures.	Positive
	Employees hired during various stages of project implementation & operation	8.5.1	Number of male / female employment created by project.	Positive
Social Well-Being	Children and Adults	4.3.1	Number of people receiving formal and non-formal education and training.	Positive
	Women and Children	5.4.1	Average time saving associated with collecting fuel and cooking	Positive
	End user households	7.1.2	Number of ICS distributed under the project.	Positive
	End user households	7.1.2	% Users reporting operational project stove	Positive
	End user households	12.2.2	Average Fuel savings per household per year	Positive
Environmental well-being	End user households with focus on women who are primary cooks	3.9.1	% Users reporting reduction in smoke/PM after shifting to ICS in project.	Positive

4 BENEFITS FOR THE PLANET

4.1 Condition of Natural Capital and Ecosystem Services at Project Start

According to Global Forest Watch (database by World Resources Institute) [12], from 2001 to 2021, Liberia lost 2.05Mha of tree cover, equivalent to a 22% decrease in tree cover since 2000. In 2010, Liberia had 9.16Mha of natural forest, extending over 97% of its land area. In 2021, it lost 128kha of natural forest equivalent to 75.3Mt of CO_2 emissions.

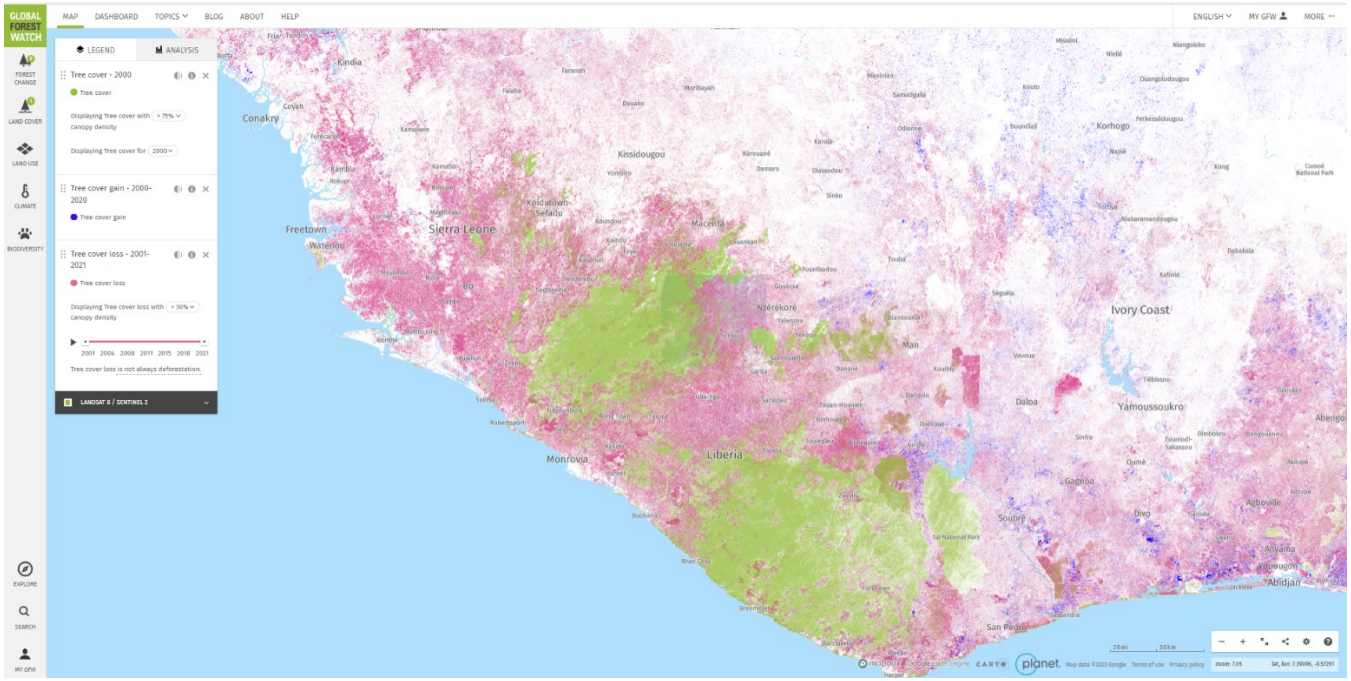
While as per the same, from 2000 to 2020, Liberia gained only 57.8kha of tree cover.

