SUSTAINABLE AGRICULTURAL PRACTICES FOR CARBON SEQUESTRATION BY ORGANIC AND NATURAL FARMING GROUPS

Prepared by EPIC Sustainability Services Private Limited

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Summary:

EPIC Sustainability Services Private Limited (here after EPIC) has performed validation and verification of the project titled "Sustainable agricultural practices for carbon sequestration by organic and natural farming groups" VCS id: 3115 in Karnataka state, India to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. The validation and verification were performed on the basis of VCS standard v.4.3 requirements for the VCS project, as well as criteria given to provide consistent project operations, monitoring and reporting.

The validation and verification were conducted by means of document review, follow-up interviews and site inspection, and the resolution of findings. The review of the joint PD&MR documentation and the subsequent follow-up interviews and site inspection has provided EPIC with sufficient evidence to determine the fulfillment of stated criteria. A total of 10 CL (Clarification requests) and 13 CAR (Corrective action request) and 01 FAR (Forward Action Request) were issued to the PP which was resolved satisfactorily as summarized in Appendix 1. There was a methodological deviations validated as acceptable and hence the uncertainties were addressed to a reasonable degree.

The project activity is to promote and implement a package of Sustainable Agricultural Land Management (SALM) practices in different farming systems across the Karnataka state and to generate GHG removals through soil and tree carbon sequestration (agroforestry practices). The project has applied the VCS approved methodology "VM0017 Adoption of Sustainable Agricultural Land Management", version 1.0.

In summary, it is EPIC's opinion that the project entitled "Sustainable agricultural practices for carbon sequestration by organic and natural farming groups" as described in the latest VCS PD&MR,, meets all relevant VCS standard v.4.3 requirements for the VCS project and correctly applies the VCS approved methodology "VM0017 Adoption of Sustainable Agricultural Land Management", version 1.0 and hence can be recommended for registration as a VCS project activity. This project is estimated to generate approximately 171,399 tCO2e in GHG emissions reductions on an average annual basis throughout its lifetime (30 years). The projects climate benefits include emissions reduction or removals of approximately 5,141,971 tCO2e over the lifetime of the project. The audit team has assessed that the emission reductions/removals from the project activity "Sustainable agricultural practices for carbon sequestration by organic and natural farming groups" in State of Karnataka, India during the period 01st October 2017 to 30th September 2022 amounts to net emissions of 1,107,315 tonnes of CO2 equivalent.

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1 INTRODUCTION

1.1 Objective

EPIC Sustainability Services Private Limited (EPIC) has been contracted by Kanaka Management Services Private Limited (KMS) to jointly validate and verify the project activity titled "Sustainable agricultural practices for carbon sequestration by organic and natural Farming groups". The purpose of the joint validation and verification audit activity was to conduct an independent assessment of the project in order to determine whether the project complies with the validation and verification criteria as set out in the guidance documents listed in Section 1.2 of this report, including the project design, monitoring procedures and the GHG emission reductions and removals estimated ex-ante in the joint Project Description (PD) and Monitoring Report (MR) are materially accurate.

1.2 Scope and Criteria

The scope of the joint validation and verification was an independent and objective review to validate the design and verify the emissions removals of the proposed project activity in Karnataka state of India, against the Verified Carbon Standard (VCS), the identified methodology and associated tools.

The verification of this project was based on joint PD & MR and supporting documents made available to the validation and verification team. These documents were reviewed against the requirements of the VCS standard v4.3, VCS guidelines, the VCS Validation and Verification manual v3.2, VCS AFOLU Non-Permanence Risk Tool v.4.0 and VCS methodology VM0017 Adoption of Sustainable Agricultural Land Management v1.0.

The validation is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design. The work carried out by EPIC is free from any conflict of interest.

EPIC has performed the validation based on a risk-based approach focusing mainly on the significant risks to meet the qualification criteria and the ability to generate VCUs.

1.3 Level of Assurance

In line with VCS requirements and as per ISO: 14064-2:2019 a reasonable level of assurance is defined for the verification of the project. This implies that based on the process and procedures conducted by EPIC the overall information in the joint PD & MR is materially correct and is a fair representation of the actual project details and is prepared in accordance with the VCS requirements and the applied methodology for information pertaining to GHG quantification, monitoring and reporting.

1.4 Summary Description of the Project

The project activity is an adoption of sustainable agricultural land management (SALM) practices (covering an area of 57,516 hectares and consisting of 29,739 farmers, eligible under the Agriculture, Forestry and Other Land Use (AFOLU) Scope as a VCS grouped project, located in the state of Karnataka, India. This is a grouped project. The project aims to promote organic farming, improving the fertility of soil and enables agroforestry practices. The project utilizes RothC model for estimating the carbon stock changes in the soil due to variations in the management practices. This project is estimated to generate approximately 171,399 tCO2e in GHG emissions reductions on an average annual basis throughout its lifetime (30 years). This projects climate benefits include emissions reduction or removals of approximately 5,141,971 tCO2e over the lifetime of the project. The project also aims in training the farm communities; create awareness on impact of usage of synthetic fertilizers on crop yield, and encourage the practice of agroforestry. During the current monitoring period (01st October 2017 to 30th September 2022) the project has achieved net emissions reduction or removals of 1,107,315 tonnes of CO2 equivalent.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

The validation and verification process consists of the following phases:

- A document review of the joint PD&MR documents and preparation of validation and verification protocol.
- On-site visit to the project activity and interviews with project developer, project consultant, farmer associations and farmers; and
- Resolution of outstanding issues and the issuance of final validation and verification report and opinion.

In order to ensure transparency, a validation and verification protocol was prepared for the project according to the requirements of VCS Standard v4.3. The validation and verification protocol serves the following purposes:

It organizes, details and clarifies the requirements that a project is expected to meet.

It ensures a transparent validation and verification process where the validator will document how a particular requirement has been verified and the result of the verification.

A sampling plan was drafted based on the monitoring of parameters as indicated in the PD-MR and verification was done on the compliance with the methodological requirements. A random sampling plan was adopted as there was no stratification of the samples.

During the validation and verification, non-fulfilment of the validation and verification protocol criteria or identified risks to the fulfilment of project objectives were raised as either CAR or CL. Corrective Action Requests (CAR) were issued, where:

- Mistakes had been made that directly impacted on the project results; or
- VCS requirements had not been met; or
- There was a risk that the project would not be accepted as a VCS project or that emission reductions will not be certified.

The Clarification Requests (CL) were issued where additional information was needed to clarify issues, and Forward Action Requests (FAR) were issued related to project implementation that required review during the next verification of the project activity.

The following team members from EPIC are involved in identifying the following:

Name	Role	Components reviewed
Mr. R. Vijayaraghavan	Lead Auditor (until 29th October 2024)	Completeness check, desk review, supervision of field audit, discussion with project representatives, issuance of findings, report preparation
Mrs. Sheela H K	Lead Auditor (From 30th October 2024)	Completeness check, desk review, supervision of field audit, discussion with project representatives, issuance of findings, report preparation
Prof. Matthew Harrison	Verra approved IME acting as Technical Expert	Completeness check of RothC modelling data, Desk review, Assistance to the audit team on RothC model data assessment.
Ms. Swetha S	Auditor	Discussion with project representatives, Report preparation
Dr. Gajendra C V	Auditor (until 31st Aug 2023)	Desk review, discussion with project representatives, assistance in field audit, preparation of Draft Verification Report
Mr. A. Prabu Das	Technical Reviewer (TR)	Technical review

Ms. Madhura M S	Trainee Technical Reviewer	Technical inputs to the technical reviewer
Dr. Dakshina Murthy Kadiyala	Verra approved IME assisting TR team	Technical inputs to the technical reviewer
Mr Diamino Armando Nhanombe	Technical expert assisting TR	Technical inputs to the technical reviewer

2.2 Document Review

As a first step, the validation and verification team has reviewed the joint PD&MR v.1.0 (initial PD&MR) and additional background documents submitted by the project participant. Based on the review, the validation and verification team has issued corrective action requests (CAR's) /clarification requests (CL's). As a result of these findings the joint PD&MR is revised to v.1.6 (herein after referred to as final PD&MR). The resolution of findings by the validation and verification team is presented in Appendix 01 of this report. A complete list of all documents and records reviewed are attached in Appendix 02 of this report, and the non-permanence risk report is presented in Appendix 03. The information in the PD-MR and documents provided by PP was reviewed and crosschecked with the field data. Observations during the site visit and interviews were also compared with the information provided for the cross-check. Where relevant, publicly available data was used for verification of the information and assessment of whether the requirements have been met.

2.3 Interviews

As part of the validation and verification process between 30th June 2022 to 02nd July 2022 the audit team physically visited districts covering the different IPCC zones to conduct interviews with identified project stakeholders such as farmers and farmer associations. The primary objective was to validate and verify that the project activity instances met the eligibility criteria and the baseline scenario and project description, and monitoring data were accurate. The personnel associated with the project proponent and /or implementing partner / relevant stakeholders were interviewed during the site inspection conducted. Additionally, remote audit was also carried out on 15th July 2022 with the PP, farmers and farmer associations covering the different climatic zones. Based on the grant of permission for extension of the monitoring period, the PP extended the 1st monitoring period from initial 01st October 2017 – 31st December 2021 to present 01st October 2017 – 30th September 2022 to record the $SOC_{c,mc,t}$ data and parameter annually in the project. To verify the project activities implemented for the extended monitoring period, the audit team conducted follow-up document review and additional interviews remotely with the farmers, PP and Project Management Team (KMS) from 06th to 9th May 2025. The project interventions such as soil improvement practices viz., , use of organic manure, plant residue mulching and agroforestry were performed in the extended monitoring period.

2.4 Site Inspections

The on-site assessment which was conducted as part of the validation and verification activity involved.

1. An assessment of the implementation of the proposed VCS project activity as per joint PD&MR in line with the applied methodology.
2. A review of information flows of the project design for generating, aggregating and reporting of the monitoring parameters.
3. Interviews with project director, project & co-ordinator, project manager, field officers, farmer trainer and farmers were conducted to confirm the implementation of the project in accordance with the PD&MR.
4. A cross-check on information provided in the PD&MR and its supporting documents.
5. A review of calculations and assumptions made in determining the GHG data/VCU's, and
6. An identification of QA/QC procedures.

After the review of the project Joint PD&MR and documents, a site visit was carried out from 30th June 2022 to 02nd July 2022 and remote audit was carried out on 15th July 2022. During the site visit, physical inspection of the project components (Inspection of farmland, Crops and trees grown on farm land, SALM practices, No. of farm machineries maintained, Farm diaries) followed by interviews with the on-site personnel was carried out to verify the project details. During the site inspection, a total of 37 farmers were visited across the different climatic zones. The selection of the farms was based on random sampling as there was no stratification of the samples. Representatives from 5 farm associations were also interviewed. Some of the zones as per plan could not be visited due to the prevailing spread of COVID. Hence follow up interviews (remote audit) during July 15 was conducted by audit team, in which a total of 30 farmers across the different IPCC zones were interviewed. Using the random sampling approach as specified in the CDM sampling and surveys guideline and considering a confidence level of 95% and 10 % precision, the total number of sample farms (proportion of total population) that needs to be verified for the SALM practices implementation in proportion to the expected implementation, was calculated as 43. However, to cover the risks related to the remote audit, the sample size was increased to 30, so the final sampled farmers are 67 that includes on-site (37 no's) and remote audit (30 no's).

The site visit photographs are attached in the Appendix 4.

Details of personnel interviewed during the onsite visit 30th June 2022, 01st & 02nd July 2022, 15th July 2022 and on 06th to 9th May 2025 as part of the remote audit.

Name	Designation and Company	Interview Topics
Mr. Muniraju K S	Director, Vedic Green Solutions	Project implementation Monitoring plan and Procedures, Training details, field measurement, Organization set up of the project, criteria for selection of farmers, grievance redressal mechanisms

K.E.Y Rani and Team	Kanaka Management Services	Project Design, Project implementation Monitoring plan and Procedures, GIS Analysis, RothC modeling data. Project risks.
Mr. Jayaprasad B C	Project head and Co-ordinator	Baseline survey, Monitoring the data and quality check, field measurements, grievance redressal mechanisms
Mr. Vishwanath K S	Field Officer, Sakleshpura	Data collection and data monitoring, data measurement, farm dairy, trainings organization and transfer of information to farmers
Mr. Chethan Gowda	Field officer, Ramanagara	Data collection and data monitoring, data measurement, farm dairy, trainings organization and transfer of information to farmers
Mr. Narayana Gowda	Filed officer, Chikkamagalur	Data collection and data monitoring, data measurement, farm dairy, trainings organization and transfer of information to farmers
Mr. Shivakumar K S	Field officer, Chikkamagalur	Data collection and data monitoring, data measurement, farm dairy, trainings organization and transfer of information to farmers
Mr. Nandisha G G	Field officer, Chikkamagalur	Data collection and data monitoring, data measurement, farm dairy, trainings organization and transfer of information to farmers
Farmer association directors (5), farmers (37 nos as part of on-site inspection) and (40 nos as part of remote audit)	As per left column	Information on project activity, status of organic farming by registered farming groups, marketing and sale of agriculture produce and local stakeholder consultation process.

2.5 Resolution of Findings

Resolution of Clarification and Corrective Action Requests

The objective of this phase of the audit was to resolve the corrective action requests and clarifications and any other outstanding issues which needed to be clarified prior to EPIC positive conclusion on the

monitoring report and the project design. During the verification process 10 CLs and 13 CARs and 01 FAR were raised.

All the findings were resolved during this phase. In order to ensure the transparency of the validation and verification process, the concerns raised and responses that were given are summarized in Appendix 01 of this report and documented in more detail. All the corrective actions have been incorporated into the revised documents viz., joint PD&MR and ER calculation sheet.

Internal quality control

A Technical Reviewer is appointed to review the final draft validation and verification report and the final validation and verification report. The comments made by the Technical Reviewer are taken into consideration and incorporated in the final report. The final report (after resolutions of all findings) is then submitted to the Head - Operations for review and approval.

2.5.1 Forward Action Requests

A Forward Action Requests (FAR) is issued when certain issues related to project implementation should be reviewed during the first verification.

01 FAR was raised during the combined validation and verification of the project activity.

3 VALIDATION FINDINGS

3.1 Project Details

Project type, technologies and measures implemented, and eligibility of the project:

Section 1.2 of the joint PD&MR identifies the sectoral scope and category of the project. The applicable sectoral scope is 14 i.e Agriculture, Forestry and other Land use (AFOLU), and the category is Agricultural Land Management (ALM) and subcategory Improved Cropland Management. Moreover, the joint PDMR clearly indicates that the project is a grouped project. EPIC validation team confirms that the sectoral scope and category of the project have been correctly identified. The project aims to promote of sustainable agriculture land management through organic farming and practice of agroforestry.

Project design, including eligibility criteria for grouped projects:
The proposed project is assessed to be eligible under the scope of the VCS Program: as summarised below:

1. The project is an agricultural land management project and falls under the Improved crop land management. This was verified from the information in the PD-MR and site inspections. As the SALM practices are implemented in the farms, the project qualifies as a ALM project under VCS requirements.

2. The baseline scenario is farmers not practising the SALM methods and the land is cropland.

3. The project area shall not be cleared of native ecosystems within the 10-year period prior to the project start date.

4. The crediting period of the project is 30 years, renewable in line with VCS standard requirements for ALM projects.

The EPIC audit team assessed the eligibility criteria for grouped projects and the assessment conclusion is provided below:

Eligibility criteria for addition of new project activity instances to the grouped project	**EPIC audit team assessment conclusion**
The geographical boundary of the new instance must be within the State of Karnataka. Detailed documentation regarding the exact geographical location such as GPS coordinates will be provided.	The EPIC audit team visited project areas and confirmed that the project area is implemented in 29 districts of Karnataka and hence the geographical boundary is the stake of Karnataka. The future project activity instances will be implemented in these districts of Karnataka.
Ownership Similar criteria as stated in section 1.7 of the VCS PD will be applicable, based on which the relevant new project areas will be included into the project. For the ownership of the project. i.e., solely for the 'Rights of access to the Carbon Credits' – a participation agreement has been established between the cooperative societies of which the farmers are members and the project proponent (VGS) declaring that the carbon credits generated by the implementation of the project activity, is exclusively allocated to the developer of the Project. Under this agreement, the farmer associations will be provided a share of proceeds related to the carbon credit sale by an equitable sharing mechanism. Further it will be verified that the instance (individual farm) adopting the project activity belongs to the individual farmer and the status of land is private land and there are no	The ownership of future project activity instances is similar to that of the initial project activity instances. For future project activity instances, the legal ownership of the farmland remains with the farmers, and the PP will enter into agreements with the farmers. Under these agreements, the carbon generation revenue from the project will be under the control of the PP. The EPIC audit team concluded that the project ownership for future project activity instances is consistent with the initial project activity instances.

existing disputes. The legal title of the land parcels is held with individual farmers and is indicated through the land records available with the local authority (Tahsildars) of the Karnataka state which will be verified.	
Approval and authorization Approval and authorization as mentioned from time-to-time will be applicable for all the instances. The current requirements applicable for the instances added in this verification are mentioned in section 1.7 of the VCS PD&MR.	All the future PAIs will be screened against the applicability conditions and eligibility requirements prior to approval and inclusion in the project. The participation agreement is establishment between the farmers and the PP in the project after the approval and authorization of the stated requirements in section 1.7 of the VCS PD&MR.
Double Counting	The areas within the project are exclusively seeking registration under the VCS program and have not been involved in any other carbon projects. The audit team reviewed various program registries for potential carbon projects in Karnataka and cross-checked the KML files of other projects against the territory of Project 3115 to ensure the project area is unique. Additionally, interviews with the PP confirmed that any future instances added to the project shall be distinct and not included in any other carbon project.
Start date	In conformance with the requirements of a grouped project design, the EPIC audit team verified from PP that the start date of the future project activity instances will be after the start date of the grouped project (1st October 2017). Hence, the audit team concluded that the eligibility is in compliance with the section 3.5.16 (6) requirements of VCS Standard v4.3.
Baseline scenario and Additionality	The state of Karnataka has 31 districts. As part of the first project activity instances, the project is implemented in 29 districts, covering 98% of the state's districts. The baseline and additionality of the project activity are almost identical across these districts. In all districts, the baseline consists of unsustainable agricultural practices that lead to soil nutrient loss and soil degradation. Consequently, with the project's success, additional farmers will be encouraged to adopt organic farming.

