Validation Report for:

Client	*Greenerth Solutions (Greenerth Climatech and Impact Solutions Pvt Ltd*
Project title	*Artisinal Biochar Production using cotton biomass in Maharashtra, India*
Project ID	*GCSP1176*
Methodology	*Global Artisan C-Sink, V.2.1*
Date of issue	*15.05.2025*
Version	*V.1*

Introduction
Objective and Scope

The Validation ensures that the requirements and framework conditions of the methodology have been met in the specific project proposal (including its implementation and monitoring plan) and the underlying assumptions are correct.

Criteria for Validation

PDD validated along the criteria of Methodology:

Global Artisan C-Sink Standard version 2.1

Reasonableness of Assumptions

The validator can confirm that the assumptions applied by the project comply with the criteria of the standard and the estimates of future values are appropriate. The methodology has been defined by the standard holder and does not need further evaluation. The quality of the data used for the estimates are plausible.

Materiality

The quantitative materiality of the final validation statement is covered by the error tolerance as 95% from the stated value. It is regularly updated through a yearly performed risk analysis.
CERES can confirm that this materiality threshold is reasonable and does also include the qualitative aspects of the materiality since the data and the data management system is checked at different levels of the project throughout the production and processing of the biochar.

Team for Validation and their roles

Overview on Team members and their roles:

Name	Role	Activity
Luna Shrestha	Team Leader for validation	Desk Reviewer
Bernhard Schulz	Independent reviewer	Independent Reviewer of finalized findings report and issuing the validation statement

Means of Validation

Desk/ Document Review

CERES received and reviewed the Project Design Document (PDD), Methodological Annex and supporting documentation to assess initial conformance with the requirements of Methodology Global Artisan C-sink based upon Carbon Standards International (CSI). A list of relevant documents that form the basis for the validation opinion can be found in Annex 1.

Key factors that impact the reported emission reductions and storage/ sequestration were identified, and a risk analysis was created to focus on the critical elements presenting potential risk for errors. These elements included inventory data collection and handling, assumptions underlying the baseline characterization, the feedstock used in the pyrolysis unit and the usage of biochar to create C-sinks and assessing relevant applicability and eligibility criteria.

The validation team conducted a desk review of the documentation provided by the project proponent. The key project documents, as prepared by the client are as follows:

- Project Design Document, Version 1.1 dated 15.05.2025
- Key monitoring factors applied during production of biochar

The project proponent provided extensive supporting documentation in addition to the primary documents listed above (see Annex 1).

Strategic and Risk Analysis

The following table presents the areas of concerns where specific validation risks might result in non-compliances with the standard requirements. It is reflected in the risk analysis which is updated on a yearly basis.

Area of Concern	Potential Risk	Means of Validation
General information		
Project location	Project location does not meet preconditions with respect to eligible countries	PDD, supporting documents, on-site audit
Baseline scenario	The baseline scenario does not correspond to the scenario predefined by the standard	Information provided by the project proponent.
Project boundaries	n/a (please see Project boundaries and project location section)	

Eligibility: Quality of biochar	Artisans are not trained and do not operate the pyrolysis in a professional manner	Training manual and records, On-site audit
Ex ante estimations for C-sink	If biochar production is not carried out properly, the real methane emission for Kontiki/Soil pit could be higher than the mean 30 kg CH_4/t DM biochar produced.	On-site audit
Social responsibility	Payments to producers not done on time or for an unfair price	Self-declaration form, interviews with producers during on-site audits.
Technology and business		
Pyrolysis unit (Kon tiki/ TLUD)	pyrolysis technology which is not approved by CSI	On-site audit
Origin of feedstock	Feedstocks is not sustainably sourced	PDD, supporting documents, on-site audit
Feedstocks	Not dry enough	On-site audit
Concept understanding (Training)	Producers not aware about basic techniques of proper biochar production	On-site audit, training material, training records
Application and trade of biochar	Biochar is sold for heating purposes instead of being used as soil amendment	Verify correctness of data provided through the dMRV-tool during on-site audits.
Emission		
Type of emission compensation	Commitment to stop burning any kind of crop residues is not kept	Interviews with farmers and neighbours during on-site audits.
Digital Monitoring Reporting and Verification (dMRV)		
Type of dMRV application	dMRV application not endorsed by the standard	Supporting documents, CSI website
Internal Control System	Monitoring results do not reflect reality	On-site audit
Determination of C-Sink	Incorrect volume/bag of produced biochar	Remeasuring bag volume during on-site audit
Registration of C-Sink	Incomplete set of data (like missing geo localization or unknown owner of the C-sink site)	Checking completeness of provided information for each C-sink sale.