The 2020 SDG 7: Energy Progress Report 2022, Chapter-2[13] points to 2.4 billion people still without access to clean cooking as of 2020. Further, as per the same report, the number of people without access to clean cooking in Sub-Saharan Africa is set to increase by almost 20 million every year this decade, rising from 923 million in 2020 to over 1.1 billion in 2030, as small gains in the percentage of people with clean cooking fail to keep pace with population growth. Liberia alone has more than 5 million people that access deficit toward clean cooking fuels and technologies.

Thus, traditional cooking methods are prevalent across the host country. The use of these traditional inefficient biomass stoves is a significant driver of deforestation. Widespread usage of unsustainably sourced, non-renewable biomass (NRB) for cooking results in equivalent GHG emissions attributed to use of non-renewable biomass.

[12] https://www.globalforestwatch.org/dashboards/country/LBR

[13] https://trackingsdg7.esmap.org/downloads



Map of Liberia indicating tree cover loss between 2001 and 2021[14]
(Pink area indicated tree cover loss, blue colour shows the gain in tree cover and green colour highlight the areas with >75% tree cover)

4.2 Expected Impacts on Natural Capital and Ecosystem Services

Impact #1	Amount of CO_2e emissions avoided or sequestered.
Type of Impact	Positive, Actual, Direct
Affected Natural Capital and/or Ecosystem Service(s)	GHG concentration of atmosphere, climate change

[14] https://www.globalforestwatch.org/dashboards/country/LBR

Resulting Change in Condition	The project ICS requires less fuel for producing the same amount of thermal energy as compared to traditional inefficient cookstoves. The project by replacing the inefficient traditional stove with the energy-efficient ICS will reduce approximately 14,410,999 tCO_2e of GHG emissions over the crediting period of 7 years. Thus, reduction of GHG emissions translate to a positive impact on climate change.

Impact #2	Total non-renewable wood fuel saved after shifting to project device
Type of Impact	Positive, Predicted, Direct
Affected Natural Capital and/or Ecosystem Service(s)	Forest area, biodiversity, water, and soil, etc.
Resulting Change in Condition	The project ICS will help beneficiary in consuming less fuel as compared to traditional inefficient stoves. It will save approx. 3.26 tons non-renewable biomass per stove every year.

4.3 Natural Capital and Ecosystem Services Monitoring Plan

The following data and parameters will be monitored under the project to assess the impacts on the natural capital and ecosystem. The sampling approach adopted for collecting the corresponding data has been presented in section 3.3 of the PD.

Impact#	SDG Indicator	Monitoring Parameter	Monitoring approach	Frequency
Impact#1	13.2.2	Tonnes of greenhouse gas emissions avoided or removed	This parameter will be monitored under VCS program. No separate sampling or monitoring will be undertaken under SDVISta program.	Annual / Biennial
Impact#2	15.2.1	Total non-renewable wood fuel saved after shifting to project device	This parameter will be monitored under VCS program. No separate sampling or monitoring will be undertaken under SD VISta program.	Annual / Biennial

4.4 Net Positive Natural Capital and Ecosystem Services Impacts

The project by replacing the traditionally inefficient cook stoves with the higher efficient project ICS technology, will reduce an estimated ~14,410,999 tCO2e GHG emissions over the Seven-year project crediting period.

It will also help in annually estimated reduction/savings of ~3.26 tons of woody biomass/stove. The following table summarize the net positive natural impact by the project.

	Target beneficiary	SDG Indicator	Parameter	Impact
Environmental well-being	Natural Capital	13.2.2	Amount of CO_2e emissions avoided or sequestered per year	Positive
	Natural Capital	15.2.1	Total non-renewable wood fuel saved after shifting to project device.	Positive

APPENDIX A: CAUSAL CHAIN