	The practice of organic farming faces similar barriers across these districts, thus the additionality remains consistent for future project activity instances. The EPIC audit team visited the project area and, based on onsite observations and interviews conducted, concluded that the baseline and additionality for future project activity instances will be similar to those of the initial project activity instances. The EPIC audit team confirmed that the challenges faced in promoting organic farming, such as lack of access to quality organic inputs and market linkages, are consistent across the districts. These barriers hinder the widespread adoption of organic farming practices. However, the project aims to overcome these obstacles by providing support and resources to farmers, demonstrating the benefits of organic farming. The success of the initial project activity instances serves as a model and incentive for other farmers in the region to transition to sustainable agricultural practices, thereby ensuring the project's scalability and replicability. The EPIC audit team validated that the baseline and additionality for future project activity instances are consistent with those of the initial instances.
Classification of land cover types	According to the VM0017 methodology, the project areas are categorized based on IPCC climatic regions, specifically as Tropical Dry, Tropical Wet, and Tropical Moist zones. All future PAIs must be classified in accordance with these IPCC climatic zones.
Quantification of GHG emissions and Monitoring of GHG removals	The quantification and monitoring methods for accounting GHG emissions and removals for the new PAIs will follow the same criteria outlined in Sections 4 and 5 of the VCS PD&MR v1.6.
Applicability of the methodology and Soil Organic Carbon (SOC) modelling for further instances	Based on interviews with the PP and the Project Management team, it is confirmed that all future Project Activity Instances will meet the applicability conditions of the VM0017 methodology and its associated tools. a. Land is either cropland or grassland at the start of the project. The audit team conducted site inspections and reviewed the project area KML files using Google Earth Pro to verify land use and land cover changes for all land parcels included in the project, confirming that the land was

	either cropland or grassland at the project start date. All future PAIs will be assessed using the same technologies to ensure that the land is either cropland or grassland before inclusion into the project. b. The new project does not occur on wetlands. The audit team reviewed land use and land cover changes in the project area and confirmed that the project activity falls under the cropland category and does not occur on wetlands. Satellite imagery from 2006–07 showed no evidence of water bodies within the project boundary. All land parcels exhibit extensive agricultural activity based on seasonal rainfall and soil suitability. Based on interviews with the Project Proponent (PP) and the Project Management team, it is confirmed that all new PAIs will meet this requirement and will not take place on wetlands. c. The land is degraded and will continue to be degraded or continue to degrade. The audit team cross-checked the monitoring sheets used during the pre-project survey and confirmed that the soil organic carbon content was low. Additionally, interviews with farmers revealed that the increasing use of inorganic fertilizers, coupled with declining crop yields, indicated a loss of soil fertility. A review of the Desertification and Land Degradation Atlas — 'State-wise Status of Desertification/Land Degradation (area in ha)' — further confirmed that the land parcels in Karnataka are undergoing degradation (https://vedas.sac.gov.in/static/atlas/dsm/Desertification_Atlas_2016_SAC_ISRO.pdf). Based on interviews with the Project Proponent (PP), the audit team concludes that all future PAIs shall meet this requirement. *1.* The area of land under cultivation in the region is constant or increasing in the absence of the project. The audit team reviewed the Land Use/Land Cover Maps of Karnataka for 2015–16, 2011–12, and 2005–06, and confirmed that the land area under cultivation in the project region has been consistently increasing over the years in the absence of the project. All future PAIs will

	comply with this requirement of the VM0017 methodology. 2. Forest land, as defined by the national CDM forest definition, in the region is constant or decreasing over time. Through a review of peer-reviewed literature, the audit team confirmed a reduction in forest land in the project area. All future PAIs included in the project shall be from regions where forest land cover is either constant or decreasing over time. 3. There must be studies (for example: scientific journals, university theses, local research studies or work carried out by the project proponent) that demonstrate that the use of the Roth-C model is appropriate for: (a) the IPCC climatic regions of 2006 IPCC AFOLU Guidelines, or (b) the agroecological zone (AEZ) in which the project is situated. In the project, the PP has utilized farmers' farm diary data along with peer-reviewed literature relevant to the climatic conditions prevailing in the state of Karnataka. The project area is classified according to IPCC climatic regions—specifically Tropical Dry, Tropical Wet, and Tropical Moist—for Soil Organic Carbon (SOC) modelling. The Rothamsted Carbon Model (RothC) version 26.3 is used to estimate SOC changes in both the baseline scenario and under project interventions. Variable input data such as weather data, soil parameters, and land use and management information are used to run the RothC model. Peer-reviewed literature (Bhattacharyya et al., 2013 and Paramesh et al., 2022) has been selected to demonstrate the appropriateness and validation of the RothC model for IPCC climate zones similar to those in the project area. Based on interviews with the PP and the project management team, it is confirmed that all future PAIs must be categorized according to IPCC climatic zones and that the RothC model will be used for estimating carbon stock changes.
Deploy the SALM technologies or measures specified in the project description	The project area is classified according to IPCC climatic zones, and the RothC model is used to estimate changes in Soil Organic Carbon (SOC) stocks. All new PAIs will employ the same technologies or measures outlined in the PDMR and must meet all the criteria of the VCS Standard for

	inclusion of the new PAIs.
Comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances.	The new PAIs will meet the specified eligibility criteria outlined in the most recent version of the VCS Standard 4. Each instance must fulfill at least one complete set of eligibility criteria for inclusion as a new project activity instance.

The EPIC audit team assessed the eligibility criteria for applying the SOC modelling tool and the assessment conclusion is as follows:

Eligibility criteria for applying SOC modelling tool demonstrated by PP in the joint PD & MR	**The EPIC audit team assessment conclusion**
According to the conditions for applying RothC model to SOC estimations, there must be studies (for example; scientific journals, university theses, local research studies or work carried out by the project proponents) that demonstrate that the use of the Roth C model is appropriate for: (a) the IPCC climatic regions of 2006 IPCC AFOLU Guidelines, or (b) the agro-ecological zone (AEZ) in which the project is situated. According to IPCC climate regions, the project activity instance is in tropical dry climate zone. The following studies have been selected to demonstrate that the application of the RothC model is appropriate and that the model is validated for similar AEZs/ IPCC climate regions. The study "Simulating change in soil organic carbon in two long term fertilizer experiments in India: with the RothC model" published by Bhattacharyya et al. in 2013[1], aimed to assess the impact of different long-term fertilizer treatments on soil organic carbon (SOC)	The EPIC audit team reviewed the referenced journal article, "Simulating change in soil organic carbon in two long-term fertilizer experiments in India: with the RothC model" by Bhattacharyya et al. (2013). This paper evaluates the RothC model (version 26.3) for estimating total organic carbon (TOC) changes at two long-term fertilizer experimental sites representing humid and semi-arid climates in India. The RothC model operates on a monthly time step to calculate TOC (t C ha^{-1}). Model performance was assessed using several statistical parameters: (i) r – simulation correlation coefficient; (ii) RMSE – root mean square error measuring total simulation error; (iii) M – mean difference between predicted and measured values indicating total simulation bias; and (iv) t of M – t-test of M. The EPIC audit team confirmed that the project area falls within the tropical dry, tropical moist and tropical wet zones as defined by IPCC climate regions, similar to those described in the journal article. Review of Soil Modelling SOP provided by PP, confirmed that similar statistical parameters are used in the current project. Therefore, the audit team considers the RothC model, which has been applied in India for modelling organic carbon dynamics, to be appropriate for the project area given its comparable climatic conditions Review of the scientific literature, "Simulating soil organic carbon under different climate change scenarios: A RothC model application to typical land-use systems of Goa,

in two agricultural experimental sites in India. The researchers used the RothC model to simulate changes in SOC stocks in response to different fertilizer treatments, including organic and inorganic amendments. The study found that the RothC model accurately predicted changes in SOC stocks in response to different fertilizer treatments, demonstrating the model's applicability and effectiveness in predicting SOC changes in long-term agricultural experiments in India. Another relevant study, "Simulating Soil Organic Carbon Stock Under Different Climate Change Scenarios: A RothC Model Application to Typical Land-Use Systems of Goa, India" by Paramesh et al[2]., explored the effect of climate change on SOC stocks across different land-use systems in Goa. This research highlights the influence of varying environmental conditions on soil health and carbon storage, underscoring the RothC model's value for sustainable land management and climate resilience. These studies validate the model's relevance and application to the project's climatic and ecological context.	India" by Paramesh et al. (2022), indicated the significance of SOC in influencing soil functions and soil processes. The study evaluated the impact of land-use change on SOC dynamics in coastal agroecosystems. The impact of land use on SOC stock was simulated using the RothC model under different climate change scenarios. The audit team confirmed that the scientific literature closely aligns with the project's tropical wet climatic condition and cropping system. As demonstrated in the scientific literature regarding the use of the RothC model, the PP has used the RothC model to simulate changes in SOC stocks using soil and climate parameters under different land-use systems. Based on the documents assessed, the EPIC audit team is of the opinion that the RothC model is suitable for assessing soil organic carbon changes in different regions of India, including the project area. Therefore, the RothC model is deemed appropriate for use in this project.

Project proponent and other entities involved in the project:

The project proponents of the project are Vedic Green Solutions (VGS) and Kanaka Management Services Private Limited (KMSPL). No other entities are involved in the project.

Ownership:

The ownership of the project i.e., solely for the 'Rights of access to the Carbon Credits' – a participation agreement has been established between the cooperative societies of which the farmers members and

the project proponent declaring that the carbon credits generated by the implementation of the project activity, is exclusively allocated to the developer of the Project. Under this agreement, the farmer associations will be provided a share of proceeds related to the carbon credit sale by an equitable sharing mechanism. Besides, the project proponent commits to support farmers community, to pursue best agricultural practices, contributing to efficient use of natural resources and low-carbon production and enhanced carbon sequestration.

The audit team verified that the farmers are owners of the land and are participating in the project. The rights to the carbon emission reductions generated by the project are with the project proponents which are verified through agreement with farmers and personal interviews. In turn, an equitable sharing agreement from the proceeds of the carbon credit sales between the farmers associations and the farmers is in place as verified from the documents submitted.

Project start date:

Section 1.8 of joint PD&MR indicates that the project start date is 01st October 2017 and based on VCS requirements, the start date is based on the initiation of the implementation of SALM practices at the farm level. The earliest date of the farmer associations adopting the practice of SALM and signing the agreement with the project developer is hence considered as the appropriate start date. The validation and verification team checked the proof (i.e. Participation agreement between the project proponent and farmer associations) of project start date provided by the PP. Further, the agreement has stipulated the various SALM practices that qualify under the project and indicates that the practices are already adopted as on the date of the agreement. This was also verified by interviews with farmers and farmer associations. Hence, the project start date defined by PP complies with section 3.7 of the VCS Standard v.4.3.

Project crediting period:

The start date of the crediting period is the start date of the implementation of SALM practices at the farm level and signing agreement with project developer. The crediting period starts from 01st October 2017 to 30th September 2047. And the lifetime of the crediting period is 30 years renewable (three times).

This version of the joint PD&MR covers the first verification period of the "sustainable agricultural practices for carbon sequestration by organic and natural farming groups" from 01st October 2017 to 30th September 2022.

Project scale and estimated GHG emission reductions or removals:

Projects are categorized by size according to their estimated average annual GHG emission reductions or removals. Materiality thresholds differ for projects of different sizes. As the projects is lesser than 300,000 tonnes of CO2e per year it is categorized as projects (Para 3.9.1 of VCS standard v4.3).

Project location:

The project is implemented on 57,516 ha of agricultural lands involving 29,739 farmers of Karnataka State (situated between 11°47'32"' N and 18°16'3"' N latitude and 76°43'22" E and 77°17'50" E longitude), India.

The project area generally is sum of all the farms where SALM practices have been adopted from the start of the project activity as relevant for this monitoring period. This was verified to be 57,516 hectares comprising of 29,739 farmers as verified from the geospatial data and land ownership documents submitted. Following the guidance on grouped projects under the VCS standard v.4.3 only those instances within the administrative boundaries of Karnataka State which are to be added in the future, can claim emission reductions during the subsequent crediting period. The project area was validated by evidence of official land certificates (i.e. RTC Khata Extracts) and in accordance with the applied methodology.

Conditions prior to project initiation:

The proposed project is implemented in the Karnataka state and covers 57,516 ha of agricultural lands and consists of 29,739 farmers. The condition prior to the project initiation in the project area is crop land or agriculture land and not cleared any native ecosystems within 10 years of the project start date.

Project compliance with applicable laws, statutes and other regulatory frameworks:

Section 1.14 of joint PD&MR discusses the SALM project activity follows all the applicable legal and regulatory requirements. Currently no laws and regulations prevent or enforce the project activity or baseline land use scenarios. However, the project meets the objectives of the National Agroforestry policy, 2014, National Mission on Sustainable Agriculture (2010) and the organic farming Policies of the state government (Govt. of Karnataka).

The project complies with applicable laws, status and other regulatory frameworks. During site visit and interviews, the audit team asked project proponent and project co-ordinators about legal and regulatory issues and no conflicts were identified. Meanwhile, the audit team also cross checked the National agroforestry policy 2014[1] and national mission on sustainable agriculture 2010[2] and organic farming policies of state government[3], and is of the opinion that the project is implemented in line with the relevant policies.

Participation under other GHG programs:

The project is not included in any other emissions trading program or any other mechanism that includes GHG allowance trading. Furthermore, the GHG emission reductions and removals generated by this project will not be used for any other such programs or mechanisms. The project is not listed under any other international or national carbon standard/registry. The project has not been rejected by any other GHG program. This was verified from the declaration submitted by the PP to the audit team.

Other forms of credit:

The project is NOT reducing GHG emissions from activities that are included in an emission trading program or any other mechanism that includes GHG allowance trading. The project has not sought nor received another form of GHG-related environmental credit, including renewable energy certificates. This was verified from the declaration submitted by the PP to the audit team.

Sustainable development contributions:

[1] https://agricoop.nic.in/sites/default/files/National%20Agroforestry%20Policy%202014.pdf

[2] https://agricoop.nic.in/sites/default/files/National%20Mission%20For%20Sustainable%20Agriculture-DRAFT-Sept-2010.pdf

[3] https://organics-millets.in/assets/pdf/Organic-Policy-Book-English-Final.pdf

The Sustainable Development Goals (SDGs) also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity. There are 17 SDGs in total with each goals having their own set of targets. The National Institution for Transforming India (NITI Aayog), the premier policy think tank of the Government of India, has created the SDG India Index which covers 16 out of 17 SDGs (excluding SDG 17). The SDG India Index emphasizes on holistic approach to assess environmental, social and economic status of the country. This project contributes to achieve the following SDG goals:

Goal 1 No Poverty

Goal 13 Climate action

Goal 15 Life on land

SDG 1: End poverty in all its forms everywhere: The project promotes Organic agriculture, which is a key antipoverty strategy in rural areas, providing rural employment, lowering input costs for small farmers, and raising incomes by offering premium prices for produce. It also enhances farm biodiversity and resiliency in light of weather patterns, which have become increasingly extreme and erratic.

SDG 13: Take urgent action to combat climate change and its impacts: Under organic agriculture, the carbon footprint of the sector is reduced owing to the following: i) synthetic fertilizers, which are fossil-fuel based and whose production is energy-intensive, are not used; ii) organic practices build soil organic matter, which help sequester carbon from the atmosphere and enhance the carbon storing capacity of soil iii) organic operations perform better on a per hectare scale than conventional agriculture with high level of efficiency of energy use. Carbon sequestration from the atmosphere through soil rehabilitation also positively impacts SDG 13 in mitigating climate change

SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss: Organic agriculture can reduce and even reverse the degradation effects of conventional agriculture to the soil. Organic practices restore the life in soils, which is an important carbon sink.

The project has assessed that the SDG contributions are realistic and has verified the same from interview of the farmers and review of documents. Overall, the audit team concludes that the project contributes to three SDG's viz. SDG 1 No Poverty, SDG 13 Climate action, and SDG 15 Life on land in a quantifiable way.

Additional information relevant to the project, including:

Leakage is not applicable for this project as monitored during the verification period (01st October 2017 to 30th September 2022). The lands are being used for cultivation of crops. Also, there is no shift in activities viz., grazing, fuel wood collection for cooking etc.

Commercially sensitive information:

There is no commercially sensitive information in the documents provided by the project proponent.

Upon review of the information provided by PP and the updated PD-MR, the overall conclusion of the audit team is that the information in the PDMR is accurate, complete, and provides an understanding of the nature of the project.

3.2 Participation under Other GHG Programs

The audit team concludes that the project is not currently participating in any emission trading or other binding limit program or mechanism and hence the risk of double counting is zero. Also review of other GHG trading mechanisms such as Gold Standard, Plan Vivo and CDM was done to confirm the same. And there is no risk of rejection as the project is under validation for the first time as verified from the VERRA listing registry. Further the declaration from the PP to this effect was submitted.

3.3 Safeguards

3.3.1 No Net Harm

There are no significant negative impacts on the farmer community and hence there is no need for mitigation. The on-going stakeholder consultation process has identified no major grievances or negative inputs from the farmer associations. Some aspects related to the organic farming were identified as risks for which mitigation measures are already in place. More than 90% of the farmers identified positive aspects of the project. However, as the project is designed to accommodate modifications or changes to the project design, to address any such related grievances in the future.Based on the documents assessed and onsite observations, it was found that the use of inputs (chemical pesticides, biological control agents and agro chemicals) is similar in the baseline scenario. This is due to the reason that the project intervention relates more to organic inputs for the soil related to crop type. The promotion of the organic farming does not impact the use of the other inputs for the crops. The interview with farmers indicates that is some cases, they are voluntarily incorporating the practices such as usage of agro-chemical, biological control and pesticides, only to minimise the crop damage and productivity loss, which however is not monitored in the project. The EPIC audit team concluded that as input management practices in the baseline scenario are not increased to a significant extent from project implementation and other potential risks include soil degradation, water contamination, and harm to non-target species are not significant in the project scenario. The audit team validated the impact of these inputs by comparing the baseline and project scenarios. Overall, there is no significant impact of these inputs in the baseline scenario compared to the project scenario.

The EPIC audit team is of the opinion that the primary goal of the project is to reduce the agrochemicals usage and adopt organic practices to minimize its risk on environment, biodiversity and on the local community people. In the project scenario, the increased usage of organic inputs demonstrates the increased SOC in soil, as indicators on the minimal risks and improved biodiversity in the project area and improved soil health. The improved soil health which in turn reduces the ground water contamination and positively impact on the environment and on community people.

During the site visit, the audit team interviewed farmers and farmer associations who are the relevant stakeholders and verified that the PP has put into place the mitigation measures and that the Project has a overall net positive impact, based on both environmental and social aspects. The feedback from the farmers indicated that since the project implementation, the yield has also increased, which along with the higher market value for organic produce contributes to better profits and improved socioeconomic conditions. Hence, the audit team deems that the PP has taken the reasonable steps to mitigate the potential negative impacts.

3.3.2 Local Stakeholder Consultation

The audit team took the following steps to verify the project's method(s) for conducting effective consultation with stakeholders.

- Verified that the joint PD-MR includes a detailed description of the stakeholder consultation process both at the project start date and the on-going consultation as applicable for this verification period.
- It was verified from the interviews with the farmers and farmer associations that stakeholder meetings to promote the awareness of the SALM activities was conducted during the period from May to July, 2017. These meetings were conducted at the district levels and due notice was provided to the relevant stakeholders identified. The supporting information such as minutes of the meetings, photographs, attendance lists were verified.
- It was verified that the local stakeholders were intimated by due notice of the audit teams visit by confirming the same with the field monitoring staff and farmers. The notice submitted by PP was reviewed to meet this requirement.
- During onsite, the audit team interviewed local stakeholders on their awareness related to the project design and implementation, risks, costs and benefits, relevant awareness on the laws and regulations and the process of VCS Program validation.
- While onsite, the audit team interviewed project personnel involved in community outreach who confirmed that the consultation process was implemented as described in the joint PD-MR.
- Finally, interviews with famers, farmer association representatives, and farmer societies confirmed that the consultation process is on-going with representatives from all participating farmers being represented in order to learn from project successes and failures in order to ensure the project is being implemented using an adaptive management framework.
- It was verified that no negative inputs were provided to the project during the period stakeholder consultations, but clarifications on the project benefits were provided as requested by the stakeholders. Hence no significant changes to the project implementation were done as overall the feedback was positive.

In summary, given the evidence collected, the audit team concludes that the projects method(s) for conducting effective stakeholder consultations, as described in the joint PD-MR, sufficiently satisfy the VCS requirement.

3.3.3 Environmental Impact

As the project involves implementation of SALM practices by the farmer association, the VGS Project team has not identified any major risk or impact to any local stakeholders, to their property rights and natural resources. Hence as EIA is not applicable, it was not performed. However some of the risks and barriers faced by the organic farmers associations have been discussed during the periodic meetings as verified

from the interviews during the site inspection. It was also assessed by the audit team that these risks are sufficiently addressed by the PP to the satisfaction of the farmers and the mitigation measures are also included in the mitigation adaptation plan submitted by the PP.

3.3.4 Public Comments

This project was open for public comment from 17/06/2022 to 17/07/2022. There were no public comments were received. This was verified by EPIC validation and verification team in VERRA registry (**https://registry.verra.org/app/projectDetail/VCS/3115**).

3.3.5 AFOLU-Specific Safeguards

The VGS Project team has not identified any major risk or impact to any local stakeholders, to their property rights and natural resources from the implementation of this project activity. The queries raised on the long-term viability for implementation of organic farming was addressed satisfactorily by the PP and adequate mitigation mechanisms are in place. The feedback from the local stakeholder meetings held with the farmer associations indicated an overall satisfaction on project implementation activities of the farmers. Most of the farmers welcomed the initiatives of the project. However, the identification of risks will be ongoing process throughout the project implementation. The audit team is of the opinion that all potential risks as applicable for the project of this nature and scale has been identified and the mitigation actions put in place by the PP are satisfactory to reduce the risks to manageable levels.

In the context of this project, the location of the project is defined by the agricultural land owned by the farmer. The details of the same has been provided by PP which is verified by the audit team. The analysis of the social, economic and cultural diversity within local stakeholder groups and the differences and interactions between the stakeholder groups have been analyzed based on the baseline survey and provided to the VVB. The farmers association also decides on the eligibility of the farmer based on the agricultural practice. Hence the association itself is representative of comprising of farmers from different socio-economic backgrounds based on the education, size of landholding, caste and family size. Based on the results of the baseline survey, the feedback from the farmers indicated the various types of risks they face due to adoption of the SALM practices. The mitigation actions implemented by the project indicated a satisfactory level of outcome as indicated in the feedback provided during the ongoing stakeholder consultation as more than 94% provided positive opinion on the project activities.