Sampling Approach and onsite Visit
The following sampling approach is chosen for the onsite visit:

-All Artisan Pro (100 %) will be visited, and inspected when production takes place

Validation Findings Summary

Any non-conformity identified during the validation process were resolved through the issuance of findings. The types of findings / non-conformities issued by CERES can be categorized into:

Major Non-Conformity: This type of finding could only be closed upon receipt by CERES of evidence indicating that the non-conformity had been corrected. Resolution of all major Non-conformities was a prerequisite for issuance of a validation statement.
Minor Non-Conformity: This type of finding could only be closed upon receipt by CERES of evidence indicating that the non-conformity had been corrected. Resolution of all minor Non-conformities can be corrected until the following verification audit in the next year.
Observation: An Observation indicates an area that should be monitored or ideally, improved upon. Observations might be an indication of something that could become a non-conformity if not given proper attention. No correction is required for Observations.

All findings issued during the validation process, and the corrective actions submitted can be found in the Annex 3 of this report.

Annexes:

Annex 1: List of documents checked during validation
Annex 2: Producer list (confidential)
Annex 3: Finding report validation
Annex 4: Report on the validation findings
Annex 5: Validation statement

Annex 1: List of documents checked during validation

- Project Design Document
- Social responsibility declaration form
- (Sample) contract between Artisan C-Sink Manager and Artisan Biochar Producer
- Internal training protocol
- Sampling Plan
- Declaration of honour (methane compensation by avoiding GHG-emissions from burning crop residues)
- dMRV Manual
- Blueprint of the Internal Control System (ICS)
- Template Internal Inspection Checklist/Report

Annex 2: Producer list (confidential)

The list of producers of biochar will not be publicly available but will only be available for the project.

Annex 4: Report on the validation findings

The following areas of validation findings were checked during the process:

0. Project Start Date

The project start date is 17.01.2025

The very first batch for which a C-sink may be claimed must have been produced maximum 3 month before CERES will have issued the **verification statement**.

1. General description

General description of the project, Scope and purpose

The project description and objectives are well explained. The activities of the project are in line with the standard requirements and all feedstock information is given as needed.

The project falls under the Global Artisan C-Sink 2.1. It meets the requirements outlined in the standard since its purpose is to produce biochar from sustainable feedstock and apply it into different matrixes.

Baseline Scenario

The baseline scenario for carbon removal accounting is the "business as usual", in which no permanent biochar-based carbon sink is generated and is considered as zero. The fact that biomass could have been used differently in the baseline scenario, has no impact on the consideration of the baseline as zero.

$$C\_sink\ (Baseline) = 0\ tCO2e$$

This corresponds with the requirements of the standard of CSI.

Project Boundaries and Project location

The emissions from biomass cultivation, harvesting, transportation, crushing, pyrolysis, pyro-gas combustion, milling, blending, and soil or material incorporation are fully taken into consideration through a margin of security of 20 kg CO2e per ton of biochar (DM).
To keep the certification procedures reasonably lean, Artisan Biochar Producers
are not required to provide a detailed account of these potential emissions, but a security margin of 20 kg CO_2e per ton of biochar (DM)is levied.
The emissions caused by biomass transport >30 Km as well as biochar transport > 100 Km., are compensated through the retirement of persistent C-Sinks.

The project is located in Village Khangaon, Taluka Hinganghat in Wardha District in Maharashtra State in India. **The GPS location of first artisan pro location is +20.490856, +78.548602**

Project Eligibility

The following eligibility criteria of the standard have been identified and are met by this project:

- Production of biochar according to Global Artisan C-Sink conditions.
- Farmers and Artisan Biochar Pros are not certified under any other methodology for nature-based climate service (i.e. biomass production and soil organic carbon).