The farmer associations coordinate the interaction with the farmers who are the stakeholders. As the associations represent the farmers and coordinate the stakeholder consultations it is ensured that communication and consultation are performed in a culturally appropriate manner, including language and gender sensitivity. The same was verified from feedback from the farmer which indicated an overall satisfactory outcome.

The statement of declaration that neither the project proponent nor any other entity involved in project design or implementation are involved in any form of discrimination or sexual harassment has been provided by the PP which has been verified by the audit team.

The audit team interviewed farmers, field officers, and farmer association representatives. It was confirmed that the grievance process is described in the PD-MR is consistent with the protocols followed and feedback is taken from farmers during the various on-going meeting and training camps conducted.

In summary, the audit team concludes that the feedback and grievance redressal procedure described in the joint PD&MR sufficiently meets the VCS requirements. Through onsite observations and interviews with project personnel, the audit team confirmed that the discussion of risks in the joint PD&MR is comprehensive and also includes risk identified as part of the non-permanence risk analysis. It was also verified that the farmers are well aware of the risks and the mitigation measures adopted.

3.4 Application of Methodology

3.4.1 Title and Reference

The following methodologies and tools have been applied to the project activity. The validity of the same was verified by the audit team as being correct.

Approved VCS methodology VM0017: Adoption of Sustainable Agricultural Land Management (version 1.0)

- The project establishes additionality by use of Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, version 1.0

AFOLU Non-Permanence Risk Tool v4.0,

3.4.2 Applicability

The project applies the VCS methodology VM0017: Adoption of Sustainable Agricultural Land Management (version 1.0). Each project activity instance planned to be included in the grouped project will have to follow the applicability conditions under the methodology and applied tools which is assessed as below.

Applicability condition	Description of how the project meets these criteria as per joint PD&MR	VVB description of how the project meets these criteria
a) Land is either cropland and grassland at the start of the project	The lands owned by the farmers are designated for agricultural purpose only. Section 1.13 of the VCS joint PD&MR describes the historical land use of the project activity instance which confirms the land as cropland. From the historical survey it was verified that the land use at the project start date was cropland.	The audit team by means of checking the land cover data of project area and on-site investigation, it is verified that the project area are crop land and not cleared any native ecosystems.
b) The project does not occur on wetlands	As already established the project activity falls in cropland category and therefore	The audit team by means of checking the land cover data

	does not occur on wetlands. The Satellite imagery (2006-07) of the project area showed no signs of such water bodies within the project boundary. All the land parcels have extensive agricultural activities based on the seasonal rainfall & soil suitability.	of project area, it is verified that the project area do not occur on wetlands.
c) The land is degraded and will continue to be degraded or continue to degrade	As the project activity is implemented on the farmlands it is a crop land. The historical trends have shown the decrease in the fertility of the soil due to the unsustainable agricultural practices and in the absence of the project will lead to the degradation of the farmland.	The audit team by means of checking the and monitoring sheets used for the survey prior to start of the project established that the soil organic carbon content is less, Further due to increasing use of the inorganic fertilizers the decrease of the yield indicated the loss of soil fertility as verified from the interviews with the farmers. Hence it is verified that the project area land is degraded and will continue to be degraded or continue to degrade without the presence of project activity.
d) The area of land under cultivation in the region is constant or increasing in absence of the project;	The area under crop land has shown a constant trend of increase in the project area. According to National Remote Sensing Centre, ISRO, Hyderabad land use land cover data for the years 2005-06 and 2015-16, the area under cultivation follows an increasing trend in the project area.	The audit team has verified the area under crop land by checking the LULC map of the project area of the year 2005 and 2016 provided by PP and also by interviewing the farmers on their historical land use patterns.
e) Forest land, as defined by the national CDM forest definition, in the region is constant or decreasing over time;	The forest cover in the state of Karnataka, has decreased over time prior to the project start date as verified from publicly available documents as indicated in the PD-MR.	The audit team reviewed the justification provided and conducted a background check based on historical geospatial data. To verify the decreasing trend of the

		forest cover and hence it is accepted.
f) There must be studies (for example, scientific journals, university thesis, local research studies or work carried out by project proponents) that demonstrate that the use of the RothC model is appropriate for: (a) the IPCC climatic regions of 2006 IPCC AFOLU Guidelines, or (b) the agro- climatic zone (AEZ)in which the project is situated.	According to IPCC climate regions, the project activity instance is in tropical dry, , tropical moist and tropical wet climate zone. The following studies have been selected to demonstrate that the application of the RothC model is appropriate and that the model is validated for similar IPCC climate regions. * Simulating Soil Organic Carbon Stock Under Different Climate Change Scenarios: A RothC Model Application to Typical Land-Use Systems of Goa, India" (Paramesh et al., 2022) This research assessed the effects of climate change on SOC stocks across various land-use systems in Goa, India, which spans the Tropical Wet and Tropical Moist zones Hence the applicability condition is met. The study concluded that ROTH C model can effectively predict soil carbon dynamics under Indian environmental and climatic conditions by providing accurate initialization and parametrization of the model. Bhattacharya, et al. (2011) - This study analysed the effect of land use management including manure application on total organic content of soil in Indore district of Madhya Pradesh state, India. Application of RothC model in this study revealed that supplement of organic materials coupled with fertilizers can	Validation team through discussion with PP and scientific literature review of Paramesh et al., 2022 and Bhattacharya, et al. 2011 highlights that the studies are conducted in India and falls under similar IPCC zones as that of the project area (Tropical dry, tropical moist and tropical wet) and Hence, their usage is conservatively accepted.

	increase the SOC sequestration. Hence the applicability condition is met. Ref: Bhattacharyya, T., et al. "Evaluation of RothC model using four Long Term Fertilizer Experiments in black soils, India." Agriculture, ecosystems & environment 144.1 (2011): 222-234	

In addition to the methodology, the applications of the tools as below were also verified by the audit team:

- The project establishes additionality as per Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, version 1.0 which is appropriate as as assessed by the audit team in the sections below. ,
- AFOLU Non-Permanence Risk Tool v4.0 has been correctly applied as assessed by the audit team in the sections below,

3.4.3 Project Boundary

The project boundary was verified using the provided KML file submitted by the PP and comparing the publicly available geospatial database and found to be accurate. The total project area is 57,516 hectares and consists of 29,739 farmers across the state of Karnataka. According to the VCS approved methodology VM0017: Sustainable Agricultural Land Management Version 1.0, the project participant has selected the following emission sources to be included and excluded from the project activity.

Source		Gas	Included or Excluded in the PD	Justification/Explanation of choice in the PD	VVB conclusion
Baseline	Inorganic fertilizer	CO_2	Excluded	Negligible emission from application of organic fertilizer, hence not considered	Exclusion is accepted as it is insignificant
		CH_4	Excluded	Negligible emission from application of organic fertilizer, hence not considered	Exclusion is accepted as it is insignificant
		N_2O	Included	Considered as emission from use of synthetic fertilizer	Inclusion is accepted as per the applied methodology VM0017.
	Biomass burning*	CO_2	Excluded	Not considered as per methodology	However, carbon stock decreases due

Source		Gas	Included or Excluded in the PD	Justification/Explanation of choice in the PD	VVB conclusion
					to burning are accounted as a carbon stock change as per VM0017
		CH_4	Included	Considered as it is one of the major emissions	Inclusion is accepted as per the applied methodology VM0017
		N_2O	Included	Considered as it is one of the major emissions	Inclusion is accepted as per the applied methodology VM0017.
Project	Organic Fertilizer	CO_2	Included	Considered as organic carbon is sequestered by use of organic fertilizer and SALM practices	Inclusion is accepted as per the applied methodology VM0017
		CH_4	Included	Negligible emission from application of organic fertilizer	Exclusion is accepted as it is insignificant
		N_2O	Included	Negligible emissions from application of organic fertilizer, hence not considered	Exclusion is accepted as it is insignificant
	Above ground biomass	CO_2	Included	Considered as trees sequester CO2 which is a major carbon pool as part of the agroforestry	Inclusion is accepted as per the applied methodology VM0017
		CH_4	Excluded	Negligible emissions, hence not considered	Exclusion is accepted as it is insignificant
		N_2O	Excluded	Negligible emissions, hence not considered	Exclusion is accepted as it is insignificant
	Belowground biomass	CO_2	Included	Considered as trees sequester CO2 which is a major carbon pool as part of the agroforestry	Inclusion is accepted as per the applied methodology VM0017

Source		Gas	Included or Excluded in the PD	Justification/Explanation of choice in the PD	VVB conclusion
		CH_4	Excluded	Negligible emissions, hence not considered	Exclusion is accepted as it is insignificant
		N_2O	Excluded	Negligible emissions, hence not considered	Exclusion is accepted as it is insignificant

*Biomass burning, though observed in the baseline is not considered in the project activity and no emission reductions are claimed for the avoidance of biomass burning.

According to the template requirements, the map should show the physical locations of the various installations or management activities taking place as part of the project is provided in the form of KML files. The project boundary is defined by individual farms, a KML file delineating the eligible project areas has been provided for the review to audit team. The EPIC audit team deems that the project clearly delineates the project boundaries, have a precise and accurate representation of the eligible project areas. Based on the above analysis, the audit team is of the opinion that in the joint PD-MR, the project proponent has appropriately justified the choice of selection of project boundary, selected carbon sources, sinks and reservoirs in line with the requirements of the applied methodology.

3.4.4 Baseline Scenario

According to the VM0017 methodology, the project proponent shall use the most recent version of the combined tool to identify the baseline scenario and demonstrate the additionality in A/R CDM project activities. The baseline scenario is recognized as existing or historical land management practices. Thus, the initial project activity instance is using the tool - “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities.

The main crops grown in Karnataka are Rice, Ragi, Jowar (sorghum), maize, and pulses (Tur and gram) in addition to oilseeds and several other cash crops. Cashews, coconut, cardamom, chillies, cotton, sugarcane, and tobacco are also produced. The Kharif crops in Karnataka comprise millets, paddy (rice), maize, moong (pulses), groundnut, red chilies, cotton, soybean, sugarcane, rice, and turmeric. Great millet, wheat, Maize, Cotton, Bajra, Chillies, Onion, and Groundnut are the major crops grown in Rabi season.

According to a study conducted in 2015, organic fertilizer potential has not been fully utilized as the government has given high incentive especially in the form of heavy subsidy for using chemical fertilizers. According to a study by ICAR in 2014, the organic content in the soli in India had decreased to 0.3 to 0.4 % which is well below the acceptable limit and is a cause for concern. Though farm yard manure and organic manure is being used in some parts it is not prevalent as most of the farmers are not aware of the long term benefits. According to the fertilizer usage statistics for 2012-2013, Karnataka uses 15.31

lakh tonnes of inorganic fertilizer / year which comprise of the commonly used NPK fertilizers. This makes the state one of the highest users of chemical fertilizers.

According to a recent study by the Council on Energy, Environment and Water (CEEW) less than 4 per cent of Indian farmers have adopted sustainable agricultural practices and systems. The study, supported by the Food and Land Use Coalition (FOLU), found that scaling up sustainable agriculture would be critical to improve farm incomes and bolster India's nutrition security in a climate-constrained future.

Hence the audit team is of the opinion that the relevant national and/or sectoral policies and circumstances have been considered and are indicated in the project description in determining the baseline scenario.

Step 0: Preliminary screening based on the starting date of the A/R project activity

Project start date is 01.10.2017 based on the first instance added. Based on VCS requirements, the start date is based on the initiation of the implementation of SALM practices in the farm level. The earliest date of the farmer associations adopting the practice of SALM and signing the agreement with the project developer is hence considered as the appropriate start date. The evidence has been provided to the VVB.

Hence the date qualifies as conforming to the definition of start date as per VCS requirements in the instance were started, which shall be after start date of the grouped project. Interview with farmer association and farmers verified that they were aware of the planned project implementation.

The EPIC audit team reviewed the farmers agreement in which it clearly indicates about the benefit sharing. The revenue from the project activity is discussed with the farmers before signing the agreement with the farmers. The EPIC audit team interviewed farmers during the onsite visit and confirmed that the revenue from the project activity was seriously discussed and is the key point that leads the farmers to decide to join the project. Hence the EPIC audit team is of the opinion that the project seriously considered the revenue from planned sale of VCUs as the project is mainly depends on the participation of the farmers.

Step 1 Identification of alternative land use scenarios to the proposed A/R CDM project activity

Sub-step1a. Identification of alternative land use scenarios to the proposed project activity
The following alternatives are considered:

Alternative 1. The continuation of land use and management existing prior to the implementation of the project activity with unsustainable practices, which will lead to the loss in soil nutrients and degradation.

Alternative 2. Adoption of sustainable agricultural land management (SALM) practices by not considering incentives from the carbon revenues.

Alternative 3. Establishment of land with commercial tree plantation (Afforestation / Reforestation).

All the selected alternatives have been verified to be in compliance with all applicable legal and regulatory requirements in India.

Barrier analysis was used for the elimination of land use scenarios that are prevented by the identified barriers. The barriers that are considered which prevent the alternatives 2 and 3 were verified to be

credible. Financial, technological, local traditions and institutional barriers exist for these alternatives as verified from the interviews with the farmers during onsite visit

The EPIC audit team assessment conclusion for the different types of barriers is provided below:

Barrier Analysis	EPIC audit team assessment conclusion
Investment Barriers: The Investment barriers including the lack of subsidies, high input costs and shortage of biomass.	The EPIC audit team reviewed the paper titled "Economics of Organic Farming over Conventional Farming: A Case Study in Karnataka, India" which evaluates the economic viability of organic farming compared to conventional farming practices in Karnataka. The study involves a detailed comparison of the costs and returns associated with both farming methods. The EPIC audit team reviewed the information and confirmed that the initial costs for organic farming are higher due to the transition period and the need for organic inputs. This is one of the important barriers for the farmers because lack of subsidies. The lower yield and lack of marketing for the organic produce leads to the lower returns initially is also one of the barriers for the farmers to start practice of organic farming. The EPIC audit team is of the opinion that the investment barrier is the main barrier which hinders the farmers practicing the organic farming.
Institutional Barrier	The identified institutional barriers and underdeveloped supply chains present considerable challenges that need to be addressed to promote organic farming effectively. The reliance on personal knowledge and networks, along with the lack of formal educational materials and institutional support, indicates a need for more structured support systems for farmers. Additionally, the logistical issues within the supply chain, including inadequate storage and transportation facilities, must be resolved to prevent product spoilage and ensure organic products remain uncontaminated. The government's efforts to support marketing through fairs and exhibitions are commendable, but more consistent market access is necessary for farmers to benefit fully. Establishing direct linkages between farmers, processors, and retailers could significantly improve farmers' market access and income. Finally, the challenges associated with scaling organic farming to an industrial level underscore the need for tailored approaches that consider the unique requirements and limitations of organic farming methods. The

	EPIC audit team concludes that while organic farming presents numerous benefits, but these are the crucial barriers which hinders the expansion of organic farming. Further the literature submitted by PP also indicate the decreasing trend of adoption of organic farming by farmers in Karnataka over the past few years.
Technological barrier	The EPIC audit team is of the opinion that the organic farming in Karnataka is significantly hindered by a range of technological and policy barriers. The lack of access to quality planting materials and organic inputs, coupled with inadequate infrastructure and weak government support, presents challenges. The mindset favouring chemical-based farming and the aggressive marketing by the chemical agri-input industry further complicate the transition to organic practices. The underdeveloped supply chain for organic products, poor market linkages, and insufficient financial and policy support worsen these issues. Addressing these barriers requires stronger government policies, improved infrastructure, better access to quality organic inputs, and robust marketing and distribution networks for organic products. The EPIC audit team concludes that these barriers are the significant challenges for expansion of organic farming in Karnataka.
Local traditional barrier	Extensive dependence on chemical farming has shown its many defects. The land is losing its fertility and requires larger quantities of fertilizers. Pests are becoming immune, requiring farmers to use stronger pesticides. Both consumers and farmers are now gradually shifting back to organic farming in India because organic farming is healthier. However, local and traditional technology prevents the extensive adaptation of organic agriculture. The use of local seed materials and farmyard manure (FYM) does not supply the required nitrogen to plants, leading to a nutrient deficit. Traditional equipment may not be sufficient for large-scale farming activities. The EPIC audit team is of the opinion that there is a clear shift towards organic farming in India due to its health benefits, the transition is hindered by reliance on traditional methods and technology.

The implementation of Sustainable Agricultural Land Management (SALM) practices which is alternative land use scenario 2, faces investment and institutional barriers, along with prevailing practices that create

obstacles to voluntary adoption by farmers. Additionally, access to finance to implement SALM practices is limited, as there are no funding agencies to promote such activities. Most of these activities depend on grants and revenue from the carbon credits market. The adoption of agroforestry (Scenario 3) faces significant barriers related to investment, technology, policy, and infrastructure. High initial costs, lack of financial resources, limited technological awareness, inadequate policy support, and insufficient infrastructure all contribute to the challenges of adopting agroforestry practices. The Outcome of Sub-step 2b is that the land use types that are not prevented by any barriers is the Alternative 1 which is, the continuation of the pre-project land use which is unsustainable conventional techniques which will lead to degradation of fertile crop land.

After applying the barrier analysis, the outcome is that the continuation of existing land use which is the only possible baseline scenario. Hence, common practice was applied in step 4. The audit team has assessed the analysis by performing a background check on similar project that is registered in India under VCS mechanism,

The assessment is provided in the section below.

The audit team has verified that the joint PD&MR correctly describes the baseline scenario (continuation of land use activities prior to the project scenario) based on the requirements of the methodology VM0017.

VVB has cross-checked the validity of the relevant laws and based on its local expertise and interview with farmers and farmers associations concluded that the baseline scenario is relevant and appropriate.

3.4.5 Additionality

For the Demonstration and assessment of additionality the STEP 4 of the Tool "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, version 1.0" has been used.

Step 4: Common practice test

Karnataka has implemented several initiatives to promote sustainable agriculture practices. The audit team reviewed the information in section 3.5 and Appendix 3 of the VCS PD&MR v1.6 and conducted an independent assessment of the publicly available data regarding the similar projects implemented at both private and public level.

Government Initiatives			
Name of the Organic Company/ Project	Project details	Term of contract with farmers	EPIC audit team assessment

Paramparag at Krishi Vikas Yojana (PKVY) (https://pgsindia-ncof.gov.in/)	The PKVY is implemented across all districts and taluks of Karnataka during 2015-16 with an objective to provide exposure to farmers about organic farming technologies. A financial assistance of Rs.3000/ha was provided to farmers for initial three years to form clusters of 20 hectares. The project was executed over an area of 25,968 ha. In the PKVY scheme, after the initial three-year period of assistance for organic farming, the farmers are expected to continue their organic farming practices. The financial support for implementation of project is provided by state government.	No legal contract term exists between the farmers and government entity. The financial assistance is provided for initial 3 years	When compared to PKVY, the project implemented by VGS aims to provide financial and technical support for farmers to practice sustainable farming through long-term contractual agreements of 30-year period. The VGS project is distinct from the other government initiatives as its project objectives aims to provide continued support to farmers for practicing organic farming, agroforestry, implementing mulching activities and provides training to farmers to stop burning trash. The project is executed over an area of 55,000 ha and regular periodic consultation is carried out with farmers. Project interventions are monitored to assess the effectiveness of project implementation.
Private Initiatives			
Gopalan Organics (https://www.gopala	It is a commercial organic farming venture started in	Contract farming based on market	Through review of the organic company

norganics.com/gopalan-organic-who-we-are.php)	2000, located in Bangalore around 120 acres of which 55 acres are green houses and tunnels. The company deals with export of fresh herbs and vegetables. The objective of the project is to commercially promote organic farming, practice crop rotation and efficient water management.	demand, quality control and cost efficiency	details, the audit team confirms that Gopalan orgranics is a business venture that promotes organic farming in a small scale area of 120 acres. There is no fixed long-term binding agreements with farmers and functions as per market factors. In comparison to the project implemented by the PP, the Gopalan organic doesn't promote agroforestry and prevent burning of trash/stubble. Furthermore, Project interventions are monitored to assess the effectiveness of project implementation.
Phalada Agro (http://phaladaagro.com/farmers/)	In 2002, the company brought in its first group of 20 organic farmers, certifying around 300 acres of land as organic. Currently span across 10,000 ha. Works on commercial based demand and market supply factors. Promotes organic farming .	Contract farming based on market demand, quality control and cost efficiency	Through review of information on Phalada Agro organic company, the audit team concludes that the Phalada agro focuses solely on organic farming and market demand based organic exports. It focuses on certification of organic products, whereas the PP aims at holistic development of the farmers through

			periodic trainings, provision of FYM, Organic fertilizers and promoting agroforestry practice to improve the income generation of farmers. Regular monitoring of project interventions is conducted throughout the project to gradually shift farmers from use to synthetic fertilizers to organic farming.
24 Mantra Organics (https://www.24mantra.com/24-mantra-organic-our-organic-farmers/)	The company is started in 2004 and functional across 84 farms in 12 states in India. The company's core objective is to perform direct procurement from farmers and promote organic farming.	Contract farming based on market demand, quality control and cost efficiency	The audit team verified the information on 24 Mantra Organics and concludes that it is a commercial organic farming venture with sole focus on direct procurement of organic products from farmers. The company doesn't engage in promotion of agroforestry practices or mulching activities.
Sahaja Sambrudha (https://www.sahajasamrudha.org/sustainable-agriculture/)	It is an NGO, Established in 2001, the company promotes sustainable agriculture and facilitate procurement, marketing and sales of organically produced products. The project spans across 37,000 acres, with 15000 organic farmers connected with the NGO.	Contract farming based on market demand, quality control and cost efficiency	It is distinct from the current project, as the PP also implement agroforestry practice and monitores the project effectiveness. The audit team verified the publicly available data in Shaja Sambrudha which confirmed that the

			NGO receives grants from Swissaid, ATMA, Nabard, FWWB_Millet, and other prominent institustions. Whereas, considering the VGS implemented project area and farmers associated with the project, it is not possible to run the project and monitor the activities effectively in the absence of carbon credits.

In compliance with the requirement of AR-T00L02 v1, paragraph 33 and 34, the audit team excluded all the similar carbon projects executed in the state of Karnataka which are registered, pipeline listed and/or seeking registration for comparative analysis. All the government and private initiatives were considered for comparison with the current project implemented by VGS. Organic farming is a common intervention between the all the initiatives executed by Private and Government entities and Project 3115. The audit team verified the data in APEDA website (Agricultural and Processed Food Products Export Development Authority and confirmed that there was no significant increase in area under organic farming from 2015-16 to 2016-17. Furthermore, a report from APEDA on Indian Organic market confirmed that the despites many organic farming initiatives in Karnataka, it ranks 8th in the state-wise under organic cultivation. The government schemes lack regular monitoring and long-term implementation goals. There is no proper organic sector database and regularized market and financial support for organic farmers. Thus, the audit team confirms that the information on the constraints for implementation of organic farming practices stated in section 3.5 of the VCS PD&MR is acceptable. This project stands out due to the unique challenges faced in Karnataka. High subsidies for inorganic fertilizers in the state lead farmers to choose and use them in large quantities, creating a barrier to the adoption of organic fertilizers. Consequently, the adoption rate of organic fertilizers is very low. Additionally, agroforestry is not commonly practiced, and the burning of crop residues is prevalent in Karnataka state.

The EPIC audit team confirmed that the project aims to overcome these barriers by engaging farmer members and promoting Sustainable Agricultural Land Management (SALM) activities. The EPIC audit team concludes that this type of project is not a common practice in Karnataka due to several barriers to the adoption of organic farming by the farmers. Therefore, the EPIC audit team is of the opinion that the project activity is not a common practice in Karnataka. VVB has cross checked the validity of the relevant laws and based on its local expertise and interview with farmers and farmers associations and concluded that the additionality demonstration by the project activity is appropriate. The proposed AFOLU SALM project activity is not the baseline scenario and hence, the project is additional.

3.4.6 Quantification of GHG Emission Reductions and Removals

Quantification of baseline emissions, project emissions and leakage has been made in accordance with the VM0017 v1.0 methodology. A methodology deviation applicable for the first monitoring period was validated. The Validation team has assessed the calculation of GHG emission of the project activity and found it compiling with the applied methodology and requirements, methodological steps followed and equations applied are explained below.

Procedures for quantifying the GHG emission reductions and removals generated by the project during the project crediting period were calculated in accordance with the VCS approved methodology VM0017 v.1.0. The audit team performed an intensive quantification review of all input data, parameters, formulas, calculations, conversions, statistics and resulting uncertainties and output data to ensure consistency with the VCS documentation, methodology and the PD&MR.

The audit team verified the ex-ante_ex-post sheet, along with its supporting source files such as master ER aggregate sheet (2017-2022), ABMS Monitoring data sheet for Agroforestry and Fertilizer from which the values have been sourced for the calculation of baseline and project emissions reductions or removals across all the GHG sources and sinks. As part of independent evaluation, the audit team reproduced calculations for the selected samples to ensure credibility and accuracy of the generated ERs. All the conversion factors, formulae and calculations are performed as per the guidance provided in VM0017 methodology. The cited scientific literatures were reviewed to confirm the source of the default values used in the estimation of baseline and project emissions.

For Baseline emissions: The baseline emissions were estimated based on the data recorded during VGS monitoring undertaken prior to October 2017 for the total project area. The baseline net GHG removals by sinks are estimated using the equation 3 in section II (4.8) of the Approved VCS methodology VM0017 (version 1.0).

The total baseline emissions and removals are given by:

$$BE_t = BEF_t + BEFF_t + BEBB_t - BRWP_t$$

Where

BE_t Baseline emission in year t, t CO2e

BEF_t Baseline emission due to nitrogen fertilizer use in year t, t CO2e

$BEFF_t$ Baseline emission due to use of fossil fuels in agricultural management in year t, t CO2e

$BEBB_t$ Baseline emission due to biomass burning in year t, t CO2e

$BRWP_t$ Baseline removals due to changes in woody perennials in year t, t CO2e

The audit team reviewed the “M” column - Ex-ante_ERs sheet of Ex-ante_Ex_post document and confirmed that the baseline emissions are calculated as per VM0017 v1.0 methodology. The baseline

emissions are calculated for an overall project area of 57,516 with the adoption rate for the first monitoring period (2017-2022) considered to be 90% and the adoption rate for the subsequent years is affirmed to be 100%. This is based on the 2016 baseline survey data, which indicated that 10% of the farmers may be subject to conventional farming and as the project progresses aim to comply with the project activities. Based on site inspections and interviews with the individual farmers and representatives of farmers, it if deemed that the 90% adoption rate for the first monitoring period is acceptable and conservative.

For 2017 (1st October - 31st December), $BE_t = BEF_t + BEFF_t + BEBB_t - BRWP_t$

$BE_t = 4,918 + 0 + 0 - 0$.

Baseline emissions due to inorganic fertilizer use

The baseline emissions from synthetic fertilizer, $BEF_{t,}$ are calculated using equation 1 and 2 of the latest version of the CDM A/R Tool: Estimation of direct nitrous oxide emission from nitrogen fertilization v. 01. The resultant baseline emissions factor is 0.38 tCo2e. The EPIC audit team conducted interviews with the farmers and reviewed the farm diaries, confirming that the farmers are maintaining these diaries. In the farm diaries, the farmers are recording the quantity of fertilizers applied in the crop fields before the implementation of the project. Therefore, the baseline emissions from synthetic fertilizers are one of the significant emissions in the baseline.

The audit team verified the scientific literature sources specified in table 9 of the PD&MR and concludes that the default values used for estimation of BEF_t are appropriate. Baseline emissions due to inorganic fertilizer usage per year were estimated using overall project area and BEF data. Ex-ante_ERs sheet (G column) of Ex-ante_Ex-Post Document provides detailed calculations of BEF for the overall crediting period.

For 2017 (1st October - 31st December), BEFt = (Project area (ha) * BEF (tCo2e/ha) = (51,764.40 * 0.380)

BEFt = 4,918.

Baseline emissions due to the use of N-fixing species

During the onsite visit, the EPIC audit team confirmed with the farmers that they are not growing any nitrogen-fixing species in the baseline. As there is no baseline established for the use of N-fixing species, baseline emissions changes due to the use of N- fixing species are considered as zero, therefore: BEN t = 0

Baseline emissions due to burning of biomass

The project is promoting the cessation of biomass burning and thus emissions due to this practice are expected to decrease within the project as compared to the baseline emissions. Hence the emissions are based on the total crop residue subjected to burning and calculated by use of the emission factor as mandated by the methodology. However, the project is not claiming for emission reduction under this SALM practice and hence not applicable. BEBB t = 0

Baseline emissions from existing woody perennials

The baseline removals from woody perennials, BRWP t are calculated using the latest version of the Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities ver 4.2

The EPIC audit team confirmed during onsite visit that the baseline trees are considered to be non-existent as the project is primarily a Cropland. Only new trees added by the project will be considered in the project removals from existing woody perennials conservatively assumed to be zero. BRWP t =0

Baseline emissions from use of fossil fuels in agricultural management

As per the tool 'Estimation of emissions from combustion the use of fossil fuels in agricultural management' (Section VI.2 of the Methodology) the baseline emission due to the use of fossil fuels which is insignificant compared to the project net anthropogenic GHG removals. Hence, these emissions are found to be insignificant and are assumed be zero in the baseline scenario. BEFF t = 0

Equilibrium soil organic carbon density in management systems

The SALM management practices promoted by the project are Residue management (Mulching and Cover crops), use of organic fertilizers and Agroforestry. The RothC soil organic model was used for SOC estimations. The monitoring has recorded the field data of these practices as well as the data required for the RothC model. The model was run across 397 farmers data samples to project SOC changes for the overall crediting period. During baseline scenario, no project interventions were considered, and only weather data was incorporated into the model. The project area is categorized into 3 IPCC zones and five distinct cropping seasons, to ensure that the model accurately reflects on-ground residue management practices. The PP has estimated baseline SOC at equilibrium using equation 1 of the VM0017 methodology. The EPIC audit team assessment conclusion for the model calibration is provided below:

Actual value Calculation	Model value calculation	Epic audit team assessment conclusion
PP calculated field Measured Data Conversion from Total Organic Carbon (%) to Soil Organic Carbon (t/ha). Total organic carbon (%) is from the field measurement and the source for the bulk density is Open Lans Map data (Open Land Map data). Soil with a SOC of 0.59% (0.0059) and a bulk density of 1.215 grams per cubic centimetre, would have SOC to a	Variable input data are used with the proper data source for the modelling SOC data. The variable input data includes monthly rainfall, monthly evaporation, mean air temperature, clay content of the soil, Decomposability of the incoming plant material - the DPM/RPM ratio and soil cover. The detailed information on the value applied and the data source is provided in the SOC	The EPIC audit team reviewed the standard operating procedure for the RothC model application in the project. The procedure includes detailed steps for outlining the necessary data sources and providing instructions for running the RothC model. The team's assessment confirmed that the methodology used by the PP to calibrate the Roth C model is appropriate. The project used

depth of 30 cm (0.3 m) per hectare (10,000 m^2) of: (0.0059) x (1.215 x 0.3 x 10,000) = 21.51 tC/ha	Modelling SOP. The SOP document clearly explained how the project calibrated using Roth C model.	input data as per IPCC Zoneszones for weather parameters and DPM/RPM ratio. The audit team also validated the accuracy of the input data and the model's predictions by comparing predicted values with field values, demonstrating the reliability of the RothC model in estimating SOC changes.

Equilibrium soil organic carbon density in management systems Baseline SOC in equilibrium t, tC is calculated using baseline areas in cropland with management practice, soil organic carbon density at equilibrium and other variable inputs. The project used Roth C Model for SOC estimations and the detailed explanation of data source in the " Soil Modelling_SOP_V1.pdf /64/. The document detailed the data source for the variable inputs, how the model is calibrated to improve the accuracy and the estimation of SOC. The EPIC audit team reviewed the SOP and confirmed that the Roth C model is calibrated across IPCC zones (Tropical dry, tropical moist and tropical wet) of Karnataka . The audit team reviewed the baseline projection files (2017-47) for 397 farmers samples across different IPCC zones and confirms that the modelled values stated in table 11 of the VCS PD&MR is acceptable. Hence the calibration of the model and the data source used is appropriate.

Baseline removals due to change in soil organic carbon

SALM practices that have resulted in an increase in SOC estimations between baseline and project scenarios will result in SOC changes, and these changes are considered for emission reduction calculations. The project's implementation of SALM management practices, particularly residue management and cover cropping, has been validated as effective in increasing SOC levels. As per the SALM methodology it is conservatively assumed that baseline removals due to changes in SOC are zero. BRS t = 0

Total baseline emissions and removals:

$$BE_t = BEF_t + BEFF_t + BEBB_t - BRWPt$$

The baseline emissions in year t in tCO_2e is only due to the baseline emissions due to nitrogen fertlilizers, Remaining emissions are considered as zero.

BEt= BEFt+0+0-0

Baseline emissions for the current monitoring period is provided below :

Year	BEF_t	BE_t

2017*	4,918	4,918
2018	19,670	19,670
2019	19,670	19,670
2020	19,670	19,670
2021	19,670	19,670

* October to December 2017

Project Emissions

For Project emissions: The actual net GHG removals by sinks are estimated using the equation in section III (1.9) of the Approved VCS methodology VM0017 (Version 1.0). The actual net GHG removals by sinks are calculated using equation 7 of the methodology.

$PE_t = PEF_t + PEFF_t + PEN_t + PEBB_t - PRWP_t - PRS_t$

Where,

PE_t Estimate of actual net project GHG emissions and removals by sinks in year t, t CO2e

PEF_t Estimate of project emissions due to nitrogen fertilizer use in year t, t CO2e

$PEFF_t$ Estimate of project emissions due to burning of fossil fuels for agricultural management in year t, t CO2e

PEN_t Estimate of project emissions due to the increase use of N-fixing species in year t, t CO2e

$PEBB_t$ Estimate of project emissions due to biomass burning in year t, t CO2e

PRWPt Estimate of project removals due to changes in biomass of woody perennials in year t, t CO2e

PRS_t Estimate of project removals due to change in soil organic carbon in year t, t CO2e. (Monitored and estimated annually)

The audit team reviewed Column U - Ex-ante_ERs sheet of Ex-ante_Ex-post document and confirmed that the actual net GHG emissions and removals by sinks are calculated in accordance with VM0017 methodology.

For 2017 (1st October – 31st December) $PE_t = PEF_t + PEFF_t + PEN_t + PEBB_t - PRWP_t - PRS_t$

PEt = 4,426 + 0 + 0 + 0 - 0 – 27,784

PEt = -23,358. Similarly, project emissions are calculated for the overall crediting period.

Estimation of Project Emissions due to fertilizer use

Estimation of project emissions due to nitrogen fertilizer use in year t, t CO2e. **(PEFt)** are calculated using equation 1 and 2 of the latest version of **A/R Methodological tool 07 "Estimation of direct nitrous oxide emission from nitrogen fertilization" (Version 01)** The project implementation leads to gradual shift from use of synthetic fertilizers to organic fertilizers in the project. The project promotes use of organic fertilizers (Organic Manure, Farmyard Manure and crop residue). The farmers are provided training for switching from conventional farming to organic farming. The audit team reviewed the IPCC Wise sheet in ABMS Monitoring Data - Fertilizer document and confirmed that the project leads to progressive increase in organic fertilizer input and subsequent reduction in synthetic fertilizer usage in the 1st monitoring period. The project scenario emissions due to fertilizer use is estimated using the aggregated data of the ex-ante – baseline factor - 0.38 tCo2e per hectare.

The audit team reviewed O column – Ex-ante ERs sheet of Ex-ante_Ex-post document and confirmed that the PEFt is calculated using the applicable project area as per each IPCC zone and project emission factor.

In the SOC_Agro_Forest_Calc sheet of Ex-ante_Ex-post document, adoption rate for the first monitoring period (2017-2022) is considered to be 90% and the adoption rate for the subsequent years is affirmed to be 100%. The crop area (ha) as per each IPCC zone*PEFt (tCo2e/ha) resulted in PEFt use in a year.

For 2017, PEFt = 3,627 + 725 + 74 (Across all the three IPCC zones)

PEFt = 4,426

Project emissions due to use of fossil fuels for agricultural management Estimation of project emissions due to burning of fossil fuels for agricultural management in year t, t CO2e: As there is no net increase in the use of fossil fuels used for farm machinery during project implementation, it is not considered in the project. The audit team verified the annual fossil fuels usage data submitted by the PP, which indicated that the project activities do not foresee an increment in the use of farm machinery during project implementation. The project emissions from the use of fossil fuels are deemed negligible as the average annual emissions resulting from use of fossil fuels during the current monitoring period is lower than the baseline scenario. Hence, the project scenario ex-ante calculations, the emissions due to use of fossil fuels is considered as zero. PEFFt = 0

Project emissions due to the use of N-fixing species

Estimation of project emissions due to the increase use of N-fixing species in year t, t CO2e: The audit team conducted interviews with the PP and farmers and confirmed that no specific N-fixing species are used in the project and the agroforestry area doesn't include more than 50% of the area under N-fixing species in the baseline, thus the estimations of emissions from N-fixing species is not required as per the requirement specified in VM0017 methodology. The audit team reviewed the farm diary evidence documents to confirm the list of tree species maintained in the project. PENt = 0

Project emissions due to burning of biomass

Estimation of project emissions due to biomass burning in year t, t CO2e: As the project activity is not claiming for emission reduction under the biomass burning, it is not applicable. The project aims to curtail

the biomass burning activities completely due to implementation of SALM practices. Thus, the emissions from biomass burning are accounted for as zero in the project. PEBBt = 0.

Project removals from woody perennials

Estimation of project removals due to changes in biomass of woody perennials in year t, t CO2e: The changes in the agroforestry trees are measured and the change in biomass calculated using equation 12, 13 and 14 of the latest version of the CDM A/R tool: Estimation of carbon stocks of trees and shrubs in A/R CDM project activities v. 4.2. An agroforestry area of 5,752 ha is considered for estimation of project removals of which 90% is considered as the adoption rate for practice of agroforestry by farmers included in the project for the initial five years which resulted in an eligible agroforestry area of 5,258 ha which is considered for calculation of PRWPt across IPCC zones in the project. The audit team verified the farm dairy evidences and calculations in the ABMS Monitoring data sheet for Agroforestry to affirm that the removals are estimated appropriately in the project.

Furthermore, the ex-ante woody perennial removals factor PRWPt (tCo2e/ha/year) applied for each IPCC zone is determined in "Input-values" sheet in Ex-ante_Ex-post excel document. The audit team through site inspections and interviews with the farmers confirmed the practice of agroforestry, tree species present in the field and tree count in each field in the project.

All the scientific literature cited for the use of allometric equations to calculate above-ground biomass across varied IPCC zones (Tropical Dry, Tropical Wet and Tropical Moist) is verified to confirm its suitability for accounting AGB and BGB in the project.

Project equilibrium soil organic carbon density in management systems

Estimation of project removals due to change in soil organic carbon in year t, t CO2e: The SALM management practices promoted by the project are Residue management (Mulching and Cover crops), use of organic fertilizers and Agroforestry. The RothC soil organic model was used for SOC estimations. The ABMS recorded the field data of these practices as well as the data required for the RothC model. The model inputs are derived annually from ABMS data, applied across the entire project cropland area. The ABMS sheets includes recorded data regarding farmer details, crop area, biomass production, harvested annual dry matter, major and minor crops, crop production, fertilizer usage (organic and synthetic), farmyard manure application, amount of crop residue, agroforestry species, amount of woody perennials, area under agroforestry, tree count, DBH, and others. Based on the documents assessed and the onsite observation, the project promotes the use of organic fertilizers and the project emissions due to the nitrogen fertilizers is the only intervention which results in project emissions. The uncertainty estimates are calculated according to the VM0017 methodology (section 1V.2.8). For the ex-ante estimates, SOC change values are taken from the published literature (Bhattacharya et al 2013). The audit team reviewed the SOC_Agro_Forest_Calc sheet in Ex-ante_Ex-post sheet and confirmed that specifically, treatment T4 (100% NPK + Paddy Straw) is selected in the project, as it represents the project intervention effectively and includes plant inputs in the SOC modeling.

Project removals due to changes in soil organic carbon

As part of the ex-ante estimation, the SOC changes values were derived from peer-reviewed literature by Bhattacharya et al 2013, which modelled SOC dynamics for soil depths of 0-13 cm and 13-23 cm under various agricultural treatments. As the project interventions were similar to Treatments T3 (100%

NPK+FYM), T4 (100% NPK+Paddy Straw), T5 (100% NPK+Green Manure) of the published literature, the average SOC change from T3, T4, T5 were selected for SOC modeling. The study area associated with these treatments reflects conditions present in over more than 75% of the total project area. The audit team reviewed the SOC_Agro_Forest_Calc sheet in Ex-ante_Ex-post sheet and confirmed that the SOC project removals values calculations are appropriate and as per equation 6 in section III.1.8 of VM0017 methodology.The calculations follow equation 6 of the applied methodology and are as follows:

1. SOC at Equilibrium (PSequil) – The equilibrium SOC stocks for each climate zone (Tropical Dry, Tropical Moist, Tropical Wet) have been calculated using Roth C model (tC/ha) multiplied by the project area (ha), as per equation 4 of the applied methodology (Example: Reference- " VM0017-Master ER aggregate 2019 rev 5.xlsx- Cell Number F17 to F-19)".