- Social Impact: Involved parties have to be compensated fairly and transparently. Project proponent has committed to respect basic social responsibility criteria.
- Project location: Project is located in low- or middle-income country according to the World Bank classification.
- Biochar production does not exceed 1500m^3/year for a single Artisan Pro and is done with a low-tech production unit.
- The C-sinks issued in this project are not claimed in any other Carbon Crediting Scheme.

Ownership Project Proponent

The project proponent is the Artisan C-Sink Manager. The producers produce biochar with the aim of creating C-Sinks. While C-Sink Farmers are expected to apply the biochar in their own farm to improve their soil and increase farm resilience to climate change, Artisan Pro producer will mainly sell the biochar, which needs to be tracked either by the producer, the Artisan C-Sink Manager, or a certified Biochar Trader.

By default, C-Sink Farmers owns the C-Sink. There are transparent agreements for the transfer of ownership per project to the Artisan C-Sink Manager.

CERES confirms that correct information has been provided.

Additionality

As described in chapter 18 of the standard, within the methodology additionality is per se given and a project specific proof is not required and has not been conducted during the validation.

The Global Artisan C-sink will, thus, be the decisive monetary incentive and knowledge transfer to produce climate positive biochar and thus carbon sinks. The Global Artisan C-Sink Manager will provide not only training on biochar production but also on the preparation and application of biochar-based fertilizers, which (a) will enable most farmers to establish this practice and (b) will avoid the adoption of unsustainable biochar production practices which could result in pollution and GHG-emissions. Moreover, methane compensation, as introduced by the Global Artisan C-sink is a key element to achieving net negative emissions with Kon-Tiki based biochar C-sinks.

Global Artisan C-sink assures the adoption of low-emission technology, methane compensation, and the use of sustainably sourced biomass. Without those boundary conditions, biochar production in countries with low purchasing power and limited financial and technical possibilities would hardly result in net negative emissions. Hence, additionality of any C-sink certificates issued under this standard is guaranteed.

2. Ex-ante (Forecast) estimation

Ex-ante (Forecast) estimation - Calculations for C-sink

The Biochar C-sink calculated during validation is a future estimate of the possible produced Carbon C-sink. This is under the assumption that the production of the Biochar is done with the available biomass quantity which was assessed by the project proponent under consideration of the development plan for the project.

The assumption is considered reasonable and inherent in the projection. The scope of the project will not change even if the quantity of Biochar produced will be increased.

However, the effectively created C-sinks will be monitored during the process and the C-sink-value will be issued after verification and all steps are documented in a dMRV-tool. C-sink producers must offset their additional emissions which are not covered by the Margin of Security against permanent C-sinks. Therefore, there is no risk of misstatement for the C-Sink throughout the process.

The source of the data will be directly obtained from the different players within the supply chain and counter-checked during verification onsite audits.

3. Technology and business cases

Pyrolysis unit and Technology

Type of pyrolysis unit: Kon-tiki
Biochar producer category: 1 Artisan Pro

Training of Artisan Biochar Producer

The Artisan Biochar Producer follows a biochar production training given by a qualified trainer and prove their proficiency. The Global Artisan C-Sink Manager proves how the Artisan Biochar Producers were qualified to:

- Identify and do the proper treatment of the feedstock before pyrolyzing.
- Produce high-quality biochar with low emissions.
- Volume and weight measurement.
- Biochar sampling procedure.
- Understand how to track the produced biochar.
- Proficient use of the Artisan smartphone app.

As per the project design description, the Artisan Biochar Producers are skilful in the principles of feedstock selection, biomass drying, biochar kiln operation principles, volume measurement of the produced biochar, biochar sampling, and the proficient use of the Artisan smartphone app. Continuous compliance with these requirements will be monitored during on-site audits on a yearly basis.

Biomass Feedstock and methane emissions during storage

The feedstock preparation and storage are done according to the following principles, that are in line with the Global Artisan C-Sink Standard.
Biochar produced in this project originated from the artisan's farm or from biomass processing. Selected biomass stems from annual crop residues, forest gardens, agroforestry, short rotation coppice, woody residues from fallow fields with a fallow period shorter then 10 years. Feedstock is pre-dried, is stored airy, and protected from rain. The water content of feedstock is below 25%. Artisan Pros are measuring the feedstock humidity with an appropriate humidity meter and record it in the production protocol.