2. Estimate of the project SOC in year t, tC (PSt) – The default transition period (20 years) specified in VM0017 has been applied to represent the time taken for SOC to reach equilibrium after land-use change. The time increment has been applied to represent each monitoring year's change toward equilibrium, consistent with methodology requirements. SOC stock values for the current monitoring year were derived for each climate zone using Equation 5, incorporating estimated SOC values for the project year and applying the transition dynamics to calculate annual removals.

3. Estimate of project removals due to changes in soil organic carbon (SOC) in year t, tCO_2–(PRSt): As per Equation 6 of the applied methodology, changes in SOC were calculated by taking the difference between PSt and PSt-1(SOC for the previous year) and then converting the result to tonnes of CO_2 by multiplying by 44/12. The total project removals across all climate zones were aggregated for each year of the current monitoring period. (Reference: - VM0017-Master ER aggregate 2019 rev 5.xlsx- Cell Number E-32 to E-34).

Aggregate PRSt totals across the monitoring period (2017-2022), giving 956,032 tCO_2e (Reference: Ex-post ERS of Ex-ante, Ex-post excel sheet: Cell no. O8) of project removals for the current monitoring period before uncertainty deductions. The project removals after uncertainty deductions are 946,716 tCO_2e.(Reference: Ex-post ERS of Ex-ante, Ex-post excel sheet: Cell no. Q8).

The SOC changes for the initial two years (2017 and 2018) have been considered zero, since the corresponding data was used for the calibration of Roth C model. Hence these years are excluded from the calculation of project removals, and therefore no SOC gains are accounted during this calibration period.

The VVB confirms that the updated SOC project removal calculations have been carried out in accordance with Equation 6, with correct application of equilibrium SOC stocks, transition period, and time increment. The calculation steps are traceable, and the EPIC audit team is of the opinion that the calculation of project removals is in compliance with the applied methodology.

RothC Modeling for estimation of changes in SOC

The RothC model implementation followed a structured, step-wise procedure to estimate soil organic carbon (SOC) changes due to sustainable agricultural practices. First, field-measured Total Organic

Carbon (TOC) percentages were converted into SOC stocks (tC/ha) using a standard formula incorporating soil bulk density, depth, and area, with bulk density values sourced from OpenLandMap. In the second step, sampling was designed based on stratification of the project area into USDA soil orders, resulting in 16 soil order and further divided using three IPCC climate zones—Tropical Dry, Moist, and Wet. Using the CDM sampling tool (95% confidence, 10% precision), a total of 397 samples were selected for baseline, calibration, and validation across different years. The third step involved collecting and inputting data required for RothC modelling, including monthly rainfall (from Karnataka DES), evaporation (Terraclimate dataset), average temperature (EMPRI Karnataka report), clay content (OpenLandMap), DPM/RPM ratio (default value 1.44), and soil cover (TNAU Agritech). These inputs enabled the model to simulate SOC changes across baseline calibration, project validation and application of model during project implementation periods, accurately reflecting the impact of sustainable land management practices on soil carbon sequestration.

Uncertainty Analysis: The audit team verified the calculations in Ex_Ante_Ex_Post Sheet and VM0017-Master ER Aggregate sheet (2017-2022), wherein the PP has calculated the uncertainty associated with the RothC model outputs using the approach described in section IV.2.8 of the applied methodology VM0017. The audit team reproduced the calculations in "SOC" sheet of VM0017-Master ER Aggregate sheet (2017-2022) document and confirms that the quantification of uncertainty is carried out as per equation 12-17 of the applied methodology VM0017. The PRSmax,t and PRSmin,t data calculations are detailed in PRSmax_PRSmin excel document. The uncertainty deductions are quantified across IPCC climatic zones in the project. The deductions were applied where the calculated uncertainty was more than 15%.

Through assessment of uncertainty data in SOC data Table – Equation 16 (C column), the audit team concludes that the uncertainty deduction is applicable for tropical moist zone as the UNCt (%) is more than 15%.

Leakage: As per the methodology, leakage from a switch to non- renewable biomass use or fossil fuels is the possible source of leakage. In the project, organic manure is used, and any shift occurs within the farm boundary. Hence the leakage, ex-ante is estimated as 0. The methodology further states that If the ABMS survey data show that 10% or fewer project households use non-renewable biomass from outside the project or fossil fuels to replace the biomass diverted to agricultural fields, then the leakage is considered insignificant and ignored. In the project as verified from the interviews with the farmers, there is no diversion of the biomass as the crop residues which were earlier burnt are recycled back to the soil to increase the organic content. This was verified from the survey data and also from periodic interview with the farmers related to such practices.

Estimated net GHG emission reductions and removals:

The estimation of net anthropogenic GHG removal by sink is made using equation 8 of the methodology

$\Delta R_t = BE_t - PE_t - LHE_t$

Where

ΔR_t Estimate of net anthropogenic GHG emissions and removals in year t, t CO2e

PE_t Estimate of actual net project GHG emissions and removals in year t, t CO2e

PE_t Baseline emissions and removals in year t, t CO2e

LHE_t the leakage from a switch to non-renewable biomass or fossil fuel in place of the biomass used for cooking /heating diverted to agricultural system in year t, t CO2

As indicated in table of joint PD&MR (section 4.3) extracted the net GHG emission reductions summary from the calculation's sheets with the validated baseline and estimated ex ante project emissions. It also shows the buffer emissions which were calculated using the 10% non-permanence risk validated in the subsequent section of this report. All of the calculations have been checked and found to be correct. All relevant formulae and assumptions are written in the joint PD&MR v1.6. The audit team verified the calculation in Ex-ante ERs sheet - column M (BEt), U (PEt), W (LHEt) which resulted in ΔR_t in Column X and confirms that the net anthropogenic GHG emissions and removals are estimated as per equation 8 (section III.3) of the VM0017 methodology. Hence, the estimations in Ex-ante_Ex-post document and presented in section 4.3 of PD&MR v1.6 is acceptable.

Net GHG emissions reductions and removals for the current monitoring period:

Year	Baseline emissions or removals - BEt (tCO_2e)	Project emissions or removals - PEt (tCO_2e)	Leakage emissions - LHEt (tCO_2e)	Net GHG emission reductions or removals - ΔR t (tCO_2e)
1st Oct 2017	9,767	1,065	0	8,701
2018	27,347	1,577	0	25,770
2019	21,425	-2,26,429	0	2,47,854
2020	17,580	-2,30,165	0	2,47,745
2021	11,720	-2,33,623	0	2,45,343
30th Sep 2022	19,177	-3,12,725	0	3,31,902
Total	**1,07,016**	**-10,00,299**	**0**	**11,07,315**

3.4.7 Methodology Deviations

The EPIC audit team reviewed the methodology deviations of the projects and confirmed that the project deviated from sections IV.1.1b and IV.2.4 of the applied methodology. According to these sections, proper sampling standards need to be used to monitor the data and parameters of the project. However, for the first monitoring period, the project carried out complete monitoring of all project activities for interventions like fertilizer usage and agroforestry. The EPIC audit team is of the opinion that the monitoring of the entire project area is conservative and accurate. During the onsite visit, the EPIC audit team reviewed farm diaries in which farmers-maintained records of the quantity of fertilizer applied and the number of trees planted for agroforestry. Therefore, the complete monitoring of the project area is conservative and accurate, and the methodology deviation will not negatively impact the estimation of ERs (Emission Reductions) of the project.

3.4.8 Monitoring Plan

The monitoring plan as described in detail in sections 5.1 to 5.3 of the VCS joint PD&MR has been verified by the audit team. The parameters available at the validation, the parameters that will be monitored, recording frequency and QA/QC procedures are deemed reasonable and appropriate. Data and parameters available at validation and fixed for the baseline period and the verification of all the data ex-ante and data ex-post (monitoring parameters) including data measurement, data transfer, data archiving, aggregation and calculation of baseline emissions, project emissions, and leakage emissions are tabulated below and was cross-checked from the field survey sheets, calculation sheets for baseline, project, leakage and net carbon emission reductions. The monitoring sheets and calculations spreadsheet that aggregates the claimed GHG benefits submitted by PP was verified by the audit team.

Parameter	Description	Assessment by VVB team
Ex-ante		
BSN_t =0	Synthetic fertilizer use	It is verified that the monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. Interview with farmers during site inspection was done on the fertilizer usage for different crops to assess the accuracy of the information.
$Crop_{i,t}$ =0	Harvested seasonal dry matter yield for crop i	It is verified that the monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. Interview with farmers on the yield of each crop during site inspection was also done to assess the accuracy of the information.
Areai ,t =0	Total annual area harvested of crop i or N-fixing trees i	It is verified that the monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. Interview with farmers during site inspection was also done to assess the accuracy of the information.

$Areaburnt_{i}$,t =0	Annual area of crop i or N-fixing trees i burnt	The PP has not considered emission reductions from crop burning and hence not applicable.
$MB_{C,t}$ =0	Mass of crop residues burnt	The PP has not considered emission reductions from crop burning and hence not applicable.
C_F	Combustion factors that depend on vegetation type	The PP has not considered emission reductions from crop burning and hence not applicable.
$FC_{j,t}$	Fossil fuel consumed in vehicle or equipment recordedby vehicle and fuel type	It is verified that the monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. The quantification of fossil fuels like petroland diesel used in farm machinery has been cross verified by means of interviews with farmers.
$BA_{C,\ m_c\ ,t}$ =0	Baseline areas in cropland with management practice, *mC*	Baseline survey based on farmers and farmers associations were reviewed and has been cross verified by means of interviews with farmers.
$SOC_{C,m_c\ ,t}$ =0	Soil organic carbon density, to a depth of 30 cm, at equilibrium for cropland with management practice, *mC*	Review of the soil test report was done and cross checked with the values from the soil health cards of the farms.
$BP_{C,m_c\ ,t}$ =0	Baseline production in cropland per season with management practice from within the project, mC	It is verified that the monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data.
$BR_{C,m_c\ ,t}$ =0	Baseline fraction of production returned as residues per month (calculated from $BP_{C,m_C\ ,t}$ =0) in cropland with management practice, m_C	It is verified that the monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data.
R_J	Root-shoot ratio for tree species j	It is verified that the Value is applied (0.30) based on scientific studies of common native species in

		India which is appropriate for the region. The audit team verified the scientific studies of common native species in India. Biomass Production and Carbon Sequestration Potential of Different Agroforestry Systems in India: A Critical Review 2022, 13(8), 1274 and confirmed the root-shoot ratio used in the project is appropriate.
$Area_{i,t=0}$	Total annual area harvested of crop / under cropland	It is verified that the monitoring sheets have been done in accordance with commonly followed measurement practices. Crop planted area as available at the start date of the project was 51,764 hectares. Cross check with ABMS sheets was done and verified from interviews with farmers.
$A_{p,i}$	Area under agroforestry tree planting	It is verified that the monitoring sheets have been done in accordance with commonly followed measurement practices. The total eligible agroforestry planted area is 5,752 hectares and only planted area of 5,258 ha was considered for estimtation of project removals from woody perennials. Cross check with ABMS sheets was done and verified from interviews with farmers.
DBH	Diameter at breast height of agroforestry trees	It is verified that the monitoring sheets have been done using standard techniques as per Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities ver 2.0 and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data.
$f(DBH)$	Above- ground biomass of trees using allometric function applicable to species groups returning total above-ground tree biomass on the basis of DBH as entry data	It is verified that the monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. The allometric equations used were relevant to the species considered, hence is acceptable.

$Temp_m$	Average temperature per month	It is verified from the annual report published by the Government of Karnataka. It is verified that the RothC input sheets have been done in accordance with methodology requirements and are accurate and appropriate
$Evap_m$	Average evapotranspiration per month	The audit team verified the USGS Monthly Evapotranspiration data and confirms that the source is appropriate. It is verified that the RothC input sheets have been done in accordance with methodology requirements and are accurate and appropriate
$Prec_m$	Average precipitation per month	The audit team verified the annual reports published by Government of Karnataka and confirms that the source is appropriate. It is verified that the RothC input sheets have been done in accordance with methodology requirements and are accurate and appropriate
Ex-post parameters monitored for the years 2017, 2018, 2019, 2020, 2021 and 2022 for the monitoring period from the start date onwards.		
PSN_t	Annual Synthetic fertilizer use	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. Interview with farmers during site inspection was done on the fertilizer usage for different crops to assess the accuracy of the information.
$PA_{C,t}$	Areas in cropland	Review of the calculation sheets was done and compared with the field sampling data. The values reported by farmers are crosschecked by the field coordinators through regular internal inspections. Crop planted area monitored for this monitoring period of the project was 51,764 hectares. Cross check with ABMS sheets was done and verified from interviews with farmers.
PF_t	The price of inorganic fertilizer	The market survey data submitted was verified to be appropriate.

$Crop_{i,t}$	Harvested annual dry matter yield for crop *i*	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. Interview with farmers on the yield of each crop during site inspection was also done to assess the accuracy of the information.
$Area_{i,t}$	Total seasonal area harvested of crop I	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. Interview with farmers during site inspection was also done to assess the accuracy of the information.
$Areaburnt_{i,t}$	Seasonal area of crop I	It is verified that the monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. Interview with farmers growing sugarcane during site inspection was also done to assess the accuracy of the information.
$MB_{C,t}$	Mass of crop residues burnt	The PP has not considered emission reductions from crop burning and hence not applicable.
C_F	Combustion factors that depend on vegetation type	The PP has not considered emission reductions from crop burning and hence not applicable.
$FC_{j,t}$	Fossil fuel consumed in vehicle or equipment recorded by vehicle and fuel type	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data. The quantification of fossil fuels like petrol and diesel used in farm machinery has been cross verified by means of interviews with farmers.

$PA_{C,m_C,t}$	Project areas in cropland with management practice, *mC*	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data.
$SOC_{C,m_C,t}$	Soil organic carbon density, to a depth of 30 cm, at equilibrium for cropland with management practice, *mC*	Review of the calculation sheets was done along with the input data such as average temperature, precipitation and evapotranspiration, for RothC model which was verified to give accurate results. Further, a cross check was done by inferring values from the soil health cards (on which soil test reports are based) of the farms. In comparison, a conservative value was applied as the output data indicated the modelled value to be lesser than the soil test reports.
$PP_{C,m_C,t}$	Production in cropland per season with management practice from within the project, mC	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data.
$PR_{C,m_C,t}$	Project fraction of production returned as residues per season in cropland with management practice, mC (calculated from PPC,mC ,t)	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data.
$PM_{C,m_C,t}$	Project composted manure input in cropland per season with management practice, mC, Farmer self-assessment and monitoring by VGS field staff based on supply from association.	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data.

D	Transition period	IPCC default period of 20 years as proposed in the methodology VM0017 has been applied.
$Temp_m$	Average temperature per month	It is verified from the annual report published by the Government of Karnataka. It is verified that the RothC input sheets have been done in accordance with methodology requirements and are accurate and appropriate
$Evap_m$	Average evapotranspiration per month	The audit team verified the USGS Monthly Evapotranspiration data and confirms that the source is appropriate. It is verified that the RothC input sheets have been done in accordance with methodology requirements and are accurate and appropriate
$Prec_m$	Average precipitation per month	The audit team verified the annual reports published by Government of Karnataka and confirms that the source is appropriate. It is verified that the RothC input sheets have been done in accordance with methodology requirements and are accurate and appropriate
R_J	Root-shoot ratio for tree species j. Not applied conservatively for this monitoring period	It is verified that the Value is applied based on scientific studies of common native species in India which is appropriate for the region.
DBH	Diameter at breast height of agroforestry trees (long-living trees), Measurement by VGS field staff	It is verified that the ABMS monitoring sheets have been done using standard techniques as per Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities ver 2.0 and are accurate and appropriate. Review of the calculation sheets was done and compared with the field sampling data
f(DBH)	Above-ground biomass of trees using allometric function applicable to species groups returning total above- ground tree biomass on the basis of	It is verified that the ABMS monitoring sheets have been done in accordance with methodology requirements and are accurate and appropriate. The allometric equations used were relevant to the species considered, hence is acceptable.

	DBH as entry data. f (DBH) applied for baseline GHG emission reductions and removals and throughout the project monitoring	.

The basis of classification of the IPCC Climatic zones are described in section 1.4 of the revised PD-MR. The monitoring data sheets (based on farm diaries) submitted by the PP has been verified by the audit team which indicate SALM activities included under this project are carried out across majority of the farms in all the strata (For ex-ante, the adoption rate is 90%. In ex-post, all interventions are carried out by more than 95% of farmers). Hence as the full monitored data sets are available, the calculations for the fertilizer application rates and the agroforestry removals were based on the field data from the farm diary.

As per the methodological requirements, stratification is applied for quantification of the SOC stocks. The input SOC stocks at baseline (t = 0) have been estimated based on the field measurements across the different strata. The final SOC stock values have been modelled based on the RothC model using the appropriate input parameters. IPCC climatic zone has the major influence on the soil organic carbon and hence this considered as the basis for the stratification.

According to IPCC climate regions, the project activity instance is in tropical dry climate zone. PP has provided details on studies which have been selected to demonstrate that the application of the RothC model is appropriate and that the model is validated for similar AEZs/ climate regions. Hence VVB is of the opinion that the model can be applied to the project area.

A majority of the farmers (>95%) are implementing all the SALM interventions in the farms. The audit team has verified this based on the ABMS database provided. Where the intervention is not applicable, it is indicated as zero.

Based on information and data submitted by the PP, audit team has verified that Applicable baseline (t = 0) values for SOC stocks has been provided in section 6 of the revised PD-MR. The inorganic and organic fertilizer application rates are also provided. The crop productivity and the amount of crop residue returned to the soil for the IPCC-climatic zones are summarised in the section 6 of the revised PD-MR. The field monitoring data for these parameters has been crosschecked by the audit team for accuracy.

The PD-MR is updated to include more information on the sampling design for the monitoring of data and parameters. The EPIC audit team reviewed this updated section and confirmed that the project involves several interventions, including organic fertilizer use to avoid chemical fertilizer emissions and agroforestry. For these interventions, the Project Proponent (PP) has conducted comprehensive monitoring (full census) across all project areas. Farmers maintain a farm diary in their individual farm fields, where they record the quantity of fertilizers applied and the number of tree saplings planted. This indicates that, for these two interventions, the PP is performing full coverage monitoring for the current monitoring period.

The EPIC audit team considers that having data from all project areas is more accurate than relying on sampled data and has validated it as a methodology deviation. However, according to the applied methodology, proper sampling standards must be adhered to. Therefore, the EPIC audit team has raised a FAR (refer to Appendix 01) for the project. This FAR is for the next verification cycle to ensure that the PP uses appropriate sampling standard criteria and describes the sampling design for future monitoring periods in the monitoring plan.

Regarding Soil Organic Carbon (SOC) changes, monitoring the entire project area is challenging due to its extensive and variable nature. To address this, the project followedthe CDM's General Guidelines for Sampling and Surveys for Small-Scale CDM Project Activities for sampling the project area. The EPIC audit team confirmed that the CDM guidelines for sampling is acceptable as it is designed to sample in large and variable landscapes.

To ensure that all the different conditions across the project area were properly represented, the PP divided the entire project site into 16 soil classes based on USDA. These strata were based on two important classification systems: climate zones defined by IPCC—Tropical Dry, Tropical Moist, and Tropical Wet—and soil types identified by the USDA soil orders.

For the SOC estimation, the CDM sampling tool was applied yielding total of 361 samples across the zones. To increase accuracy and account for any potential sampling errors, PP collected 397 samples in total. These samples were checked against actual field data to ensure that the collected data were reliable, and the variation is within a standard deviation of 15%, which is within acceptable limits.

The EPIC audit team reviewed the sampling approach and agreed that the method used to divide and sample the area is acceptable as it represents the entire variability of the project area. The combination of climate zones and soil types provided a strong foundation for representing the area's diversity. The EPIC audit team also confirmed that the number and distribution of samples were sufficient to reflect the SOC conditions across the whole project site.