Feedstocks: cotton biomass
Dry matter determination of the feedstock is done by a digital moisture meter

Application and trade of biochar, Planned business development

Artisan Pro producers will mainly sell the biochar. It will be tracked either by the Artisan Pro, the Artisan C-Sink Manager, or a certified Biochar Trader.

The following applications are possible for this project:

- Geological C-sink (biochar applied to soil)
- Temporary C-sink (biochar used in materials)

The made projections and planned business development are considered reasonable for this project.

Methane emissions compensation

All sources of methane emissions have been taken into account and calculated according to the rules given in the Global Artisan C-Sink standard version 2.1. (For details, please refer to the standard section 14. Methane emission)

The following option is applicable to the project:

- Compensation of methane emissions by avoiding GHG-emissions from burning crop residues

Digital Monitoring, Reporting and Verification (dMRV)

The standard of CSI requests that CSI endorses all data management systems before they are allowed to be used. This is also true for the dMRV system **Varaha AG Climate Pvt Ltd** which is used by the project proponent.
The responsibilities of the management for recording and checking the relevant data is clearly described in PDD and its related annexes. The frequency of data collection is determined and the quality management and controlling of data is deemed to be satisfactory.The presented dMRV system fully covers all requirements concerning origin and quantification of feedstock, proper biochar production and quantity measurement, recording of the C-sink matrix and the GPS location of the final biochar application.

Internal Control System and quality control

The Global Artisan C-Sink standard refers to Internal Control Systems (ICS) for the certification of C-Sink networks, Artisan Pros and C-sink cooks/villages. ICS is a tool for quality assurance, where the C-Sink manager implements an internal inspection and monitoring system verifying compliance with the requirements of the Global Artisan C-Sink Standard adapted to the local conditions.

Through the documents which were assessed during the PDD review the project proponent provided satisfactory evidence that he is competent to implement an efficiently working ICS which closely monitors the project stakeholders activities.

4. Determination of C-Sink

Monitoring Plan for C-Sink

The project proponent has provided a monitoring plan and supporting documents with standard operating procedures. All the required data and procedures for the ongoing monitoring of the project are described in this plan and its corresponding annexes. The plan describes the data to be collected, their frequency, and the source of supporting documents. The monitoring procedure is appropriate to the project and is described in sufficient technical detail to allow it to be carried out consistently throughout the lifetime of the project (see also remarks made under "*Digital Monitoring, Reporting and Verification (dMRV)*".

By implementing the description provided in the PDD a complete "craddle to grave – assessment" of the C-sinks will become feasible.

Margin of Security for Uncertainties and Leakages

The Global C-Sink Standard prohibits non-sustainable biomass cultivation, land use change and soil organic carbon depletion - thus, leakage in sense of carbon expenditure outside of the project boundaries is avoided as much as possible. It is assumed that activity shifts to biochar production causes only minimal leakage emissions.

The level of the safety margin is deemed sufficient to cover all potential leakage emissions.

All emissions, if not covered within the margin of security (leakages), are calculated correctly.

Calculation of C-sink in the Validation statement

The calculation of the GHG storage/sequestration is done with the C-sink tool of CSI. CERES has assessed that the estimated permanent C-sinks of the project activity complies with the applied methodology and requirement of the Artisan C-sink standard. The correct entry of the data into the C-sink tool will be regularly checked during the onsite inspection by verifying the data on a sample basis.

The calculation is based on the Global Artisan C-Sink Standard version 2.1. All conversion factors correspond to the default values from the standard.
All sources of emissions from fossil fuels have been taken into account and calculated according to the rules given in the Global Artisan C-Sink standard version 2.1.
All sources of methane emissions have been taken into account and calculated according to the rules given in the Global Artisan C-Sink standard version 2.1. (For details, please refer to the standard section 14. Methane emission).
The dMRV provides the necessary data to carry out the correct methane emissions compensation.

The C-Sink is calculated in the C-sink tool. The data for the basis of the calculation is verified during the onsite inspection and – as a desk review - before issuing C-sink credits.