By using these 397 samples, the project can effectively monitor and compare the SOC changes with modelled data while adhering to methodological standards. This approach balances the need for accurate data collection with the practical limitations of monitoring large and diverse project areas. The EPIC audit team is of the opinion that whereas the initial monitoring of fertilizer use and agroforestry provides a conservative data set, adherence to proper sampling methodologies is required for future monitoring periods. For SOC monitoring, the project's use of stratified random sampling ensures reliable data collection across the project area , aligning with established guidelines and enhancing the robustness of the project's monitoring efforts.

The EPIC audit team is of the opinion that the applied deviation in terms of data and parameters description and inclusion and, an increased sample size, enhance the accuracy of SOC estimation without compromising the conservativeness, The description of the data and parameters are deviated as per the needs of the project but does not impact negatively on the conservativeness instead improves the accuracy of the ERRs.

Assessment of RothC Modeling employed in the project estimation of changes in SOC

The RothC model implementation followed a structured, step-wise procedure to estimate soil organic carbon (SOC) changes due to sustainable agricultural practices.

First, field-measured Total Organic Carbon (TOC) percentages were converted into SOC stocks (tC/ha) using a standard formula incorporating soil bulk density, depth, and area, with bulk density values sourced from OpenLandMap.

The total organic carbon (TOC) was determined through laboratory analyses of soil samples submitted by farmers. The measured TOC values were subsequently converted into soil organic carbon (SOC) stocks for the period 2016 to 2022. The calculation file (Conversion_%OC_SOC.xlsx) and the laboratory reports (Soil Test Report – Consolidated Report – KAR-2016_R1.1.pdf) are submitted as supporting evidence for the measured SOC stock values from 2016 to 2022.In the second step, sampling was designed based on stratification of the project area using USDA soil orders, resulting in 16 soil order classes and further divided into three IPCC climate zones—Tropical Dry, Moist, and Wet. Using the CDM sampling tool (95% confidence, 10% precision), a total of 397 samples were selected for baseline, calibration, and validation across different years. The tool calculated 132 samples for the Tropical Dry zone, 127 samples for the Tropical Moist zone, and 102 samples for the Tropical Wet zone.

The third step involved collecting and inputting data required for RothC modelling, including monthly rainfall (from Karnataka DES), evaporation (Terraclimate dataset), average temperature (EMPRI Karnataka report), clay content (OpenLandMap), DPM/RPM ratio (default value 1.44), and soil cover (TNAU Agritech). These inputs enabled the model to simulate SOC changes across baseline calibration, project validation and application of model during project implementation periods, accurately reflecting the impact of sustainable land management practices on soil carbon sequestration.

In the fourth step, the RothC software (v2.1) from the Rothamsted website was enabled to perform SOC simulations.

In the fifth step, Input data was collected, including monthly weather parameters—temperature, rainfall, and evapotranspiration—for baseline (2012–2016) and project periods (2018–2022), along with clay content, land use type, initial SOC stocks, and crop management details.

In Step 6, carbon input data from crop residues and FYM was incorporated, calculated as area-weighted averages based on ABMS field data and distributed across five cropping patterns (Kharif, Kharif/Rabi, Kharib/Rabi/Summer, Zaid/Summer and Perennial) based on seasons were identified within three IPCC zones (Tropical Dry, Tropical Wet and Tropical Moist). Each farmer's land management data—including crop inputs and year of SOC measurement, was encoded into RothC's configuration files. The model also applied standard decomposition rates for active SOC pools and used land-cover-specific DPM/RPM ratios.

Step 7 involved model calibration for the baseline (2016–2017), using 397 samples across Karnataka, with weather and input data from 2012–2016. The baseline conditions were included for a period of 2 years prior to start date. .

In Step 8, project intervention calibration was conducted using 2018-specific data. Model predictions were validated against observed SOC across Tropical Dry, Moist, and Wet zones, confirming RothC's robustness for estimating SOC changes under varying IPCC climatic conditions. Hence, the SOC changes for the initial two years (2017 and 2018) have been considered zero, since the corresponding data was used for the calibration of Roth C model. Hence these years are excluded from the calculation of project removals, and therefore no SOC gains are accounted during this calibration period.

Step 9 - The RothC model was validated using independent soil organic carbon (SOC) data collected in 2019 and 2020 from 730 soil samples across Karnataka's three IPCC zones. Management practices (e.g., tillage, carbon inputs, irrigation) were integrated into the model to reflect their influence on SOC dynamics. Goodness-of-fit measures, including R^2 and RMSE, confirmed strong alignment between observed and modelled SOC values, reinforcing model robustness. Comparison of modelled vs field samples were performed in the project.

In Step 10, a projected scenario indicated a gradual decrease of the SOC reflecting the degradation of the soil quality in the absence of project intervention, using Batch 1 samples and historical weather data. This served as a counterfactual for assessing the impact of interventions.

Step 11 involved applying the validated model in forward simulation mode for 2022 using actual weather, FYM, and crop residue inputs from 2018–2022 at the same sample locations. The resulting SOC projections under the project scenario were compared to the baseline projection to quantify carbon removals. The deviation of modelled SOC from measured SOC for 2022 was quantified following 100*(measured-modelled)/measured formula.

In Step 12, model simulations were configured by specifying weather, management, and soil parameter files, and selecting simulation modes (short-term or equilibrium). This comprehensive application demonstrated the model's utility for long-term scenario analysis and monitoring SOC changes due to climate and management interventions.

The audit team based on verification of inputs files used for RothC modeling and assessment of data sources used in model validation, concludes that the model was appropriately applied to project SOC carbon stock changes under various IPCC climate zones and project management interventions scenarios.

3.5 Non-Permanence Risk Analysis

The audit team has performed an independent assessment of the non-permanence risk rating determined by the project proponent. For each risk factor it is verified that the rationale, assumptions and justifications used to support the risk score are appropriate. Relevant documents have been reviewed to support the risk score and the overall risk rating is verified to be appropriate and suitable in the context of the project design and implementation. The updated information in the revised NPR report (V 1.4) along with the supporting documents for assigning the scores related to Project Management, Financial viability, Opportunity cost, project longevity, land tenure and community engagement and political risk were reviewed by the audit team.

Non-permanence Risk Buffer withholding of 10% (calculated as a per cent of net change in carbon stocks prior to deduction of leakage, see ("VCS-Risk-Report-Calculation-Tool-v4.0 SALM.xls" and "Monitoring_Data_ABMS.xlsx"). was verified to be calculated and applied correctly. The assessment of risk analysis is attached as Appendix 03 as part of this report.

The audit team is of the opinion that overall, the methodology and referenced tools have been applied correctly to calculate baseline emissions, project emissions, leakage and net GHG emission reductions and removals. The EPIC audit team assessment conclusion for the risk scores for each risk element is provided in detail in the Appendix 03. The non-permanence risk analysis and assessment conclusion for all the rationale, assumptions and justifications are provided in the Appendix 03

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project titled "Sustainable agricultural practices for carbon sequestration by organic and natural Farming groups" start date is verified to be 01st October 2017 based on activities confirming to the VCS definition of the start date for AFOLU projects. The date is based on the date on the first SALM practices were started by the farmers based on the agreement between Farmer associations and the project proponent (i.e. Vedic Green Solutions).

The documents submitted by the Project proponent Vedic Green Solutions for the start date have been reviewed by the audit team and are found acceptable and meet the requirements as defined by VCS standard v.4.3.

The crediting period starting date is 01st October 2017 and ends on 30th September 2047 (30 years). This period is consistent with the requirements of section 3.8.2 of the VCS standard v.4.3 (i.e. the project crediting period shall be thirty years, renewable three times for a total of 90 years) This version of the VCS joint PD&MR covers the first verification period of the project from 01st October 2017 to 30th September 2022.

Before project implementation burning of crop residues, use of synthetic fertilizers or inorganic fertilizers is more evident in the project areas; this was verified during the onsite and offsite interviews. After project implementation practice of sustainable land management practices viz., , use of organic manuring crops, application of farmyard manure, crop residue mulching, and practice of agroforestry are being practiced. And also, VGS has conducted various training programmes to farmers on soil fertility improvement; this was evident during the onsite and offsite interviews with the farmers and field officers. And the project has achieved the objectives which is to ensure the increasing the capacity of soil to sequester carbon, enhance the carbon sequestration by agroforestry practices such as planting of trees, reduce emissions from use of synthetic fertilizers.

The project is being implemented on agricultural farms of Karnataka covering an area of 57,516 ha consisting of 29,739 farmers as on the project start date. The project is estimated to result in average

GHG emission reductions and removals equivalent to 171,399 tC02e per year. For this verification period i.e. from 01st October 2017 to 30th September 2022, the project has generated net anthropogenic emission reductions of 1,107,315 tC02e.

According to VCS standard 4.3 of section 3.16.1, the project proponent must demonstrate that a project contributes to at least three SDGs by the end of the first monitoring period, This has been verified from the information provided in the VCS joint PD&MR that the project contributes to achieve the 03 SDG's viz., SDG 01 (i.e. End poverty in all its forms everywhere), SDG 13 (i.e. Take urgent action to combat climate change and its impacts) and SDG 15 (i.e. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

In summary, the verification is based on the document review, onsite interview and remote audit (i.e., through Google meet and telephonic discussions); found that there are no material discrepancies between the project implementation and the project description. The audit team checked the status of monitoring plan, the completeness of monitoring system and found no discrepancies between the actual monitoring system and the monitoring plan set in the VCS joint PD&MR. The project has not applied for under any other GHG scheme and there will not be any double counting. The audit team was able to conclude the project has been implemented as described in the VCS joint PD&MR conform to the eligibility criteria.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The audit team reviewed all the project documents and GHG emission reduction calculations in order to ensure the consistency with VCS standard v.4.3 requirements and the VM0017 methodology. Calculations for emission reductions were reproducible and consistent with documentation.

The audit team also assessed the data storage procedures to ensure accuracy and continuity in record keeping. Field data collected were appropriately recorded, copied and transcribed to electronic format with reliable quality checks.

During verification the evidence provided in the form of project documentation, in-person interviews and visual inspection was adequate to support the quality and quantity of GHG emission removals reported by the project. The project proponent demonstrated appropriate conservativeness in all calculations and took measures to ensure that reliability of all evidence provided. Furthermore, the PP has estimated uncertainty and discount factors by applying the statistical analysis such as R^2 and RMSE. The uncertainty of the RothC model is calculated as per step 4 of section IV.2.8 of the applied methodology VM0017.

Hence the audit team is of the opinion that the GHG ERRs have been quantified correctly in accordance with the monitoring plan and applied methodology for this verification period.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	NPRR Buffer %	Buffer pool allocation	VCUs eligible for Issuance
1st Oct 2017	9,767	1,065	0	8,701	10%	870	7,831
2018	27,347	1,577	0	25,770	10%	2,577	23,193
2019	21,425	-2,26,429	0	2,47,854	10%	24,785	2,23,068
2020	17,580	-2,30,165	0	2,47,745	10%	24,774	2,22,970
2021	11,720	-2,33,623	0	2,45,343	10%	24,534	2,20,809
30th Sep 2022	19,177	-3,12,725	0	3,31,902	10%	33,190	2,98,712
Total	**1,07,016**	**-10,00,299**	**0**	**11,07,315**		**1,10,732**	**9,96,584**

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The GHG removals for the project reporting period are based on monitoring of field data and calculation procedures and factors that have been assessed by the verification team, as described in section 4.2 of this report. The verification team has concluded that a reasonable level of assurance has been reached based on the review the monitoring procedures and the internal quality control measures which are adopted. Further the sufficiency of quantity, and appropriateness of quality of the evidence, have been verified from cross-checks performed on the reported data by the audit team. Hence audit team is of the opinion that the approach adopted by the PP for the monitoring of the GHG emission reductions were found to conform to the project design and monitoring plan which ensured a high level of data reliability.

5 VALIDATION AND VERIFICATION CONCLUSION

Kanaka Management Services Private Limited (KMS) has contracted EPIC Sustainability Services Private Limited (EPIC) to perform the validation and verification under the VCS standard. The assessment covered the scope of the validation of the project design and verification of implementation status achieved for the project titled “sustainable agricultural practices for carbon sequestration by organic and natural faming groups”

The validation and verification was based on the Joint project description – Monitoring report (PD-MR), and other supporting documents submitted to the assessment team by the client. The assessment criteria was based on the requirements in VCS Standard v4.3, the applied GHG methodology “VCS

methodology VM0017 “Adoption of Sustainable Agricultural Land Management”, v1.0” and its associated tools.

The project activity is a agricultural land management, eligible under the Agriculture, Forestry and Other Land Use Scope in VERRA scheme located in the Karnataka state, India. The project aims to engage and support farming communities / farmers in the promotion of organic fertilizers, conserve the natural farming, protection of soil through various soil improvement practices viz., , use of organic manure, plant residue mulching and agroforestry. The proposed project is estimated to generate approximately 5,141,971 tCO2e over the crediting period of 30 years, and an average of 171,399 tCO2e per year.

On the basis of the physical site inspection of the project activities and review of the documents submitted by the project participant, the assessment team confirms with a reasonable degree of assurance that the project design and monitoring plan conforms with the VCS requirements and the GHG reductions are effectively monitored. In conclusion, it is EPIC’s opinion that the VCS project “Sustainable agricultural practices for carbon sequestration by organic and natural farming groups” meets all relevant requirements established by the VCS Standard 4.3, applicable Methodology (VM0017), associated tools and modules.

The verification of the GHG emission reductions was based on the validated PD, the baseline and monitoring methodology, validation reports, emission reduction spread sheets and other supporting documents made available to the EPIC verification team by the Project Proponent. The Project Proponent management team is responsible for the preparation and reporting of GHG emissions data, and the reported GHG emission reductions based on the project monitoring plan. For this verification period from 01st October 2017 to 30th September 2022, the project has generated ex-post net anthropogenic emission reductions of 11,07,315 tC02e. After applying the buffer of 10%, the tradable VCUs have been calculated as 996, 584 tC02e for the current monitoring period.

It is the responsibility of the EPIC verification team to express an independent GHG verification opinion on the reported GHG emissions from the project for the monitoring period, from 1st October 2017 to 30th September 2022, and on the calculation of GHG emission reductions from the project based on the verified emissions for the same period.

EPIC concludes, with a reasonable level of assurance that the net anthropogenic GHG removals of the “Sustainable agricultural practices for carbon sequestration by organic and natural farming groups” are fairly stated in the Joint PD-MR (version1.7), dated 09th August 2025. The net anthropogenic GHG removals have been calculated correctly on the basis of the approved baseline and monitoring methodology and the monitoring plan contained in the validated PD.

Verification period: From 01-October-2017 to 30-September-2022

Verified GHG emission reductions and removals for the current verification period is as summarised below:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	NPRR Buffer %	Buffer pool allocation	VCUs eligible for Issuance
1st Oct 2017	9,767	1,065	0	8,701	10%	870	7,831
2018	27,347	1,577	0	25,770	10%	2,577	23,193
2019	21,425	-2,26,429	0	2,47,854	10%	24,785	2,23,068
2020	17,580	-2,30,165	0	2,47,745	10%	24,774	2,22,970
2021	11,720	-2,33,623	0	2,45,343	10%	24,534	2,20,809
30th Sep 2022	19,177	-3,12,725	0	3,31,902	10%	33,190	2,98,712
Total	**1,07,016**	**-10,00,299**	**0**	**11,07,315**		**1,10,732**	**9,96,584**

APPENDIX 01: RESOLUTION OF FINDINGS CAR'S AND CL'S

LIST OF CLARIFICATION REQUESTS

CL ID	01	**Section no.**	1.11of PD-MR	**Date:** 18/07/2022
Description of CL				
Section 1.11 Clarify, How the project activity encourage the Agroforestry activities				
Project participant response				**Date:** 04/08/2022
1. Agroforestry is sustainable land-use system that maintains and/or increases the total yields by combing food crops (annuals) with tree crops (fruits or perennials) and livestock on the same unit of land. It's a best community cultural, social practice of the local people with economic and ecological benefits. 2. In the said project area, ALLEY CROPPING system is adopted along with agricultural and horticultural crops. 3. Helps soil fertility replenishment, land regeneration, food security, conserve local biodiversity, anticipate local climate change issues, and prevent soil erosion. 4. Helps in maintaining the cycle such as nitrogen cycle and carbon cycle etc., 5. Conserve energy 6. Increase the SOC, Nutrient cycling and increases livelihood				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022
The response by PP has been verified by means of the site interviews and review of relevant information has been done to conclude that the finding is adequately addressed. CL 01 is closed.				

CL ID	02	**Section no.**	2.3 of PD-MR	**Date:** 18/07/2022
Description of CL				
The project proponent did not identify any significant risk or impact to any local stakeholders' property rights or natural resources, as was stated in Section 2.3. Please clarify on the minor risks that the VGS project team has identified.				
Project participant response				**Date:** 04/08/2022

The following risks / barriers have been identified and discussed during the on-going meetings with farmer associations:

1. Production Risks : Many of the organic farmers or with natural land management practices, noted that weather and climatic risks are similar for organic and conventional farmers
2. Others pointed out that any farmer without irrigation faces the risk of drought, but that organic farmers' investment in soil quality allows their soils to hold water and withstand drought better than those of their conventional counterparts.
3. While diseases, insects and, especially, weeds can cause problems for organic farmers, in meetings most said that though farmers use best practices to prevent pest problems from developing and to reduce risks from pests, still few problems are observed such as reduced in yield for first three year in the land conversion period. But by crop diversification, such risks can be minimised.
4. Other barriers faced by organic farmers are:
5. Input Risks. Organic farmers on many occasion face shortages of certified organic seeds, biological pesticides, specialized farm equipment designed for organic cultural practices and other inputs
6. The access to capital is a risk for organic farmers because banks are unfamiliar with organic production systems and have difficulty evaluating credit-worthiness. As a result, the flow of credit to organic producers is limited and can be difficult to obtain.
7. Organic Marketplace Risks. The Price premiums are less stable and are dropping in some cases

The same is updated in section 2.3 of the PD-MR

Documentation provided by project participant	
Updated PD-MR	
DOE assessment	**Date:** 06.08.2022
The response by PP has been verified by means of the site interviews and review of relevant information has been done to conclude that the finding is adequately addressed. Hence the CL 02 is closed.	

CL ID	03	**Section no.**	4.4 of PD-MR	**Date:** 18/07/2022
Description of CL				
Section 4.4 Please clarify, how it is ensured that net GHG emission reductions and are relevant to the carbon accounting pools considered.				
Project participant response				**Date:** 20/09/2022
The PD-MR and the monitoring sheets have assessed the relevant parameters based on the methodology requirements, Appropriate conservative values have been applied in the estimations to ensure that the emission reductions are quantifiable and are accurate and reflect the carbon pools considered.				
Documentation provided by project participant				
Updated PD-MR and monitoring sheets				
DOE assessment				**Date:** 26/09/2022
The response by PP has been verified by means of the review of relevant information such as monitoring sheets and ER calculation sheets to conclude that the finding is adequately addressed. CL 03 is closed.				

CL ID	04	Section no.	1.11 of PD-MR	Date: 18/07/2022
Description of CL				
Section 1.11. Clarify on how the farmers are participating in the project and mention the role of Vedic green solutions and other entity involved in the project.				
Project participant response				**Date:** 04/08/2022
VGS, in association with NGOs, Co-operatives, and Farmers Groups since from 2017 aimed to promote organic/natural agriculture and Agro-Forestry in the State of Karnataka. VGS taken following activities to meet its objectives 1. Helped to farmers groups to adopt organic standards 2. Training and awareness programs on organic & natural farming methods both (physical and virtual)AV, classroom and field based training 3. Best Agricultural Practices and Development of Crop Based Package of Practices 4. Recommend the organic fertilizers used for cropping patterns 5. Periodic conduct periodic Soil Testing camps 6. Assist in Preparation of Farmyard manure and vermicomposting and liquid fertilizers 7. Preparation and distribution of pamphlets and awareness information. 8. Field demonstration & marketing support for organic produce, 9. Helped farmers groups to setting up agri processing units across Karnataka 10. VGS also trained many ICS field officers, ICS field managers to successfully implementation of organic projects in all districts 11. Distribution of tree saplings and Monitoring of Agroforestry by VGS staff				
Documentation provided by project participant				
NA				
DOE assessment				**Date:** 11/08/2022
The response by PP has been verified by means of the site interviews and review of relevant information has been done to conclude that the finding is adequately addressed. CL 04 is closed.				

CL ID	05	Section no.	3.5 of PD-MR	Date: 18/07/2022
Description of CL				
Sections 3.5. How the project has assessed that the common practice test is adequately addressed. Please clarify.				
Project participant response				**Date:** 17/09/2022
In state of Karnataka, the project is the first to involve organic farmers associations in carbon credit related projects. The proposed SALM Project activity is the first of its kind in the region of Karnataka to propose carbon credits. Hence as it is not a common practice, and it is additional. The survey of the GHG programs adopting SALM practices has been conducted and it is established that at the start date of the project such a similar project did not exist in the region (Karnataka). From the existing database of registered projects under the VM0017 it was checked that one other project is registered under VCS in India but it is in different state (Maharashtra). However as it not common for the project to be implemented without carbon credits the project passes the common practice test. The detailed description is provided to the VVB in the updated PD-MR.				
Documentation provided by project participant				

Updated PD-MR
DOE assessment **Date:** 21/09/2022
The response by PP has been verified by means of the review of relevant information such as information in the joint PD-MR and publicly available information to conclude that the finding is adequately addressed. CL 05 is closed.

CL ID	06	**Section no.**	4.4 of PD-MR	**Date:** 18/07/2022
Description of CL				
Section 4.4 Please clarify, whether the estimated baseline emissions or removals and estimated leakage emissions are considered				
Project participant response				**Date:** 04/08/2022
The baseline emissions or removals and project emissions or removals are estimated now.				
Documentation provided by project participant				
Updated PD-MR and calculation sheets				
DOE assessment				**Date:** 11/08/2022
The response by PP has been verified by means of the review of relevant information such as PD_MR, monitoring sheets and ER calculation sheets to conclude that the finding is adequately addressed. CL 06 is closed.				

CL ID	07	**Section no.**	3.3 of PD-MR	**Date:** 18/07/2022
Description of CL				
The monitoring of data w.r.t trees in farm boundaries is not clearly mentioned in the PD-MR				
Project participant response				**Date:** 04/08/2022
As a part of organic farming methods, Each member has a buffer zone for the Agroforestry; they plant trees in buffer zone for various benefits as described earlier. VGS helps in the distribution of fruits bearing plants, shade plants etc. Every year the farmer plants 8- 10 trees. VGS field staff or the field officer who monitors the farm diary, periodically measures the tree growth by recording the DBH values and age of trees, tree species etc. The monitoring section is updated with details of the tree monitoring data, which is in accordance with the CDM tool.				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022
The response by PP has been verified by means of the review of relevant information such as PD_MR, monitoring sheets and ER calculation sheets to conclude that the finding is adequately addressed. CL 07 is closed.				

CL ID	08	Section no.	5 of PD-MR	Date: 18/07/2022
Description of CL				
Source of Data collection from the farm as observed from the source documents for some parameters (price of inorganic fertilizer, fossil fuel consumed in vehicle or equipment recorded by vehicle and fuel type) as mentioned in the PD-MR are not matching with the field observations.				
Project participant response				Date: 04/08/2022
Price of inorganic fertilizer is monitored by use of the market survey and interview of farmers and is recorded annually. Fossil fuel consumption and use of fuel type (Diesel) to run the farm equipment is also recorded by VGS field staff and reported annually. The same is updated in the PD-MR.				
Documentation provided by project participant				
Updated PD-MR.				
DOE assessment				Date: 11/08/2022
The response by PP has been verified by means of the review of relevant information such as PD_MR, monitoring sheets and ER calculation sheets to conclude that the finding is adequately addressed. CL 08 is closed.				

CL ID	09	Section no.	5 of PD-MR	Date: 18/07/2022
Description of CL				
Based on the interview it was observed that some of the farmers are not continuously practicing organic farming. Please clarify on drop rate of organic farmers (1st October 2017 to 31st December 2021).				
Project participant response				Date: 04/08/2022
The data from the farmer associations indicate that the average drop rate was 3% at the project start date. However in future this is balanced by the expected joining rate of 3-4 %. Hence considering this, the number of farmers has been considered for this monitoring period.				
Documentation provided by project participant				
NA				
DOE assessment				Date: 11/08/2022
The response by PP has been verified by means of the review of relevant information such as interviews with farmers, PD_MR, monitoring sheets and ER calculation sheets to conclude that the finding is adequately addressed. CL 09 is closed.				

CL ID	10	Section no.	3.1 of PD-MR	Date: 18/07/2023
Description of CL				
Based of the KML file submitted for the project area, clarify on the changes to the planted area.				
Project participant response				Date: 12/09/2023

PP response

The analysis of historical images going back more than 10 years using satellite data was undertaken to assess the cropping pattern in the paddy growing areas which had been included in the project activity. It was observed that paddy crop identified in the baseline scenario remains as paddy crop in around 3412 ha for around 1430 farmers as summarised below. In these cropping systems, there are no activities that drain the paddy field to be converted to other land uses. Following the normal crop cycle practised in the region, there is a brief period where the cultivable land is kept fallow or green manure crops (which are ploughed back in the soil) are grown, allowing the farmer to revert to the cultivation of paddy crop according to the season. For the other area of 4933.95 ha covering 2310 farmers the above requirements could not be conclusively established. Hence these areas have now been removed and the updated KML file and calculations are submitted to the VVB for an eligible area of 65066 ha comprising 30,204 farmers.

Crop System under Paddy – Fallow – Paddy is 2707.66 ha covering 1188 farmers

Crop System under Paddy – Green manure crop – Paddy is 704.56 ha covering 242 farmers.

Paddy – Fallow- Other crop – 4933.95 ha covering 2310 farmers.

Documentation provided by project participant	
PD-MR, monitoring sheets	
DOE assessment	**Date:** 19/09/2023
The response by PP has been verified by means of the review of relevant information such as interviews with farmers, field visit to the farm areas and through review of PD_MR, monitoring sheets and ER calculation sheets to conclude that the finding is adequately addressed. The explanation provided for the removal of farm area where it could not be conclusively established that the requirement is met, is accepted by the audit team. CL 10 is closed.	

LIST OF CORRECTIVE ACTION REQUESTS

CAR ID	01	**Section no.**	1.4 of PD-MR	**Date:** 18/07/2022
Description of CAR				
Section 1.4 Describe about each eligibility criteria viz., applicability of the methodologies, additionality, classification of land cover types, baseline scenario establishment, quantification of GHG emission and monitoring of GHG removals.				
Project participant response				**Date:** 04/08/2022
The description is provided in the updated PD-MR				
Documentation provided by project participant				
Updated PD-MR				

DOE assessment	Date: 11/08/2022
Under section 1.4 of the joint PD-MR, PP described about the eligibility criteria and the information is updated. CAR 01 is closed.	

CAR ID	02	Section no.	1.11 of PD-MR	Date: 18/07/2022
Description of CAR				
Section 1.11 Describe the project activity or activities (including the technologies or measures employed) and how it/they will achieve net GHG emission reductions or removals.				
Project participant response				Date: 04/08/2022
Section 1.11 is updated to address the query.				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				Date: 11/08/2022
Under section 1.11 of the joint PD-MR, PP described about measures (viz., use of organic fertilizer, sequestration by Agroforestry, and avoidance of chemical fertilizer) taken to achieve the net GHG emission reductions or removals. CAR 02 is closed.				

CAR ID	03	Section no.	1.12 of PD-MR	Date: 18/07/2022
Description of CAR				
Section 1.12 describe about ownership as per VCS standard v.4.3 (section 3.10).				
Project participant response				Date: 04/08/2022
Section 1.7 of the PD-MR is updated with the details of the land ownership and project ownership. The relevant legal and ownership documents are submitted.				
Documentation provided by project participant				
Project ownership documents (Agreement of VGS with farmer associations for 70,000 hectares) submitted. Updated PD-MR				
DOE assessment				Date: 11/08/2022
Under section 1.12 of the joint PDMR the information is updated. And also the audit reviewed agreement of VGS (Vedic Green Solutions) with farmer associations for 70,000ha. CAR 03 is closed.				

CAR ID	04	Section no.	1.14 of PD-MR	Date: 18/07/2022
Description of CAR				
Section 1.14 Describe how the project activity is compliance with Laws, Statutes and Other Regulatory Frameworks as per the VCS joint PDMR template v.4.1				
Project participant response				**Date:** 04/08/2022
Section 1.14 of the PD-MR is updated with the relevant applicable laws.				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022
Under section 1.14 of the joint PD-MR, PP described the project activity is compliance with laws and other regulatory frameworks. CAR 04 is closed.				

CAR ID	05	Section no.	1.17.1 of PD-MR	Date: 18/07/2022
Description of CAR				
Section 1.17.1 Quantify how the proposed project activity is contributing to sustainable development goals per VCS joint PDMR template 4.1.				
Project participant response				**Date:** 04/08/2022
The details of how the project meets the SDG goals, 1, , 13 and 15 are described in the section 1.17.1 of the PD-MR.				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022
Under section 1.17.1 of the joint PD-MR the SDG's viz., SDG 01, SDG 13 and SDG 15 are quantified as per the VCS joint PD-MR template and the information is updated. CAR 05 is closed.				

CAR ID	06	Section no.	2.2 of PD-MR	Date: 18/07/2022
Description of CAR				
Section 2.2. Demonstrate how the project will communicate the following: 1) The project design and implementation, including the results of monitoring. 2) The risks, costs and benefits the project may bring to local stakeholders. 3) All relevant laws and regulations covering workers' rights in the host country.				

Project participant response	Date: 04/08/2022
The details are updated in the section 2.2 of the joint PD_MR. The samples of the employment letter of VGS field staff are submitted.	
Documentation provided by project participant	
Updated PD-MR	
DOE assessment	**Date:** 11/08/2022
Under section 2.2 the information are updated. CAR 06 is closed.	

CAR ID	07	**Section no.**	3.2 of PD-MR	**Date:** 18/07/2022
Description of CAR				
Section 3.2. Please demonstrate the applicability conditions of the tool along with justification.				
Project participant response				**Date:** 04/08/2022
Section 3.2 of the PD-MR is updated.				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022
In section 3.2 justification has been provided pertaining to the applicability conditions of the tool. Hence the CAR 07 is closed.				

CAR ID	08	**Section no.**	3.4 of PD-MR	**Date:** 18/07/2022
Description of CAR				
Section 3.4. Explain barriers that are considered in demonstration of additionality				
Project participant response				**Date:** 04/08/2022
Section 3.4 of the PD_MR is updated to address the query				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022
In section 3.4 justification has been provided pertaining to the barriers. Hence the CAR 08 is closed.				

CAR ID	09	**Section no.**	4.2 of PD-MR	**Date:** 18/07/2022
Description of CAR				

Section 4.2. Describe the project emissions as per applied methodology with all relevant equations along with the default values used (refer joint PDMR template v.4.1).
Project participant response **Date:** 04/08/2022
Section 4.2 is updated as per the applied methodology
Documentation provided by project participant
Updated PDMR
DOE assessment **Date:** 11/08/2022
The section 4.2 is described as per joint PDMR template v.4.1. Hence, CAR 09 is closed.

CAR ID	10	**Section no.**	5.3 of PD-MR	**Date:** 18/07/2022
Description of CAR				
Section 5.3 Please describe as per the Joint PDMR template v.4.1 on following aspects viz., 1) the policies used for oversight and accountability of monitoring activities 2) the procedures used for internal auditing and QA/QC. 3) the procedures used for handling any internal auditing performed and any non-conformances identified and 4) the implementation of sampling approaches, including target precision levels, samples sizes, sample site locations, stratification, frequency of measurement and QA/QC procedures. Where applicable, demonstrate whether the required confidence level or precision has been met.				
Project participant response				**Date:** 04/08/2022
Section 5.3 of the PD-MR is updated with the relevant information				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022
The section 5.3 is described as per joint PDMR template v.4.1. Hence, CAR 10 is closed.				

CAR ID	11	**Section no.**	6.5 of PD-MR	**Date:** 18/07/2022
Description of CAR				
Section 6.5 The table is not matching as per the joint PDMR template v.4.1. Please correct it.				
Project participant response				**Date:** 04/08/2022
The table in section 6.5 is now updated.				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022

The section 6.5 table is updated as per VCS joint PDMR template v.4.1. Hence the CAR 11 is closed.

CAR ID	12	**Section no.**	1.17, 1.18, 2.4 and 6.4 of PD-MR	**Date:** 18.07.2022
Description of CAR				
Update the sections 1.17, 1.18, 2.4, and 6.4 as per VCS joint PDMR template 4.1 and VCS standard v.4.3				
Project participant response				**Date:** 04/08/2022
The relevant sections of the PD-MR are now updated				
Documentation provided by project participant				
Updated PD-MR				
DOE assessment				**Date:** 11/08/2022
The sections viz., 1.17, 1.18, 2.4 and 6.4 are updated as per the VCS joint PDMR template v.4.1 and VCS standard v.4.3. Hence the CAR 12 is closed.				

CAR ID	13	**Section no.**	Verra review comments	**Date:** 22/02/2023
Description of CAR				
PP to address the review comments raised by VERRA				
Project participant response				**Date:** 14/10/2023
The comments are addressed in the updated PD ver 1.4 and excel spreadsheets				
Documentation provided by project participant				
Updated PD-MR and spreadsheet				
DOE assessment				**Date:** 26/10/2023
The updated PD and the supporting excel sheet is verified to be addressing the issues raised by VERRA. CAR 13 is closed				

FAR from this Verification

FAR ID	01	**Section no.**	Section 5.3 of the PD-MR	**Date: 26-06-2024**
Description of FAR				

Verra raised a finding on the sampling design per the CDM's General Guidelines for Sampling and Surveys for Small-Scale CDM Project Activities, and the data/parameters monitored as part of the Activity Baseline and Monitoring Survey (ABMS) for Roth-C model application. The PP monitored the entire project area for interventions like fertilizer application and agroforestry. However, as per sections IV.1.1b and IV.2.4 of the applied methodology, the PP needs to use proper sampling standards to monitor the data/parameters for monitoring purposes. The EPIC audit team is raising a FAR for the next verifier to check whether the PP has defined the proper sampling criteria for the monitoring of data from the next monitoring period.

Project participant response	**Date:**
Documentation provided by project participant	
VVB assessment	**Date:**

LIST OF INFORMATION REQUEST (IR)

IR	01	Section no.	-	Date: 18/07/2022
Description of IR				
The following documents are requested to be submitted: 1. Document to support start date of the project. 2. Undertaking for no double counting. 3. GPS coordinates and KML file of the project boundary 4. Organizational setup flowchart of the project activity 5. Non-permanence risk tool. 6. Agreement with farmers for project participation and proof of credits ownership and sharing. (70,000 hectares) 7. ER sheet calculation spread sheet along with source documents / data sheets for verification period. 8. Feedback forms pertaining to LSC meeting and ongoing LSC details for the verification period. 9. Evidence of that the land is cropland and/ grassland as per methodology. 10. Evidence on the project area under cultivation over previous years as per methodology. 11. Monitoring data sheets for the verification period. 12. Evidence related to first of its kind established by additionality analysis. 13. Standard operational procedure for collection of data for soil organic carbon estimation. 14. Employment contract details by the project activity. 15. Proof of on-going trainings registers. 16. Sample Farm diaries 17. Non_permanance risk report				
Project participant response				Date: 04/08/2022

The following documents are submitted:

1. Document to support start date of the project.
2. Undertaking for no double counting.
3. GPS coordinates and KML file of the project boundary
4. Organizational setup flowchart of the project activity
5. Non-permanence risk tool.
6. Agreement with farmers for project participation and proof of credits ownership and sharing. (70,000 hectares)
7. ER sheet calculation spread sheet along with source documents / data sheets for verification period.
8. Feedback forms pertaining to LSC meeting and ongoing LSC details for the verification period.
9. Evidence of that the land is cropland and/ grassland as per methodology.
10. Evidence on the project area under cultivation over previous years as per methodology.
11. Monitoring data sheets for the verification period.
12. Evidence related to first of its kind established by additionality analysis.
13. Standard operational procedure for collection of data for soil organic carbon estimation.
14. Employment contract details by the project activity.
15. Proof of on-going trainings registers.
16. Sample Farm diaries
17. Non_permanance risk report

Documentation provided by project participant
1. Document to support start date of the project. 2. Undertaking for no double counting. 3. GPS coordinates and KML file of the project boundary 4. Organizational setup flowchart of the project activity 5. Non-permanence risk tool. 6. Agreement with farmers for project participation and proof of credits ownership and sharing. (70,000 hectares) 7. ER sheet calculation spread sheet along with source documents / data sheets for verification period. 8. Feedback forms pertaining to LSC meeting and ongoing LSC details for the verification period. 9. Evidence of that the land is cropland and/ grassland as per methodology. 10. Evidence on the project area under cultivation over previous years as per methodology. 11. Monitoring data sheets for the verification period. 12. Evidence related to first of its kind established by additionality analysis. 13. Standard operational procedure for collection of data for soil organic carbon estimation. 14. Employment contract details by the project activity. 15. Proof of on-going trainings registers. 16. Sample Farm diaries 17. Non_permanance risk report
DOE assessment | **Date:** 11/08/2022

The document(s) submitted has been verified and review has been done to conclude that the requirement is adequately addressed. IR 01 is closed.

APPENDIX 02: LIST OF DOCUMENTS REVIEWED

Sl. No.	Particulars
1.	VCS Standard v.4.3
2.	3115_PD-MR_V 1.7 Clean
3.	Chikkamunavalli farmer agreement.pdf
4.	Devarshigihalli farmer agreement.pdf
5.	Doori farmer agreement.pdf
6.	Farmer Agrement Chikkamangaluru.pdf
7.	Itagi farmer agreement.pdf
8.	Neginahal farmer agreement.pdf
9.	Kogilgere_Darward_Farmers RTC.pdf
10.	PreviewRTC_BB KUMAR_CHIKKAMANGALU_SUGKS.pdf
11.	PreviewRTC_BD BASAVEGOWDA_CHIKKAMANGALU_SUGKS.pdf
12.	PreviewRTC_CHIKKEGOWDA_CHIKKAMANGALU_SUGKS.pdf
13.	RTC KHATA_Deversignahalli.pdf
14.	Amboli_Darward_Farmers RTC.pdf
15.	BHOMI-RTC_JOSHI DATTATRAY GURUNATH_CHIKKAMUNOLI.pdf
16.	Ittagi Farmers RC Khata_Belguam1.pdf
17.	Ittagi Farmers RC Khata_Belguam2.pdf
18.	Internal Inspection Report_Kharif.pdf
19.	Internal Inspection Report_Rabi.pdf
20.	VGS SSOCP Agreement_Final_5th Oct 2017_Deversiganahalli.pdf
21.	VGS SSOCP Agreement_Final_10th Oct 2017_Dori.pdf
22.	VGS SSOCP Agreement_Final_10th Oct 2017_Ittagi.pdf
23.	VGS_Bhoomi_SSOCP_signed agreement copy.pdf
24.	Annexure-1 Bhoomi Sustainable development.pdf
25.	VGS SSOCP Agreement_Final_1st Oct 2017_Chikkamunovalli.pdf
26.	Location details_D3_GPS_Coordinates.xlsx
27.	Location details_D3_ProjectArea.kml
28.	Farmer diary translated_Kannada_Conversion_Chikkamagalur.xlsx
29.	Farmer diary translated_Kannada_Conversion_Hassan.xlsx
30.	Monitoring_D10&11 baseline data.docx
31.	Monitoring_D15 SOP for SOC.docx
32.	Monitoring_Fertiliser Prices_2011 to 2021.xlsx

33.	ABMS Monitoring_Data_V6 (Agroforestry, Fertlizer and SOC, A/R).xlsx
34.	GHG aggregate sheet for claimed emission reductions
35.	Monitoring_Annexed -4 c Updated Farmer Diary.pdf
36.	soil analysis report_MANJUNATH 2-11-2016.pdf
37.	Soil analysis report_MANJUNATH 14-03-2016.pdf
38.	Soil analysis report_MANJUNATH 15-03-2016.pdf
39.	Soil analysis report_VARIJA 05-03-2016.pdf
40.	Soil analysis report_YCR 02-11-2016.pdf
41.	Soil analysis report_YCR 15-03-2016.pdf
42.	Soil analysis report_YCR 15-3-2016.pdf
43.	Soil analysis report_YCR 16-03-2016.pdf
44.	Soil analysis report_JJ RAMESH.pdf
45.	PP declaration_12. No eviction dispute declaration.docx
46.	PP declaration_13. VCS Declaration_no_double_counting.doc
47.	Regulations & Policies_3115_Policies_related_to_OrganicFarming.pdf
48.	Regulations & Policies_National Agroforestry Policy 2014.pdf
49.	Regulations & Policies_Organic-Policy-Book-English-Final.pdf
50.	Stakeholder meeting_Organic-Policy-Book-English-Final.pdf
51.	Stakeholder meeting_Example of Meeting Notice.pdf
52.	Stakeholder meeting_LSC meeting VGS.docx
53.	Training Shedual 2022_ICS_Belgaum & Darward.pdf
54.	Training_Training, agro-forestry plants, various crops, farmers photographs with captions.docx
55.	Training_Soil Vasu Training Photoes.zip
56.	Farmers Training Devarshigihalli.pdf
57.	Farmers Training Doori.pdf
58.	Farmers Training Itagi.pdf
59.	Farmers Training Neginahal.pdf
60.	ICS Staff Training.pdf
61.	Farmers Training Chikkamunavalli.pdf
62.	Risk report_SALM 1.1 04082022.docx
63.	3115_NPR_ V 1.7 CLEAN VERRA RESUB VCS-Risk-Report-Calculation-Tool-v4.0 SALM REV 2 VERRA resub
64.	Soil Modelling_SOP_V1
65.	3115_Ex_Ante_Ex_Post_Sheet
66.	PRSmax_PRSmin

67.	VM0017-Master ER aggregate 2017 rev 6 VM0017-Master ER aggregate 2018 rev 6 VM0017-Master ER aggregate 2019 rev 6 VM0017-Master ER aggregate 2020 rev 6 VM0017-Master ER aggregate 2021 rev 6 VM0017-Master ER aggregate 2022 rev 6
68.	RothC Model Output
69.	Lab_Reports
70.	Conversion_%OC_SOC

APPENDIX 03: NON PERMANENCE RISK REPORT

Use appendices for supporting information. Delete this appendix (title and instructions) where no appendix is required.

Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating as per PP	VVB Opinion	Method of verification
a)	Species planted (where applicable) associated with more than 25% of the stocks on which GHG credits have previously been issued are not native or proven to be adapted to the same or similar IPCC-climatic zone(s) in which the project is located. This is a project where SALM activities are involved and the crops and trees planted are adapted to the IPCC climatic zones respectively as no exotic species have been planted. Also this is the first monitoring which is verified and there are no GHG credits issued previously.	0	The project titled "Sustainable agricultural practices for carbon sequestration by organic and natural farming groups" involve planting of mostly native species and some non-native species, which are however well adapted to the local conditions. Also PP has removed perceived invasive species such as Eucalyptus and the revised A/R inventory sheets were reviewed. Also there are no GHG credits issued previously . Hence as there is no significant negative impact, the score of 0 is appropriate for this criterion.	Review of Risk report, supporting documents and A/R inventory sheet and onsite inspection
b)	Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued.	Not Applicable as this is the	The onsite visit inspection indicated that the ongoing enforcement of project activity such as creating awareness on	Onsite inspection, joint PD&MR and risk report

	The land is legally owned by the farmers. Hence there is not risk of encroachment.	validation and first verifcation	soil health and crop residue management, has been implemented for this verification period. The EPIC audit team confirmed through interviews during onsite visit that the farm land is legally owned by the farmers. Hence there is no incidences of encroachment were reported for the verification period which indicates the effectiveness of the SALM practices.	
c)	Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (ie, any area of required experience is not covered by at least one individual with at least 5 years' experience in the area). The management team has sufficient experience and necessary skills for the execution of the project. The CV of the management team is submitted to VVB to evidence this.	0	It was verified during the onsite visit that the project developers (KMSPL) and Vedic Green Solutions (VGS) have a minimum experience of five years in AFOLU sector projects. Further, the audit team reviewed the CVs of the management team and verified the same. Hence the experience and skills of the personnel are considered as sufficient to meet the criteria.	Onsite inspection, PD-MR, review of the personnel information submitted (CV of the management team).
d)	Management team does not maintain a presence in the country or is located more than a day of travel from the project site, considering all parcels or polygons in the project area.	0	It was verified that the full time professional staff and field officers, are located at each district and have adequate access to the project areas. The	Onsite inspection, PD-MR, review of personnel information submitted.

	The project has deployed field staff, field manager at each district level.		EPIC audit team interviewed farmers during onsite visit and confirmed that the project staff are available for the famers to discuss their concerns.	
e)	**Mitigation:** Management team includes individuals with significant experience Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting (eg, individuals who have successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs. The management team has sufficient experience and necessary skills for the execution of the project. The CV of the management team is submitted to VVB to evidence this.	-2	It was verified during the onsite visit that both management team and consulting teams has minimum experience of a in AFOLU projects. Hence the experience and skills of the personnel are considered as sufficient to meet the criteria.	Onsite inspection, PD-MR, review of personnel information submitted (CV of the management team).
f)	**Mitigation:** Adaptive management plan in place The management team has developed an adaptive management plan and it is presented to VVB.	-2	Adaptive management plan in place as verified from the Joint PD&MR submitted by PP. This plan focusses on capacity building of the farmers to be prepared for the severe climatic events which are foreseen. The SALM practices are of help in mitigating these future risks.	Through site visit and interviews. Review of documents submitted. The score assigned is acceptable.
Total Project Management [a + b + c + d + e + f]		-4	Risk rating perceived is appropriate in this section considering all applicable criteria.	Applicable as above.

Financial Viability				
Q	How many years does it take for the cumulative cashflow to break even? Not applicable	NA		
Q	What percentage of funding is needed to cover the total cash out before the project breaks even has been secured? Not applicable	0	NA	NA
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment Not applicable	0	NA	NA
b)	Project cash flow breakeven point is between 7 and up to less than 10 years from the current risk assessment Not applicable	0	NA	NA
c)	Project cash flow breakeven point between 4 and up to less than 7 years from the current risk assessment The financial analysis which indicates the cash flow break-even point has been submitted to the VVB. This indicates a breakeven point of 6 years.	1	According to the financial analysis, the project cash flow break-even point is at 6 years. The EPIC audit team reviewed the financial analysis document where the project demonstrated the cash inflows and outflows for the project, confirming that the project achieved break even in the 6th year. Hence the risk score is deemed appropriate.	Through document review of cash flow spread sheet. The score assigned is acceptable.
d)	Project cash flow breakeven point is less than 4 years from the current risk assessment	0	NA	NA

	Not applicable			
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven Not applicable	0	NA	NA
f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven Not applicable	0	NA	NA
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven Not applicable	0	NA	NA
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven More than 80% of funds are secured and the project has also applied for bank loan. The financial sheet is submitted to the VVB.	0	The project currently secured 80 % or more funding needed to cover the total cash out before the project reaches breakeven, therefore the most appropriate conservative score of 1 was applied at this risk rating. The EPIC audit team reviewed the financial sheet provided by the PP and confirmed that the project secured more than 80% of funds before the break even. Hence the risk score applied is appropriate.	Review of financial analysis of the project

i)	Mitigation: Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven The project has demonstrated lines of credit which are accessible by bank loans and has availability of callable financial resources of more than 50% of total cash out before project reached breakeven point in 6 years.	-2	The project has demonstrated lines of credit which are accessible by bank loans. This indicates that more than 50% callable financial resources exist before the 6 years breakeven period	Through document review of bank loan document the score assigned is acceptable.
Total Financial Viability [(a, b, c or d) + (e, f, g or h) + i]		0	Risk rating perceived is appropriate in this section considering all applicable criteria.	Applicable as above.
Note: When a risk factor does not apply to the project, the score shall be zero for such fact				
Opportunity Cost				
a)	NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated Not applicable	0	NA	NA
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to100% more than from project activities Not applicable	0	NA	NA
c)	NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than from project activities	0	NA	NA

	Not applicable			
d)	NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated Where the majority of baseline activities over the length of the project crediting period are subsistence-driven (in this case subsistence farming), an NPV analysis is not required, but an assessment of the net impacts of the project on the social and economic well-being of the communities who derive livelihoods from the project area shall be undertaken. Based on this assessment, the project shall be assigned an opportunity cost score of zero is assigned	0	Baseline activities in the project area are subsistence driven i., subsistence agriculture. The SALM practices does not displace any activities, it aims to improve the existing practices to make it more productive and sustainable. According to the NPR tool V4.0, where the majority of baseline activities over the length of the project crediting period are subsistence-driven, an NPV analysis is not required, but an assessment of the net impacts of the project on the social and economic well-being of the communities who derive livelihoods from the project area is required. Given the nature of the project and onsite assessment, the EPIC audit team confirmed that the project is not negatively impacting on socio economic well-being of the community people. Hence the risk rating assigned is acceptable.	. Site inspection and interviews with farmers

e)	NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity Not applicable	0	NA	NA
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity Not applicable	0	NA	NA
g)	Mitigation: Project proponent is a private limited company. Not applicable	0	NA	NA
h)	Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over the length of the project crediting period (see project longevity) The Project is protected by legally binding commitment from the landowner to continue management practices that protect the credited carbon stocks over the length of the project crediting period of 30 years. The agreement with the farmer associations mentions the validity of 40 years which extends beyond the crediting period.	--2	The project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over the length of the project crediting period i.e 30 years, this is reviewed and checked using the document provided (VGS agreement with farmer associations). Further the agreement is valid for 40 years, which extends beyond the crediting period. Hence the risk score is appropriate.	Agreement with the farmers, site inspection and interviews with farmers
i)	Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over at least 100 years (see project longevity)	0	NA	NA

	Not applicable			
	Total Opportunity Cost [(a, b, c, d, e or f) + (g + h or i)]	-2	Risk rating perceived is appropriate in this section considering all applicable criteria.	Applicable as above.
Note: When a risk factor does not apply to the project, the score shall be zero for such factor				
Project Longevity				
a)	Without legal agreement or requirement to continue the management practice As the project has a valid legal agreement in place to continue the management practice, this is not applicable. The Project is protected by legally binding commitment for a period of 40 years from the landowner to continue management practices that protect the credited carbon stocks which is beyond the length of the project crediting period (30 years)	0	The project is protected by legally binding commitment for 40 years to continue management practices that protect the credited carbon stocks beyond the length of the project crediting period i.e 30 years, This is reviewed and checked using the document provided (VGS agreement with farmer associations).	Agreement with the farmers, site inspection and interviews with farmers
b)	With legal agreement or requirement to continue the management practice The Project is protected by legally binding commitment from the landowner to continue management practices that protect the credited carbon stocks over the length of the project crediting period.	10	It can be realistically assumed that farmers will sustain the adopted SALM and agroforestry practices in the project area beyond project crediting period since doing so provide sustained livelihoods and environmental benefits i.e. increased crop	Agreement with the farmers, site inspection and interviews with farmers

			yields, and productive farm fields. As the farmers realize the benefits they are unlikely to reverse these practices in the future. This was confirmed during the site visit by audit team. Though, the project has a crediting period of 30 years, the adopted SALM practices will remain adopted and implemented for longer duration. Hence the applied risk score is appropriate.	
	Total Project Longevity	10	Risk rating perceived is appropriate in this section considering all applicable criteria.	Risk rating is accepted.
Note: Total may not be less than zero. Any project with a legally binding agreement that covers at least a 100 year period from the project start date will be assigned a score of zero. Any project with a project longevity of less than 30 years fails the risk assessment				
	Internal Risk			
	Total Internal Risk (PM + FV + OC + PL) = (-4+ 0+ -2+10) Total may not be less than zero.	**4**	Risk rating perceived is appropriate in this section considering all applicable criteria.	Risk rating is accepted.
2. External Risk				

a)	Ownership and resource access/use rights are held by same entity(s) Land is owned by the farmer and the carbon generated is under the control of the PP	0	NA	NA
b)	Ownership and resource access/use rights are held by different entity(s) (eg, land is government owned and the project proponent holds a lease or concession) Land is owned by the farmer and the carbon generated is under the control of the PP	2	The ownership and resource access/use rights area held by different entities. The EPIC audit team conducted interviews with the farmers during the onsite visit and confirmed that the land ownership is with the farmers. Farmers are the legal landowners. VGS made an agreement with the farmers to implement the project and in the agreement, it is clearly mentioned that the resource access rights such as carbon rights of the project are under the control of PP. The EPIC audit team reviewed the farmer agreements and concluded that the applied risk score is appropriate.	Review of agreement with the farmers, interviews with the farmers and site inspection
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership The Project area is legally owned private land. The land ownership documents are provided to the VVB. Hence not applicable.	0	The project area is legally owned by the farmers, hence there are no existing disputes over land ownership. Further, declaration is provided by the	NA

			PP to this effect applicable for this monitoring period.	
d)	There exist disputes over access/use rights (or overlapping rights) Villagers living within the Project's Boundary do so only on the Leakage Management Area (LMA). No villagers occupy the project area. Hence not applicable.	0	The project area is legally owned by the farmers, hence there are no existing disputes over access/use rights. . Further, declaration is provided by the PP to this effect applicable for this monitoring period.	NA
e)	WRC projects unable to demonstrate that potential upstream and sea impacts that could undermine issued credits in the next 10 years are irrelevant or expected to be insignificant, or that there is a plan in place for effectively mitigating such impacts. Not applicable	0	NA	NA
f)	Mitigation: Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period The Project is protected by legally binding commitment from the landowner to continue management practices that protect the credited carbon stock over the length of the project crediting period.	-2	The Project is protected by legally binding commitment from the landowner to continue management practices that protect the credited carbon stock over the length of the project crediting period. This statement is in accordance with the VGS agreement with farmer associations.	Review of agreement with the farmers, interviews with the farmers and site inspection
g)	Mitigation: Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have	-0	The Project area is legally owned private land with clear land titles verifiable from official land	Review of agreement with the farmers, interviews

	implemented activities to resolve the disputes or clarify overlapping claims		records. No mitigation measures applicable. Further, declaration is provided by the PP to this effect applicable for this monitoring period.	with the farmers and site inspection
Total Land Tenure [(a or b) + c + d + e + f +g)]		0	Risk rating perceived is appropriate in this section considering all applicable criteria.	Risk rating accepted.
Note: When a risk factor does not apply to the project, the score shall be zero for such factor				
Community Engagement				
a)	Less than 50% of the households living within the project area who are reliant on the project area, have been consulted. It is assessed that all the farmers who are part of the farmers associations have been consulted. Hence the score is zero.	0	PP conducted a number of consultations involving farmers, farmer associations, non-government organizations to obtain free prior informed consent to the project. Farmer and Farmer association level consultations involved all villages. Hence a score of Zero is assigned which is acceptable.	Site inspection and interviews with farmers
b)	Less than 20% of the households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted.	0	It is assessed that all the farmers who are part of the farmers' associations have been consulted. Hence not applicable.	Not Applicable

	It is assessed that all the farmers who are part of the farmers associations have been consulted. Hence the score is zero.			
c)	Mitigation: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area. Through the SALM activities it has been demonstrated that net benefits are generated to the farmers.	-5	The project generates the net positive impacts based on the SALM activities on the social and economic well-being of the local communities. The benefit sharing agreement ensures that the farmers get a share of the proceeds from the sale of carbon credits.	Site inspection and interviews with farmers
	Total Community Engagement (CE) [where applicable, (a+b+c)] If a=0, b=0 and c=-5; then CE=-5. Total **may be** less than zero.	-5	Risk rating perceived is appropriate in this section considering all applicable criteria.	The risk rating is accepted.
Political Risk				
Q	What is the country's calculated Governance score?			
a)	Governance score of less than -0.79 Not applicable	0	NA	NA
b)	Governance score of -0.79 to less than -0.32 Not applicable	0	NA	NA
c)	Governance score of -0.32 to less than 0.19	2	The governance score is calculated using The World Bank	

	Average score of all six indicators for the five most recent years (2012-2016) is 0.27 Table has been attached.		Institute Worldwide Governance Indicators, average score of all six indicators for the five most recent years (2012-2016) is considered and the value is -0.27	Governance indices: The World Bank Institute Worldwide Governance Indicators
d)	Governance score of 0.19 to less than 0.82 Not applicable	0	NA	NA
e)	Governance score of 0.82 or higher Not applicable	0	NA	NA
f)	**Mitigation:** India is implementing AFOLU or other activities and has an established DNA under the CDM and has at least one registered CDM A/R project. The sustainable agricultural practices are being encouraged by the Government of India.	-2	India has an established Designated National Authority under the CDM, and at least one registered project under A/R CDM exist. SALM practices are being encouraged by Govt. of India.	The risk rating is accepted.
Total Political [(a, b, c, d or e) + f)]		0	Risk rating perceived is appropriate in this section considering all applicable criteria.	Risk rating accepted.
Note: When a risk factor does not apply to the project, the score shall be zero for such factor				
Total may not be less than zero				
Total External Risk (LT + CE +PC) ((0)+(-5)+0)		**0**	Risk rating perceived is appropriate in this section	Risk rating accepted.

			considering all applicable criteria.	
	Note: Total may not be less than zero			

3 Natural Risk						
Risk Category Factors				Risk Rating	VVB Opinion	Method of verification
a)	Fire (F) Minor (5% to less than 25% loss of carbon stocks) Every 10 to less than 25 years. The farmers maintain the agriculture fields and protect from any major losses due to fire as mitigation.	2	0.5	1.0	There is no natural fire categorized as catastrophic risk in this project area as the fires risk is reduced by the crop mulching activities as applicable for the current verification period	Site visit inspection
b)	Pest and Disease Outbreaks (PD) Minor (5% to less than 25% loss of carbon stocks) Less than every 10 years. The farmers use pesticides to prevent pest and disease outbreaks as mitigation.	5	0.5	2.5	There is no risk of pest and disease outbreak in the project area. In the project area the farmers use bio-pesticides to prevent the pest and disease outbreak.	Site visit inspection and interviews with the farmers

c)	Extreme Weather (W) Minor (5% to less than 25% loss of carbon stocks) Less than every 10 years in the IPCC climatic zones. Sustainable irrigiation practices are followed to avoid high loss due to famine.	5	0.5	2.5	It has been verified that there has been no agriculture crop loss events due to extreme weather in the project area, as applicable for the current verification period.	Site visit inspection and interviews with the farmers.
d)	Geological Risk (G) Insignificant (less than 5% loss of carbon stocks) or transient (full recovery of lost carbon stocks expected within 10 years of any event). Chance of occurrence is very minor. Every 50 - 100 years.	0	1	0	Historical data in the region indicates that risks such as earthquakes, volcanic activity have been identified and their chance of occurrence is every for 50-100 years.	Document review.
e)	Other natural risk (ON1) Not Assessed as not applicable	0	0	0.00	NA	NA
f)	Other natural risk (ON2) Not Assessed as not applicable	0	0	0.00	NA	NA
g)	Other natural risk (ON3) Not Assessed as not applicable	0	0	0.00	NA	NA
Total Natural Risk [F + PD + W + G + ON]				6.0	Risk rating perceived is appropriate in this section considering all applicable criteria	Risk rating is accepted.
Note: When a risk factor does not apply to the project, the score shall be zero for such factor						

	Risk rating is determined by [LS x M]			
	Total Natural Risk (F + PD + W + G + ON)	6.0	Risk rating perceived is appropriate in this section considering all applicable criteria	Risk rating is accepted.
	Note: Total may not be less than zero			
	If the Total Natural Risk is above 35 then the project fails the entire risk analysis			
	STEP 2: OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION			
	Risk Category	Rating		
	a) Internal risk	4		
	b) External risk	0		
	c) Natural Risk	6		
	Overall risk rating (a + b + c)	10	Risk rating perceived is appropriat	Risk rating is accepted.

			e in this section considering all applicable criteria	
	Note: Overall risk rating shall be rounded up to the nearest whole percentage	10		
	The minimum risk rating shall be 10, regardless of the risk rating calculated	10		
	If the overall risk rating is over 60 then the project fails the entire risk analysis			
	Total Risk Assessment	10	Risk rating perceived is appropriate in this section considering all applicable criteria.	Risk rating accepted.

Summary of assessment:

Risk category	Risk rating	Requirements for risk rating
a) Internal risk	4	Note:

b) External risk	0	• Overall risk rating shall be rounded up to the nearest whole percentage. • The minimum risk rating shall be 10, regardless of the risk rating calculated. • If the overall risk rating is over 60 then the project fails the entire risk analysis.
c) Natural risk	6	
Overall risk rating a) + b) + c)	10	
Total risk assessment buffer applicable	10%	VVB assessment: The buffer applied reflects the risk rating as applicable to the project activity and meets the requirements of AFOLU Non-Permanence Risk Tool.
Net emission reductions for this verification (01st October 2017 to 30th September 2022) in tCO_2e	1,107,315	Refer to the certification opinion in the report.
Emission reduction buffer (Buffer Credits) in tCO2e	110,732 for the current monitoring period	
Tradable emission reductions	996,584(tradable VCUs)	

APPENDIX 04: SITE VISIT PHOTOGRAPHS